

EAA

2021 Kiel, 6-11 Sept.

Widening Horizons

Virtual Meeting



EAA
2021 Kiel, 6-11 Sept.
Widening Horizons

ORGANISERS



HOW TO READ THE ABSTRACT BOOK

The Abstract Book is ordered by session numbers which were allocated during the session submission (i.e., the number sequence is discontinuous).

Author's affiliation is stated in brackets following the author's name; where authors share the same affiliation, it is only stated once.

Index of Authors includes all session organisers and only the main authors of contributions.

Please note that names, titles and affiliations are reproduced as submitted by the session organisers and/or authors. Language and wording of titles and abstracts are not revised.

27th EAA Annual Meeting (Kiel Virtual, 2021)

ABSTRACT BOOK

27th EAA Annual Meeting (Kiel Virtual, 2021) - Abstract Book

Technical editing: Kateřina Kleinová (EAA)

Design and layout: Kateřina Kleinová (EAA)

Design cover page: Janine Cordts (Institut für Ur- und Frühgeschichte Universität Kiel)

ISBN: 978-80-907270-8-3

European Association of Archaeologists

Prague, July 2021

© European Association of Archaeologists, 2021

Contents...

5	Understanding Prehistoric Demography	9
16	“Economic Archaeology” and Quantitative Approaches – Measuring the Variations in Production and Consumption from Archaeological Data.....	16
21	Domesticating Time: Temporal Changes in Animals and Plants during the Holocene	20
22	A United Europe of Things 2. Large Scale and Local Networks of Differences and Similarities in Medieval Material Culture	23
34	Scales of Interaction in the Bronze and Iron Age Central Mediterranean	28
35	Human Mobility and Archaeological Thought: Moving forward	32
46	Advancing Skyscape and Landscape Archaeologies: Relations with the Sky. Interactions between Disciplines.....	37
48	Ebb & Flow: Exploring Rivers from Prehistory to the Present Day	43
49	Luxury in Life and Death in the European Iron Age. Identity - Elite Networks - Economy - Arts and Crafts.....	49
57	A Martial World or a Diverse Community? Gender, Social Stratification and Minorities on Castles.....	54
85	Islamic Archaeology in Europe and Beyond: Widening Horizons, Blurring Boundaries. Part 1	57
86	Islamic Archaeology in Europe and Beyond: Widening Horizons, Blurring Boundaries. Part 2	62
87	The Material Culture of Attachment: Social Bonds, Childhood and Emotionally Important Objects	66
94	Decision-making in Archaeological Heritage Management: Moving forward	68
95	Arts in Work: About the Interaction of Soundscapes and Taskscapes in Antiquity	71
97	Redrawing Lines in the Sand: New Archaeological Approaches to Addressing Climate Impacts [CCH].....	75
100	To Gender or not to Gender? Exploring Gender Variations through Time and Space [AGE].....	79
101	On the Shoulders of Prometheus: International Collaboration and the Archaeology of the South Caucasus.....	84
111	Preserving Transformative ‘Palimpsests’: The Role of Digital Heritage and Participative Approaches in Current Urban Archaeology.....	87
114	1200 BC from the Atlantic to Asia: Social Collapse and Resilience in Regional Perspective. Part 1	88
115	1200 BC from the Atlantic to Asia: Social Collapse and Resilience in Regional Perspective. Part 2	93
116	The Archaeology of Magyar Raids in Western and Eastern Europe.....	97
119	On Class, Elitism, and Poverty: Archaeology and Social Class	102
120	What Is “Social” in Social Archaeology? Re-evaluating Social Theory and Its Impact in European Prehistory.....	104
130	BIG-BIO: Opportunities and Challenges of BIG Data with a Focus on BIO-Archaeology.....	107
131	The Place of Queer Theory in Current Archaeological Debates: All T, No Shade? [AGE].....	112
140	Compensation in Architecture and Archaeology - On Compensation as a Concept, Method, and Professional Practice	115
141	Between Bones and Beliefs: Human-Bird Relations in Central and Northern Europe in the 1st Millennium AD.....	119
143	Dendroarchaeology: Wood Science for the Reconstruction of Past Landscapes and Human-Environment Interactions Based on Archaeological and Historical Studies of Wood Remains	123
144	The Ever Changing Coast: Interactions of People, Landscapes and Environment along Europe’s Seas in High-Resolution	128
149	Bioarchaeology of Health, Lifestyle and Social Change in the Later Middle Ages	137
152	Ancient West Asia and Egyptian Soundscapes in Contact	146
153	Archaeology in the Digitocene Age: Discussing Critical Approaches, Onto-Ethics, and Policies of Digital Practices	150
156	Users of Heritage: Critical Appraisal of the Adoption of Citizen Science in Digital Processes of Archaeological Knowledge Production.....	155
164	Constructive Conservation: Making Monuments Useful	157
165	People Power? Past, Present and Future for Public Participation in Archaeological Fieldwork	160
167	Dirty Heritage: Towards an Archaeology of Consumption, Waste and Environmental Change	164
169	Periodicity and Cyclicity in Prehistoric Practice as Seen in Waterlogged Contexts	166
171	The Emergence of Social Inequality in Europe and Southwest Asia: From the Later Upper Palaeolithic to the Early Bronze Age	169
172	Sacrifice & Value: Seeking an Anthropological Archaeology of Sacrifice	175

178	Between Autochthonism, Marxism and Turboslavism: Concepts of Slavs and Slavic Origins Through Space and Time	178	278	Systemic Approaches to Agricultural and Land Use Change in Prehistoric Societies. Part 1	354
179	The Geoarchaeology and Sustainability of Cultivation Terraces and Lynchets in Europe.....	182	279	Living in the Mountains: Settlement Strategies from the Beginning of the Holocene to Modern Times in Southern Europe. Part 2	358
180	Protecting Archaeological Heritage in the Globalisation Era: Trends, Challenges, Solutions [Illicit Trade].....	191	281	Resource Use and Recycling in Urban Ecologies.....	363
188	Beast and Human: Northern Europe, from the Bronze Age to Modern Times.....	193	282	Systemic Approaches to Agricultural and Land Use Change in Prehistoric Societies. Part 2	366
192	Landscapes and the Augustan Revolution: Exploring the Transformation of the Western Provinces between the Republic and the Early Empire.....	197	284	Innovations, Ideology and Interactions - The Narratives of Early Modern Decorated Earthenware	372
202	Ancient Cultural Routes: Past Transportation as a Two-Way Interaction between Society and Environment.....	200	287	Economic and Technological Networks of the Eurasian Steppes	376
204	Are We Really Strategic? Devising and Implementing Archaeological Strategies	206	294	Widening Horizons – Contributing to Communities in a post-Covid-19 World through Increasing Access to Archaeology and Heritage.....	380
205	Lithic Raw Materials in Prehistory: Methods, Practice and Theory. Part 1.....	208	295	Beyond the Far Horizon: Evaluating Regional Survey in the Western Iberian Peninsula. The State-of-the-Art and Future Prospects [FIDO; Archaeological Prospection]	384
206	Lithic Raw Materials in Prehistory: Methods, Practice and Theory. Part 2.....	213	296	Tracing Prehistoric Hunter-Gatherers in Their Environment: Challenges and Perspectives for Prospecting Elusive Lifeways [PaM; Archaeological Prospection].....	389
207	Combustion Features in Mediterranean Late Prehistory: Multidisciplinary Approaches to Their Uses and Functions	219	297	Modelling Complexity: Past Interactions between People, Climate and Environment [PaM].....	392
213	Routed Archaeology II - Archaeological Routes and New Technologies.....	226	298	The Long Fourth Century BC: Tracing the Transformation of Southern Italy in Its Mediterranean Context	398
214	Kingship in Early Medieval Europe: Places of Royal Power and Ritual.....	229	300	Contact – the ‘Other’ in Experimental Use-Wear Studies	403
216	Horizon Europe: Addressing the Priorities	232	313	Earth, Water and Fire: Approaching Living Habitat and Community Landscape Management.....	411
217	Prehistoric Landscapes under the Bog: Tracing Cultural Responses to Environmental Change	233	315	Conflict Escalation and De-escalation in Urbanity.....	415
219	The Historical Ecology of Reclamation Landscapes: Towards a Cross-Cultural Comparative Perspective.....	236	318	How Can Metal Corrosion Products Contribute to Archaeological Research? - Archaeometallurgy@EAA, Part 1	418
221	Connecting Prehistoric Anatolia and Europe through Foodways	239	319	IMPR - Phytoliths in Geoarchaeology and Micromorphology	422
222	Lost in Translation: Transformed and Forgotten Knowledge.....	243	321	Contemporary Approaches to the Investigation and Management of Archaeological Resources in Alluvial Environments.....	426
228	Agricultural Change and Social Inequality: Approaching Complexity.....	248	322	Small-Island Resilience and Vulnerability	429
230	Stories and Compassion: Material Culture, Memory, and Emotion	256	326	Everything You Always Wanted to Know About Phytoliths (But Were Afraid...): Their Contribution to the Modeling of Past Human Behavior	433
231	Embracing Change: New Insights and Theories on the Changing “European Worlds” from the 3rd and 2nd Millennium BC.....	259	327	Engendering Public Archaeology [AGE].....	436
232	Swords to Ploughshares – Conciliation as an Alternative to Conflicts. A Diachronic Perspective between Late Neolithic and Viking Age	264	330	The Carpathian Basin as a Melting Pot? Perspectives on Social and Cultural Diversity from the Neolithic to the Bronze Age.....	439
233	In Search of the Urban Habitat: Exploring the Connection between Towns and Their Environment in Time and Space [Urban Archaeology].....	268	334	Human-Environmental Networks in Healing Cults, Rural Sanctuaries and Sacred Groves between Intersectionality and Transcultural Negotiation	447
235	Is Machine Learning in Archaeology Fact or Fiction?.....	273	337	Deciphering turning points in Human-Environmental Interaction.....	452
236	Representation matters – Diversity in Visual Representations of the Past.....	275	339	Social Networks of Non-Urban Settlements during the Early and High Middle Ages in Europe.....	460
238	Human Visual Archives, Globally. Materials, Forms and Meanings of Human Representations in Ancient Times	279	340	IMPR - Phytoliths as a Proxy for Palaeoenvironmental Reconstruction	466
244	The Sea and the City: Unravelling Stories from the Seafaring World from the 9th to the 18th Century.....	283	341	Wide Horizons - No Limits? Dynamically Formulating the Boundaries of Archaeology	472
245	Lost in Translation? - Interplay of Archaeological Theory and Scientific Practice as Key for Modern Archaeological Reasoning.....	287	342	IMPR - Microscopy Session: Phytoliths in Soil Thin Sections.....	475
246	IMPR – Phytoliths in Integrated Archaeobotanical and Ethnoarchaeological Studies	290	343	The Rise of Patriarchy. An Archaeological View [AGE]	475
247	Pleistocene Early Weaponry Technologies: A Multifaceted Mosaic of New Evidence and Behaviours [PaM].....	299	344	How Many People? Archaeological Approaches to the Study of Past Demography	477
249	Forestry, Subsistence and Industry: The Character and Conservation of Woodland Heritage.....	302	346	Mortality, Materiality, and Meaning – Employing Archaeological Material Science for the Reconstruction of Funerary and Ritual Practices.....	482
251	IMPR – Phytolith Identification, Classification and Morphometry.....	307	347	Public and Community Archaeology in a (Post-)Covid Landscape [Public Archaeology].....	487
256	IMPR – Phytoliths Biogeochemistry - From Phytoliths Formation and Role in Modern Plants to New Proxies for Archaeology and Palaeoecology	312	348	Derivatives of Their Men? Alternatives to the “Woman Problem” in Mortuary Archaeology [AGE].....	490
259	Mobile Pastoralism, Salt and Cheese. Ethnographic Perspectives on the Spatial Configuration of a Long-Term Mediterranean Triad.....	317	350	Keeping Apart and Coming Together: Mobility Restrictions and Confinement as Health Practices in a Longue Durée Perspective.....	493
260	Probatio Diabolica: Absence of Evidence Is Not Evidence of Absence.....	321	351	Between Style and Function: The Technology of Neolithic Pottery Finishes in SE Europe	495
265	Sweet and Sour: Successes and Challenges of Collaboration in Enhancing Resilience and Sustainable Management in Archaeology [Public Archaeology].....	323	352	Empowering the Voiceless. The Role of the Rural Population in State Building and Christianisation in East-Central Europe.....	500
267	History of Measuring and Calculations in Archaeology.....	325	354	The Plant Story. Cultivation and Use of Plants in the Neolithic and Early Bronze Age in the Central and Eastern Europe.....	503
268	At the Edge: Liminal Architecture During the Medieval Period or Liminal Architecture: resisting the stereotype	328	355	Community Archaeology and Climate Threat Response.....	506
269	Between Variability and Singularity: Crossing Theoretical, Qualitative and Computer-based Approaches to Types and Typologies in Archaeology [PaM].....	332	359	Food Cultures in Ancient Societies.....	509
273	Towards an International Archaeology of Fortifications: Methodologies and Interpretations [COMFORT].....	337	361	Rock Art Technology: Theoretical and Methodological Approaches. Part 2.....	523
276	Crossed Approaches to Transitions in the Neolithic: Understanding Social Mechanisms Underlying Material Culture Transformation Using the Concept of Chaîne Opératoire	346	362	Mounds and Monumentality in Broader Perspectives: Digital and Non-Digital Techniques to Explore Past Barrow Landscapes.....	526
277	Living in the Mountains: Settlement Strategies from the Beginning of the Holocene to Modern Times in Southern Europe. Part 1	350	365	“Invisible Products” - Scientific Advancements in Identifying Animal Secondary Products and Their Contribution to Understanding Animal Domestication and Human-Animal Relationships	531

367	Ideological, Technological & Economic Change in the First Millennium BCE at the Eurasian Extremities: Japan and Britain in Wider Context	535	467	The Future is Now: Sustainable Approaches to Post-Pandemic Understanding and Management of Cultural Heritage.....	708
368	A Dark Golden Age. New Approaches in the Research of the Circumalpine Middle Bronze Age	539	468	Biosocial Archaeology: When Ancient DNA Opens the Discussion to Social Structures.....	709
370	The Tangible and the Intangible: New Vistas on Cultural Heritage Documentation and Management	543	469	Coast Land Contacts – The Southern Baltic Area in Early Historical Times (1 – 600 AD).....	717
373	Social Interaction in Heritage Environments	548	470	Recent Chronology: Challenging Copper Age Historical Narratives in Central, South-Eastern and Eastern Europe	721
375	Archaeology, Language and Landscape	550	471	What’s So Cultural about Appropriation? Archaeological Perspectives on Cultural Annexations.....	724
376	Expanding Horizons: Decolonisation, Contested Ownership of Archaeological Material, and the 1970 UNESCO Convention on Cultural Property.....	555	472	EAA Community Climate Change and Heritage’ (CCH) Roundtable	727
377	A World of Clay II: From Fragments to Societies.....	556	473	Cross-Channel Connections: Complementary New Perspectives on Later Medieval Archaeology in France, Belgium, Netherlands, and the British Isles	727
379	The Interaction between Nomadism and Sedentism: An Approach through Religious Practices and Beliefs	562	475	Human Bone and Tooth Artefacts in Hunter-Gatherer Contexts – Case Studies, Analyses, Interpretations and Theories.....	732
381	Children of the Bronze Age: Connecting Europe from the Time of Bell Beakers to the Urnfield Period	565	476	Understanding and Expanding Capacity in Archaeological Data Management beyond Western Europe.....	734
382	From the Field to the Computer. The Validity of Quantitative Methods Regarding the Quality of Archaeological Data.....	569	479	From Climate Change to Activism: How Can European Hunter-Gatherer Archaeology Contribute towards Broader Contemporary Debates? [PaM]	737
383	Social Transformations in Ancient Cyprus	572	480	How Much Shape Matters? Approaches in Pottery Studies	741
388	Prehistoric Inter-Societal Dynamics along the Atlantic Façade from the Neolithic to the Iron Age.....	577	482	Moulding the World. Craftsmen and Craftsmanship between the Baltic and the Carpathians in the Light of Archaeometallurgical Research (2600-500 BC)	744
389	From Coast to Coast – Current Archaeological Research on Cultural Exchange along and across the Baltic Sea	579	486	Hunter-Fisher Social Ecology in Forested Environments: Approaching Boreal Naturecultures	748
390	Cross-Disciplinary Approaches to Archaeothanatomical and Taphonomic Analyses of Human Remains	585	487	A network for agent-based modelling of socio-ecological systems in Archaeology (NASA).....	752
392	Identity Politics and Culture(s) in Neolithic and Bronze Age Archaeology.....	593	489	Widening Horizons: Sharing Perspectives on Professional Practice in Europe.....	757
394	Who Were the First Potters? Current Research in Early Pottery Production in Western Eurasia. Part 1	595	490	Universal Design or How to Guarantee Access to All on Archaeological Sites and Parks.....	759
395	Who Were the First Potters? Current Research in Early Pottery Production in Western Eurasia. Part 2	600	491	Untangling Life Cycles in Multi-Functional Domestic Areas: Interdisciplinary Approaches to Analyse Space Use and Transformation in the Mediterranean.....	762
402	Climate and Environmental Change in the Nile Valley	604	492	Scientists, Submitters and Scroungers: Alternative Views on Radiocarbon Dating in Archaeology.....	767
404	New Technologies, New Theories? Reflections on the Perception and Simulation of Building Environments and Architecture.....	605	493	‘How the Neolithic Created the Bronze Age’: Neolithic Societies of Europe on the Eve of Metallurgy.....	769
409	Archaeologists, Sites and Methodologies: Professional and Personal Networks in mid-20th-Century Europe (Part 2)	608	495	Covid 19: Assessing the Impact and Planning for a Different Future for Archaeological Heritage Tourism.....	771
411	A Community of Ancestors: The Urnfield Phenomenon in Northern Europe.....	612	496	A World of Clay I: Widening Analytical Horizons	774
412	People on the Move: Changing Genes, Cultures and Languages	614	497	What Do My Data Signify? How Can This Theory Be Supported? Interrogating Connections between Science and Theory in Funerary Archaeology.....	779
415	Northern Eurasia in the Late Pleistocene-Holocene: Periphery or Transit Zone? [PaM]	617	498	Interdisciplinary Studies on Sicily: Case Studies and Methodology	784
416	Visible to the eye? Transmission of ideas through everyday visual culture.....	620	500	Integrating Neandertal Legacy: From Past to Present [PaM].....	786
417	Connectivity in Later Prehistoric Europe: Mobility, Trade and Interaction from the 2nd Millennium BCE to the 1st Millennium AD.....	622	501	Widening the Horizons of Archaeological Metalworking Studies - Archaeometallurgy@EAA, Part 2.....	792
418	Should I Stay or Should I Go? Patterns of Mobility in Prehistoric Sedentary and Pastoralist Societies.....	626	503	Towards an Inclusive Future: A Strategy for Rock Art Research, Management and Social Value.....	798
421	Demography in Archaeology beyond Boom and Bust? Critical Examinations of Phases of Under- and Overpopulation.....	631	504	News from the Bronze Age – Scaling Dynamics and Narratives.....	801
427	Island Sustainability and Resilience in Europe: Archaeological, Palaeoecological and Historical Approaches.....	633	505	On the Move: Interdisciplinary Approaches in Studying Human Mobility	806
428	Adult Age-at-Death in Past Populations: Widening Horizons of Methods, Approaches and Interpretations	639	508	Preserving the “Living Heritage” of Abandoned Lands. Archaeology and Sustainable Practices to Protect and Conserve Upland Landscapes	810
432	Perspectives on Bronze Age Changes	644	509	Horseman-Horse Couple through Time and Space. Part 1	813
435	Post-medieval Europe and Widening Horizons.....	649	510	Horseman-Horse Couple through Time and Space. Part 2	818
436	Creativity and Resourcefulness Online: How Archaeologists and Heritage Educators Overcame the Pandemic and Reached the Public in New Ways.....	651	511	A Crossroads between the Continents – Interdisciplinary Approaches to Interconnectedness in the Ancient Mediterranean	823
438	Tracing Baptism in the Archaeological Record	653	513	Producing Power: Exploring the Relationship between Production and Socio-Economic Change in the Mediterranean from the Chalcolithic to the Iron Age.....	828
440	‘Touching Objects, Feeling Materials’: Material Transformations, Technology and Sensoriality in Ancient Material Culture	656	514	Small but Significant: Exploring Neo-Eneolithic Miniature Representations as Material Objects	833
441	The Archaeology of Coastal Communities	661	515	New Realities? A Critical Approach to Recreating Objects for Examining and Presenting the Past.....	838
442	Misuse of the Medieval in the Early 21st Century	667	516	From Critique to Synthesis: Transcending the Genomic Divide within Archaeology	842
443	Re-Imagining How We Create and Develop Archaeologists in a Post-COVID World	667	517	Consider the Collections: Rethinking Approaches to Colonial Museums for the 21st Century	846
445	Digital Methods and Typology: New Horizons.....	668	518	Worth the Effort: Evidence of Prehistoric Cross-Craft Interactions	848
452	European Crypt Burials II - A Heritage (Still) at Risk between Science and Public Display	674	520	Integrating all Dimensions: 3D-Applications from Excavation to Research to Dissemination.....	853
453	Multidisciplinary Approaches to Environmental and Human Fingerprints of the Roman Period	676	521	Shaping a Discipline: Knowledge Transmission and Exchange in the History of Archaeology. Part 1	857
454	Applied Archaeology – New Directions for the Discipline in a Changing World	683	522	Shaping a Discipline: Knowledge Transmission and Exchange in the History of Archaeology. Part 2	863
456	From Contemporary Knowns to Past Unknowns - Unlocking Ancient Human-Environment Interconnections via Modern Isotopic Records.....	683	523	Settlements out of Nowhere – Theory and Practise of Detecting Settlements by Means of Combined Aerial Archaeology, Geophysics, Predictive Modelling.....	866
462	Assessing the Impact of Major Climatic and/or Environmental Events on Human Culture and Subsistence.....	691			
463	What Really Was a Castle?: Widening the Horizons of Interdisciplinary Interpretation.....	697			
465	Soil and Sediment Micromorphology in Archaeology	701			

524	Medieval Glocalisation: Local Manifestations of Global Connections.....	869
525	Of the Water: Fish and Molluscs in the Ancient Eastern Mediterranean	871
528	Shifting the Focus: Mountains as Central Places in (Pre-)History.....	875
529	Adding Flesh to the Bones: The Integration of Biochemical and Biomolecular Techniques in the Study of Human-Animal Relationships	881
530	Breaking Points. Medieval and Modern Societies in Transition through Material Culture	886
533	Bioarchaeological Approaches towards Understanding the Impact of Different Forms of Crises on Human Lifeways.....	890
537	Human-Environment Interaction in Northern Eurasia from Micro- to Macro-Regional Level.....	896
541	Pastoralism of the Past: Insights into Social, Cultural and Environmental (In)stability.....	903
542	Europe's Medieval Pasts: A Manifesto.....	907
543	Material Minds: Exploring the Interactions between Cultural Artefacts, Material Culture and Embodied Mind.....	907
544	Archaeology Tourism and Sustainability.....	909
545	Southeastern Europe in 5th and 4th Century BC - Indigenous Communities in Classical World.....	911
546	Idiosyncratic Burials: Interpreting the Politics of Death and Dead Bodies	914
547	Down by the River - Evidence of Material Culture for Prehistoric Waterborne Communication along European Rivers, Lakes and Coastal Waters	918
548	Tracing the Past, Charting the Future: Exploring Archaeological Research Collaboration between the Americas and Europe	921
549	Ancient Pastoralist Adaptations in the Eurasian Steppe: The Intersection of Biomolecular and Landscape Archaeology	922
681	Mediterranean Archaeology: from Interconnected Patchworks to Overarching Inter- and Transdisciplinary Frameworks.....	927
683	Contested Colonial Collecting: Revitalization, Repatriation and Reburial.....	929
684	Imaginations and Imaginaries of the Palaeolithic and Mesolithic – Distorted Views, Embellishment, and What We Make of It [PaM].....	930
685	Between East and West. Material Studies of Social Interactions in 3rd Millennium BC on the Northern European Plains.....	932
687	Medieval Stone Monuments: The Materiality of Remembrance	934
688	Society Facing Changes. Regions on the Southwest Baltic between 2500 - 1500 BC	937
690	General session: New Methods and results.....	941
691	General Session: Burials, Rituals and Memories.....	949
692	General Session: Environmental Impacts on History.....	954
693	General Session: Archaeology and the Public.....	956
	Index of Authors (Session Organisers and Main authors).....	958

5 UNDERSTANDING PREHISTORIC DEMOGRAPHY

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Armit, Ian (University of York) - Damm, Charlotte (University of Tromsø) - Črešnar, Matija (University of Ljubljana)

Format: Regular session

In recent years, archaeologists have become increasingly interested in questions related to the demography of prehistoric communities. Indeed, the study of population dynamics is critical to many of the questions we now want to ask about the prehistoric past, whether our concern is population size, structure or mobility. Demographic analysis can operate at multiple scales, each posing its own challenges and necessitating the development of innovative theoretical and methodological approaches. Studies using aDNA analysis have identified significant population movements across large swathes of Europe, dramatically affecting the genetic composition of prehistoric communities. Isotope analyses have similarly made great strides in detecting prehistoric mobility, permitting finer-grained understandings of the mobility of specific individuals and groups. Summed Probability Distribution analyses of radiocarbon dates have been used as proxies for population fluctuations over time, while ethnoarchaeological and cross-cultural approaches to population reconstruction remain important in understanding local and sub-regional population dynamics.

This session brings together researchers working across the broad field of prehistoric demography, including papers from Stone Age Demographics, and COMMIOS (Communities and Connectivities: Iron Age Britons and their Neighbours), two large-scale projects studying prehistoric Norway and Britain respectively. Instead of focussing on one method, the aim of the session is to explore how different methodologies, spatio-temporal scales and theoretical perspectives may complement each other within and between projects and case studies to provide a more nuanced understanding of prehistoric demographies. We invite papers at any spatio-temporal scale, from the size and composition of individual households and intra-settlement organisation, to regional and supra-regional settlement patterning and population structure. Papers may focus on the development of specific methods, theoretical frameworks for demographic reconstruction, or case studies.

ABSTRACTS:

1 THE COLOGNE PROTOCOL: ESTIMATING PAST POPULATION DENSITIES

Abstract author(s): Schmidt, Isabell (University of Cologne) - Hilpert, Johanna (Kiel University - CAU) - Kretschmer, Inga (Landesamt für Denkmalpflege Stuttgart) - Peters, Robin (Landschaftsverband Rheinland) - Broich, Manuel - Schiesberg, Sara - Vogels, Oliver - Wendt, Karl Peter - Zimmermann, Andreas - Maier, Andreas (University of Cologne)

Abstract format: Oral

During the last decade, the Cologne Protocol has been established in prehistoric research for estimating past population size and density through a geo-statistical, site density based upscaling approach. The estimated data are available at different spatial scales, ranging from regional areas of social units up to continents. The relevant proxies are selected based on their validity for the relevant socio-economic setting, which currently comprises mobile hunter-gatherers and sedentary farmers, while the overall methodological framework is kept consistent. The application of the protocol to a long diachronic series of European prehistoric periods provides a consistently derived and scalable set of spatially explicit data on past population dynamics. The work takes place within the framework of the Rhine-Lucifs Project and the CRC806 at the University of Cologne.

In this presentation we will discuss the methodology and results from our research with regard to scaling issues in Late Pleistocene forager contexts. Perspectives will be provided for the application of the Cologne Protocol to new contexts. Recently published manuals for modelling Core Areas in MAPINFO, ARCGIS, QGIS/SAGA, and R, are briefly introduced.

2 DWELLINGS, SETTLEMENT ORGANISATION AND POPULATION FLUCTUATIONS: A MULTI-SCALAR CASE STUDY FROM ARCTIC NORWAY

Abstract author(s): Damm, Charlotte (Arctic University of Norway)

Abstract format: Oral

Methods employed by archaeologists to address prehistoric demography not only use different types of data, but also target demography at different spatio-temporal scales: from site based, event and individual oriented cases through landscape and culture-historically delimited group scale studies to interregional and diachronic population analyses. Each of these scales have their merits and make important contributions to the knowledge of demographic variation and developments. However, in order to discuss the dynamics of prehistoric demography, it is important to acknowledge the inherent relationship between different scales.

The presentation will illustrate this through preliminary results from a project in Arctic Norway, Stone Age Demographics, investigating northern maritime foragers ca 6000-0 BCE. Based on radiocarbon dates and Bayesian chronologies the projects investigates re-use and contemporaneity of house-pits dwellings; extensive surveys and redocumentation of sites assist in evaluation of settlement organisation in one coastal region; and radiocarbon dates are used in SPD modelling of population fluctuations across millennia and in comparison with climatic change.

Combining the information from all three scales of analysis together results in a more substantial and nuanced insight to the demographic patterns of these northern foragers.

3 EXPLORING LOCAL GEOGRAPHICAL CONDITIONS UNDERPINNING REGIONAL DEMOGRAPHIC CHANGE AMONG HUNTER-FISHER-GATHERERS IN SOUTHWEST COASTAL NORWAY (11,500-4300 CAL BP)

Abstract author(s): Lundström, Victor - Bergsvik, Knut (University Museum, University of Bergen)

Abstract format: Oral

Once communities started to explore and settle along the Norwegian coast after the last ice-age, population numbers started to grow at an exponential rate (Solheim, 2020; Jøregensen, 2020). This is often attributed to notions of the coast as providing highly productive and stable ecozones that help suppress any severe setbacks to a population's trajectory of long-term growth. However, long-term changes in a population's growth are ultimately underscored by the fitness of specific life-history strategies that are more or less determined by the fact that resources do not rank equally in their calorific return, nor are they evenly distributed across space (Tremayne and Winterhalder, 2017). It is our impression that previous work on the Norwegian Stone Age has dealt with these concerns inadequately, and we wish to remedy this with a case study from the west coast of Norway. In this paper, we wish to explore how evenly or unevenly Stone Age population-levels were distributed across space by posing the following research question: Were some areas along the west coast settled at greater population levels, densities and intensities over time than others, and if so, where was this and why? Informed by the paradigm of human behavioral ecology (HBE) we predict that settlement and subsistence practices were organized across the landscape in ways that would have -other things being equal- maximized their fitness. To test these predictions, we bring to the fore ethnographically upscaled population counts (Lundström et al., 2021) and juxtapose them against local estimates on growth rates using spatially explicit analyses on radiocarbon dates (e.g. Crema et al., 2017) and stray finds.

4 TERRITORIES, STRATEGIES AND TWO GENERATIONS

Abstract author(s): Odgaard, Ulla (Independent researcher)

Abstract format: Oral

This paper presents a model of non-sedentary territorial management based on archaeological surveys in combination with ethno-historical and anthropological studies in Greenland. It is further suggested that the model can also have relevance for studies of other prehistoric societies.

The archaeological surveys revealed a landscape of many settlements, with varying numbers of house-structures. Attempts of 14c datings did not answer questions about demography in the area: Were they many hunters at one time or just a few? Which strategies for exploitation of the landscape were applied?

The Thule culture hunters were direct ancestors of modern Inuit, and in several cases, it has been possible to interpret archaeological structures with the help of the existing ethnographic and ethno-historic sources.

Today there is no ownership of land in Greenland, and everybody can in principle go hunting everywhere. However former concepts of user's rights to territories and camp sites can still be met among hunters. Interviews with contemporary hunters and observations in their hunting camp made it possible to create a model, which applied on the ancient camps make sense. On this basis it has been possible to interpret population dynamics and change of strategies through time.

5 POPULATION DYNAMICS AND THE EXPANSION OF AGRICULTURE. ASSESSING THE RADIOCARBON GAPS DURING THE NEOLITHIZATION PROCESS IN THE WESTERN MEDITERRANEAN

Abstract author(s): Cortell-Nicolau, Alfredo (Departament de Prehistòria, Arqueologia i Història Antiga. Universitat de València) - Crema, Enrico (Department of Archaeology, University of Cambridge) - Shennan, Stephen (Institute of Archaeology, University College London) - Rivas, Javier (Department of Economics, University of Bath) - García-Puchol, Oreto (Departament de Prehistòria, Arqueologia i Història Antiga. Universitat de València)

Abstract format: Oral

The increase in the radiocarbon record during the past years has helped acquiring a better understanding of the Neolithization process in the Western Mediterranean. Different theoretical (not necessarily contradictory) models, such as the classic wave of advance, the Dual Model or arrhythmic models have been proposed in the light of the new information obtained through the increasing 14C dating programmes.

However, this greater volume of information has not solved one of the problems characterising the Neolithization process. From the Alps to the Iberian Mediterranean, it is common to find radiocarbon voids between the last groups of hunter-gatherers and the first groups of farmers. These 'gaps' can last from 200 to 500 years, and despite some efforts, have still not received a satisfactory explanation from the archaeological community.

In this proposal we approach the problem from the perspective of population dynamics, and develop a theoretical model, which could account for those gaps in the radiocarbon record emphasizing the relationships between the last Mesolithic populations and the first Neolithic groups. Our framework is now limited to the Iberian Mediterranean, but its results could be explored for different geo-chronological frames.

6 GENOME-WIDE INVESTIGATION OF THE REGIONAL DIVERSITY OF POPULATION DYNAMICS DURING WEST EUROPEAN MESOLITHIC-NEOLITHIC TRANSITION

Abstract author(s): Rivollat, Maïté (University of Bordeaux, PACEA, France; Max Planck Institute for the Science of Human History, Department of Archaeogenetics, Jena, Germany)

Abstract format: Oral

The Neolithic transition from foraging to farming is one of the most important events in human history. Starting from 12,000 years ago in the Middle East, the new lifestyle spread towards Europe via separate continental and Mediterranean routes. Both streams eventually overlapped in Western Europe. Here, a complex period of contact, interaction and exchange with autochthonous hunter-gatherers from the Mesolithic to the Late Neolithic resulted in a mosaic pattern of the material culture that is well-known in archaeology.

Investigated in greater detail using genomic data, incoming farmer groups have been shown to have a clear Near Eastern/Anatolian cultural and genetic background with only limited genetic contribution from hunter-gatherers for at least two millennia from the south-east to Western Europe, despite considerable evidence of mutual material exchange. However, thus far no genomic data was available from modern-day France, the key region where both routes converged.

Here, in the framework of the collaborative project INTERACT (ANR/DFG), we present new genome-wide data from 101 individuals from 12 sites covering today's France and Germany from the Mesolithic to the Neolithic (7000-3000 BCE). Utilising the genetic substructure observed in hunter-gatherer groups across Europe, we are able to trace characteristic patterns of admixture between incoming farmers and indigenous hunter-gatherers in different regions, which are consistent with both routes of the Neolithic expansion. In particular, Western European early farmers show a higher proportion of specific Western Hunter-Gatherer ancestry compared to those linked to Southeastern or Central Europe. Our data shed a new light on the complexity of biological interactions between human groups during the Neolithic expansion and establishment in Western Europe, echoing the archaeological knowledge and confirming major regional variations. This increasing resolution paves the way for a finer, multi-scale approach to better document the processes implied in the mobility and evolution of prehistoric groups.

7 SOCIAL GENOMICS OF THE LBK, INSIGHTS FROM THREE DIFFERENTIATED SITE TYPOLOGIES

Abstract author(s): Gelabert, Pere (Department of Evolutionary Anthropology, University of Vienna) - Olalde, Iñigo (Institute of Evolutionary Biology - CSIC-UPF) - Ringbauer, Harald (Department of Archaeogenetics, Max Planck Institute for Evolutionary Anthropology; Department of Genetics, Harvard Medical School, Boston, Massachusetts) - Teschler-Nicola, Maria (Department of Anthropology, Natural History Museum, Vienna) - Anders, Alexandra (Institute of Archaeological Sciences, Eötvös Loránd University) - Bickle, Penny (Department of Archaeology, University of York) - Hofmann, Daniela (Department of Archaeology, History, Cultural Studies and Religion, University of Bergen) - Pavuk, Juraj (Archäologisches Institut der SAW, Nitra) - Pinhasi, Ron (Department of Evolutionary Anthropology, University of Vienna) - Reich, David (Department of Genetics, Harvard Medical School, Boston, Massachusetts; Broad Institute of Harvard and MIT, Cambridge, Massachusetts; Howard Hughes Medical Institute, Harvard Medical School, Boston)

Abstract format: Oral

The Linear Pottery Culture (LBK, ALP in Eastern Europe), represents one of the major cultural groups of the Early Neolithic in Central Europe, and was associated with the dispersal of farming over a vast region of previously uncultivated Europe. The LBK cultural complex flourished for around 500 years, from around 5,500 BCE to its disappearance around 5000 BCE. Genetic studies have already characterized the ancestry of these peoples, however until today, genetics have not decisively provided insight into LBK social organization. Here we analyse three different LBK sites: The cemetery of Nitra, the graves from Polgár-Ferenci-hát and the Massacre of Asparn-Schletz, spanning the duration of the cultural complex. Our strategy allows us to deeply characterize the familial connections of these sites, the demographic patterns and inter-sites connections. We have revealed the presence of large family clusters in the cemeteries of Nitra and Polgár-Ferenci-hát, as well as high degrees of unrelatedness between parents (indicated in the aDNA of children) in the culture, indicating large population sizes at the onset of the LBK. From the site of the Schletz massacre, we have produced genomic data from the entire assemblage of individuals, providing a snapshot of a "living" LBK population.

8 USING ANCIENT DNA, ISOTOPIC ANALYSIS, RADIOCARBON DATES AND ARCHAEOLOGICAL EVIDENCE FOR (RE)CONSTRUCTING DEMOGRAPHY AND SOCIAL STRUCTURES

Abstract author(s): Massy, Ken (LMU Munich)

Abstract format: Oral

Reconstructing past life, with all its varying perspectives, has been one of the main focal points in archaeology ever since. Scientific methods, developed in different fields of research, were integrated into archaeology bit by bit, with some having turned out to be essential for future analyses for us to understand human life and its remnants we still encounter today. One of the major breakthroughs was the extensive use of calibrated radiocarbon dating in order to put cultural changes into a timeline. It was used to determine the principal chronological framing of "cultures" in the first place (e. g. beginning of the Neolithic), but has evolved to a multi-purpose tool for all kinds of applications, inter alia, demography.

In some way, ancient DNA, a much younger field of research, has shown a similar evolution from geographical large-scale population genomics based on small sample sizes (e. g. biological provenance of Neolithic people in Central Europe) to detailed questions about pathogens, kinships, ancient proteomics etc. However, this development took place way faster as seen with radiocarbon dating.

With a huge number of skeletal remains of humans analysed in the micro-region of Augsburg, Bavaria, including all available scientific methods, a new time in archaeology has begun. Ancient DNA analyses generated data about kinships among the inhabitants of this small-scale area, showing core families accompanied by non-related foreign women and wealth-inheritance. The information of the pedigrees reconstructed via aDNA are then used to refine radiocarbon dating by Bayesian modelling and estimate the timeframe of cemetery occupancy. All these methods combined with “hard” archaeological evidence led to a new understanding of mobility and settlement development as well as demography within this micro-region.

9 DEMOGRAPHY AT THE MESO-SCALE: AN INTEGRATION OF LOCALIZED DEMOGRAPHY AND SETTLEMENT PATTERNS IN PREHISTORIC JAPAN

Abstract author(s): Simmons, Charles - Gjesfjeld, Erik (University of Cambridge) - Kaner, Simon (University of East Anglia; Sainsbury Institute for the Study of Japanese Arts and Cultures; University of Cambridge) - Crema, Enrico (University of Cambridge)

Abstract format: Oral

The Jomon Period of Japan was a pre-agricultural complex society that existed on the main islands of the Japanese Archipelago from as early as about 15,500 cal BP until the introduction of agriculture from the Korean Peninsula around 2800 cal BP. Over the course of this long and diverse period, a series of increases and decreases in population levels were experienced, with the most significant being a “boom and bust” that occurred during the Middle Jomon (ca. 5500-4,600 cal BP). Regional-scale analyses first uncovered this demographic event using total regional counts of archaeological sites and the pit house dwellings characteristic of the period. Analyses at these scales demonstrated that different regions of Japan experienced the event to varying degrees and with different temporal offsets for the initiation of the event, and some regions, particularly those in Western Japan, were relatively unaffected by the event. This paper contributes to the understanding of these demographic events by using Bayesian computational analyses on a meso-scale dataset of nearly 2000 pit houses from over 50 sites within a 13 sq. km area that was surveyed or excavated nearly in its entirety in Kanagawa Prefecture in the Kanto region of Japan. These analyses employ a Monte-Carlo simulation to account for the uncertainty associated with periodized chronologies and provide localized demographic estimates. These estimates are then compared to patterns of continuity and discontinuity in settlement occupation to help connect observations across regional and site-level scales.

10 REGIONAL DEMOGRAPHIC RESPONSES TO THE SPREAD OF RICE FARMING IN JAPAN: NEW INSIGHTS FROM BAYESIAN ANALYSIS OF THE RADIOCARBON RECORD

Abstract author(s): Crema, Enrico (University of Cambridge) - Shoda, Shinya (University of York; Nara National Research Institute for Cultural Properties)

Abstract format: Oral

The 1st millennium BC saw a pivotal episode of demic and cultural diffusion that led, in the subsequent centuries, to long-lasting social, cultural, economic, and genetic changes in the Japanese islands. This period marks the end of the so-called Jomon period, characterised by a subsistence economy predominantly centred on hunting and gathering, and the start of the Yayoi period, when a package of cultural traits brought-in by migrant groups from the Korean peninsula spread across the Japanese archipelago. A core element of the Yayoi package was rice and millet farming, and its broad-scale demographic impact can be observed by a population boom and by a shift in the regions with highest population density from north-east to southwest Japan. The Jomon-Yayoi transition was, however, far from a homogeneous process, and archaeological evidence indicates a wide range of responses, from the immediate adoption of the full Yayoi package to instances of partial adoptions, hybridisation, rejection, and even cases of short-term adoption followed by a reversion to previous subsistence economies. This paper examines the demographic consequences of these regional responses to the Yayoi package by synthesising and analysing the rich settlement and radiocarbon data offered by Japanese archaeology. It will employ a new Bayesian framework for analysing large collections of radiocarbon data to detect the presence of major shifts in population growth rate and examine their timing in relation to evidence from subsistence and climate data.

11 HOUSES OR HOUSEHOLDS? A SOCIO-ECONOMIC ANALYSIS OF THE CHALCOLITHIC SETTLEMENT FROM HĂBĂȘEȘTI (IASI COUNTY, ROMANIA)

Abstract author(s): Balaur, Radu (Alexandru Ioan Cuza University of Iasi, Interdisciplinary Research Institute - Science Department, Arheoinvest Center)

Abstract format: Oral

Problems of a social nature are less discussed with regards to the Cucuteni communities. The dwelling represents the spatial delimitation of the social group within the settlement. The spheres of social structures in a community, represented by the management of the common space, the position of the individual and the family within the group, and the degree of solidarity of the group, seem to be influenced by the quantity and quality of the raw materials, also by the available labour force, the experience of the builders, individual’s desire to allocate a different amount of resources in the construction of housing, etc. In this case, we discussed the settlement of Hăbășești, one of the few Cucutenian settlements fully investigated. I followed first the individual analysis of the

houses in order to identify their functions. Included among the analysis criteria were the way of constructing, the orientation and the size of the houses, the presence of the artefacts discovered inside as the identification of the activity areas in each structure. The next step considered the distribution of structures at the settlement level in order to identify possible relationships between dwellings. Most activities identified inside the houses were related to activities that ensured the survival of individuals, and also a possible collaboration between the households.

12 DEMOGRAPHIC NUANCES OF RADIOCARBON DATING AND DEATH RATES OF THE BRONZE AGE EASTERN CARPATHIAN BASIN

Abstract author(s): Daróczy, Tibor (Aarhus University, Department of Archaeology & Heritage Studies)

Abstract format: Oral

Demography, as the science of social statistics, is an important means of better understanding past realities and to lay the foundations of emic perspectives. Undoubtedly, graves are an important, if not the most significant, means of evaluating dynamics of past populations. They do provide a straight-up quantitative and qualitative approach to assess amounts of deaths, but in order to view these numbers as death rates the depth and, especially, span of time of each burial ground and their micro- and macro-regional temporal relation must be established and refined. Furthermore, intervals of time of architectural layers of multistratified sites provide aid to enhance these chronologies. Both aspects would suggest not just cherry-picked radiocarbon dating of prestigious burials or architectural finds, but the systematic AMS dating of both burial grounds and multistratified series within a site. A rigorous sampling strategy for both, selected individuals and such sites, would need to be implemented in order to even consider the weighted estimate based on the unearthed graves of Bronze Age death rates. New research and implementation of such sampling strategies for radiocarbon dating sheds new light on the intensity of death from one century of the 3rd and 2nd millennium BCE to the other. Results of both the evaluation of a synoptic radiocarbon database containing dates of the deceased individuals of the Bronze Age Eastern Carpathian Basin and implemented sampling research of multistratified sites, also from the same period and region, shifts our views to a more refined distribution of death through these two millennia. The improvement of absolute chronologies of various micro-regions has the potential to echo into other fields of demography, significantly challenging previously held beliefs of directionalities of movement of people, disease and social practises.

13 PAST POPULATIONS IN SILICO: ADVANCES IN MODELLING ARCHAEOLOGICAL POPULATIONS

Abstract author(s): Verhagen, Philip (Vrije Universiteit Amsterdam) - Séguy, Isabelle (INED Paris; CEPAM Université de Nice-Côte d’Azur) - Düring, Andreas (IfoS, Munich) - Bertonecello, Frédérique (CEPAM Université de Nice-Côte d’Azur) - Vlach, Marek (Institute of Archaeology, Czech Academy of Sciences) - Angourakis, Andreas (University of Cambridge) - Lane, Justin (Prospectus Research, Kristiansand) - Degioanni, Anna (Université Aix-Marseille) - Pennec, Sophie - Courgeau, Daniel (INED Paris)

Abstract format: Oral

Simulation modelling is increasingly applied to reconstruct, interpret and understand the demographic behaviour of past populations. Many factors are known to influence the dynamics of human populations, including demographic patterns, social practices, political coercion, technological know-how, warfare, cultural beliefs, and a myriad of both biotic and abiotic environmental factors. Accounting for all such processes is challenging and requires a great deal of interdisciplinary collaboration. In this paper, we want to set out the major advances, alternative approaches, and challenges in modelling ancient populations while presenting an agenda for future research in this field. In particular, we address the following issues:

- Intrinsic dynamics of human populations (natural growth under stable conditions)
- Integration of social and environmental factors in population models
- Spatial and temporal scales of population movement, from generation-wise individual displacements to continental mass migration
- Spatio-temporal effects of high-impact events, such as epidemics and climatic episodes
- Model designs and validation methodologies able to link population models to archaeological data, particularly the osteoarchaeological record of cemeteries.

14 HOW MANY MYCENAEANS DOES IT TAKE TO CHANGE A LIGHT BULB? AGRICULTURAL POTENTIAL AS A METHOD FOR ESTIMATING POPULATION SIZES

Abstract author(s): Timonen, Riia (Leiden University)

Abstract format: Oral

The Late Bronze Age (ca. 1600 – 1200 BCE) in the Aegean is renowned for considerable advancements, such as the development of palatial administrative systems, agricultural intensification, and organized long-distance trade. All of these efforts were presumably enabled by a considerable population increase. However, very few population estimates exist for this time period. This absence is largely due to the lack of data on contemporary burials, and the sizes of households and settlements. In the absence of such traditional demographic data, the concept of agricultural potential can be used to provide population estimates. The agricultural potential uses information about the landscape (e.g. soils, contour, vegetation) and subsistence strategies (cultivation, herding) to calculate the maximum number of individuals who could be sustained by the food produced on a particular land area. This talk presents the results of a recent study, which aimed at determining the size of the Late Bronze Age (LBA) Argive Plain population

through its agricultural potential, as well as testing the usefulness of such an approach in comparison to other demographic methods. The Argive Plain in the southern mainland Greece is known for its large citadels such as Mycenae and Tiryns. These are also one of the few settlements with previously published LBA estimates of population sizes. A comparison of these estimate to the regional agricultural potential resulted in a discrepancy in which the number of individuals dwelling the citadels was high compared to the agricultural potential. This presentation discusses how underlying assumptions included in different demographic methods may result in mismatches in population estimates, and shows why the comparison of methodologies is important. This way, the case study also presents an innovative way to overcome issues related to the poor availability of demographic data.

15 MIGRATION, MOBILITY AND SOCIAL INTERACTION IN BRONZE AND IRON AGE BRITAIN: INITIAL RESULTS OF THE COMMIOS PROJECT

Abstract author(s): Armit, Ian - Bleasdale, Madeleine - Büster, Lindsey - Fischer, Claire-Elise (University of York) - Booth, Tom (The Francis Crick Institute) - Patterson, Nick - Isakov, Michael (Harvard University) - Evans, Jane (British Geological Survey) - Hamilton, Derek (SUERC) - Reich, David (Harvard University)

Abstract format: Oral

Recent advances in aDNA and isotope analysis have revealed unparalleled insights into issues of mobility and population change in European prehistory. Until recently, however, the main impact of this work has been in the Neolithic and Early Bronze Age periods, where major demographic transformations are attested. The COMMIOS Project (Communities and Connectivities: Iron Age Britons and their Continental Neighbours) sets out to examine the population dynamics of Bronze and Iron Age communities through a combination of scientific and humanities approaches, focussing on Britain and neighbouring regions of mainland Europe, c. 1500 BC – AD 100.

Combining aDNA and multi-isotope analysis with osteoarchaeology and the contextual analysis of mortuary practices, COMMIOS examines later prehistoric population dynamics at several scales. At the broad scale, aDNA analysis can reveal the genetic diversity of Bronze and Iron Age populations in Britain (including genetic relationships with communities in continental Europe) and, alongside multi-isotope analysis, can provide insights into mobility patterns and inter-regional contacts. At a more local scale, the integration of these techniques with osteoarchaeology and funerary archaeology allows us to examine questions concerning kinship, gender and inequality within and between later prehistoric communities. Finally, the integration of these methods can expand our understanding of the individual life course and help us explore the different experiences and treatments of Bronze and Iron Age people. This paper examines the background to the project and explores its initial results.

The COMMIOS Project is led by the University of York, partnered with the University of Glasgow, UKRI (British Geological Survey) and Harvard Medical School. The project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and grant innovation programme under grant agreement No 834087.

16 TRACING POPULATION DYNAMICS IN LATE PREHISTORIC SLOVENIA: HOW TO COMBINE TRADITIONAL AND MODERN SCIENTIFIC DATA AND APPROACHES

Abstract author(s): Cresnar, Matija (University of Ljubljana) - Armit, Ian (University of York) - Mason, Philip (Institute for the Protection of Cultural Heritage of Slovenia) - Koon, Hannah - Nicholls, Rebecca (University of Bradford) - Leskovar, Tamara (University of Ljubljana) - Snoeck, Christophe (Vrije Universiteit Brussel) - Potočnik, Doris - Ogrinc, Nives (Institute Jožef Stefan)

Abstract format: Oral

The history of intensive archaeological research, especially of the rich remains from the Bronze and Iron Ages in Slovenia extends far back into the 19th Century. In the 20th century, antiquarian approaches were slowly replaced by more question-driven investigations, while in the recent decades development-led interventions dominated and still dominate research.

Typological studies (of artefacts) were, and often still remain the most common research approach, which has nevertheless provided solid foundations for further investigations. However, it is also important that the more recent development-led investigations include scientific analysis as part of the post-excavation analysis. The amount of archaeological material and data available is therefore very substantial and provides a firm base for further scientific research, which can now address demography and population dynamics in unprecedented ways.

Important new techniques and methods have been introduced and are increasingly being integrated into archaeological research. However, these data often remain alienated from traditional archaeological studies, so that interpretations often do not produce the results desired by the archaeologist as a humanist. However, in fact, for the first time, we have acquired tools, to help us approach to individual biographies, the demography of small communities, as well as regional and transregional population dynamics.

The recent case studies from Slovenia are diverse and do not answer all the questions we may ask about late prehistoric demography; however, they already outline new pathways that further investigations could use in thorough interdisciplinary research to better understand the different levels of population dynamics.

17 IDENTITY OF THE MEDITERRANEAN CELTS: LIMITS AND POSSIBILITIES TO STUDY PARTICULAR RITUAL PRACTICES

Abstract author(s): Pruvost, Melanie (PACEA UMR5199) - Ciesielski, Elsa - Roure, Rejane (UMR 5140 ASM, CNRS, Université Paul Valéry Montpellier 3)

Abstract format: Oral

Over the last decade, views of the Celts have changed significantly. Archaeologists have demonstrated the great complexity of ancient populations and have shown how earlier perspectives regarding Celtic populations in the Iron Age have to be reviewed. Furthermore, recent innovative approaches to archaeological data allow us to explore new questions concerning the diet, health and demography of past populations. Through the study of remains from one specific ritual practice: the exhibition of weapons and severed heads at Le Cailar (France, 3rd century BCE), we will investigate the potentialities and the limits of multidisciplinary approaches to characterize the Mediterranean population of Iron Age. Isotopic analyses, palaeogenomic approaches and taphonomic studies will be combined with archaeological and historical data to understand better the identity of the Celtic people of the South of France. We will suggest a link between biological identity, i.e. the past genetic events (mixture, isolation, migration), which leads to one population/individual to their cultural identity.

18 BUILDING A BIGGER PICTURE: POTENTIAL OF DATA FROM THE MARCOMANNIC SETTLEMENT ZONE OF THE MIDDLE DANUBE REGION IN DEMOGRAPHICAL RESEARCH

Abstract author(s): Vlach, Marek - Komoróczy, Balázs - Zelíková, Michaela - Sofka, Stanislav (Institute of Archaeology of the Czech Academy of Sciences, Brno) - Smrčka, Václav (Institute for History of Medicine and Foreign Languages. First Faculty of Medicine, Prague)

Abstract format: Oral

The Middle Danube region during the Roman Period exhibit one of the specific geopolitical contexts representing a direct coexistence and multifaceted interactions of the barbarian and Roman provincial world. During the period the low-lying regions to the north of the Middle Danube Limes were inhabited by the Germanic tribes of Marcomanni and Quadi. Within the long-term archaeological research, anchored mostly in culture historical paradigm, usually limited attention was paid to demographical aspects of the Germanic populations. It is also caused by the limits of anthropological research due to almost exclusively applied cremation burial practices. The presently ongoing research project (Grant Agency of the Czech Republic) aims - amongst other issues - also to fill in this gap in research of demographical aspects. So far, the archaeological research has assembled large quantity of information, however, scattered throughout countless publications and has differentiated information characteristics. In order to open its potential for demographical research, the large-scale collection and formalization of the available data is essential and presently ongoing. Using various methods and tools (e.g. spatial analyses, multivariate statistics) it is the aim to evaluate their interpretative potential and to expectably provide ground for establishment of meaningful spatiotemporal proxies for derivation of various demographic estimates (population size, density etc.) on regional, subregional (well surveyed spatial units) or community level (residential areas, dwellings). It will be also complemented with modelling and simulation of complexity and dynamics (agent-based modelling) of the selected phenomena on various scales (e.g. development of the settlement structure, formation processes of burial grounds).

A. WHEN THE WORLD CHANGED. POPULATION, SETTLEMENT CHANGE AND MAJOR EVENTS

Abstract author(s): Torfing, Tobias (Sydvestjysker Museer)

Abstract format: Poster

The paper will examine the relation between intra-site development in settlement size and possible driving outside factors. The scope of the paper is settlements in a small area in southwest Jutland in Denmark and the time frame is roughly 200 BC to 600 AD. The paper will combine the use of radiocarbon dating and specific analysis of large-scale archaeological excavation as evidence of changes in population size and compare these changes with possible driving factors.

The analyses show a period which encompasses several major changes in how people lived, and how settlements was organized. From a shift from a very loose structure of single farmsteads to settlement organized in small hamlets and larger villages. In some periods both the house-size and the size of the fenced areas of each farmstead grows, while in others the size declines drastically. There are also periods in which almost no settlement activity has been found or dated.

These shifts will be compared to major "world" changes. Both social factors, such as the rise and fall of the roman empire and related migrations, and natural occurrences, such as sea-level changes, volcanic activity, and pandemics, will be considered. Especially two drastic drops can be observed, one between 50 AD-200 AD and one in around 450 ad 550 AD. The last possibly related to either climate disaster related to volcanic activities in the 530, or the Justinian plague slightly later, but migration to the British Islands is also considered.

“ECONOMIC ARCHAEOLOGY” AND QUANTITATIVE APPROACHES – MEASURING THE VARIATIONS IN PRODUCTION AND CONSUMPTION FROM ARCHAEOLOGICAL DATA

Theme: 4. Globalisation and archaeology

Organisers: Pasquini, Béline (Université Paris 1 Panthéon-Sorbonne) - Millot-Richard, Clara (Université Paris 1 Panthéon-Sorbonne; CNRS - UMR 8215 Trajectoires) - Keil, Jessica (Leopold-Franzens-Universität Innsbruck)

Format: Regular session

Economic approaches are crucial to enhance our understanding of prosperity in ancient societies. By assessing variations of production, exchange and consumption, it is possible to describe and interpret fluctuations of wealth and standard of living in human communities. Quantitative measures of production and consumption are vital for archaeologists and historians interested in economic growth and standards of living.

Many archaeological studies of past economies based on quantitative approaches have been published in the past. Most of them are based on multiple variables such as storage capacities of granaries, the type and size of workshops, or the circulation of goods. However, despite what has already been achieved, many archaeologists working on production and consumption still disregard quantitative approaches and limit their focus on technical processes without integrating these into a broader economic scheme. Measurements of economic fluctuations can indeed be challenging. Economic sciences themselves have been created in and for modern times. They often offer limited resources and tools for ancient times. Moreover, archaeological materials differ significantly from written sources used by historians working on contemporary and early modern economies.

We believe it is crucial to develop economic and quantitative approaches for pre-modern economic systems. The improvement of data management systems and the growing practice of rescue archaeology in many European countries since the 1990s provide archaeologists with a considerable amount of data. Thanks to these developments, it is now possible to contemplate quantitative approaches of variations of production and consumption. The aim of this session is, therefore, to present innovative methods to measure variations in production and consumption on short and long-term timelines, on small and large scales. Contributions dealing with the implementation of concepts or methods coming from modern economics are also welcome. We accept papers ranging from prehistorical sedentary societies to mediaeval times, without geographical restrictions.

ABSTRACTS:

1 AN ECONOMIC HISTORY OF EXCHANGES FROM GRAVE GOODS : SOME QUANTIFICATION ISSUES IN ARCHAIC CAMPANIA (8TH-6TH BC)

Abstract author(s): Maudet, Ségolène (Université de Lorraine - Hiscant)

Abstract format: Oral

My research aims at studying economic exchanges from archaeological sources, especially from grave goods, in Campania between the 8th and the 6th centuries BC. I have developed a method of analysis combining the use of GIS with a cautious quantification, mostly in order to contextualize some of the phenomena I observed regarding the consumption of allogeous goods (Greek, Etruscan and Phoenician vases, Egyptian and Phoenician ornaments and scarabs, etc.). In my paper for this session, I would offer a critical review on some methods of quantification, in two complementary perspectives: first, the quantification of funerary contexts, and secondly, some issues about allogeous ceramic's quantification in archaic Campania.

A Social Network Analysis has recently been made on grave goods from a Greek site in Campania, Pithekoussai. Grave goods were isolated, counted, and assumptions were made about the links they allowed to observe between Pithekoussai and some other Mediterranean sites.

I propose in this paper to examine how such a quantitative and formal approach tends to neglect some fundamental properties of grave goods, and to propose other forms of quantification, more respectful of the complexity of the funerary context.

Another aspect of my communication would concern ceramics' quantification, especially when the goal is to compare different types of context (graves, sanctuary, settlement) or even different sites. Depending on the vases fragmentation and on the classifications homogeneity, many issues arise when trying to quantify those sherds. I will use some empirical examples from my ongoing study of unpublished graves from Pontecagnano and Calatia.

2 TRACKING MICROREGIONAL ECONOMIC TRENDS THROUGH ARCHAEOBOTANY: LESSONS FROM THE LATE ANTIQUE NEGEV HIGHLANDS

Abstract author(s): Fuks, Daniel (McDonald Institute for Archaeological Research, University of Cambridge)

Abstract format: Oral

A recent study of quantitative archaeobotanical and ceramic data from trash middens provided the first empirical proof for export wine production in the Late Antique Negev Highlands, tracing its rise and fall within a period of approximately two centuries (mid-4th–mid-6th c. CE). This study advanced an original approach to tracking trends in ancient production, using quantitative changes in grape pip proportions as an index for the intensity of grape cultivation, and those of Gaza amphorae as an index for involvement in Mediterranean trade. For the sake of future applicability and adaptability of this approach to economic archaeology, this presenta-

tion surveys its strengths and limitations, with reference to the comparability of archaeological contexts, dataset size, and temporal/regional resolution. In addition, reasons why an alternative approach – based upon calculating production capacity of known winepresses – yielded different conclusions regarding Byzantine Negev viticulture, will be discussed, including how to reconcile the discrepancy. Furthermore, additional archaeobotanical findings from the Byzantine Negev Highlands demonstrate how different scales of temporal analysis yield different narratives of the microregional agricultural economy. This not only contributes to more holistic, multi-scalar economic reconstruction but offers potentially profound opportunities for integrated models. For instance, seasonal effects can potentially be incorporated in archaeological-economic reconstructions, as is done in modern gross domestic product (GDP) growth models. Findings from the Late Antique Negev Highlands demonstrate how archaeobotany can contribute to economic reconstruction on millennial, decadal-centennial, and seasonal levels, while emphasizing the importance of temporal scale in economic archaeology.

3 REFLECTIONS ON THE QUANTIFICATION OF LATE ROMAN BRICK PRODUCTION: THE “AULA PALATINA” IN THE IMPERIAL RESIDENCE OF TRIER

Abstract author(s): Schmidts, Thomas - Herdick, Michael (Römisch-Germanisches Zentralmuseum)

Abstract format: Oral

When Trier became the imperial residence in the 4th century AD, a large-scale building program began that permanently changed the appearance of the city. Among the most striking large-scale buildings were the imperial palace, the largest thermal complex north of the Alps and one of the largest churches of late antiquity. The supply of building materials was an enormous logistical challenge: about 2 million bricks were needed for the construction of the “Aula Palatina” alone. The demand for bricks was met by newly founded brickworks, though these production sites have not yet been located. Four large producers that met the demand in the 1st half of the 4th century are known by their stamps on the bricks. In the second half of the 4th century, additional producers can be identified and military bricks were also delivered from the more distant border regions at high transport costs. This may have been an indication that the demand could no longer be met in a suitable manner by private suppliers.

Based on current findings using experimental archaeology and process chain analysis, the effort in labor and time, as well as material resources for a brick kiln firing are quantified. The results will be contrasted with current research on brick production in the Trier region. The goal is to develop a quantification model for the procurement of ceramic building materials for the construction of the “Aula Palatina” and to identify future research needs.

4 FORMATION OF ANCIENT INDUSTRIAL DISTRICTS – THE CASE STUDY OF THE EASTERN EIFEL

Abstract author(s): Hunold, Angelika (RGZM - Römisch-Germanisches Zentralmuseum, Leibniz-Forschungsinstitut für Archäo) - Schaaff, Holger (RGZM)

Abstract format: Oral

The quarrying and mining district of the Eastern Eifel, situated nearby the confluence of the Rhine and Moselle rivers and characterised by mineral raw materials, very early became an economic player of supra-regional importance. From the Roman era, the products – primarily basalt lava mills, tuff stone building material, and pottery – were traded throughout much of Europe. Even today the raw materials are a significant economic factor.

The initial triggers in this development were two technology and knowledge transfers from the Mediterranean: the introduction of the rotary mill and the introduction of stone construction on the territory north of the Alps. As a result, the quarries and mines became part of the Roman expansion and urbanisation policy. But which were the additional key factors and how can an ancient industrial district be defined? The case study of the Eastern Eifel provides evidence about this. The contribution focuses on the formation, development and social impact of the district in Roman times.

5 ON THE OTHER SIDE OF THE MIRROR: HOW EUROPEAN LATE PREHISTORY PEOPLE MEASURED AND QUANTIFIED THEIR OWN WORLD?

Abstract author(s): Poigt, Thibaud (UMR 5607 Ausonius - Univ. Bordeaux Montaigne; UMR 5608 TRACES - Univ. Toulouse Jean Jaurès)

Abstract format: Oral

The quantitative approaches of archaeological data allow to transcribe in our modern analysis grid what remains of ancient economic activities. In this paper, I propose to reverse the question focusing on the way Bronze and Iron Age people developed practices and tools to organise, count and measure their own world, from natural resources to possible surpluses. I will present a brief overview of the main archaeological remains allowing to characterise the use of measuring instruments, practices, institutions during Late Prehistory. The study will investigate several features of measuring during European Late Prehistory: weighing metrologies, metal calibrations and capacities of ceramic containers. The data analysis will rely on a set of analytical tools dedicated to metrological studies and developed in the scope of various interpretative approaches.

In addition to the formal presentation of the data and their analysis, this paper will question the degree of awareness and knowledge of the Late Prehistory people concerning the quantification in an economic perspective. One of the main points will be to determine

what position occupy the quantification in the development of daily production, exchanges or storage practices, their impact on the construction of economic – formal or informal – institutions and their materialisation in the archaeological record.

6 ENERGY EXPENDITURE CALCULATIONS ON COPPER AND BRONZE METALLURGY AS A QUANTITATIVE TOOL FOR UNDERSTANDING BRONZE AGE ECONOMY?

Abstract author(s): Brinkmann, Johanna (Institut fuer Ur- und Fruehgeschichte Kiel)

Abstract format: Oral

Energy expenditure calculations have been used in archaeology mainly to describe construction processes (e. g. of megalithic tombs and grave mounds, see Müller 1990, Schulze-Forster/Vorlauf 1990). However, energy expenditure calculations prove to be a valid tool to approach questions of production and consumption in Bronze Age societies. This offers the possibility to study the production of copper and bronze artefacts in a quantitative way. Archaeological finds and features indicate a series of changes in metal processing technology at the end of the Early and the beginning of the Middle Bronze Age (around 1600 BC) in Central Europe. The oxidizing smelting process is replaced by a smelting technique that runs under reducing conditions. The reducing process allows the production of larger amounts of metal and a greater standardisation, but presupposes a more complex furnace construction, which is indicated by furnace features from the Eastern Alps. In the later phase of the Early Bronze Age a change in alloying from arsenical copper and copper with a low tin content to tin copper with approximately ten percent of tin occurs. An examination of the archaeological material and the systematic evaluation of experimental results show that these changes in metalworking technology are accompanied by an increase in energy expenditure required for the production of copper and bronze artefacts and an increased demand for wood resources. The calculation of the energy expenditure – including all production steps – gives a comparative value (in person hours) for every copper or bronze artefact measured by their weight. These person hours do not, however, reflect the economic or intrinsic value of the object, as the concept of energy expenditure calculations was created in and for modern times. Nevertheless, the presented method represents a new quantitative approach that allows for comparison between different (types of) copper and bronze artefacts.

7 IRON AGE ECONOMICS IN PERSPECTIVE OF DATA QUANTIFICATION FROM ARCHAEOLOGICAL ANALYSES OF – HOW FAR CAN WE GO?

Abstract author(s): Bursak, Daniel - Danielisová, Alžběta (Institution of Archaeology of the CAS, Prague)

Abstract format: Oral

Character of production is a key indicator of the overall development level of any studied past society. Importance of our understanding of economic activities is even more accentuated in periods with unbalanced archaeological source base like in case of the La Tène period in Central Europe (5th – 1st century BC) when we literally miss graves from the 2nd century onwards. Common hypotheses are typically built on interpretation of specialisation of crafts, their spatial distribution, intensity, and the network of resources, producers and consumers. From this viewpoint, we are establishing the hierarchy of settlements, their involvement in long-distance trade etc. Quantitative aspect has so far been used in terms of representation of various production activities, in the bioarchaeological research or as an alternative approach to artefactual studies and material analyses.

We would like to introduce a new perspective which emerged during our work focused on geochemical analyses of artifacts made predominantly of copper alloys. With a large amount of data covering a timespan of more than four centuries, we can distinguish a long-term trend of narrowing the geochemical pool of possible resources. Simultaneously we detect a wider spectrum of produced alloys. These results correlate well with hypotheses on the development of specialized crafts and tendency towards centralized supply in the younger part of the given period. Based mainly on the evidence of influx of exogenous material, we discuss the market-oriented production versus its control by the elites, which has been postulated by earlier works but still lacks more exact verification. The dialogue between archaeometric data and hypotheses on the La Tène organisation of the production will be illustrated on a broader spectrum of evidence, including glass, gold, salt and iron.

8 SALT AND IRON IN FRANCE AND GERMANY: COULD THESE RAW MATERIALS BRING AN EARLY MARKET ECONOMY TO LIGHT?

Abstract author(s): Millot-Richard, Clara (Paris 1 Panthéon Sorbonne)

Abstract format: Oral

Market economy can be defined as a set of mechanisms through which human societies secure and regulate their material reproduction. This is done mainly via the supply of, and the demand for, rare products that meet tangible or social needs. Thus, the concepts derived from economics have been regarded as inappropriate to study ancient societies and indeed, they can hardly apply as such because archaeological data are incomplete. However, the data available on raw materials, especially salt and iron, can certainly be analysed from an economic point of view.

The aim of this presentation is to show how the market economies of the Iron Ages can be apprehended and understood when applying the methods of economic science. Salt and iron are resources that can be described as strategic. Iron is highly valued for its physical properties. Consequently, both resources are very likely to be contingent on market trends that are inherent to the normal course of supply and demand. The concepts of specialisation, trade, industrialisation, which are often regarded as the pillars of a market economy, are also perfectly applicable to salt and iron. In order to highlight some of the economic phenomena that affected

Iron Age societies, our presentation will be based on the data on salt and iron that we have collected in the East of France and the West of Germany.

To study them, we used spatial analysis, but also to understand the interplay between production factors and consumption factors. Moreover, the statistics clearly show correlations, on a given period, between consumption contexts and the various categories of objects. Thanks to this dual approach, the variations in demand and the dynamics of the raw materials market become noticeable. This kind of approach enables to detect demand, therefore to highlight from the archaeological data available the market dynamics.

9 A WEALTH FROM CRUCIBLE AND ANVIL – IRON AGE SPATIAL SOCIO-ECONOMY AS SEEN THROUGH MULTIMETAL CRAFTSMANSHIP AND METAL USE

Abstract author(s): Svensson, Andreas (Dept. of Archaeology and Ancient history, Lund University)

Abstract format: Oral

The project 'From the Crucible and at the Anvil' was started in 2015 with the goal of examining the socio-economic implications of metalworking in Iron Age Scandinavia, focused on the spatiality, economic remits and technological repertoires of metal use. The connection between economy and metal use is central to the project. Within one case study, metalworking sites have been analysed from a macro-level landscape perspective covering the wider south-east Scandinavian region throughout the Iron Age (500BCE-1100CE).

In this paper, results from the case study are presented and evaluated. The macro-spatial patterns of metal craftsmanship are used to infer the role of metal use in the overarching economic climate. Employing a data-set from both contract-archaeology and inventory projects in southern Sweden, quantitative approaches and spatial statistics have been both necessary and fruitful. Using a macro-level approach, the site-information analysed was reduced, with spatial location, primary metal use and coarse chronology forming key attributes.

This method differs significantly from the more high-resolution qualitative approaches normally favoured when countering questions concerning the societal implications of metal use. What are the benefits and limitations of these approaches? And how can these methods be integrated in economic analyses of the Iron Age?

A qualitative landscape analysis of a sub-region of the study area forms the basis of another case study within the project. The focus here has been to elucidate the spatiality of commodity-chains of metal use, and contrast those patterns to the general Iron Age landscape. Comparing the two case studies provides the opportunity to gauge the use of both sets of approaches, highlighting pros and cons. Arguments for utilizing an inclusive toolbox with regards to method and theory when interpreting the economic landscapes of the past will in this way be advanced in the paper.

10 WRITING ECONOMIC HISTORY WITHOUT CONCRETE FIGURES? BRONZE AGE NORTH TYROL AND THE QUESTION OF THE ECONOMIC SIGNIFICANCE OF METAL PRODUCTION

Abstract author(s): Keil, Jessica (University of Innsbruck - Department of Archaeologies)

Abstract format: Oral

Based on metal analyses, the so-called "classical Ösenring (ingot torque) copper" is closely associated with copper mining in the Tyrolean Lower Inn Valley (fahlore mining district Schwaz – Brixlegg) in Western Austria. In the Early Bronze Age, it was distributed in considerable quantities over large parts of Europe up to Scandinavia. Thus, it can be assumed that during this epoch an intense mining activity took place in North Tyrol – which was abandoned in the Middle Bronze Age and resumed in the Late Bronze Age –, and yet it is hardly possible to make quantitative statements on this matter. This is mainly due to the fact that corresponding mining traces and processing facilities are missing or have not been preserved.

Under such circumstances, what possibilities remain for writing an economic history of the region and assessing the importance of metallurgy within this framework? Since the archaeological sources on the Early Bronze Age in the area are quite limited overall (burials of this period, for example, are almost unknown), the incorporation of archaeometric data seems absolutely necessary. Archaeozoological, geochemical, and palynological analyses are of particular importance here. The purpose of this paper is to present some preliminary conclusions from an ongoing research project in this regard: on the one hand, such sources are consulted in a case study based on the Buchberg near Wiesing, a smelting site in the Tyrolean Lower Inn Valley. On the other hand, valuable insights can be derived from a more far-reaching comparison of archaeometric data from Bronze Age sites in the Eastern Alps.

In this way, even if no direct calculations on the (Early) Bronze Age metal production in North Tyrol are feasible, we can nevertheless obtain concrete figures and information on the economic system and the importance of metallurgy therein.

21 DOMESTICATING TIME: TEMPORAL CHANGES IN ANIMALS AND PLANTS DURING THE HOLOCENE

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Rosenstock, Eva (Freie Universität Berlin, Einstein Center Chronoi) - Orton, David (University of York, Department of Archaeology, BioArCh) - Antolin, Ferran (Universität Basel, Integrative Prehistory and Archaeological Science - IPAS)

Format: Regular session

Investigation of the effects of domestication in the Southwestern Asian to European trajectory of Neolithization and subsequent periods so far has focused on morphological aspects. Besides coat colour and texture or body size and shape in animals as well as rachis structure or grain size and shape in plants, however, there have also been changes in biological rhythms. Such temporal changes with domestication have so far received only spotlight research. Did animal birthing seasons and birth spacing change with domestication? Did spread into different climates affect animal life cycles? How were ruminant and equid lactation periods manipulated? How did domestic birds lose migration? Can we see changes in growth and wear rates? How did germination and harvest seasons change with latitude? Can we trace the origins of winter/summer crops? How did irrigation affect plant life cycles? Can we say anything about the temporality of wild and domestic microbes? The session aims to bring together researchers working on data and theories to unravel temporal changes in domesticates sensu lato during the entire Holocene more systematically.

ABSTRACTS:

1 A TIME TO SOW, A TIME TO REAP: CHANGING BIOLOGICAL AND ECONOMIC RHYTHMS IN SOUTHWEST ASIAN PLANT AND ANIMAL DOMESTICATION

Abstract author(s): Marom, Nimrod (University of Haifa, Department of Maritime Civilizations & the Leon Recanati Institute for Maritime Studies) - Fuks, Daniel (McDonald Institute for Archaeological Research, University of Cambridge)

Abstract format: Oral

This paper explores aspects of temporal variation in southwest Asian plant and animal domestication which have contributed to the economic success of the 'Neolithic package'. More specifically, we relate biological aspects of seasonality with economic developments in the evolution and diffusion of agriculture. We discuss how: (1) flowering/lambing times affect geographic diffusion of domesticates; (2) ripening/slaughtering times affect risk management strategies; and (3) harvesting/sowing times, as well as seasonal grazing regimes, affect both human labor and perceptions on time. For instance, spontaneous hybridization of tetraploid domesticated emmer with the wild grass, *Aegilops tauschii*, conferred genetic adaptability to non-Mediterranean climates in the resultant hexaploid wheat. As a result, wheat today is grown in a variety of climates and latitudes worldwide, is the most important source of food grain for humans today and the largest primary commodity. Genetic mutations affecting photoperiod enabled evolution of spring wheat from winter wheat, while in southwest Asia more subtle differences of harvesting season between wheat and barley were key to managing weather-related risks. Finally, loss of seed dormancy and ripening uniformity were part of an increasing process of economic routinization under domestication. It emerges that changes in biological temporality of domesticates over the Holocene are related to increasing geographic diffusion, increasing production intensity, and decreasing diversity in herds and fields – processes inherent in contemporary globalization. Thus, while biologists since Darwin considered domestication a model for the study of evolution, we suggest that domestication may also offer a model for the study of globalization.

2 AGRICULTURAL PRACTICES OF THE NEOLITHIC COMMUNITIES IN THE CENTRAL BALKANS: WHAT CAN THE WEED SEEDS TELL US?

Abstract author(s): Sabanov, Amalia (Laboratory for Bioarchaeology, University of Belgrade) - Obradović, Đurđa (Institute of Archaeology, Belgrade) - Filipović, Dragana (Institute for Pre- and Protohistory, Christian Albrecht University, Kiel) - Antolín, Ferran (Integrative Prehistory and Archaeological Science - IPAS, University of Basel; German Archaeological Institute, Berlin)

Abstract format: Oral

The Neolithic farming communities and the agricultural practices in the Central Balkans are still poorly understood, even though this geographical region played an important role in the spread of the Neolithic way of life. Archaeobotanical analyses contribute greatly to the investigation of this topic, especially if they are conducted systematically at multiple archaeological sites. The analysis of remains of crops can determine the crop choice, but does not provide enough knowledge on other aspects of plant cultivation. Nevertheless, the examination of remains of arable weed species can supply important data concerning strategies of field preparation, sowing season, management and harvest of the cultivated crops. Despite the numerous excavated Neolithic sites in this region, the paucity of systematically collected archaeobotanical data, paired with differences in the strategies employed for retrieving plant remains, raises challenges for the assessment of agricultural practices and direct comparisons between the sites. Our study has, therefore, focused on several Neolithic sites in modern day Serbia and North Macedonia where a more systematic approach for the recovery of plant remains was adopted and which could provide relevant information concerning weed species. The collected data allow us to observe intra- and inter- regional patterns and differences in the farming practices. Further, we explore whether agricultural choices show a dependency on environmental constraints and opportunities or cultural preferences and learned traditions. Apart from offering hypotheses on the nature of agricultural practices which will serve as a good starting point for future studies, we

also stress the need for systematic sampling for archaeobotanical remains at Neolithic sites in the Central Balkans, as more robust archaeobotanical datasets are needed for a more profound understanding of early farming in the region.

3 IDENTIFYING SHEEP AND GOAT TEETH AND MANDIBLES USING GEOMETRIC MORPHOMETRICS FOR STUDYING THEIR DIACHRONIC EVOLUTION

Abstract author(s): Jeanjean, Marine - Evin, Allowen (Institut des sciences de l'évolution)

Abstract format: Oral

Sheep and goat are often herded together and show great morphometrics resemblance of their skeleton. While discrete criteria are now available to identify a large number of bones and teeth, quantitative approaches are still scarce especially for mandibles and isolated teeth. The aim of this study is therefore to propose new 2D geometric morphometric (GMM) protocols for distinguishing sheep and goat applied to lower third molar and mandible based on landmark and sliding semi-landmarks approaches. Once identified, teeth and mandibles size and shape can be quantitatively studied through time and space, leading to a better understanding of the bio-cultural drivers of sheep and goat diversity. Our analyses combine modern specimens of known breed, sexe and estimated age with archaeological specimens dating from the Neolithic to the middle-age and originating from the North-Western Mediterranean basin. The GMM results will be contextualised in the framework of ERC-DEMETER project aiming at studying « Eight millennia of changes in domestic plants and animals: understanding local adaptation under socio-economic and climatic fluctuations ».

4 SEASONAL REPRODUCTIVE RHYTHMS OF EARLY INTRODUCED SHEEP IN THE IBERIAN PENINSULA: DECIPHERING NEOLITHIC PATHWAYS

Abstract author(s): Tornero, Carlos (IPHES-CERCA, Institut Català de Paleoecologia Humana i Evolució Social; Area de Prehistòria, Universitat Rovira i Virgili - URV) - Balasse, Marie (Archéozoologie, archéobotanique: sociétés, Pratiques Et Environnements - AASPE, Muséum National D'histoire Naturelle, CNRS) - Navarrete, Vanessa (Laboratori d'Arqueozoologia, Departament de Prehistòria, Edifici B Facultat Filosofia i Lletres. Universitat Autònoma de Barcelona) - Martín, Patricia - Messana, Chiara (IPHES-CERCA, Institut Català de Paleoecologia Humana i Evolució Social; Area de Prehistòria, Universitat Rovira i Virgili - URV) - Sierra, Alejandro (Laboratori d'Arqueozoologia, Departament de Prehistòria, Edifici B Facultat Filosofia i Lletres. Universitat Autònoma de Barcelona) - Fiorillo, Denis (Archéozoologie, archéobotanique: sociétés, Pratiques Et Environnements - AASPE, Muséum National D'histoire Naturelle, CNRS) - Saña, Maria (Laboratori d'Arqueozoologia, Departament de Prehistòria, Edifici B Facultat Filosofia i Lletres. Universitat Autònoma de Barcelona)

Abstract format: Oral

Spanish Sheep livestock is today one of the largest in the European Union. In this area, the significance of sheep farming arises from its threefold production uses (milk, meat and wool), and the frugality, endurance and adaptability of sheep. Given their exceptional rusticity, Iberian sheep is capable to live in difficult environments, with harsh climates, little rain, low temperatures in winter and high ones in summer, taking advantage of poor pastures and agricultural by-products. To this is added a capability to de-seasoning, a distinctive marker of many sheep livestock systems with autumnal lambing as the main lambing season. Autumnal lambing is prized because it brings benefits in terms of out-of-season availability of sheep products, and here sheep flocks have this ability without artificial or pharmacological treatments.

In this contribution we check the ability to de-season sheep breeds in the Iberian Peninsula during the Early to Late stages of the Neolithic. Birth season and lambing period are investigated using intra-tooth sequential oxygen isotope values from archaeological sheep specimens found in some of the most relevant sites together with a new reference data set from modern sheep specimens covering a more detailed dates of birth. Autumn lambing and prolonged lambing periods are both present in some of the tested sites while others show spring births as a general rule. Our findings are discussed in the frame of the Iberian Peninsula considering two axes: i) the location of sites within the different agroecological environments of the Iberian Peninsula; and ii) the timing and geographical distribution of sites along the neolithisation processes.

5 UNRAVELLING MODES OF LIVESTOCK MANAGEMENT IN THE CENTRAL PYRENEES DURING THE EARLY NEOLITHIC

Abstract author(s): Sierra, Alejandro (Laboratori d'Arqueozoologia, Departament de Prehistòria, Edifici B Facultat Filosofia i Lletres, Autonomous University of Barcelona; Primeros Pobladores y Patrimonio Arqueológico del Valle del Ebro, Universidad de Zaragoza) - Balasse, Marie (AASPE « Archéozoologie, archéobotanique: sociétés, pratiques, environnements » UMR 7209 CNRS MNHN) - Rivals, Florent (ICREA; Institut Català de Paleoecologia Humana i Evolució Social - IPHES-CERCA; Universitat Rovira i Virgili - URV, Departament d'Història i Història de l'Art) - Bréhard, Stéphanie (AASPE « Archéozoologie, archéobotanique: sociétés, pratiques, environnements » UMR 7209 CNRS MNHN) - Montes, Lourdes - Utrilla, Pilar (Primeros Pobladores y Patrimonio Arqueológico del Valle del Ebro, Universidad de Zaragoza) - Fiorillo, Denis (AASPE « Archéozoologie, archéobotanique: sociétés, pratiques, environnements » UMR 7209 CNRS MNHN) - Saña, Maria (Laboratori d'Arqueozoologia, Departament de Prehistòria, Edifici B Facultat Filosofia i Lletres, Autonomous University of Barcelona)

Abstract format: Oral

The adoption of animal husbandry in the different areas that make up the Iberian Peninsula was fast, with all domestic species (sheep, goat, cattle, pig) being documented in all regions between 5600 and 5400 cal BC. The speed of this process must have been

due to the fast adaptation of farmers' societies to differing environments by modifying livestock management. This work aims to contribute to a better understanding of the Neolithisation process in the Iberian Peninsula with a multidisciplinary study of one of the earliest assemblage for the Early Neolithic in the Iberian Peninsula. To this end, this paper presents an integrated approach including archaeozoological, isotopic, and dental microwear analyses of the domestic herds from the Chaves cave (Central Pyrenees; 5600-4900 cal BC). The results document strategies applied to the management of domestic herds reproduction, feeding and demography, in relationship to the exploitation of animal productions. Sheep herd shows the existence of "out-of-season" lambing (autumn/early winter) and low seasonal variability in feeding, as far as could be evidenced from stable carbon isotope ratios and dental microwear. Besides, the exploitation of this species for meat and milk consumption is documented. The cattle population also low variability and high abrasiveness in their feeding. Finally, the pig population shows the feeding by production/consumption residues, documenting a home-based system with stabling of herds. Furthermore, these results are compared with others published for the Iberian Peninsula, in an attempt to elaborate a livestock production model for this region during the Early Neolithic. The results have shown a rapid adaptation of farmers' societies to the central Pyrenees (and to the Iberian Peninsula) and advanced zootechnical practices reflecting strong knowledge of animals needs, being able to control the structure of the herds and sustainability of animal productions.

6 DIVERSTY OF CATTLE DURING THE LATE NEOLITHIC CARPATHIAN BASIN

Abstract author(s): Csippán, Péter (Eötvös Loránd University of Sciences, Institute of Archaeology)

Abstract format: Oral

During the Late Neolithic of the Carpathian Basin, the consumption of wild game increased generally. This trend appears in all known sites from the period, with the ratio of the bone finds of wild game near 50% or higher. However, based on the quantity of the bones of domestic mammals, their stocks were also significant. What are the possible explanations for this phenomenon? Was that a special cultural attitude or can we interpret it as a sign of degradation of the stocks of domestic species? Some researchers explain these processes with a second wild fauna inflow of Holocene to the Carpathian Basin and they hypothesize, that the meat of wild game was available easily, so their consumption was more common.

The question is whether these environmental and/or cultural processes had an impact on the breeding ways of the main domestic species like cattle? Was there a homogenous phenotype around the Carpathian Basin during the Late Neolithic or can we reckon with local breeds?

In this study, the author compares cattle bone finds from different Late Neolithic sites of the Carpathian Basin, moreover, with conventional osteometric methods and geometric morphometrics, tries to find as much as possible answers to these questions above.

7 CATTLE-BASED AGRICULTURE IN THE EARLY AND MIDDLE NEOLITHIC IN THE POLISH LOWLANDS: INVESTIGATING TEMPORAL AND REGIONAL CHANGES IN CATTLE POPULATIONS

Abstract author(s): Gembicki, Maciej (Department of Archaeology, Adam Mickiewicz University in Poznan) - Lisowski, Mik (Bio-Arch, University of York) - Winkler-Galicki, Jakub - Derebecka, Natalia - Wesoły, Joanna (Department of Biology, Adam Mickiewicz University in Poznan) - Marciniak, Arkadiusz (Department of Archaeology, Adam Mickiewicz University in Poznan)

Abstract format: Oral

The gradual decline in body size of cattle is a post-domestication phenotypic adaptation well documented across Europe in the Neolithic. Whilst these continental trends are clear, more local patterns of variation in body size and shape may be overlooked. In our presentation we focus on gradual changes in morphology of cattle over time happening in several regions of the Polish Lowlands after the Early Neolithic. Data coming from traditional osteometry as well as three-dimensional geometric morphometrics suggest that initially, in the Early Neolithic, the size and shape of cattle bones did not vary significantly between the regions. However, with time, the populations of different regions started exhibiting different patterns of change in their morphology. The reasons for these variations are not fully apparent. It is not clear whether these changes can be attributed to an introduction of genetically distinct morphotypes of cattle, or rather the variations in cattle exploitation caused by the local economy or ecology.

8 SEASONAL CALVING IN EUROPEAN PREHISTORIC CATTLE

Abstract author(s): Balasse, Marie (AASPE, CNRS MNHN, Paris) - Gillis, Rosalind (ICArEHB, Universidade do Algarve) - Živaljević, Ivana (BioSense Institute, University of Novi Sad) - Berthon, Rémi (AASPE, CNRS MNHN, Paris) - Kovačiková, Lenka (Laboratory of Archaeobotany and Palaeoecology, University of South Bohemia) - Bălăşescu, Adrian ("Vasile Pârvan" Institute of Archaeology, Romanian Academy) - Bréhard, Stéphanie (AASPE, MNHN, Paris) - Dimitrijević, Vesna (Laboratory for Bioarchaeology, Department of Archaeology, University of Belgrade) - Stefanović, Sofija (BioSense Institute, University of Novi Sad; Laboratory for Bioarchaeology, Department of Archaeology, University of Belgrade) - Ivanova, Maria (Vienna Institute for Archaeological Science - VIAS, University of Vienna; Institut für Ur- und Frühgeschichte und Vorderasiatische Archäologie, Universität Heidelberg)

Abstract format: Oral

Present-day domestic cattle are reproductively active throughout the year, which is a major asset for dairy production. Large wild ungulates, in contrast, are seasonal breeders, as were the last historic representatives of the aurochs, the wild ancestors of cattle. Aseasonal reproduction in cattle is a consequence of domestication and herding, but exactly when this capacity developed in domestic cattle is still unknown and the extent to which early farming communities controlled reproduction seasonality is debated.

Seasonal or aseasonal calving would have shaped the socio-economic practices of ancient farming societies differently, structuring the agropastoral calendar and determining milk availability where dairying is attested. In this study, we reconstruct the calving pattern through the analysis of stable oxygen isotope ratios of cattle tooth enamel from 18 sites across Europe, dating from the 6th mill. cal BC (Early Neolithic) in the Balkans to the 4th mill. cal BC (Middle Neolithic) in Western Europe. Seasonal calving prevailed in Europe between the sixth and fourth millennia cal BC. These results suggest that cattle agropastoral systems in Neolithic Europe were strongly constrained by environmental factors, in particular forage resources. The ensuing fluctuations in milk availability would account for cheese-making, transforming a seasonal milk supply into a storable product.

22 A UNITED EUROPE OF THINGS 2. LARGE SCALE AND LOCAL NETWORKS OF DIFFERENCES AND SIMILARITIES IN MEDIEVAL MATERIAL CULTURE

Theme: 6. Material culture studies and societies

Organisers: Sawicki, Jakub (Institute of Archaeology, Czech Academy of Sciences in Prague) - Lewis, Michael (British Museum; Portable Antiquities Scheme) - Vargha, Mária (Universität Wien, Institut für Geschichte, Digital Humanities)

Format: Regular session

The idea of 'unity of culture' of Medieval Latin Europe is well known in historical literature, especially when it concerns the so called 'Europe North of Alps'. Scholars had often inclined that due to long distance trade, universal knowledge of Latin and shared religious ideas we can observe cultural similarities all over Late Medieval Europe. Our question is whether a similar trend is visible in portable material culture? To be more precise what are the similarities and differences in portable material culture, 'in and between' regions, during the period AD 1000 to AD 1550.

The first session on this theme was held at the EAA 2019 in Bern and enjoyed great interest and a large audience. Then most papers were focused mostly on North-West Europe, raising a need for a broader European perspective. We hope that more interregional focus will allow us to observe networks of material culture in different social and economic contexts across time. Broadening the chronology also opens discussion on the appearance and disappearance of small finds in burials in some parts of Europe, and thus, allows us to have an insight on the impact of material culture through changes in religious belief.

We will accept papers concerning full and late medieval (1000-1550) material culture focusing on:

- finds that are typical in regions as well as their comparison with other regions
- possible borders and peripheries of a common material culture
- interactions between local material culture and imported objects
- production, consumption and interregional exchange
- grave finds and their presence in burials (impoverishment of cemeteries).

ABSTRACTS:

1 LOŠTICE GOBLETs IN MEDIEVAL SLAVONIA AS A SYMBOL OF HIGH SOCIAL STATUS

Abstract author(s): Tkalcec, Tatjana (Institute of Archaeology, Zagreb) - Procházka, Milan (Department of Archaeology Faculty of Philosophy and Arts, University of West Bohemia in Pilsen)

Abstract format: Oral

Loštice goblets are specific types of tableware that was produced in the area of the town of Loštice since the end of the 14th or at the beginning of the 15th century and ceased to be manufactured till mid-16th century. With its shape, specific raw material and fabrication technology that has resulted in the characteristic appearance of their surface covered with the small bumps, craters and nodules, this drinking ware represent easily identifiable goods of North Moravian workshops. Loštice goblets represent popular items that the elite wanted to have, and thus express their higher status. They have often been used as vessels for drinking beverages in castles and noble houses across the Central Europe. However, their distribution in the area of medieval Slavonia has not been considered so far.

The prevalence of Loštice goblets in the castles of Medieval Slavonia corroborates their value as a trading commodity and as luxury items that were reserved exclusively for the privileged class of society. One single specimen found in a rural settlement raises the question of the reason for its occurrence in an atypical context. Several Slavonian specimens of goblets imitating the Loštice type by their form and manner of decoration are also taken into the consideration in the context of achievement of the Loštice goblets in the Central European market as an inspiration for potters to design similar vessels.

2 IMPORT OR IMITATION? – LATE MEDIEVAL GRAPHITE WARE AND ITS INFLUENCE IN TRANSDANUBIA (HUNGARY)

Abstract author(s): Kovács, Bianka (Institute of Archaeology, Research Centre for the Humanities; Eötvös Loránd University, Institute of Archaeological Sciences) - Jáky-Bárdi, Bogáta (Eötvös Loránd University, Institute of Archaeological Sciences)

Abstract format: Oral

The graphite ware was a typical pottery product in the western areas of the Danube region in the Middle Ages, so it has great importance for research in Hungary too. Some graphitic ceramics already appeared in the tenth-twelfth-century Hungarian Kingdom, however from the second half of the 13th century more and more occurred in the country based on finds from excavations. Vessels of similar forms fired in reducing atmosphere, but without graphite were also found. The number of the latter was much higher in the 13-14th century than of the graphitic exemplars, but their proportion is reversed in the 15-16th century. Researchers in the 20th century usually considered it clear that both graphitic ceramics and reduced products were imported from Austrian provinces. However, the large amount of these ceramics suggest to recent studies the local production - at least partially - as a possibility. But there is no doubt that these types of imported objects had a strong influence on the local pottery. In our presentation, we would like to examine the incurred questions about this group – including the possible social aspects – with the help of already published and new finds.

3 MEDIEVAL WHITE MINIATURE VESSELS FROM THE CZECH LANDS AND CENTRAL EUROPE AND THEIR ENTANGLEMENT IN THE SOCIAL-ECONOMIC NETWORKS

Abstract author(s): Capek, Ladislav (Department of Archaeology, University of West Bohemia)

Abstract format: Oral

In the High and Late Middle Ages we encounter with miniature vessels (small cups, mugs, jugs, bottles, bowls, or bells) made of white fine sorted kaolinic clay, often decorated with red pain or lead glaze that appear next to ordinary pottery (earthenware). These vessels appeared in Central Europe in the territory of Germany (Saxony) in the early as the 12th century and were previously described as Pfeifenton or an imitation of Pingsdorf-type ware. Only few production sites have been discovered so far, despite the abundance of their findings. The later miniature vessels entered the Czech lands as imports during the 13th century, before the spread of late medieval “colonization pottery”. They were found in urban, rural, secular, or ecclesial milieu and their distribution may indicate a well-developed market exchange in the 13th century. The miniature vessels from the 14th century could also be produced in Czech lands as an imitation of older examples. They were traditionally interpreted as containers for spices, salt, ointments, or fragrant essences; contemporary research considers them to be children’s toys because of their often findings in assemblages together with clay figures. These miniature vessels are one of the unusual but not rare types of medieval goods, which can point to contacts between producers and their consumers entanglement in social and economic networks, as well as the “medieval world of childhood and games”.

4 RAM, BULL AND RABBIT – POTTERY AQUAMANILIA FROM UPPER MARIBOR CASTLE

Abstract author(s): Jancar, Mojca - Ravnik, Mateja (Independent researcher)

Abstract format: Oral

A very popular object, which was an essential component of religious and secular rituals in medieval society, was an aquamanile. In the liturgy of the medieval church hand washing played an important role as at each Mass the priest washes his hands twice. However, the ritual hand washing was not limited only to the liturgy. It was also an important aspect of medieval courtly etiquette. In monastic refectories and in households of the nobility and those imitating their customs, meals began and ended with hand washing.

Aquamanilia are animal- or human-shaped vessels used for ceremonial, hand cleaning purposes as well as table decorations at banquet feasts, and were produced in large numbers all over Europe from twelfth through the fifteenth century in large variety of forms. They are usually cast in copper alloy or made from ceramic. Pottery aquamanilia are mostly found in fragments and were supposedly made for a more humble clientele. They are presumably made more locally, while copper alloy aquamanilia can be sometimes attributed to different production centres.

During excavations on the Upper Maribor Castle, Slovenia, fragments of at least five different pottery aquamanilia – five spouts representing different animals and one belly with handle and tail - were found. In this contribution, the authors will try to show the similarities and differences of these widespread and popular vessels regardless of material or region, but will focus on vessel’s form and depicted animal.

5 MATERIAL CULTURES AND SOCIAL PRACTICES IN THE ARCHAEOLOGICAL ASSEMBLAGES OF UPPSALA 1100-1550 AD

Abstract author(s): Kjellberg, Joakim (Department of Archaeology and Ancient History)

Abstract format: Oral

This presentation will address issues of identities and social practices within the Swedish medieval towns from a perspective of material culture and artefact assemblages. In my soon to be finalized PhD project at Uppsala university I have been studying changes in the archaeological assemblages from 14 archaeological excavations in the town of Uppsala in relation to the overall structural

development of the urban environment. Within the material there are discernable traces of shifting social and ethnic identities as well as different gender and age groups. The differences in status of the households is also possible to track over time giving new insights to the dynamic of the town. By taking such a multi-object and comparative approach to select materials from more than 70 000 medieval objects, ranging from personal belongings to mass-materials, a new and hitherto unexplored potential to capture and discuss the experience of urban everyday life, the effects of urbanization as well as household dynamics in the region have been made possible.

6 DIFFERENCES AND SIMILARITIES OF MATERIAL CULTURE IN EAST BALTIC AND OSTRIV CEMETERY ARTEFACTS FROM MEDIEVAL PERIOD USING ELECTRON MICROSCOPY

Abstract author(s): Saleem, Khurram - Schürmann, Ulrich (Institute of Materials Science and Engineering, CAU, Kiel; ROOTS-Cluster of Excellence, Kiel) - Shiroukhov, Roman (Zentrum für Baltische und Skandinavische Archäologie, Schleswig) - Ivakin, Vsevolod - Baranov, Vyacheslav (Institute of Archaeology of the National Academy of Science of Ukraine - IS NASU) - Bornheim, Claus von Carnap (Zentrum für Baltische und Skandinavische Archäologie, Schleswig; ROOTS-Cluster of Excellence, Kiel) - Kienle, Lorenz (Institute of Materials Science and Engineering, CAU, Kiel; ROOTS-Cluster of Excellence, Kiel)

Abstract format: Oral

Material science approaches are powerful tools to investigate material artefacts. In archaeology, observing networks of material culture to study the interregional connections is at centre stage of studies since decades. The interdisciplinary approaches of material science analysis and archaeology can unearth quantifiable comparisons between artefacts of different regions to trace the networks. In this research, analytical tools have been utilised to investigate the microstructure and composition of artefacts to draw similarities and differences between them. The artefacts are grave goods found at Ostriv cemetery, located 100 km South of Kiev in Ukraine and belong to the 10-11th century. These artefacts definitely belong to the East Baltic tribes and are not comparable with the local material culture of Kieven Rus'. This is the first time that artefacts from the Baltics have been found in an archaeological context so far east. Therefore, it is hypothesized that the population buried at Ostriv cemetery are immigrants from East Baltic regions. Hence pointing towards extension of Baltic networks into east European regions. Our question is whether a trend is visible in portable material culture of the two regions. To investigate this, material composition and structural similarities and differences between typologically similar artefacts are made. For the investigation of the materials, Transmission Electron microscopy (TEM) and Scanning Electron Microscopy (SEM) have been utilised. Focussed Ion beam (FIB) has been used to extract a nano-sized lamella out of the original artefact to keep the process quasi non-destructive. The study demonstrated the comparison of chemical compositions between the Medieval brass artefacts from East Baltic and Ostriv. Additionally, differences in chemical compositions between the outer surface and internal parts of the artefacts were noticed, owing to the significantly modified outer surface, mainly at the interface with the environment.

7 “TRIEWE AS STIEL”: KNIFE MANUFACTURING TECHNOLOGY IN NORTHERN EUROPE, 10TH-12TH CENTURIES

Abstract author(s): Hall, Mark E. (Black Rock Field Office, Bureau of Land Management)

Abstract format: Oral

Iron knives are one of the most ubiquitous artifacts found on Early Medieval and Medieval sites in Northern Europe. This paper is a Bayesian meta-analysis of a sample of knives from several locations in Northern Europe dating from the 10th through the 12th centuries. In addition to metallographic and typological data from the author’s research on the knives from Dublin and Waterford, Ireland and Deer Park Farms, North Ireland, previously published materials from York and Winchester, England, Kivivare and Rouge, Estonia, and Novgorod, Russia are included. The shape/form typology proposed by Ottoway (1992), which focuses on the shape of the back of the blade and handle, and the manufacturing typology proposed by McDonnell (1989), which classifies the blade on how steel is used in the blade, are utilized in this study.

The Bayesian meta-analysis shows that there is only a weak correspondence between the typological shape and manufacturing typology, potentially implying that the shape of a knife has little to do with its physical properties such as hardness, toughness and ductility. While manufacturing types 3 (pile-welded) and 4 (carbured edges) are not common at the above-listed sites, the meta-analysis does indicate that there is a correlation between the manufacturing typology and the site. Across the sites, hardness values are fairly similar for each manufacturing type, though there are some individual outliers. These results will be discussed in regards to technological styles.

References

- McDonnell, G. (1989) Iron and Its Alloys in the Fifth to Eleventh centuries AD in England. *World Archaeology* 20: 373-382.
- Ottoway, P. (1992) Anglo-Scandinavian Ironwork from Coppergate. *The Archaeology of York: The Small Finds* 17/6. York: York Archaeological Trust.

8 DISTANT INFLUENCES AND NEAR EXCHANGES: NEW PUBLIC FINDS EVIDENCE FOR FINNISH LATE IRON AGE AND EARLY MEDIEVAL MATERIAL CULTURES

Abstract author(s): Oksanen, Eljas (University of Helsinki) - Wessman, Anna (University of Bergen)

Abstract format: Oral

Late Iron Age and early medieval material culture in Finland (c. 600 - c. 1200) combines peripherality with liminality, arising as it does from relatively sparsely populated regions of northern Europe and at the same time closely connected to the east-west trade routes that joined the Baltic Sea with the great eastern European river networks. This paper considers new metal-work archaeological evidence in Finland that has emerged over the last five years through public (mostly metal-detected) small finds. Until recently, most of the knowledge on the material culture from this period was based on published inhumation cemeteries, despite this not being the dominant burial form during this time.

In this paper we will analyse public small finds in order to discuss evidence for international and interregional influences and contacts emerging from the data. There is, for example, a substantial rise in the number of recovered objects of the so-called Permian (by the upper Kama River in Russia) type, as well as other eastern and overseas Baltic styles. These distributions have not been examined before on a national scale, and they open a window into examining population structures, settlement patterns, and the flow of material culture influences within the region of modern Finland and beyond. Novel evidence for regional differences between eastern and western, maritime and inland, and sparsely and densely settled areas is apparent. Further, this new material may indicate fundamental biases in the processes by which archaeological data, its dating and subsequent analyses has been carried out, calling for a more substantive reassessment of the Finnish archaeological chronologies.

9 LOCAL OR REGIONAL? ELEMENTS OF MEDIEVAL URBAN MATERIAL CULTURE FROM BAIJA MARE (NAGYBÁNYA) AND SATU MARE (SZATMÁRNÉMETI)

Abstract author(s): Szocs, Peter Levente (County Museum Satu Mare)

Abstract format: Oral

The two towns were part of medieval Satu Mare County of the Hungarian kingdom (today North-western Romania). The distance between them was only cca. 60 km, and in many aspects the two towns enjoyed similar historic evolution, but there are several significant differences, too, due primarily to the natural resources available at local level. The town of Baia Mare was one of the important centres of silver and gold-mining, and coin-minting of the kingdom, while the economy of Satu Mare was based on the farming and husbandry, in addition to the commerce of salt and to its role played as the county's administrative see. During the last decades, several rescue excavations revealed a considerable amount of finds from medieval urban households of the two towns. The majority of the finds belongs the usual categories of ceramic vessels: table ware, cooking and storage pots and various fine ware. Furthermore a significant amount of stove tiles were recovered, while the number of other items made of other materials (bone, metals or glass) remain low, but not negligible. The paper will focus on several selected samples of the finds from the two sites and will compare their composition and specificities. This type of analysis might offer the opportunity to identify goods produced locally and their regional distributions, in contrast or in parallel to the items of the long distance trade.

10 WHAT DID A LOST AND FORGOTTEN MEDIEVAL SETTLEMENT IN THE MIDDLE OF THE POMERANIAN FOREST HAVE IN COMMON WITH LONDON?

Abstract author(s): Sikora, Jerzy (Institute of Archaeology University of Lodz)

Abstract format: Oral

The medieval settlement complex in Ostrowite existed between the middle of the eleventh century and the beginning of the fourteenth century. It was located on the shore of and on an island on Lake Ostrowite (described as Waldsee – Forest Lake in Late Medieval sources), about 10 km south-east of Chojnice. It was situated in East Pomerania, in the northern part of the Kraina Lakeland, close to the Tuchola Forest Plain, in what could be called a medieval border area between the Kingdom of Poland and Pomeranian Principalities. During over twenty years of research, remains of settlement features on the island and on the shore were found, as well as two inhumation cemeteries, relics of two subsequent timber bridges leading to the island, and poorly preserved remains of timber fortifications connected with the first bridge. Field walking/surface surveys, metal detector surveys, and excavations yielded tens of thousands of small finds. Most of them are characteristic of the medieval Slavic culture in Pomerania, however, a number of them seem to expose a wide network of trade connections reaching far east to Central Asia and west to London. They clearly illustrate that a peripheral settlement of relatively low importance was not only part of the local cultural and trade exchange, constituting the material culture of North-West Slavs, but that it also had links with long-distance trade and a wider North European cultural zone.

11 SMALL BUT OR PERIPHERAL? MATERIAL CULTURE OF MINOR TOWNS OF POMERELIA IN THE PERIOD OF HANSE DOMINATION

Abstract author(s): Starski, Michal (Faculty of Archaeology University of Warsaw)

Abstract format: Oral

The paper will be devoted to the characteristic of specific features of the material culture of Pomerelian minor towns in the late Middle Ages. These urban centres, such as Chojnice, Człuchów, Debrzno, Lębork, Puck, Skarszewy, were located off the main trade

routes and at the outskirts of the Hanseatic or Baltic world, however archaeological excavations conducted there revealed numerous finds related to the Hanseatic lifestyle or elements of it. Through an analysis of such categories of finds as pottery, stove-tiles, glassware and metalware a picture is drawn of Baltic towns' participation in the urban culture. It enabled inferring the nuanced status of the smaller towns in relation to the main trade centres of the Baltic Sea. The cases discussed in the paper are aimed at broadening the ongoing discussion by introducing smaller towns that complemented the urban network in the Baltic region along with the peculiarity of its commercial exchange.

12 THERE'S SOMETHING ABOUT MARY: THE ROLE OF THE VIRGIN MARY IN THE MATERIAL CULTURE OF MEDIEVAL HUNGARY

Abstract author(s): Stark, Karen (Central European University)

Abstract format: Oral

In the study of medieval religious beliefs and practices, material culture can often be overlooked in favor of textual sources. However, material culture provides a literal and figurative physical connection to the past that is invaluable and provides insights into often overlooked fragments of society. Such is the case of the Virgin Mary in medieval Hungary. The Virgin can be found in numerous—often mundane—material forms in Hungary:

on coins traded daily in markets to pilgrimage badges acquired from faraway lands. From these we can explore cultural networks and exchange, and the growth and particularities of aspects of the Marian cult within Hungary. We can, for instance, identify variants of Marian iconographic representation (e.g., the Annunciation and Maria in sole) on stove tiles and evidence of the cult of the Rosary through the discovery of rosary beads in medieval graves.

By considering material culture within the larger picture of the cult of the Virgin Mary in medieval Hungary and East-Central Europe, we can form a more nuanced and complete view of the role of this incredibly important figure in medieval religious life.

13 UNITED WE PLAY, UNITED WE PRAY? LOOKING FOR CONNECTED NETWORKS OF MEDIEVAL PLAY AND SUPERNATURAL ENGAGEMENT

Abstract author(s): Hall, Mark (Perth Museum, Scotland)

Abstract format: Oral

This paper is offered as a case study around the commonality/distinctiveness of portable material culture across medieval Europe. It will focus on material culture manifestations of play and belief/supernatural engagements, namely board games and pilgrimage souvenirs. The paper will adopt an entangled narrative of supernatural engagement, board games and cultural interaction. Its long durée trajectory commences in the mid-first millennium AD (with a link back to the earlier first millennium and Roman/European contacts) and closes in the sixteenth century. Over this time frame it will seek to highlight differences and similarities in play practices as suggested by board and dice games kit; with the nature and spread of chess a particular focus and its social and metaphorical understanding. Regarding Christianity as a broad cultural practice, wider than a set of theologically controlled faith precepts, it will also seek to understand pilgrimage as a unifying practice linking movement, supernatural engagement and gaming/play practices.

14 A UNITED EUROPE OF INSCRIPTIONS (ON MEDIEVAL DRESS ACCESSORIES)?

Abstract author(s): Lewis, Michael (British Museum)

Abstract format: Oral

Medieval 'dress accessories' are interesting object types for many reasons, not least because they can have inscriptions - many (but not all) religious in nature. These tend to be abbreviated (for example many consist of just of a few letters or words), rather than full-sentences or longer. As such they must have been well-known verses, derived from biblical texts and such like. This relationship between 'dress accessories' and 'religion' forms the basis of a thesis (presented here) that connects 'a United Europe of Things' through the over-arching presence of the catholic church.

This study will examine, in particular, inscriptions on medieval brooches, strap-ends and buckle-plates, but with reference to other types of medieval culture. Drawing primarily on the data held within the Portable Antiquities Scheme (PAS) database, but also on the information in other datasets and museum collections in Europe, it will highlight similarities and divergence in inscriptions on medieval finds.

15 MATERIAL CULTURE MADE ACCESSIBLE: 'MEDIEVAL METAL' FROM URBAN EXCAVATIONS IN FLANDERS (BELGIUM)

Abstract author(s): Deckers, Pieterjan (Vrije Universiteit Brussel, Maritime Cultures Research Institute - MARI)

Abstract format: Oral

A non-negligible hurdle in the collective analysis of medieval artefacts at large spatio-temporal scales is the accessibility and alignment of data. In many countries, development-led archaeology has yielded substantial amounts of new information in the past decades. These valuable results, however, are often fragmented and difficult to access, impeding the further valorization of archaeological fieldwork. This may be all the more true for assemblages of small finds such as metalwork, which, in contrast to bulk categories

such as pottery or glass, are typically limited in number and very diverse. Hence, they often lack coherent regional frameworks for classification, making finds processing and reporting labour-intensive and expensive.

In response to this challenge, the 'Medieval Metal' project was established in order to collate metalwork finds from medieval towns in Flanders (Belgium), one of the most economically successful and strongly urbanized regions within medieval Europe. The project is a collaboration with a range of partners, including several town archaeological services, and is funded by Flanders Heritage Agency.

'Medieval Metal' aims to revise the chronotypology of medieval metalwork for the region, aligning it with the 'Reference Typology' established by the finds recording scheme Portable Antiquities Netherlands. In addition to this expanded and updated classification, a semantic web portal is being built to expose artefact data, and a quantitative analysis of the dataset will be performed to identify important trends in the production, use and deposition of metalwork items in urban contexts in Flanders. These outcomes will be important resources for archaeologists and other scholars, but will also serve to engage lay audiences. This presentation will report on the background, goals and preliminary findings of the ongoing project.

16 WHAT TO (NOT) EXPECT OF MEDIEVAL DRESS ACCESSORIES. COMPARISON OF ASSEMBLAGES FROM WROCLAW AND PRAGUE

Abstract author(s): Sawicki, Jakub (Institute of Archaeology, Czech Academy of Sciences in Prague)

Abstract format: Oral

Medieval dress accessories (buckles, clasps, mounts, strap ends, hook and eyes, etc.) are most often the only archaeologically preserved evidence of dress. Dress, which, in addition to purely practical functions can also communicate identity and status of the wearers, their belonging to a specific class, ethnicity, social condition or a specific lifestyle.

This group of finds, used to be somewhat neglected in archaeology of Central Europe. This is due to several reasons, but the biggest issue seems to be that there were not enough accessible (and well published) finds which could constitute a significant assemblage for further analyses and drawing specific conclusions. To counter this problem, I have prepared a study based on over 1.100 dress accessories from different urban excavations in Wroclaw and Prague. Urban centres, slightly different in size, but still deriving from the same or very similar political, cultural and economic environment.

In this presentation, I would like to discuss the differences and similarities of those two archaeological assemblages as well as problems which arise during such research. These problems concern, among others, difficulties in comparing large collections from distant sites, or the specificity of dress accessories finds from a non-urban context, or even an accurate identification of specific items. All these factors contribute to the attempt to determine the social aspect of dress accessories, and their alleged belonging to people of different classes of the medieval world.

34 SCALES OF INTERACTION IN THE BRONZE AND IRON AGE CENTRAL MEDITERRANEAN

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Holt, Emily (Cardiff University) - Schirru, Davide (Università degli Studi di Roma "La Sapienza")

Format: Regular session

The cultures of the Central Mediterranean played a crucial role in the pan-Mediterranean interactions of the Bronze and Iron Ages. At large scales, these cultures facilitated trade across the Mediterranean Sea and beyond, reaching eastward to Cyprus, Crete, and the Near East, northward into mainland Europe, and westward to Iberia. These long-distance exchanges thrived despite the marked differences in social organization between the cultures of the Central Mediterranean and many of the cultures they contacted. Such exchanges carried people, ideas, and goods into new markets and new communities. At regional and local scales, the internal dynamics of Central Mediterranean communities created opportunities for both physical and social imports to become embedded in existing cultural structures, changing them and being changed by them. These dynamics are often investigated through artifact distributions, settlement patterns, and site hierarchies, but can also be addressed through materials analysis, isotope studies, and aDNA. This session will bring together research on the many scales of interaction operating in the Central Mediterranean during the Bronze and Iron Ages, with the goal of untangling the interwoven threads of cultural connection.

ABSTRACTS:

1 FROM THE ATLANTIC TO THE MEDITERRANEAN AND BACK: SARDINIA, IBERIA AND THE TRANSFER OF KNOWLEDGE IN BRONZE AGE NETWORKS

Abstract author(s): Araque, Ralph (University of Freiburg)

Abstract format: Oral

Sardinia was a hub of sea-routes connecting the Aegean and the Levant with Iberia at its latitudinal extremes in the Final Bronze Age (FBA), c. 1200-800 BC. At the West End of this network Portugal, Extremadura and Andalusia were the pivotal nodes between the Atlantic and Mediterranean worlds. Sardinia and West Iberia, although situated some 1200 nautical miles apart, shared unequivocally related bronze working techniques and typological preferences during this period. The shapes of swords and tools were almost identical and high quality binary tin bronzes prevailed.

The inhabitants of the island had apparently not much more in common with people from the West other than specific bronze technologies, local access to ores and their geostrategic locations at the intersections of greater networks. In the central Mediterranean, certain challenges accompanied the multi-directional and multicultural intensification of sea traffic, which included migration, relations and dependencies, or piracy. This led to a dynamic islander society integrating new people and knowledge into its unique cultural structure. In Iberia, at first sight there seems to have been less impact on local communities, despite its participation in the wider exchange networks. Without doubt, travelling individuals moved between both regions and transported objects alongside technological as well as metaphysical information.

This contribution shall explore the dynamics of exchange in a network without central control that must have been self-organized by its agents. It will also examine the possible forms of entanglement and hints on an unwritten symbolic code that might have signaled the recognition of agreements on dealing with strangers, to engage, to cooperate and exchange with "others" – or to the contrary, signaled the readiness to fight or to impose one's will by violence. Further focus will be on considering reasons for the marked local differences regarding the impact of contacts on local communities.

2 MULTI-PARAMETER ANALYSIS OF NURAGIC BRONZETTI: ON THE TRAIL OF METAL-DRIVEN TRADING NETWORKS IN THE FINAL BRONZE AND EARLY IRON AGE

Abstract author(s): Berger, Daniel (Curt-Engelhorn-Zentrum Archäometrie Mannheim) - Matta, Valentina (Graduate School of Arts, Aarhus University) - Nørgaard, Heide (Moesgaard Museum) - Salis, Gianfranca (Soprintendenza Archeologia, belle arti e paesaggio per la città metropolitana di Cagliari e le province di Oristano e Sud Sardegna) - Vandkilde, Helle (School of Culture and Society, Aarhus University)

Abstract format: Oral

Lead isotope and trace element analysis has over the last decades proved a significant tool for provenancing metals and hence to begin charting the variety and complexity of connections between Bronze Age societies. In metal-rich Sardinia, several archaeometallurgical studies were carried out in the early 2000s and helped fuelling the debate on long-distance metal trade. Besides, numerous oxhide ingots reached Sardinia in the Bronze Age hence testifying to the island's involvement with the Mediterranean metal-trade circuit. However, sourcing the copper and tin used for local Sardinian metalwork production has so far had limited success.

This paper reports on new multivariate analyses of Sardinian bronzetti (bronze statuettes) whose physical form embeds both local and global meanings within the Late Bronze Age/Early Iron Age world. We used a novel multi-parameter approach to analyse 48 samples of bronzetti from three Nuragic sanctuaries: Santa Vittoria-Serri, Abini-Teti, Su Monte-Sorradile. The approach combined lead, tin and copper isotopes as well as chemical analysis with metallographical and archaeological information in order to extract knowledge of the provenance and the processing of the metals.

The results reveal that most statuettes were cast and slightly worked over by cold-hammering. Specifically, local copper and/or lead sources were most likely used for their production. However, the tin in the bronzetti was imported since local tin mineralisation can be excluded by means of tin isotopes. Rather, Iberian deposits could have supplied the tin, additionally supported by preliminary results of Sardinian Late Bronze Age tin objects. A strong Sardinian – Iberian connection is manifest in the large number of Iberian artefacts discovered in Nuragic contexts, and vice versa. Finally, we can show mixing/recycling of the metal, which connects most of the bronzetti. Overall, Sardinian metalwork production relied not only on internal supply networks but was also connected to supra-regional trading partners.

3 SARDINIA AND ITS ROLE IN THE GLOBALIZED INTERNATIONALIZATION OF MEDITERRANEAN CULTURES

Abstract author(s): Pisanu, Laura - Hitchcock, Louise (University of Melbourne)

Abstract format: Oral

Since the 16th century BC, Nuragic communities, distributed through strategic nodes in the Sinis and lower Montiferru regions in western Sardinia created a network of settlements along coasts and rivers that promoted external and internal security of this territory while protecting its local resources. Maritime interaction between this region and similar networks in Mycenaean Greece and Cyprus contributed to a secure maritime environment that enabled globalized flows of artifacts such as pottery and bronze objects, raw materials such as copper and tin, technologies, and individuals to move through this and neighboring regions. The value of these networks are demonstrated by the appearance of new and internationalized civil and ritual monuments in Sardinia, Greece, and in Cyprus. We propose to investigate these entangled and internationalized styles of portable objects, technologies, and monuments through examining the similarities and differences in their uses in these regions, and through examining the degree of internationalism incorporated into architectural styles. In doing so, we shall distinguish between the foreign and local function of a selected group of objects. For example, we will examine the purpose of Cypriot bronze stands and Aegean ceramics in Sardinia, Greece, and Cyprus, as well as the incorporation of Nuragic building techniques in Greece, and the appropriation of some Aegean architectural styles in several monumental administrative structures in Cyprus.

4 APPROACHING INTERACTION IN IRON AGE SARDINIA: MULTI-SCALAR SURVEY EVIDENCE FROM THE SINIS ARCHAEOLOGICAL PROJECT

Abstract author(s): Gosner, Linda (Texas Tech University) - Nowlin, Jessica (University of Texas at San Antonio)

Abstract format: Oral

The island of Sardinia lay in a crucial location for trade and interaction in Iron Age maritime networks of the Mediterranean. Over the course of the 1st millennium BCE, Phoenicians, Carthaginians, and Romans, among others, came to trade and settle on the island, interacting with the local Nuragic culture. Despite this, the island has long been thought of as isolated. Travel writer D.H. Lawrence called it an unsubdued landscape “outside the circulate of civilization.” Recent DNA studies have underscored these perceptions, emphasizing the long-term genetic continuity of the island’s population. Archaeological research on interaction has traditionally focused on the excavation of major coastal settlements, leaving questions of interaction in the varied landscapes of the island’s interior understudied.

This paper draws from the results of the Sinis Archaeological Project (SAP) that complicate this view of interaction in Iron Age Sardinia. SAP is a regional survey in west-central Sardinia, a landscape with diverse ecologies and resources: agricultural plains, coastal, marshy, and mountainous territory. The project aims to understand the social, economic, and environmental factors that impacted resource extraction, settlement patterns, and interaction in these varied landscapes. We present our multi-scalar methodology, which integrates targeted excavation, pedestrian survey, and remote sensing. We discuss our initial results and then lay out our plans for future work in the region, on the island, and in the wider Mediterranean as part of our collaboration with the Migration and the Making of the Ancient Greek World Project. Ultimately, we suggest that multi-scalar methodology allows us to consider interaction and its impacts beyond coastal landscapes and to integrate our view of local and regional dynamics with wider Mediterranean phenomena. Work in Sardinia further illuminates the agency of Nuragic people in these dynamics in their local context, complementing scholarship on the role of Nuragic sailors in larger Mediterranean networks.

5 DYNAMIC SOCIAL NETWORKS ACROSS THE LANDSCAPE. A PETROGRAPHIC STUDY OF BRONZE AGE CERAMICS IN THE MARMILLA REGION, SOUTH-CENTRAL SARDINIA, ITALY

Abstract author(s): Gradoli, Maria Giuseppina (COMET S.a.s. Cagliari, Sardinia)

Abstract format: Oral

Focusing on the relationship between ceramic technology and social organization, this research studied 392 ceramics from eight Bronze Age settlements (1700-950 BC) in the Marmilla region (south-central Sardinia). The multidisciplinary methodology adopted, permitted to analyze the complex pattern of mobility, exchange, cultural and technological networks at a regional scale.

The selected ceramic thin sections were characterized using petrography, identifying the raw materials used, their provenance and highlighting specific technological and social choices. Considering fabric heterogeneity through time, it was demonstrated how the Bronze Age potters had a widespread appreciation of similar raw materials in the region, which indicates not only shared manufacturing traditions but also wider community interactions.

The number of samples studied and the chronological interval covered (750 years) makes this study the broadest Bronze Age petrographic dataset produced up to now for Sardinia.

Nuragic plain domestic pottery, like its imported counterparts from the Aegean, circulated among nuragic settlements as exchanged items, at an inter-site and inter-regional level, throughout the Bronze Age as demonstrated on petrographic basis.

This research also showed that pottery production throughout the Bronze Age and especially during the transitional and crisis periods of the nuragic society was not affected by any reorganization phase or social change. Potters continued their day-to day living, producing the same vessels types, using the same raw materials and even manufacturing new richly decorated vessels during the Early Iron Age, the full crisis period of the nuragic culture.

Moreover, by ceramics petrography, the author was able to demonstrate that the fabrics of two of the five Late Bronze Age burnished bowls found recently at Hala Sultan Tekke (Cyprus) came from some of the well-known production centers found in the Marmilla region (Gradoli et al. 2020).

6 CHANGING INTERSECTIONS AND INTERACTIONS IN NURAGIC SOCIETY: A NEW ASSESSMENT OF THE DYNAMICS IN SÀRRALA, EASTERN SARDINIA

Abstract author(s): Lai, Luca (University of North Carolina at Charlotte)

Abstract format: Oral

The issue of scales of interaction and connectivity in the Nuragic society of Bronze-Iron Age Sardinia is inextricably tied to the parallel understanding of the nature and extent of social complexity, and to the interpretation of the changing role and intensity of external contacts. The insular nature of the Nuragic culture coupled with Sardinia’s large landmass magnifies the impact of outside people, ideas and items while skewing it with the specific diffraction lens of local social norms and belief systems.

The specific case study examined is the coastal area of Sàrrala, in Eastern Sardinia: geographic features and buffer zones allow to the likely identification of a Nuragic territory. The evolution of the meaning of such territory and its different and changing scales of interactions are traced through settlement and building analysis, and interpreted in light of the record from elsewhere on the

island including stable isotopes and aDNA, and of Mediterranean-wide climatic patterns. While a picture of progressive demographic growth and infilling of the landscape and subsequent concentration of population and labor follows a sequence widely detected on Sardinia, specific identifiable aspects include:

- comparatively higher fragmentation/competition (ratio of complex vs. simple nuraghi; ratio of tombs vs. nuraghi);
- possible clues pointing to descent as an ordering principle;
- a fairly consistent pattern in the distribution of non-local building materials in a late phase perhaps coinciding with the advanced Final Bronze Age and the Early Iron Age.

These elements appear compatible with an organized exploitation of the available territory, and with patrilocal and closeness to emerging lineages and/or locations as a long-lasting ordering force. Questions that remain open concern the role played by internal dynamics relative to constraining factors as climate change and long-distance trade connections.

7 LOCAL AND REGIONAL MOBILITY IN AN EARLY NURAGIC COMMUNITY: STRONTIUM MAPPING CENTRAL SARDINIA

Abstract author(s): Holt, Emily (Cardiff University) - Schirru, Davide (Università degli Studi di Roma “La Sapienza”) - Madgwick, Richard (Cardiff University)

Abstract format: Oral

Understanding human and animal mobility in small-scale societies can help elucidate networks at local, regional, and inter-regional scales. In turn, these networks can shed light on inter-community cooperation and competition, differential access to goods and the development of inequality and hierarchies. Strontium isotope analysis is a powerful tool for understanding mobility and reconstructing networks. This approach is long-established, but in the cycle of methodological refinement the importance of high resolution biosphere maps on which to base interpretation has come into sharper focus in recent years. The Marie Curie project ZANBA – ZooArchaeology of the Nuragic Bronze Age – is creating a strontium isoscape of central Sardinia for use in provenancing faunal remains from excavated sites. This will allow researchers to reconstruct local interaction networks even in the absence of easily identifiable exchanged artifacts like pottery. ZANBA is domain mapping strontium isotope ratios using homogenized sampling of deep-rooted modern plants from 137 points across central Sardinia. The research area was divided into 22 separate lithologies, 19 of which were large enough to warrant sampling. This presentation reports the first results of ZANBA and discusses future directions, including using the isoscape to interpret faunal remains from the early Nuragic site of Sa Conca sa Cresia near the town of Siddi in south-central Sardinia.

8 CENTRAL MEDITERRANEAN INTERACTIONS IN THE LATE BRONZE AGE SEEN FROM CANNATELLO HUT 2 (SICILY)

Abstract author(s): Vanzetti, Alessandro (University of Rome “La Sapienza”) - Levi, Sara (Hunter College, NY) - Castagna, Maria Antonietta (Independent Researcher) - Day, Peter (Sheffield University) - Di Renzoni, Andrea (CNR - ISPC, Rome) - Cannavò, Valentina (University of Modena & Reggio Emilia) - Porta, Francesca (Independent Researcher) - Talotta, Natalia (University of Rome “La Sapienza”) - Gulli, Domenica (Soprintendenza BBCCAA, Agrigento)

Abstract format: Oral

Cannatello is a well-known site in coastal Southern Sicily, whose finds span from a vast number of locations, within the Late Bronze Age Mediterranean. The new research on the site since 2017, conducted jointly by the Soprintendenza BB.CC.AA. of Agrigento, the University of Rome “La Sapienza” and the Hunter College of New York (USA), brought to the proper definition of some relevant contexts. Among them, the completion of the excavation of hut nr.2 and the comprehensive study of its finds resulted in details about its structure, use and abandonment.

Hut 2 is the biggest hut found, in terms of size, with a particularly massive structure; its construction is placed in stratigraphic phase 2 of the site’s sequence, currently correlated with the Italian early Recent Bronze Age. In particular, its construction influenced the topographic structure of the site during phase 2. Fire was involved in its collapse, sealing the abandonment layers under the walls’ burnt remains.

The abandonment layers, although rather poor in finds, presented a high concentration of artifacts of Nuragic typology. This is well framed in the discussion of the growing insertion of the central Mediterranean, and of Sardinia in particular, in the transmarine routes, as attested at Kommòs in Crete, or Hala Sultan Tekkè and Pyla-Kokkinòkremos in Cyprus. Furthermore, the context is significant for the characterization of Nuragic-style pottery, as either imported from Sardinia or locally produced - it is well known that this situation is so far exclusive to Cannatello.

The paper intends to contribute to the ongoing debates on the scales of interaction inside the central Mediterranean (and beyond), during the boom-and-crisis phases of connectivity dating to the Mediterranean Late Bronze Age.

9 WHAT THE DEAD SEE: EXAMINING THE SOCIAL IMPLICATIONS OF FUNERARY AND SETTLEMENT POSITIONS IN BRONZE AND IRON AGE WESTERN SICILY

Abstract author(s): Ferrer-Martín, Meritxell (Universitat Pompeu Fabra) - Sevara, Christopher (University of Newcastle)

Abstract format: Oral

Between the later Bronze Age and the Iron Age, western Sicily experienced deep processes of social, political, economic and environmental transformation. The effects of these processes are seen in changes in settlement patterns, in the organization of the domestic realm, in the use and the construction of the landscape as well as in the funerary sphere. In this paper, we want to focus on the changing relationship between the living and the dead through an analysis of the placement and positioning of funerary features in relationship to other elements of their contemporary landscapes, such as settlement areas, agricultural land, paths and trade routes. What did the dead 'see' through their specific placement? How did the dead and the living interact through the landscape? How might these interactions have changed in relationship to the social and environmental changes occurring in western Sicily during this time? These questions are examined through a study of the spatial position of funerary elements in the local settlement landscapes of two well-known hilltop settlements in the region, the Bronze Age settlements of Mokarta and nearby Iron Age Monte Polizzo. To do this, we combine geospatial analyses, archaeological data and social theory to look at the changes in the associative positioning of funerary elements in relationship to other landscape elements. We then discuss the impact of this on the visual configuration and social understanding of each settlement and their surroundings, and compare these results to suggest the potential merits of expanding this analysis to further locations in future studies.

10 PAST INSULARITIES: INTERREGIONAL INTERACTIONS IN BRONZE- AND IRON-AGE PANTELLERIA

Abstract author(s): Schön, Frerich - Cespa, Stefano (University of Tuebingen) - Magri, Alessandra (Università di Bologna)

Abstract format: Oral

Situated halfway between Tunisia and Sicily, the island of Pantelleria (Italy) is a focal point to study interregional dynamics in the Strait of Sicily during the 2nd and 1st Millennium BCE. The results of two excavation projects on Pantelleria Island will be presented: the Mursia-Excavation Project (Bologna University) and the Acropolis-Excavation Project (Tuebingen University).

The Bronze Age settlement of Mursia, protected by an imposing fortification wall, was uninterruptedly occupied for three centuries, from 1750 to 1450 BCE.

The pottery assemblage of the site shows close parallels in Northern and Western Sicily and in the surrounding islands, while the presence of exotic artefacts and imported raw materials provide the evidence of interregional and long-distance interactions. Furthermore, the finding of metal objects and casting moulds points to the inclusion of Mursia within the broader socio-cultural network of the Mediterranean Bronze Age.

After the abandonment of the village of Mursia, there is no clear evidence for occupation on the island for at least 6 centuries. In the context of Phoenician expansion into the Western Mediterranean, the island was re-populated during the 8th century BCE by western Phoenician settlers. The material culture of this period shows close connections to Carthage. Pantelleria became part of the Carthaginian sphere of influence and was involved into the conflicts of the Roman-Punic Wars. At the End of the 3rd century BCE the island became part of the first Roman Province Sicilia.

This paper focuses on changing interregional dynamics like mobility, exchange, trade, warfare, colonization and abandonment and the related local responses in the Strait of Sicily from the Bronze to the Iron Age. These different dynamics and stages of occupation in Pantelleria can be considered as 'laboratories of social and cultural experiences', where issues of connectivity and relative isolation can be explored comparatively and in a diachronic way.

35 HUMAN MOBILITY AND ARCHAEOLOGICAL THOUGHT: MOVING FORWARD

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Nikita, Efthymia (The Cyprus Institute) - Radini, Anita (University of York) - Mutri, Giuseppina (The Cyprus Institute)

Format: Regular session

Human mobility has held a central and often contentious place in archaeology. Early archaeological theory, culture-historical archaeology, viewed large-scale human mobility, migration, as the driving force of any change in the material record. The advent of processual archaeology witnessed a denial of the importance of past human mobility as a cultural change agent, and an emphasis on indigenous processes and internal dynamics. More recently, post-processual archaeology stressed the role of human agency and revived the interest in the study of human mobility, acknowledging the complexity of this phenomenon. Indeed, it is nowadays appreciated that human mobility has taken several forms and was motivated by diverse incentives. To disentangle the dynamic movement of people, ideas, technologies, and objects, contemporary research encompasses a broad range of approaches from the archaeological sciences. Isotopic, ancient DNA, biodistance studies, provenance analysis and network analysis have all been adopted in different contexts. Now that the complexity of past human mobility is self-evident and the methodological tools to explore it are ever-developing, the conditions have matured to reassess the interplay between archaeological theory and human mobility. This session seeks contributions that discuss past human mobility in the context of network theory, identity studies, nationalism and postcolonial archaeology, as well as contributions that explore the social role of archaeology in understanding contemporary large-

and small-scale human relocations. We are also interested in contributions that amalgamate archaeological science approaches in the study of human mobility with broader archaeological evidence as well as evidence from other fields, such as epigraphy, historiography, and environmental studies. Finally, we encourage submissions focussed not only on the factors that instigated mobility and the nature of the mobility events but also on the implications of the relocation of past humans at a socio-economic and biological level.

ABSTRACTS:

1 FARAWAY, SO CLOSE! THE DIALECTICS OF ARCHAEOLOGICAL THEORY AND SCIENCE IN PALAEO-MOBILITY STUDIES

Abstract author(s): Karligkioti, Anna (The Cyprus Institute) - Kozatsas, Jannis (Aristotle University of Thessaloniki) - Nikita, Efthymia (The Cyprus Institute)

Abstract format: Oral

The recent EAA meeting in Maastricht selected as a general theme the "Third Scientific Revolution" in archaeology. As stated by Kristian Kristiansen in 2014, this revolution embraces new developments in archaeological sciences (genetic and stable isotopes analysis) and new methodological trends in relation to statistical quantification and modelling. Past mobility studies have been among the domains of archaeological scientific enquiry that have benefitted the most from relevant advances in ancient DNA, isotopes and agent-based modelling approaches. These scientific advances accompany a theoretical acknowledgement of the complexity of past human movement; an acknowledgement that reflects the culmination of decades of archaeological thought around the subject of human mobility. Early in the advent of western science, archaeologists employed 'migration' as an axiomatic explanatory approach to cultural change rather than a dynamic social process. This trend was followed by an appreciation that empirical results coming from the natural sciences would be employed as self-evident proof for the interpretation of social phenomena, such as human mobility, drawing upon positivist approaches, which were subsequently criticized as oversimplifying complex social dynamics. The aim of this contribution is to map the diverse approaches implemented by archaeological theory and archaeological sciences and explore how these get entangled in order to explore the complex and dynamic nature of past human mobility. Emphasis will be placed on identifying where relevant interdisciplinary research currently stands and what its future directions may be.

2 ON THE RUN: EARLY MEDIEVAL SETTLERS AT KOKSIJDE CAME FROM BEYOND THE CHANNEL

Abstract author(s): Spros, Rachèl - Snoeck, Christophe (Research Unit: Analytical, Environmental & Geo-Chemistry, Dept. of Chemistry, Vrije Universiteit Brussel; Maritime Cultures Research Institute, Dept. of Art Sciences & Archaeology, Vrije Universiteit Brussel) - Pellegrini, Maura (Thermo Fisher Scientific Italy) - Claeys, Philippe (Research Unit: Analytical, Environmental & Geo-Chemistry, Dept. of Chemistry, Vrije Universiteit Brussel)

Abstract format: Oral

The early medieval coastal communities of the North-Sea area are known to have kept close contact during the seventh and eighth centuries. Though, evidence of connections with areas from beyond the Channel are less extensive, especially indications of mobility between the North-Sea area and the Southern European Atlantic coast around modern day Spain, Portugal and southern France are vague. Still, these southern areas in Europe knew tumultuous times during the late seventh and eighth centuries and direct evidence of migrants and refugees moving towards Northern Europe was yet to be discovered. This changed with the finding of an early medieval coastal settlement at the Belgian coast. Twenty-three individuals buried at Koksijde were analysed for provenance and dietary reconstructions through carbon, nitrogen, oxygen, and strontium isotope analysis of various tissues (bone collagen, bone apatite, and tooth enamel). The results suggest that, even though most of the artefacts were of local origin, the individuals themselves were most likely not. This presentation will provide new insights into lives of this group of Southern European Atlantic coastal migrants.

3 ON THE NORTHERN BORDERS OF HERODOTUS' SCYTHIA: INDIVIDUAL MOBILITY AND FOOD PREFERENCES OF THE NOMADS OF THE MIDDLE DON

Abstract author(s): Dobrovolskaya, Maria - Volodin, Saimon (Institute of Archaeology Russian Academy of Sciences)

Abstract format: Oral

Studies of the migratory activity of the Early Iron Age nomads by applying to data on the isotopic composition of strontium are still few in number. Descriptions of Scythian migrations are mainly based on the study of archaeological and paleogenetic materials. However, today the question of the individual mobility of the Scythians throughout their life is relevant. The northern borders of Scythia, described by Herodotus, run through the forest-steppe territories of the Middle Don. It is in these places that kurgan graves materials, dating back to the 5th - 4th centuries BC, were discovered. There were examined individuals from two collective burials. We use data on the strontium isotopic composition of tooth enamel and bone tissue to evaluate the mobility. In addition, we apply to information on the carbon and nitrogen isotopic composition of bone collagen to reconstruct food models that reflect both cultural traditions and environmental characteristics. The 87/86 Sr values in the bone and enamel of the teeth are considered as indicators of the presence of an individual at different ages in a territory similar or different in its geochemical parameters from the regional Middle Don. We have identified a significant variety of individual mobility. Information on the isotopic composition of nitrogen and

carbon in bone tissue collagen is analyzed by means of the comparative data of the steppe Eurasian population of the early Iron Age. In most cases, in the study of individuals, the isotopic composition of carbon was determined, which means that this individual ate C4 plants (millet). However, there is a group of individuals with indicators of eating only C3 plants. As a hypothesis, this feature is proposed to be considered as evidence of contacts between people from the Middle Don burials with the territories and traditions of antique farmers.

4 NON-METRIC DENTAL TRAIT VARIATION AMONG WESTERN SIBERIAN FOREST-STEPPE POPULATIONS IN THE GREAT MIGRATION PERIOD

Abstract author(s): Sleptsova, Anastasiia (Tyumen Scientific Centre SB RAS)

Abstract format: Oral

In the transition period from the Early Iron Age to the Middle Ages, the disintegration of the centralized early state Sargat community and the formation of new cultures are observed on the territory of Western Siberia. The main goal of this study was to find a possible links between Early Medieval and Early Iron Age populations of Western Siberia forest-steppe zone using dental non-metric traits. The frequencies of thirty traits were observed using ASUDAS (and A.A. Zubov's program). The study was based on the dental remains of 49 individuals from four Great Migration period burial grounds (Ustyug-1, Kozlov Mis, Revda-5, Ipkul) located in Tobol river region of Western Siberia. For comparison we observed 424 individuals of Sargat culture from the burial sites located in the area between the Tobol, Irtysh, and Ishim rivers including the Baraba forest-steppe zone of Western Siberia. Trigonometrically transformed dental trait frequencies were subjected to the principal component analysis and cluster analysis based on Euclidean distances. Besides Sargat culture samples, 32 Early Iron Age dental samples from different region of Eurasia were used for statistical comparison. As a result, it was established the Sargat population (especially from Baraba forest-steppe zone) became a basis for the formation of the Early Medieval tribes. Eastern dental traits were almost absent there except for the shoveling of upper medial incisors and the deflecting wrinkle on the lower first molars. Also we cannot make a conclusion about the migration of the population in the III–VI centuries AD from Western Siberia to the Urals, although this assumption has been repeatedly described in archaeological literature. Migration of the groups from the taiga zone to the south in the III–VI centuries AD is not excluded.

The research was funded by RFBR and Tyumen Region, project number 20-49-720010.

5 GENESIS OF THE UPPER OB REGION POPULATION OF THE EARLY IRON AGE

Abstract author(s): Kishkurno, Maria (Institute of Archaeology and Ethnography SB RAS)

Abstract format: Oral

The Upper Ob region is a vast territory in West Siberia. It's landscape can be characterized as forest-steppe. The main waterway that crosses the entire region is the river Ob.

In the Early Iron Age, the region was inhabited by tribes united by Scythian-Siberian cultural and historical traditions. According to archeological data, in the second half of the 1st millennium BC they began to experience migration impact of the southwestern Saka tribes. Also, contacts are actively developing with neighboring groups of Sargat, Kulai and other tribes. Thus, the specificity of the population of the Upper Ob region could be formed under the influence of several different factors. As a result of these processes, not only cultural traditions changed, but also an anthropological composition transformation could be observed. To study the influence of all these factors on the population of the Upper Ob region of the Early Iron Age, a detailed dental morphology study was carried out. It was based on the standard method of accounting for dental phenes, and also archaic dental signs were taken.

The provided results have shown a rather interesting picture. South and southwestern migration waves did not have a significant impact on the anthropological composition of the Upper Ob region population. Also, peaceful contacts with neighboring tribes did not affect the biological component of the studied population. Another ancient component became predominant here, dating back to the Upper Paleolithic South Siberian populations. In the Bronze Age samples this component could be found in the composition of the Okunev culture population of the Khakass-Minusinsk basin. Apparently, the contacts with neighboring and migrational tribes, recorded according to archeological data, most prominently had a cultural (trade and exchange) character, without any kind of biological connections.

The research was funded by RFBR and Tyumen Region, project number 20-49-720010.

6 TRAVELLERS AND CONSUMERS: ASSESSING POTENTIAL AND LIMITATIONS OF MICRO DEBRIS IN CALCULUS TO THE TOPIC OF ANCIENT HUMAN MOBILITY

Abstract author(s): Radini, Anita (BioArCH and York JEOL Nanocentre, University of York)

Abstract format: Oral

Dental calculus is a deposit on teeth resulting from the mineralisation of dental plaque. It can adhere to tooth enamel for millennia. A great variety of particles, from diet to environment, have been found to survive in this deposit, across times and cultures. Recent work suggest it is a potential sources of information of imported food items as well as art material, providing new insights into long distant trades. In most cases the remains of exotic materials found in dental calculus has been seen as the results of 'imports', while the topic of the mobility of people rather than the goodies has not received much attention. This paper reviews the evidence of exotics materials in calculus in light of people mobility and addresses the importance of wide reference collections to ensure

stronger identifications of the remains. It discusses potential and limitations of dental calculus in the topic of people mobility and provides possible ways forward.

7 TRANS-CONTINENTAL AND TRANS-CULTURAL MOBILITY: CRUCIBLE STEEL BETWEEN INDIA, PERSIA AND EUROPE

Abstract author(s): Rehren, Thilo (The Cyprus Institute) - Alipour, Rahil (University College London) - Desai, Meghna (The Cyprus Institute)

Abstract format: Oral

Ever since the emergence of modern metallurgy has crucible steel attracted the fascination of scientists and travelers alike. As a fabled material in the West, and since the crusades colloquially linked to the city of Damascus, its true nature and origin remained a mystery until the 19th century when European travelers brought back the first specimens of unworked crucible steel ingots from southern India. The triad of Indian, Persian and European actors manifested itself when in the 1820s a British geologist recorded crucible steel making in the wider Hyderabad region, where he met a Persian trader who regularly bought the local crucible steel to be sent to Isfahan. This, of course, is ironic, given that ancient Persia was the heartland of crucible steel production, with ample industrial-scale production documented in several sites in Central Asia from the 10th c CE onward, and multiple recipes recorded in Persian manuscripts.

This paper will explore the interplay of forced migration of artisans from Central Asia to southern Iran as a result of the Mongol invasion, the movement of people and goods as part of the long-distance trade of the ingots, the diachronic movement of historical recipes and reports through copying and compiling manuscripts, and the spread of the obsession with the material among both early and contemporary metallurgists. Combining historical sources, tangible remains and intangible heritage with science-based analyses we attempt to draw a mind map of past craftsmen and their perception of the properties of matter, and its interaction with human mobility through time and space.

8 WANDERING IDENTITIES: LA TÈNE EVIDENCE IN ABRUZZI BETWEEN 5TH AND 3RD CENTURY BC

Abstract author(s): Scarsella, Elena (University of Cambridge) - Di Giovanni, Andrea (Università di Roma, La Sapienza) - D'Ercole, Vincenzo (Università Gabriele D'Annunzio, Chieti-Pescara)

Abstract format: Oral

La Tène material culture is not uncommon in Central-Italy, and it is widely recognised by now that its movement must have included some migration of sort. The historically known Senones occupied indeed most of the modern Marche, including Senigallia, Ancona, and possibly the southern part of the region, until modern Ascoli Piceno. Abruzzo has usually been considered out of the reach of this movement of Central-European influence, but recent excavations may induce to re-think some of the established paradigms. In fact, Campovalano on the coastal side of the region, Bazzano, Fossa, Capestrano and other minor cemeteries of the hinterland brought to light new materials that suggest a wider distribution not only of the La Tène material culture, but also of its people. Moreover, if Campovalano shows a more pervasive distribution of La Tène material culture, including male, female and child burials, in Bazzano and in the rest of the hinterland the evidence is more scattered and made of single or out of context objects. This new and compelling framework raises new theoretical questions about the interaction of identities in Central-Italy in the final centuries of the 1st millennium BC. La Tène people moved and migrated within the complex frame of dynamic Italic identities, in the crucial years of their formation and of their interaction with the growing power of Rome, sometimes imposing, sometimes negotiating their identity. Using as a case-study the cemetery of Campovalano and comparing it to the necropoleis of internal Abruzzo, we will address the La Tène presence in Abruzzo and their impact on local identity(es).

9 COLONIZATION AND VETERAN SETTLEMENT IN THE ROMAN PROVINCE OF MOESIA INFERIOR

Abstract author(s): Dumitrache, Iulia (University Alexandru Ioan Cuza Iasi, Romania)

Abstract format: Oral

The impact of the Roman army on the limes areas is an important issue of the present historiographical debate. It stimulated drastic shifts in demography, settlement patterns, and the economics of the conquered areas. Demographic changes consisted of both emptying areas along the limes and population transfers. Although the evidence concerning the reasons for the veterans' mobility is unfortunately parsimonious, it appears that some chose to return to their home regions, although many decided to remain in the areas in which they had served. Primarily, they were attracted by the economic opportunities offered by larger, developing towns or enjoyed social ties with people near the army camps, encouraging them to stay there after discharge, a more likely situation for the German limes, for example, while in Moesia the veterans seem more eager to join the local administrative apparatus. The main objective of the presentation is to identify the individuals in the civil milieu of Moesia Inferior that have a military background and can be included in the mobility study circumscribed to the subject. Three specific research courses should become relevant: the clustering of veterans settled in the place of discharge, the tracing of circular mobility and the mapping of veteran cases that have chosen neither their place of origin, nor their place of discharge as their residence. The results are obtained through several methods: the epigraphic investigation, focused both on military diplomas, and on stone inscriptions, providing not only information on the moment of recruitment or the military stage, but also on the life of the veterans; the prosopographic investigation, implying the use

of a complex questionnaire on every identified individual or group, and furnishing not only personal, but also historical information; the investigation of archaeological finds, in order to identify the military presence within the rural territory.

10

DO THE DORIANS HAVE DNA? ADDRESSING INDIVIDUAL AND COLLECTIVE IDENTITY IN GREEK MIGRATION TRADITIONS

Abstract author(s): Judson, Catharine (Université Libre de Bruxelles)

Abstract format: Oral

The Dorian Invasion of the Aegean is a classic example of the culture-history migration story: the Dorians, attested in later historical sources, were held responsible for major shifts in material culture in the Early Iron Age (1200-700 BCE), including the introduction of cremation burial and new pottery types. Despite archaeology demonstrating a lack of cohesive evidence for such a migration, it has remained entrenched in scholarship as an explanation for cultural and ethnic changes in the Greek world. Various attempts have been made to disentangle the ancient use of the migration tradition in reinforcing contemporary collective ethnic identities of the seventh century BCE onward from modern impositions of it onto the archaeological record and the study of ancient mobility in prehistory.

This paper focuses on the lack of ethnic specificity caused by the top-down application of a Dorian identity onto the archaeological record of the Early Iron Age. The debate is approached here through a long-standing methodological problem of identifying Dorian individuals in the archaeological record, as opposed to the Dorian collective of historical tradition. Their association with the practice of cremation, however contested, has contributed to a shared assumption that there are no Dorian bodies to study as a genetic population. This was already a difficulty for early craniometric studies of the racial makeup of the post-Bronze Age Aegean, but it has also contributed to a continued lack of aDNA or isotope studies of Early Iron Age populations aimed at addressing questions of migration and mobility during this period. This paper therefore aims to address the poorly drawn boundaries between historical traditions, archaeological cultures, and genetic populations in discussions of mobility during the Early Iron Age in Greece, and to propose a new framework for approaching local identities and ethnicity in the archaeological record.

11

UNEASY BEDFELLOWS? (BIO)ARCHAEOLOGY, ANCIENT HISTORY, EPIGRAPHY AND THE STUDY OF MOBILITY IN THE ANCIENT WORLD

Abstract author(s): Voutsaki, Sofia (University of Groningen)

Abstract format: Oral

The growth of bioarchaeological, and especially isotopic and DNA analyses (and of course the recent refugee crisis and the heated debates surrounding the causes and consequences of migration) have brought new impetus to the study of mobility in the past. While methodological advances and the proliferation and constant refinement of scientific techniques open up exciting new research possibilities, they also bring in some problems which require more attention. These include over-specialisation, lack of communication between specialists, entrenched positions and the ensuing fragmentation of the field. In the worst case, they bring scientism, i.e. the overreliance on scientific data and the omission of the archaeological, historical and cultural context.

In this paper I would like to argue that the bioarchaeological analyses of human remains have an enormous potential in enriching our understanding of mobility and connectivity in the past. However, this potential can only be fully realised if we seriously address the problem of integration. In addition, if we are dealing with the ancient Mediterranean, integration involves bringing together not only archaeology and archaeological science, but also the neighbouring disciplines of ancient history and epigraphy. As a result, integration (or consilience) requires more than combining several methods or playing data sets against each other. It requires close collaboration at every stage – from the formulation of the research design and the sampling strategy to the final interpretation. But more than that: It necessitates reflecting on research questions which arise from separate academic traditions, employ dissimilar methodologies, use distinct procedures of verification, but also rely on different funding structures and publication cultures. I would like to offer such a reflection, using examples from the highly mobile and interconnected societies of the ancient Mediterranean.

A.

TEMPORAL OR DEVELOPMENTAL? INVESTIGATING SOURCES OF CRANIAL SHAPE VARIATION BETWEEN A HISTORIC ICELANDIC POPULATION AND A MODERN AMERICAN 'WHITE' POPULATION

Abstract author(s): McCrane, Samantha - Meloro, Raphaela (University of Florida, Anthropology Department)

Abstract format: Poster

In this study, cranial variation is explored between and within two populations: a modern, likely admixed population of American individuals who identified as "White" from the William W. Bass Donated Skeletal Collection (n=50), and a genetically conserved historic population of Icelandic individuals derived from a broader temporal span from the Harvard Peabody Collection (n=41). A geometric morphometric approach revealed significant shape differences between Icelandic and U.S. White crania for overall cranial shape (F1,89= 18.298; p=0.001), shape variation associated with size (F1,89=518.15; p=0.001), and within the individual regions of the viscerocranium (F1,89=19.449; p=0.001), neurocranium (F1,89=10.958; p=0.001), and basicranium (F1,89=15.647; p=0.001). Icelandic individuals were found to have relatively smaller crania than American White individuals, with narrower faces, shorter and wider neurocrania, and longer, more posteriorly projecting basicrania. The overall larger size of American White crania compared to Icelandic crania is consistent with documented increases in cranial measurements over time. However, the direction of cranial shape variation is contrary to previously identified Northwest to Southeast clinal trends for European populations. Environmental plasticity

during development and neutral evolutionary processes resulting from migration and admixture are considered as likely candidates for producing the observed patterns of cranial variation. Measures of fluctuating asymmetry are utilized to distinguish developmental effects. These results suggest that craniofacial shape changes can be utilized as a non-destructive means for understanding how mobility and migration has shaped morphological variation in admixed populations, and that with larger, more varied samples different European populations may be able to be distinguished geomorphometrically.

46

ADVANCING SKYSCAPE AND LANDSCAPE ARCHAEOLOGIES: RELATIONS WITH THE SKY. INTERACTIONS BETWEEN DISCIPLINES

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Balbi, Jose (Sec Cultura y Educacion BA Argentina; SEAC - SIAC - CAG) - Iwaniszewski, Stanislaw (State Museum of Archaeology, Warsaw) - Martz de la Vega, Hans (Escuela Nacional de Antropología e Historia)

Format: Regular session

One of the aspects of the relationship between archeology and cultural astronomy has been the interconnection between heavenly bodies and humans. By studying the stars and their relationship with ancient constructions, we can learn about the relationships that past human societies had with the celestial bodies and the phenomena. Understanding the sky in this way is just one way to relate human experience to the celestial landscape. Astronomically aligned constructions or topographic features provided the places where the connections between humans and the landscape were created and recreated. The sky, clouds, rain, wind, earth, and the people themselves, form a web of connections that shape their actions in the world. From our point of view, places with celestial connections have generated new assemblages (the term borrowed from Gilles Deleuze and Feliz Guattari) of objects, human and non-human, revealing various aspects of ancient cultures. Our proposal is to study landscapes from different perspectives and to give them a cultural meaning.

Adding our conclusions in each of these study areas, we will attempt an ontological understanding of the proposed archaeological context. Therefore, some of the issues that the papers in this session should address with the above criteria are: Is it possible to understand how people lived in their environment by observing and studying the landscape with astronomy or any other aspect of an archaeological site? How does technology and new techniques allow us to understand the known data? What is the ontological relationship between people and their environment?

The object of the session is to achieve a presentation of the archaeological study with multidisciplinary contributions. In which archaeological research is complemented with the contribution of other sciences and study methods in the aforementioned areas.

ABSTRACTS:

1

CROMLECH OF MEZORA: AN ARCHAEO-ASTRONOMICAL IN NORTH MOROCCO UPDATING IN THE SEARCH TO IDENTIFY A SOLAR CULT

Abstract author(s): Balbi, Jose (Colchester Archaeological Group; Dirección de Cultura y Educacion BA Argentina) - Leone, Isabella (SIA - Società Italiana de Archaeo Astronomia)

Abstract format: Oral

The Mezora cromlech, has been object of our studies for the last three years. It concerns an excavated site studied for almost two centuries in the traditional Archaeology manner in a series of expeditions which took place since 1829. It was excavated several times, sometimes in the midst of complicated war-political events, and almost always without the appropriate archaeological elements or the idea of landscape/cultural archaeology or Archaeoastronomy.

Throughout our work and studies, we have come researched by means of abundant bibliography in this regard, and our studies and opinions coincide with the ideas of one of the most prolific writers about Mezora, Enrique Gonzalbes Gravioto. Gravioto believes that in recent years there have been no new studies, and that there are no complete studies based on history, sociology and geomorphology.

Our intention is to carry out a multidisciplinary study of the megalithic group, in all aspects that made it functional throughout its history. Not only we will carry out a thorough study of the existing bibliography but our work will expose the first result of our campaign to the North of Morocco, in order to place Mezora geographically, sociologically and historically in the set of Mediterranean megalithic monuments.

We studied various Archaeo-Astronomy aspects. Our current work will try to make sense of the succession of functions with which the people of the area used it: Burial site, temple for solar worship, and the possibilities of its use in the form of other sacred aspects, meeting point, mark of political boundaries and part of the prehistoric social mobility and commerce system in North Africa.

We will conclude with a field research of the site surroundings and old known routes in order to understand and discover new architectural and functional relationships, in this exciting archaeological and cult site of North Africa.

2 HUMAN LEIFWORLDS, LANDSCAPES AND WORLDBIEWS: ECOSYSTEMS, ANTHROPOLOGY, ARCHAEOLOGY, AND THE APPROACH OF CULTURAL COSMOLOGY

Abstract author(s): Rappenglück, Michael (SEAC; Adult Education Center and Observatory Gilching)

Abstract format: Oral

Human life of the individual and within communities takes place under spatial, temporal, material, energetic, biological, and communicative living conditions. They are differentiated in ecosystems. The natural conditions of life are extended by the specific anthropological characteristics and the cultural frameworks during the unfolding of human evolution. Lifeworld includes the subjective view and construction of the 'world' based on living conditions. Different lifeworlds to a certain extent correspond to a plurality of ontologies, representing perspectives of human communities/societies on the respective ecosystem. Cultures living close to their ecosystem regardless of the epoch, perceive the environment as co-environment differently than cultures that define themselves more at a distance from nature and see co-environment as environment. Archaic cosmologies contain essential elements significant for archaeology. The phenomena of the respective ecosystem are perceived with all available senses and their processing can be qualitatively different from today's scientific-technical cultures. Events, places, rhythms, corporeality, mobility, and sedentariness, tuning, sense of place and time, orientation essentially shape the conception of spatio-temporal phenomena ('the landscape', including 'seascape', 'skyscape' 'forestscape' etc). The 3D perception (sky and air, mountains, caves, depth of the sea) leads to other spaces of cosmic experience. The lifeworld is understood as a cosmic living being, a network and interplay of polar forces and events. Ancestors and archetypal entities influence from other spheres ('spiritscapes'). Cosmologies enabled ideas about orientation, modes of existence, socio-political order, the why and wherefore, assessments, and spirituality shared by social groups co-evolving with changing ecospheres, tangible in archaeological relics. Examples from different cultures provide an overview of the approach of Cultural Cosmology. The transdisciplinary methodology combines phenomenology, hermeneutics, semiotics, systems theory, and assemblage theory methodologies with content of comparative mythology, four-field anthropology, religious studies, ecology, and astronomy.

3 OM HAIL! SOME STORIES ABOUT THE BASIC PROBLEM OF ARCHAEOLOGICAL WORK IN ASIA: CYCLICAL TIME VS. LINEAR NOTIONS OF TIME

Abstract author(s): Lange, Perry (Institut fuer Ur- und Fruehgeschichte Kiel)

Abstract format: Oral

What is a memorial, how authenticity is perceived and what meanings the concepts of linear and cyclical time perception have in this context, is of great importance for the understanding of cultural heritage in Europe and Asia. Both time concepts have a direct impact on the perception of monument protection and cultural heritage. The perception of time is shaped by two phenomena. First there is the very personal experience of a linear, continuous and consciously perceptible development, such as the changes in aging, growing up with their "breaks" and "new beginnings". But time has always been perceived as a cyclical phenomenon in which changes are repeated with great constancy. Both phenomena, the linear time and the cyclical time, have accompanied mankind from their beginnings and are, in their complexity, decisive cultural catalysts for religious and philosophical questions - until today.

The practical work in Nepal has repeatedly and directly led to irritations in the communication between European and Nepalese experts, employees and institutions when it comes to the question of the value of historical material culture. One reason for these problems is the, in part, significantly different levels of meaning that are assigned to the concept of authenticity.

Why is something "old" valuable when it can - with perfect craftsmanship copied - shine in new splendor? And why should an object, space or artifact become more valuable if it is frozen and preserved exactly in its current state? The historical background for the different understanding of monuments in Asian and European consciousness could be explained in the previous chapter on the importance of the cultural influences of linear and cyclical time perception. The lecture deals with the experiences from over five years of work at one of the oldest temple sites in Nepal, the Anantaliṅgeśvara Mahādeva in the Kathmandu valley.

4 SKYSCAPES OF FBC MEGALITHIC LONG BARROWS IN SOUTHERN KUYAVIA

Abstract author(s): Iwaniszewski, Stanislaw (Arqueologia Escuela Nacional de Antropologia e Historia - Instituto)

Abstract format: Oral

On the south-eastern edge of the Kujawy Upland, within the area of the gentle undulating morainic uplands cut by numerous glacial tunnel valleys and kettle holes, there are several sites with Funnel Beaker Culture unchambered long barrows.

Monumental structures in the form of elongated earthen mounds flanked by stone rows and sometimes with added wooden ritual structures were set in drier and higher locations overlooking the immediate surroundings, which in conditions of development of more or less permanently deforested areas could have contributed to the establishment of new concepts of social space. It can be presumed that when the forest cover disappeared, the long barrows would have become visible from the surrounding landscape, and simultaneously, the sites with monuments would have offered wide-ranging views in several directions. On the other hand, the tendency to place tombs in specially selected locations might have produced an opportunity to deliberately orient them towards the four cardinal directions and the phenomena observed in the sky.

The paper explores the skylscapes of FBC long barrows at the Izbica Kujawska microregion, involving Obałki, Wietrzychowice, Gaj and Lubomin Poduchowny. It suggests that those who erected the structures embedded within them directions that linked to celestial horizon events.

5 LA MUCULUFA RECONSIDERED: LANDSCAPE AND HORIZON ASTRONOMY AT A CASTELLUCCIAN SANCTUARY ON SICILY

Abstract author(s): Orlando, Andrea (Istituto di Archeoastronomia Siciliana) - Riorden, Elizabeth (University of Cincinnati)

Abstract format: Oral

During the 1980s Prof. R. Ross Holloway of Brown University (USA) and his team excavated an Early Bronze Age site situated in a dramatic rocky cleft at a place known as Muculufa (territory of Caltanissetta). Holloway found a terrace and depositional trench filled with the remains of ritual feasting, including masses of painted pottery of exceptional quality. Many disturbed Castelluccian rock-cut tombs lined the southeast-facing escarpment running west of the terrace "sanctuary." Holloway also identified a settlement on the slopes southwest of the sanctuary; during the 1990s his disciple Prof. Brian E. McConnell expanded excavation at the terrace and focused on the settlement, where he found more distinctive pottery of the same type. Although Holloway did not hesitate to call the feasting terrace in the cleft a "sanctuary" of regional importance, he never posited an additional skyscape rationale for its location. McConnell remained agnostic on the ritual nature of the terrace area.

Given recent studies on the cognitive agency of landscape features and sky interactions during prehistory, the authors proposed an investigation of the phenomena visible from the terrace, with a reassessment of the possible meaning conveyed by the painted pottery and other artifacts found at Muculufa. Preliminary results are encouraging: at the summer solstice 2020 the sun was documented rising between distant Etna and another peak, in alignment with the cleft. The pottery contains icons of the sun rising between two mountains and the face of the "owl" type goddess figure so widely spread during the 4th to 2nd millennia BCE. Many questions remain including 1) was Muculufa, easily accessible from the south coast of Sicily, a super-regional cult place? (mysterious bone amulets of Castelluccian origin have been found as far away as the Argolid and Troy); and 2) what was the connection between solstice, tombs, terrace and settlement?

6 SKYSCAPE ARCHAEOLOGY: ARCHAEOASTRONOMY TURNED ONTOLOGICAL

Abstract author(s): Silva, Fabio (Bournemouth University)

Abstract format: Oral

Though as old as archaeology, archaeoastronomy still lacks frameworks underpinning its data collection, descriptions and interpretations. Without a cohesive body of theory, archaeoastronomical studies can look like a theoretical potpourri. Its quantitative methods and overemphasis on explanation align it with processualism; whereas its aspiration to tap into societies' cosmologies and worldviews is more allied to post-processualism. However, any attempt to realign the archaeoastronomical endeavour with any of these labels would now be not only outdated and anachronistic, but backwards-looking.

Anthropology has been turning to alternate ontologies which have led to new theoretical approaches and explorations. One such approach is the Ontological Turn, which involves asking ontological questions, rather than taking ontology as the answer (Holbraad and Pedersen 2017). It gives primacy of place to the world(s) experienced by the societies being studied, but the onus is on the scholar to change their conceptual toolbox in order to conceive those other world(s) in the same way those societies did (Henare et al 2007). The skyscape, as the element of a society's world(s) that includes the clouds, the atmosphere, the sky and the celestial objects (Silva and Campion 2015), can also be explored ontologically.

This talk will introduce the Ontological Turn as a method that can not only be adopted for archaeoastronomical studies but, as will be argued, should become a cornerstone of skyscape archaeology. It will discuss the three pillars of the ontological turn - reflexivity, conceptualisation and experimentation - and, using examples from prehistoric Europe, explain some of the ways they can be deployed to overcome the western biases and anachronisms that still plague archaeoastronomical studies.

7 EXPLORING SKYSCAPE AT KARANOVO, BULGARIA

Abstract author(s): Iwaniszewski, Stanislaw (Arqueologia Escuela Nacional de Antropologia e Historia - Instituto) - Maglova, Penka (Bulgarian Academy of Sciences, Space Research and Technology Institute, Stara Zagora Department) - Stoev, Alexey (Yuri Gagarin Public Astronomical Observatory, Stara Zagora)

Abstract format: Oral

Karanovo is an impressive tell type settlement located at the foothills of the Sărmena Sredna Gora Mountains, in the fertile valley of the Azmak River, a tributary of the Maritsa river, Bulgaria. This impressive tell has accumulated 12.4 meters of cultural stratigraphic layers, each with various occupation levels from the early Neolithic Karanovo I to the Bronze Age Ezerovo-Karanovo VII phase. Like other tells, Karanovo exhibits an ordered and repetitive pattern of the houses' continued rebuilding in the same place with the same specific grid street orientation. Though there were minor deviations from its unique street layout in later phases, the separate houses that were continuously built one on top of the other at different times generally shared their master orientation.

Using the skyscape archaeology approach, we examine Karanovo street grid orientation and its relationship with the site's surroundings. We acknowledge that buildings' orientation might be governed by specific environmental concerns such as the direction

of prevailing winds, solar radiation, heat absorption, and light penetration. We conclude that equally important were astronomical alignments linking structures with the outside world elements such as celestial objects or specific points on the landscape.

8 REACHING OUT FOR (NEW) OLD HORIZONS ALONG THE ATLANTIC FAÇADE

Abstract author(s): Mom, Vincent (Digital Preservation Project Foundation) - Higginbottom, Gail (El Instituto de Ciencias del Patrimonio - Incipit, CSIC)

Abstract format: Oral

In this paper we are comparing our research results on megalithic monuments from Neolithic Iberia and Bronze Age Britain. In particular, we are investigating the choices of monument location and the connections between monuments and astronomical phenomena. This comparison is done not so much as proof of concept relating to the migration of cultural ideas (due to the chronological differences), but at least to fathom something of the possible underlying philosophical similarities between these two sets of monuments from these differing regions: specifically, the considerations taken by builders in the creation of these monuments. Last year at EAA-SEAC, we revealed that the islands of Islay and Jura appeared to focus on particular lunar events that were different to those found in other areas nearby in western Scotland. It seems that similar lunar targets exist for the dolmens of Iberia. This presentation will review these similarities and also demonstrate how observing and studying the landscape in relation to the associated astronomy has revealed possible life-style activities and preferences as well as belief systems related to these and their environment.

9 THE ONTOLOGY OF THE ANCIENT MAYA THROUGH THEIR DEAD. THE ORIENTATIONS OF THE BURIALS OF TIKAL, GUATEMALA

Abstract author(s): Martz de la Vega, Hans - Grecco Pacheco, Daniel (Escuela Nacional de Antropología e Historia, México) - Mejuto González, Javier (Universidad Nacional Autónoma de Honduras) - González Morales, Cecilia (Universidad Tecnológica de México)

Abstract format: Oral

The Maya of the Classic Period (250-900 AD) devoted significant effort to the spatial arrangement of their cities. The principles focused on fundamental and symbolic classification systems, on landscape physiognomic properties, and on cyclical and regular movements of celestial bodies. The latter were the ones that indicated the coherence of the universe. Thus, it was for this reason that astronomical phenomena formed a common reference plane for processes and events. In this way, the definitive directions of space; that is, the north, south, east and west were decisive for his life. But also for their death because they guided, under the same principles, their dead's remains. On this occasion we will present a sample of the burials of Tikal, from the Guatemalan Petén. Tikal was one of the most powerful Mayan cities of antiquity, being therefore, the target of a large archaeological project (1956-1970), the Tikal Project of the University of Pennsylvania. The archaeological record of this project provides the data of a considerable amount of burials allowing a statistical study of the orientation preferences of some archaeological contexts and their possible spatial interpretation.

10 ASTROMORPHS IN THE HONDURAN ROCK ART: A PRELIMINARY STUDY

Abstract author(s): Mejuto, Javier - Rodas-Quito, Eduardo (Universidad Nacional Autónoma de Honduras)

Abstract format: Oral

This paper presents the preliminary analysis of two archaeological sites of rock art in Honduras, in particular the study focuses on the existence of astromorphic motifs, that is, a figure of rock art whose shape or appearance reminds of a celestial body, a set of them or an astronomical event. The works were carried out in two important rock shelters in Honduras. The first one is Ayasta, one of the most profuse both in petroglyphs and in a variety of patterns in clear danger of destruction and the rock shelter of Santa Elena, which contains one of the few examples of feathered serpents in the entire country. Despite the fact that these places have been the object of archaeological studies, there has been no bibliography or attempts to analyze the motifs that appear in this work. Therefore, after an analysis of the local horizon together with possible recordable astronomical events according to dating, we can infer the plausibility that these astromorphs are records of celestial events.

11 K'ATUNSCAPE: A LANDSCAPE MODEL BASED ON THE K'ATUN AND K'ALTUUN IN TIKAL, PETÉN

Abstract author(s): Martz de la Vega, Hans - Grecco Pacheco, Daniel (Escuela Nacional de Antropología e Historia, México) - Mejuto González, Javier (Universidad Nacional Autónoma de Honduras)

Abstract format: Oral

The Classic Period Maya (250-900 AD) had a political organization rooted in worldview and time cycles. Time was cosmic order and its registry gave coherence to the universe. This record of time was made through a complex meshwork of calendrical cycles and regular celebrations. It is known as the Long Count and it started from a fundamental unit that was the day (k'in), which was a living being, deeply linked to a variety of myths. Thus, the cycles and their entities governed all existing things. The fourth cycle was perhaps the most important of the long cycles, the k'atun or 7200 days, since after its ending, carved stelae of the rulers in turn were raised in the places of greatest power. The cycles were related to a complex geopolitical organization, which in Tikal, one of the most powerful cities, had its maximum expression. In this case, in addition to raising the mentioned k'atun ending stela, they built a

representative stage of the katunic world. Thereby, we based on Tim Ingold's ideas of meshwork and the life of lines, Felipe Criado's xscapes and Fabio Silva's skyscape, to propose that the contexts of the k'atuns, that we will describe as a "k'atunscape". The other ritual component related to the end of k'atun was the k'altuun ("covered stones, or wrapped"); consisted in covering and wrapping stelae and monuments, leaving a kind of bundle that left a part of the context hidden from view. We will discuss the meaning of the time wrapping for the mayans and, finally, the intrinsic relationship between the rulers or ajaw and the elements and beings of the cosmos through time as a fundamental tool for the exercise of political power it is also proposed.

12 INDIGENOUS ASTRONOMICAL FOOTPRINTS IN THE ROMAN TEMPLE OF PIEDRAS LABRADAS IN JARILLA (CÁCERES, SPAIN)

Abstract author(s): Rodríguez Antón, Andrea - González-García, Antonio César (Incipit - Institute of Heritage Sciences)

Abstract format: Oral

In this work we present the results of an archaeoastronomical study of the little known Temple of Piedras Labradas in Jarilla (Cáceres, Spain). More than 1000 m above the sea level, this temple was built by the Vetons and/or Lusitans (indigenous peoples of Celtic cultural substratum). On that point, they may have venerated astral gods or deities linked to natural forces, as argued by some authors. The temple and the sacred area was later appropriated by the Romans and assimilated in the new-founded nearby town of Capera.

The study of the archaeological material remains together with the orientation and location of this monument point towards the use of the Celtic start-of season feasts in the construction of the local landscape, and its latter assimilation by the Romans. Similar patterns have been previously found in several Iron Age and Roman settlements in Western Europe and the Iberian Peninsula. The present results contribute to elucidate the origin and nature of the cults in this place and the gods worshiped in it, still under discussion. Finally, these results aim at a better understanding of the pre-Roman religious traditions in this area of the Central Mountain Range in western Spain.

13 THE SKY ON EARTH: FIRST ARCHAEOASTRONOMICAL APPROACH TO THE PRE-HISPANIC MOUNDS OF THE URUGUAYAN LOWLANDS (ROCHA, URUGUAY)

Abstract author(s): González-García, Antonio César (Institute of Heritage Sciences, Incipit-CSIC) - Gianotti, Camila - Gazzán, Nicolás - Cancela, Cristina - Sotelo, Moira (Universidad de la República)

Abstract format: Oral

The development of different mound architectures in South America appears in distant ecological regions and with clear ethnic differences. We could highlight the Amazonia, the Moxos lowlands, the Paraná delta, the Uruguay and southern Brazil wetlands and the southern Atlantic coast and sierras. It is generally understood that this phenomenon materialized the establishment of communal ways of organization, the emergence of social complexity and the increase of population. These changes have been interpreted as a part of the domestication process of their environment that rendered singular archaeological landscapes.

Different social, productive and economic hypothesis have been put forward to explain the complex location, distribution and orientation patterns that these architecture displays. Recently, the recurrent and consistent spatial orientation found at the groups of mounds in Uruguay paved the way to new hypothesis that recognize other knowledge related to their ecologic environment, location and distribution.

The present study shows the result of an archaeoastronomical investigation on the orientation and location of the mounds in five sites at the Rocha department (Uruguay). We discuss the coherent orientation of these groups of mounds in relation with certain asterisms such as the Southern Cross or the Milky Way and celestial bodies such as the full moon after winter solstice. The results allow discussing how the perception and knowledge of celestial phenomena c. 3000 BP could have played a key role in the organization of space and time among these pre-Hispanic societies. Besides, some results gain particular relevance when contrasted with ethnographic, ethno-historic and archaeological information for other groups in the Southern Hemisphere. This preliminary approach prompt us to conclude that the skylore and the particular perception of time and Nature's cycles linked with flood and drought periods were part of a holistic technology that allowed these peoples to live in these wet ecosystems.

14 RESCUE ARCHAEOASTRONOMY. AN ARCHAEOASTRONOMICAL STUDY OF THE EMERGING MEGALITHS IN GUADALPERAL (EL GORDO, SPAIN)

Abstract author(s): Rodríguez-Antón, Andrea (Incipit - Institute of Heritage Sciences)

Abstract format: Oral

In the summer of 2019 an extraordinary drought rescued for a few weeks the dolmen of Guadalperal (El Gordo, Extremadura, Spain), an impressive megalithic monument which was submerged for nearly six decades under the waters of the Valdecañas reservoir, built in 1963 under fascist Franco's regime. Discovered and excavated by Hugo Obermaier between 1925 and 1927, the dolmen has been called the Spanish Stonehenge by the international press, from China to USA, although Guadalperal is a different construction to the iconic English monument. It belongs to a small sample of isolated, bigger and more complex megaliths in the Tagus basin, (compared to the smaller tombs grouped in necropolises in Extremadura and Portugal) which are in general little known because some of them are also in the flooding area of reservoirs. Since the first publication of Georg and Vera Leisner in 1960, little research has been done in Guadalperal due to the short and exceptional periods of visibility. In this work I present the results of the first archaeoastronomical

study of this outstanding megalithic structure, once again in danger under the water. It is a preliminary approach to the ideas of space, death and the relation with the cosmos of the society who built it, at least until the next drought.

15 THE SKY ABOVE MACHU PICCHU OR: ON REAL AND IMAGINED INCA OBSERVATORIES

Abstract author(s): Ziolkowski, Mariusz (Centre of Precolumbian Studies, University of Warsaw) - Kościuk, Jacek (Faculty of Architecture, Arts and Technology, Wrocław University of Science and Technology)

Abstract format: Oral

In the paper we will analyse the possible astronomical function of some structures and architectural ensembles of the Llaqta of Machu Picchu and some of its satellite sites. We will devote particular attention to the so called "Mortar room" and to the structures of Intimachay and Inkaraqay.

The Mortar room (Sala de los Morteros) is one of the buildings at Machu Picchu to which an astronomical-calendar function has been attributed. The most elaborate hypothesis was that of Eulogio Cabada, who based it on a series of photos and measurements taken in 2006-2007.

However, the precise reconstruction of the whole complex of buildings, based on 3D measurements and digital modelling as well as other series of photos, showed that in Inca times the Sala de los Morteros could not have fulfilled the postulated astronomical function.

One of the main challenges was the presence of ceilings, which made it impossible to illuminate one of the mortars and limited the illumination possibilities of the other. The same reasons made it impossible to use the mortars as mirrors for reflective astronomical observations as well as for zenithal observations of celestial bodies. On the other hand, our recent analyses of Intimachay and Inkaraqay show not only their function as astronomical instruments as such (which we have already discussed in our previous publications) but also some interesting traces of re-adaptations, probably due to the need to correct some construction errors that limited their practical use.

16 EVALUATION OF LIGHT AND SHADOW INTERACTION OF AN INCA SANCTUARY IN STELLARIUM

Abstract author(s): Zotti, Georg (Ludwig Boltzmann Inst. f. Archaeological Prospection and Virtual Archaeology) - Malville, Kim (Department of Astrophysical and Planetary Sciences, University of Colorado) - Gullberg, Steven (University of Oklahoma)

Abstract format: Oral

In the mid-15th century, the 9th Inca ruler, Pachacuti, established several royal estates, among them Ollantaytambo in the Urubamba valley. The water temple of the Incamisana is probably the most explicit expression of the Inca interpretation of the world which was animated from the combination of stone, water, and sunlight. Its western wall was illuminated by the rising sun, watered by many fountains and channels cut into the rock, and extensively sculptured to become a huge huaca, interconnected by flowing water.

A special place is the Inticacahuarina, where the shadow of a cylindrically carved-out protruding stone acting as horizontal gnomon has been reported to move into a V-shaped notch in the carved stone ledge below around December solstice. Another such gnomon's shadow appears to do the same, but the right half of the corresponding notch seems to have been destroyed.

It is well known that the Inca have worshipped the sun, and they have left a multitude of carved rocks which deserve analysis also by observation of light and shadow effects during the seasons, however extended stays required for observations depending on seasonal changes are often not possible. The open-source desktop planetarium program Stellarium has been extended in particular to analyse virtual 3D models with respect to astronomical orientation and light and shadow interaction, so that analysis of these seasonal changes can be done mostly with computers off-site.

During a short touristic visit one of us (GZ) has taken a series of photographs from which a 3D model could be produced which was however neither scaled nor oriented without proper survey. The only hint at orientation were the shadows of the cliff and gnomons recorded in the timestamped photographs. This presentation will provide some insights into the modelling and analysis process.

17 LANDSCAPE AND SKYSCAPE AT LARK HILL, NEAR STONEHENGE, IN THE LATER NEOLITHIC

Abstract author(s): Chadburn, Amanda (Historic England) - Ruggles, Clive (University of Leicester) - Leivers, Matt (Wessex Archaeology; Cultural Heritage Institute, Royal Agricultural University)

Abstract format: Oral

Although the Stonehenge World Heritage Site (WHS) is one of the most archaeologically-studied landscapes in the UK, it still has the power to surprise. Recent years have seen the discovery of Neolithic houses, West Amesbury Henge and an Avenue leading to the Durrington Walls Southern Circle. More recently in 2016, an unexpected Early Neolithic causewayed enclosure was discovered just to the north of the WHS boundary, on the chalky ridge known as Lark Hill which gave its name to the nearby garrison town of Larkhill. Archaeologists found the north-eastern circuit of a causewayed enclosure, along with lines of prehistoric posts, and enormous natural sink holes which were visible in prehistory.

About a millennium after the construction of the Lark Hill Enclosure, a line of at least six timber posts was erected over the old ditch – and the last three posts in the line faced out precisely and directly towards the position of June solstice sunrise in 2500 BC. There are several reasons for believing this solstitial alignment was intentional and meaningful, and it may even have represented

the "monumentalisation" of a broadly solstitial alignment of natural features, as has been suggested at Stonehenge itself, and may also have been the case at Durrington Walls.

This paper explores the relationship between the natural and built landscapes and the sky at this recently discovered site, with reference to other monuments in the wider area and how we interpret the landscape/skyscape as a whole in the Neolithic and Early Bronze Age.

48 EBB & FLOW: EXPLORING RIVERS FROM PREHISTORY TO THE PRESENT DAY

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Nimura, Courtney (University of Oxford) - Evans, Christopher (Cambridge Archaeological Unit/University of Cambridge) - Skoglund, Peter (Linnaeus University) - Schulting, Rick (University of Oxford) - Cooper, Anwen (Cambridge Archaeological Unit/University of Cambridge)

Format: Regular session

From prehistory to the present day, evidence for the practical, political, economic, and cosmological significance of rivers abounds. Rivers flow, so can move people and objects. They are niches, providing food and water for humans, plants, and animals alike. To say that rivers have always been essential to life is an understatement. As both potential corridors and territorial divides, they are entangled with the communities living around them. This session aims to think about the many different roles that rivers have played throughout time and think holistically about rivers as active agents with the capacity to shape human behaviour. With this aim in mind, this session has no chronological or geographical parameters, in order to facilitate an inclusive discussion.

We welcome case studies that investigate any number of topics, including rivers as borders that divide regions; routeways that connect people and promote human and object mobility; and places to conduct specific types of cultural activity. Rivers are particularly diagnostic of and sensitive to physical and anthropogenic forces, so they are ideal archaeological records and can be studied using a variety of methods. We therefore welcome case studies that highlight different proxies that can be used to evaluate human-river interaction and the scientific/archaeological/geological analysis techniques we can employ to inform our understandings. Central to this session is the goal to explore the theory of interpreting the archaeology we find in, on, and around rivers; to move past interpreting human and river interaction as a set of cause-and-effect behaviours and instead consider it as a complex and entangled relationship.

ABSTRACTS:

1 DOWN BY THE RIVER IN LATER PREHISTORIC BRITAIN

Abstract author(s): Nimura, Courtney - Schulting, Rick (University of Oxford) - Sturt, Fraser (University of Southampton) - Snoeck, Christophe (Vrije Universiteit Brussel) - Green, Chris (University of Oxford) - Cooper, Anwen (University of Cambridge)

Abstract format: Oral

Rivers have long captivated human imagination. The source of food and water, the sites of religious and ritual activities, and the inspiration for novels and myths – rivers have always been part of human experience. The later prehistory of Europe (c. 2500–400 BC) was a period of unprecedented pan-European mobility in which water travel increased and people and objects, and the ideas that they held, were circulating widely. Here we encounter a changing world, one in which the centrality of rivers comes to the fore. This is the focus of the Leverhulme-funded project 'Ebb & Flow: Exploring rivers in later prehistoric Britain'. In this paper, we present ongoing work from this two-year project (2020–2022) revolving around three themes that lead us into many areas of later prehistoric life: rivers have entangled physical and cultural histories, rivers are magnets for people and things, and rivers move people and things. We will discuss a range of evidence currently being analysed by the project, from strontium isotopes along the Hampshire Avon to the distribution of material culture around the Ribble, Great Ouse, and Nene to the new mapping of palaeochannels across our case study catchments.

2 HOSTY. THE NODAL POINT OF THE EARLY BRONZE AGE ROUTE ON THE RIVER VLTAVA IN BOHEMIA

Abstract author(s): Hlášek, Daniel (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Břicháček, Pavel (West Bohemian Museum in Pilsen) - Eigner, Jan (National Museum in Prague) - Ernée, Michal (Institute of Archaeology of the Czech Academy of Sciences, Prague)

Abstract format: Oral

In prehistoric Europe, water routes played a crucial role in the distribution of artefacts, ideas, and people themselves. Undoubtedly, large watercourses affected many aspects of the lives of the communities of that time, from purely practical ones (such as the source of water, livelihood and raw materials, the possibility to be used for economic transport) to symbolic ones (difficult to be documented archaeologically, but known from comparative mythology). One of the numerous examples may be the significance of the river Vltava in the Early Bronze Age. The Vltava was an important part of the long-distance route connecting the area of the Únětice culture, which dominated the Central European area, with the Southern areas, with important exploited sources of copper, among other things, in the Eastern Alps. The importance of the Vltava is evident from the close connection of Early Bronze Age settlements

to its watercourse. The superregional nature of the route can also be well illustrated by the settlement of Hosty at the confluence of the river Vltava and the river Lužnice, which can be seen through its landscape context, with a concentration of many hillforts, flat settlements, burial mounds and hoards. It is considered an important nodal point of the Central European trade network of the Early Bronze Age. The history of research at this site was also influenced by the river Vltava itself: specifically, by raising the level of the Kořensko reservoir, which was constructed in connection with building of the Temelín Nuclear Power Station. The systematic archaeological research, which took place at the site in the 1980s, is currently being evaluated. The current state of knowledge of this important locality mentioned above will be the focus of the presentation.

3 ON THE MOVE: ROUTEWAYS, NETWORKS, AND MEETING PLACES FROM COAST TO INLAND

Abstract author(s): Nimura, Courtney (University of Oxford) - Skoglund, Peter (Linnaeus University)

Abstract format: Oral

In this paper, we will explore the relationships between coastal and inland rock art in southern Scandinavia. Traditionally, the expressive and vivid rock art panels along the coasts of southern Sweden have attracted the most interest, while the rock art inland has garnered less attention. Based on field studies around lake Vänern and lake Vättern and adjoining river systems, we will include both inland and coastal sites to propose that these larger lakes and adjoining water systems could be seen as parts of routeways that connected people and promoted mobility. The high quantity of images concentrated at certain coastal locations, in combination with their more outspoken narrative character, indicates that coastal and inland places held various functions. We propose that they could have functioned as meeting places and aggregation sites, which served different functions in a larger communication network. We explore how the lakes and rivers of inland Sweden promoted mobility and interaction, but also discuss how they presented obstacles for those living by the sea.

4 FROM THE SOURCE TO THE SEA. BRONZE AGE WET-LAND AND RIVER DEPOSITS - CHANGES IN TIME AND SPACE

Abstract author(s): Beck, Malene (Østfyns Museer) - Frost, Lise (Moesgaard Museum)

Abstract format: Oral

In recent years the Museums of Eastern Funen (DK) have experienced a growth in Bronze Age wetland deposits. Intensive agricultural land use, also of former wetlands and meadows, combined with a growing interest in metal-detecting have brought several new finds to the light. In January 2020 the discovery of a deposit of female jewellery (Late Bronze Age period V) led to a small excavation and the rare opportunity to demonstrate a direct link between the find spot and a spring which fed the second largest river on Funen.

Both the new and old finds in the area indicate the significance of water – in various forms – relative to deposits. Moreover, issues related to landscape studies, place continuity etc. initiated a study of Bronze Age deposits and their changes in time and space on Eastern Funen. The area is rich in Bronze Age deposits, but no one has attempted to look at their context as regards to closer studies of the different landscape elements and relations to the rivers and wetlands in the region.

Initial studies indicate a connection between certain kinds of deposits and certain landscape affordances such as wetlands and specific parts of rivers. Some rivers seem to have attracted the attention for all kinds of offerings throughout the Bronze Age indicating place continuity through time, while others only seem to be used in a more restricted manner e.g. only in a shorter time span or for certain types of offerings.

Could these differences be explained by changes in the physical appearance of the rivers or parts of rivers, closeness to other relevant landscape elements or the relation to the sea? Or do they reflect changed settlement patterns and land use through time? These are some of the questions the study tries to answer.

5 WATERWAYS NETWORK AND ANCIENT COMMUNITIES AT THE FOOTHILLS OF THE OUTER EASTERN CARPATHIANS (ROMANIA)

Abstract author(s): Bolohan, Neculai („Alexandru Ioan Cuza” University of Iași)

Abstract format: Oral

Watercourses have become a leitmotif of archaeologists as they try to explain many of the smaller or larger histories of prehistoric communities. Apparently, the presence on the map of a river seems to represent the framework of a perfect model of approach that includes topography, possible living patterns, cultural features and a possible narrative.

On this occasion I will present a case study, which includes various observations on the role of a minor watercourse for a succession of prehistoric communities. This beginning of the narrative is focused on field survey carried out in a river basin located at the foothills of the Eastern Carpathians. The results obtained by relating several categories of observations tend to draw models of human relationship with the environment specific to different chronological levels (Chalcolithic, Bronze Age, Iron Age). For this I realized a path that included the acquisition of data from the field, understanding how natural topography influenced the arrangement and movement in the workspace, using data on the occupied environment and making predictions about water management. Older models as well as current living models seem to be built by joining roads and waterways. Some models of riparian settlement and community relations identified for the ancient times have survived to historical periods and prove the durability of successful behavior.

6 RIVER MOBILITY IN THE BELGIAN SCHELDT AND MEUSE BASINS

Abstract author(s): Dalle, Sarah (Department of Archaeology, University of Ghent; Maritime Cultures Research Institute, Department of Art Sciences and Archaeology, Vrije Universiteit Brussel) - Snoeck, Christophe (Research Unit Analytical, Environmental & Geochemistry, Department of Chemistry, Vrije Universiteit Brussel; Maritime Cultures Research Institute, Department of Art Sciences and Archaeology, Vrije Universiteit Brussel) - Capuzzo, Giacomo (Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles) - Hlad, Marta (Maritime Cultures Research Institute, Department of Art Sciences and Archaeology, Vrije Universiteit Brussel; Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles) - Sabaux, Charlotte (Department of Archaeology, University of Ghent, Belgium; Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles) - Salesse, Kevin (Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles) - Sengeløv, Amanda (Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles; Department of Archaeology, University of Ghent) - Stamatakis, Elisavet (Maritime Cultures Research Institute, Department of Art Sciences and Archaeology, Vrije Universiteit Brussel; Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles) - Veselka, Barbara (Maritime Cultures Research Institute, Department of Art Sciences and Archaeology, Vrije Universiteit Brussel; Research Unit Analytical, Environmental & Geochemistry, Department of Chemistry, Vrije Universiteit Brussel) - De Mulder, Guy (Department of Archaeology, University of Ghent)

Abstract format: Oral

Rivers are essential corridors that enabled people to navigate faster through the landscape than over land, especially before the construction of a reliable road network. The distribution of archaeological sites in Belgium suggests that people shaped the human landscape to large extent around access to these highways. This makes human-river interactions a vital study target in a landscape approach to mobility.

In this Belgian study, strontium (Sr) isotopes and concentrations from human cremated bone acquired in the framework of the CRUMBEL project allow us to assess how populations' mobility was influenced by the presence of rivers, using the distribution of the sampled cemeteries as a starting point. The main objective is to investigate how closeness to rivers correlates to variability in the Sr record and if this effect of rivers is similar or different in the two dominant river basins in Belgium (i.e. the Meuse and Scheldt river basins). Natural variability in the bio-available strontium complicates this approach and has to be taken into account. The study aims to analyse where in the landscape rivers did or did not facilitate people to travel and how this changed over time. Seeing the abundant availability of human bone from the Metal Ages and Gallo-Roman Period, the primary focus of this paper lies on shifts between these two periods.

7 DYNAMIC ASSEMBLAGES AND EMBODIED FLOWS: HUMAN-RIVER ENTANGLEMENTS IN THE MESOLITHIC

Abstract author(s): Živaljević, Ivana (Biosense Institute, University of Novi Sad)

Abstract format: Oral

With the global glacier retreat at the onset of the Holocene, unconstrained drainage systems gradually became colonized by a myriad of species – aquatic plants, fish, molluscs and water fowl, as well as humans who made their lives along flowing water. The clustering of a number of Mesolithic sites – e.g. along the Muge and Sado valleys in Portugal, in the Danube Gorges of the North-Central Balkans, and in the Dnieper Rapids region in Ukraine – reveals a close connection with riverine environments, through seasonal visits, more permanent settlement, or in the events of the burial of the dead. Numerous archaeozoological, stable isotope and lipid residue analyses indicate that aquatic food sources constituted an important part of the diet, insofar that the term 'fishers' rather than 'hunter-gatherers' is perhaps more accurate when describing many early-mid Holocene communities in Europe. While Mesolithic research has been firmly embedded in the study of the environment, it was primarily conceptualized as a resource to be exploited or a passive backdrop to human activity. In more recent times, the paradigm shift known as the Ontological Turn afforded new ways of thinking about actors and material worlds whose properties do not simply exist, but emerge through mutually constitutive relationships. With their constant flow and ever-changing form, shifting between the seasons of freezing and flooding, pulsing with life during migratory fish runs, shaped by human agency and shaping human experience of the world, the rivers quite literally embody the vibrant nature of entanglement. Far from being one-sided, or two-sided even, these interactions were interwoven with the dynamics of the ecosystem as a whole, eliciting various multispecies responses. In this paper, rivers flowing through Mesolithic worlds are considered as socialized landscapes, mediums which afforded specific experiences and interspecies encounters, and as dynamic assemblages of beings and abiotic actors.

8 A PASTORAL IDYLL: PREHISTORIC ANIMAL HERDING ALONG THE DANUBE FROM A STABLE ISOTOPE PERSPECTIVE

Abstract author(s): Gillis, Rosalind (ICArEHB, Universidade do Algarve, Faro)

Abstract format: Oral

The Danube has played an important role in the evolution and development of farming societies through time and space since their arrival in the late 7th millennium BC. This has been recognised by prehistorians, for example V. Gordan Childe and his use of 'Danubian' to describe the first farmers of Central Europe. Furthermore, 'Danubian' is often used to describe one of the main routes for the

spread of Neolithic communities bringing with new subsistence and cultural practices into Europe from Anatolia. During the late 6th /early 5th millennium BC settlements were located close to the Danube and its tributaries providing a fruitful environment to sustain and facilitate the development of complex societies. Stable carbon and oxygen isotopic measurements of incremental bioapatite samples from teeth can provide detailed information about seasonal herding practices. These values can also provide an insight into past environments and how communities used them to raise their animals, who were integral part of their subsistence economies. This presentation will provide a review of stable isotopic studies for the Danube region focusing on the late 6th /early 5th millennium BC material to discuss species specific herding practices and how communities used these seasonally dynamic fluvial environments to nourish their herds and support the evolution of prehistoric societies.

9 GETTING HOOKED? THOUGHTS ON THE IDENTIFICATION AND INTERPRETATION OF FISHING EQUIPMENT IN NEOLITHIC COLLECTIVE GRAVES IN GERMANY

Abstract author(s): Meyer, Christian (OsteoARC)

Abstract format: Oral

Rivers and other bodies of water surely were a source of food for people in different time periods, providing, for example, a variety of fish. Physical remains of diverse fishing equipment are known from numerous archaeological sites and may represent harpoons, hooks, nets, traps and other ways to catch and harvest aquatic resources.

Regarding prehistoric fishing equipment from Europe, this is mostly known from its durable parts that tend to survive in the ground. While waterlogged sites may preserve more than that, usually only the components made of stone, bone or metal are found. These have to be identified and interpreted correctly which is not always straightforward as not all fishing equipment is immediately recognisable as such.

In this presentation, a new interpretation of a type of worked bone artefact is presented that is associated with collective graves of the German Neolithic, mainly of the Wartberg Culture. These artefacts have been previously described as "bone hooks" but have not been firmly associated with inland freshwater fishing so far. Using a comparative approach, incorporating other archaeological as well as ethnographic examples, these bone hooks might be described as the sole surviving components of composite fishing hooks used to catch large, predatory freshwater fish, with pike as the most likely target.

As these hooks were occasionally included within collective burial chambers, either as parts of the funerary dress or as additional grave goods, they might symbolise even more than their presumed function in catching fish. Possibly, they signify a connection to riverine environments and the animals living there that has not really been explored so far. Based on the discovery of five new bone hooks a tentative interpretation is put forward which places the funerary presence of these hooks alongside the ubiquitous presence of perforated animal teeth, mostly of terrestrial carnivores.

10 IN, ON, ABOVE, ACROSS AND BEYOND THE RIVER: THE ROLE OF THE DANUBE FOR THE TELL AT SZAZHALOMBATTA, HUNGARY

Abstract author(s): Sorensen, Marie Louise Stig (University of Cambridge)

Abstract format: Oral

"It is a truth universally acknowledged, that a single man in possession of a good fortune, must be in want of a wife." (Jane Austen 1813). Similarly, it is widely acknowledged that a site located next to a river - and especially if the site is a Bronze Age tell and the river is the Danube - must be in want of said river! But is that the case?

In this paper, I aim to scrutinise how the organisation of life on the tell of Szazhalombatta was informed by its nearness to the river. Several dimensions are obvious, such as the apparently limited importance of riverine resources, the potential and evidence of long-distance contact provided by the waterway, and the degree of visibility between tells along the river. Other aspects, however, have been given less attention: can we comprehend the significance of the view and the ability to overview a large stretch of land, or how living with a cliff-edge may have influenced site organisation? Furthermore, as different tells had different degrees of economic involvement with the river, would this also mean they had different ways of integrating it as part of their intimate environment, and what may that suggest in terms of our categorisation of them as essentially the same kind of settlements?

11 TIME AND THE RIVER: PREHISTORIC COMMUNITIES AND MONUMENTS ON THE FENLAND OUSE

Abstract author(s): Evans, Christopher (University of Cambridge)

Abstract format: Oral

Overviewing results arising from Barleycroft Farm/Over's vast-scale investigations across both sides of the River Great Ouse in Britain's East Anglian Fens, the paper will consider the changing roles of a great river in prehistory. When we first embarked on the programme 25 years ago, its main research directives seemed straightforward: when had the river been a territorial divide and/or a landscape corridor? Quickly, though, as the complexity of the floodplain's buried topography and its myriad of palaeochannels emerged, all this had to rapidly change: there wasn't one river but many. How in prehistory the Ouse's mid-stream islands and their Bronze Age barrow cemeteries were approached and utilised will be explored, and also the insights provided by having 'islanded' fieldsystems. So, too, will the issue of just how long it actually takes to distinguish significant land-use patterning be explored, as the results - especially as regards Neolithic settlement - are not at all as had been expected.

12 AN 'EVERGLADES-LIKE' LANDSCAPE? HUMAN-ENVIRONMENT INTERACTIONS WITHIN THE RIVERSCAPES AND WETLANDS OF THE HUMBERHEAD LEVELS, UK

Abstract author(s): Whitehouse, Nicki (Archaeology, University of Glasgow; University of Plymouth) - Shilobod, Nika (School of Geography, Earth and Environmental Sciences, Plymouth University) - Chapman, Henry (Classics, Ancient History and Archaeology, University of Birmingham) - Bunting, M. Jane (Geography, University of Hull) - Gearey, Ben (Archaeology, University College Cork) - Davies, Kim (IMSET, Archaeology and Anthropology, University of Bournemouth) - Farrell, Michelle (Geography, University of Coventry) - Phil, Barratt (Archaeology, University of Glasgow)

Abstract format: Oral

Archaeological records show that humans have long been attracted to the range of resources available within river and wetland eco-systems, and that a wide range of settlement and economic activities occurred around the wetland-dryland interface. We explore changing wetland-dryland dynamics across inter-connected river-mere-wetlands and how these places were used and transformed over time. Our case study is the Humberhead Levels, eastern England, where there has been a long history of palaeoenvironmental and archaeological study. Today the land cover is mostly intensive agriculture, with a few protected areas centred on the remnants of heavily exploited lowland ombrotrophic mires, surrounded by the rivers and former meres of the Torne, Idle, Don, Went and Trent. Historical maps, accounts, and the sediments underlying the fields tell a different story, showing a landscape of inter-connected rivers, meres and wetlands; floodplains, open waters, marshes, water meadows, fen, wet woodland and mire, with human settlement and activity clustered on islands of higher ground. The rivers and wetlands were extensively utilised over prehistory for their resources and as routeways, whilst in the Roman and historic periods they were transformed for navigation, diverted, drained and canalized, representing a way of life and living-with-water that can be traced back through thousands of years, and which survived until the 17th century. What was it like to live in these waterscapes?

The diverse and complex character of river and wetland development and human-environment interactions is outlined through the combined use of GIS and LIDAR mapping, together with geoarchaeological mapping. An extensive archaeological database of over 5000 data points has enabled us to infer the nature and focus of human activity and land use, whilst pollen records allow us to reconstruct the land cover history of key archaeological periods, highlighting differing ways in which these riverscapes and wetlands were used over time.

13 TEOTIHUACAN AND THE SAN JUAN RIVER: A RELATIONSHIP TO EXPLORE

Abstract author(s): Moragas, Natalia - Pecci, Alessandra (University of Barcelona) - Barba, Luis - Ortiz, Agustin (Universidad Nacional Autónoma de México)

Abstract format: Oral

Teotihuacan (100 BC-650 AD) was the most important urban center in the Basin of Mexico during the Classic Period. In 2017 we started archaeological research in a specific area of the city that is defined to the north by the pyramid of the Sun and to the south by the so-called Río San Juan - actually a small river compared to many well-known large rivers in Europe and elsewhere. We have "always" known that the Río San Juan was diverted to follow the urban grid, making its course perpendicular to Teotihuacan's "Street of the Dead", and cutting this street almost to the middle.

Despite its importance the Río San Juan has not been the subject of many investigations. Yet it has been generally accepted that it played a crucial role in the life of the inhabitants of the city. However, the role of this "river" and its relationship with the city must be reassessed with specific questions. Our project, an academic collaboration between the University of Barcelona and the UNAM, originally started with different aims, but has now centered its focus on this interesting theme. The project is funded by the Palarq Foundation and the Ministerio de Cultura y Deporte de España.

14 THE SHAPING OF WATER: INTERACTIONS BETWEEN LANDSCAPE, EXPLOITATION OF WATER, AND SETTLEMENT IN THE MEDIEVAL WESTERN ALPS

Abstract author(s): Nejrotti, Luca (Ass. Cultura e Territorio - ACT; Aix Marseille Univ, CNRS, LA3M)

Abstract format: Oral

The study of hydraulic workshops can provide a privileged point of view on resource management, settlement dynamics and power relations in ancient communities.

This paper offers a summary of studies, including interdisciplinary analysis that has integrated written and material sources, carried out in different valleys of the western Alps from the Middle Ages to the early 20th century, focusing on medieval hydraulic plants: cereals, oil and hemp mills, as well as forges, fulling and paper mills.

The results of this study are encouraging and testify how, even in areas that are historically considered as marginal, the waterways were the engine of a lively economic life otherwise elusive to the scrutiny of researchers.

Mountain streams thus acquire a double role: enemies of the settlements, due to their capricious flow and the risk of floods, but also allies, able to free pre-industrial production from the slavery of muscle power. This dichotomy can still be read in the alpine landscape where the present-day settlements still choose dry places, but the roads and small production centres look for the most convenient banks of rivers and streams.

In addition, these kinds of studies, as well as having great scientific importance, open new perspectives for cultural valorisation of the landscape as a complex and entangled (natural and anthropogenic) entity.

However, some important limitations have also been highlighted: the material and written sources are often incomplete. This causes a flattening of the information which, by losing its diachronic depth, can easily fall into folklore.

Nevertheless, without indulging in excessive enthusiasm, the study of hydraulics in the western Alps allows us to find significant data on the history of the landscape, economy, and society; it also provides a wealth of information valuable for the valorisation of territories that must increasingly focus on tourism to avoid their actual marginalization.

15 THE AGE OF DEPOSITION OF ACCUMULATIVE FAN SEDIMENTS IN SERTEYKA RIVER VALLEY (WESTERN RUSSIA)

Abstract author(s): Ginter, Artur (University of Lodz, Faculty of Philosophy and History, Institute of Archaeology, Spectrometry and Luminescence Dating Laboratory, Lodz) - Kittel, Piotr - Piech, Wiktor (University of Lodz, Faculty of Geographical Sciences, Department of Geomorphology and Palaeogeography, Lodz) - Moska, Piotr (Institute of Physics - Centre for Science and Education, Division of Geochronology and Environmental Isotopes, Silesian University of Technology, Gliwice) - Krąpiec, Marek (AGH - University of Science and Technology, Faculty of Geology, Geophysics and Environmental Protection, Krakow) - Sikorski, Jarosław (Institute of Physics - Centre for Science and Education, Division of Geochronology and Environmental Isotopes, Silesian University of Technology, Gliwice) - Hrynowiecka, Anna (Gdansk Polish Geological Institute - National Research Institute, Marine Geology Branch, Gdansk) - Stachowicz-Rybka, Renata - Cywa, Katarzyna (W. Szafer Institute of Botany Polish Academy of Sciences, Krakow) - Mazurkevich, Andrey (The State Hermitage Museum, St. Petersburg)

Abstract format: Oral

In the rich of archaeological sites dated from the late Palaeolithic to the Modern Period in the region of the Serteyka River, deposits of an extensive accumulative fan were studied in detail. The main goal of the research was an attempt to reconstruct the strict chronology and palaeoenvironmental conditions of development of the most prominent gullies' system and accumulative fan in the lower sector of the present-day Serteyka River valley. An important part of the project has also checking usefulness of luminescence, radiocarbon, and lead methods of dating in determination of the age of inorganic deposits accumulation.

The studied fan is built by deluvial sediments transformed in the uppermost part into tillage diamicton. Numerous samples of sandy slope sediments and underlying organic deposits were taken for ¹⁴C, OSL, ²¹⁰Pb dating to determine the age and phases of the fan's development. ²¹⁰Pb samples were taken from a monolith. Radiocarbon dating was made for selected plant macrofossils found within inorganic deluvial deposits, and from peaty-lacustrine deposit below accumulative fan.

The use of ¹⁴C and ²¹⁰Pb methods of dating allows for elaboration of a reliable model of the evolution of modern slope processes from the 2nd half of the 17th c. to 2nd half of the 19th c. AD (i.e. during the younger part of the Little Ice Age). It was a period of human-induced deforestation, as confirmed by the results of palaeobotanical analyses. In addition, OSL dates have been obtained, but the acquired age significantly exceeded previous expectations. Three dates indicate the Neolithic period, and a chronological inversion of OSL dates can be seen. This may be due to incomplete bleaching of the sand grains during transport, which indicates that the material being transported had a relatively large volume. This further indicates not dispersed erosion, but rather the drainage of hydrated sediment.

16 FLOW REVERSALS IN RIVERS: A STUDY IN ARCHAEOLOGY OF FLOW

Abstract author(s): Edgeworth, Matt (School of Archaeology and Ancient History)

Abstract format: Oral

Reversal of flow in rivers can happen for natural or artificial reasons, or a combination of both. Here we look specifically at those cases where there is human involvement. Famous examples include the Chicago River, which used to run into Lake Michigan but now, thanks to construction of a canal linking watersheds over a century ago, runs away from it.

Not all engineered flow reversals are so well-known or on such a large scale. Yet they are more common than might be expected and mostly unrecorded, so must be deduced from material clues in the riverscape. Flow reversals are crucial events to pick up on when trying to unravel the story of the development of a stretch of river.

A case-study in archaeology of flow illustrates this point. The River Great Ouse in Bedford, England is comprised in part of multiple artificial features such as weirs, sluices, mill-races, ditched defensive boundaries, channels cut alongside railway embankments, and so on. It is a rich archaeological heritage that spans the time from prehistory to the present day. Yet what was really being acted upon by construction of such things was the flow of the river. Observing how the river flows today and working back, it should be possible to build a coherent narrative about river development through time. But there is one small stretch of river that is anomalous in the sense that it 'runs the wrong way', disrupting explanations. Did that small stretch once have its flow reversed? Why and how was this done, and when?

Answering these questions is a key that unlocks our understanding not only of why the river flows as it does today, but also how it flowed in earlier times, before the flow reversal.

49 LUXURY IN LIFE AND DEATH IN THE EUROPEAN IRON AGE. IDENTITY - ELITE NETWORKS - ECONOMY - ARTS AND CRAFTS

Theme: 6. Material culture studies and societies

Organisers: Fuerst, Sebastian (Curt-Engelhorn-Zentrum Archäometrie gGmbH) - Nordez, Marilou - Armbruster, Barbara (Laboratoire TRACES - UMR 5608, Université Toulouse 2 Jean Jaurès)

Format: Regular session

What defines an elite within a society? It may be the ability to exercise power and domination; it may be the access to specific resources. Or it can be conceptualized as the degree of centrality and connectivity within a communication and/or interaction network.

In the context of archaeological research, this last approach has the advantage that precious objects and materials, as remains of material culture, allow a reconstruction of relationships over long distances. During the Iron Age, luxury items made of precious or exotic materials were used by elite groups as symbols of power and prestige, and they were deposited as grave goods or in hoards. They can be seen as proxy variables to identify multiple highly dynamic and dense networks of influences from different regions, near and far.

The structures and mechanisms of these networks depend on the selected parameters: for example, a network of imported vessels is different from the network of precious materials like amber, especially when stylistic or craftsmanship characteristics are taken into account.

How do the networks of different precious materials and prestige objects differ? What conclusions can be drawn from this for the social structures of Iron Age societies? Do some places show a distinct betweenness or bridging centrality that made them operate as connectors between two cultures? And do other sites display a pivotal role as hubs or junctions within a local or regional social group, perhaps as centres of fine metalwork crafting?

In this session, we would like to bring together all these different perspectives on elite connectivity during the Iron Age, in order to obtain an even more detailed picture of the dynamic and complex processes during this period.

ABSTRACTS:

1 GOLDWORKING TECHNOLOGY IN THE IRON AGE – AN INDICATOR OF CULTURAL CONTACT AND EXCHANGE IN THE PRODUCTION OF LUXURY GOODS

Abstract author(s): Armbruster, Barbara - Nordez, Marilou (Centre National de Recherche Scientifique)

Abstract format: Oral

During the European Iron Age, fine metalwork is a prominent component of luxury items, comprising personal ornaments, vessels and decorative fittings. Function, style, shape and decoration of the gold and silver objects undergo a development in time and space. This evolution goes along with changes in the supply of raw materials, choice of alloy-composition and manufacturing techniques. Therefore, the luxury goods bear witness to traditions, local inventions, imitation and external factors such as contact, exchange and import in these manifold issues. The technological characteristics of metal objects reflect the artisan's skill and knowledge, both with regard to production, technical, stylistic and ritual aspects, and his ability to materialize the cultural conception of a product. This paper deals with these aspects of advancement and change in Iron Age material culture, specifically in precious metalworking of the Western Hallstatt and Latène cultures in a diachronic perspective. It highlights external influences and interactions in the goldsmith's craftsmanship in order to interpret elite networks, notably towards the Iberian and Italian Peninsulas and the eastern Mediterranean, but also towards Great Britain and Ireland.

2 WHICH BEHOLDER APPRECIATES THE BEAUTY? IRON AGE AMBER AS A (NON-) LUXURY COMMODITY IN ITS STORAGE, DISTRIBUTION AND PROCESSING CONTEXTS

Abstract author(s): Markiewicz, Joanna - Duleba, Przemysław (University of Wrocław)

Abstract format: Oral

The paper builds upon a case study of a Pre-Roman Iron Age site in Wrocław-Partynice (formerly Breslau-Hartlieb). Rescue excavations conducted there in 1906 and 1936 revealed remains of a Pre-Roman Iron Age settlement site. Among other features, the site yielded three storage pits filled with 1300-1500 kg of amber. Until now, the find remains the world's largest recorded anthropogenic amber deposit. The discovery was initially dated to the latter half of the 1st century BC. However, our recent study of the available pottery assemblage suggests that it was at least 150 earlier and shall be connected to the late Jastorf culture communities. This chronology overlaps with the dating of the amber accessories and workshops from the La Tène culture sites, such as Nowa Cerekwia, Samborowice, Berching-Pollanten and probably Staré Hradisko, Stradonice and Zavist. The paper explores the purposes this – apparently – luxurious commodity served and what it communicated in various cultural contexts within its distribution network.

3 FUR SUPPLIERS IN THE NORTH – WHAT CAN BE CONCLUDED BY STUDYING THE FUR PRODUCTS IN THE GRAVES

Abstract author(s): Kirkinen, Tuija (University of Helsinki)

Abstract format: Oral

In Finnish archaeology, the role of east Fennoscandian populations as suppliers of furs for Scandinavian, Central European and Asian consumers is generally accepted. In this network, furs were valued foremost as exotic and rare products which reflected the high status of the carrier. In Finland, furs were not rare nor exotic. Instead, animal skins had use-value as warm garments. They also had trade-in value as they could be exchanged for metals, metal artefacts, and glass beads, maybe also for horses, valuable dogs, fabrics, and food.

In this presentation, the roles of fur products for the suppliers of animal skins are evaluated by studying animal hair remains from Iron Age and medieval graves. This material evidences that status fur items are relatively scarce. I base this argument on the low numbers of fur animal (European beaver, lynx, red squirrel, and mustelids) skins in graves. However, rare black variants of furs and the preparing of furs, e.g. by pulling off the coarse hairs provide evidence of their value. Also, the graves which were accompanied with skin or fur items, clothes or wrappings, seemed to be wealthier than the graves on average. These comparisons are, however, not unproblematic.

I hypothesize that skins of wild animals had specific agency in areas where the lives of humans and wild animals were closely engaged. This engagement was based on the need of meat and furs, and the relationship was built on a series of acts which covered hunting, handling of carcasses, preparing of food and skins, and on the using of these products. For people who didn't live with these animals, the products hypothetically represented otherness and were rare and exotic, even status items.

4 PRIVILEGED NETWORKS: THREE CASE STUDIES ON FUNERARY ASSEMBLAGES (5TH CENTURY BC)

Abstract author(s): Fuerst, Sebastian (Curt-Engelhorn-Centre Archaeometry; Saarland University) - Armbruster, Barbara (CNRS Maison de la Recherche Université de Toulouse 2)

Abstract format: Oral

This paper wants to examine the long-distance connections of the elites of the 5th century B.C. on the basis of a case study from three regions: The Champagne, the Dürrnberg near Hallein, and the area between the Moselle and the Rhine. All three are regarded as centres of the Latène culture, but each shows certain specific characteristics concerning grave goods and burial customs. As a proxy for an elite, this study compares in particular the gold-bearing graves, most of which could be analysed within the CELTIC GOLD project. In addition to stylistic features, technological aspects are also included in the considerations as well as burial customs. Network analysis proves to be a particularly suitable methodology for valuating these complex interregional connections. This allows us to identify not only regional sub-groups with similar objects and funerary rites, but also individuals which were connected to more distant regions. The emerging network structures allow a deep insight into the respective social structures.

5 MULTIMETALITY IN AND BETWEEN CENTRAL MILIEUS – IRON AGE NETWORK-IMPLICATIONS OF THE PROJECT 'FROM THE CRUCIBLE AND AT THE ANVIL'

Abstract author(s): Svensson, Andreas (Dept. of Archaeology and Ancient history, Lund University)

Abstract format: Oral

The connection between metal use and elite strata in Iron Age society has long been firmly established. This association is also spatially detectable with regards to the localities of metalworking milieus in the landscape. It is commonly held that non-ferrous metalworking, including precious metal use, were linked to elite milieus (i.e. central places including their zones of dominance). Ferrous metalworking, on the other hand, is normally attributed a different spatial pattern, located to resource zones beyond the central areas (i.e. peripheral outland zones). Contrasting this spatial pattern is the often-emphasised importance of iron production to economic affluence and, hence, social and political power in Iron Age society.

Within the project 'From the Crucible and at the Anvil', the macro-spatial patterns of metal use has been tested within the region of south-east Scandinavia. The results largely supports the spatial link between centrality and non-ferrous metal use and, likewise, the deliberate positioning of ferrous metalworking in connection to resource zones. There are however notable exceptions, suggesting important divergences to the main pattern.

The analyses of metallurgical debris from selected central sites within the study area have also revealed high ratios of ferrous metalworking within the crafts-milieus. This highlights the importance of ferrous metalworking in connection to socio-economic and political centrality, and above all, the networks between centre and periphery.

In this paper, the centrality of metal craftsmanship is discussed with specific focus on the divergences in the overall spatial pattern of non-ferrous metalworking. The spatial reach of "fine metalworking" is gauged and used to elucidate the 'betweenness' of metal use beyond the central milieus. The networks of both ferrous and non-ferrous metalworking evident from the spatial analyses that the project 'From the Crucible and at the Anvil' have produced will drive a discussion on socio-economic structures in the Scandinavian Iron Age.

6 LATE LA TÈNE ELITES EITHER SIDE OF THE ENGLISH CHANNEL: SIMILAR TASTES BUT WHAT ABOUT SPACE?

Abstract author(s): Lamb, Andrew (Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart; University of Leicester)

Abstract format: Oral

Space may not be the final frontier in mortuary archaeology, but it is an underappreciated aspect of research. In contrast to settlements, where access analysis has effectively been used to demonstrate how space was utilised as a means to reinforce social positions, the space within graves has long been overlooked. This is slowly being rectified, with some studies undertaken for princely graves of the Hallstatt and early La Tène periods. By contrast, rich late La Tène elite burials continue to be examined primarily through grave good inventories, and to a lesser extent associated funerary architecture. The late La Tène period witnessed a resurgence in elite burials across a broad area of western Europe. With a few exceptions, the individuals in these graves were cremated and provisioned with items associated with feasting. Beyond these broad similarities, key regional differences can be detected in terms of the grave goods and funerary architecture provided to these burials. But what of the way in which space was utilised within these graves? What can the internal arrangement of these graves potentially tell us? This paper considers two of these elite groups: the Aylesford burials of south-east England, and those of the Hauts-de-France. These groups are closely related, utilising a common ceramic and numismatic tradition, employing a similar range of grave goods, and sharing some aspects of funerary architecture. In the past, the Aylesford group has even been considered an extension of the Hauts-de-France group. Through examining the internal layout of the graves themselves, with regards to the positioning of graves goods and human remains in relation to each other, it seeks to shed new light on how these elite groups portrayed themselves in death.

7 POWER AND CONTROL: BURIAL MOUNDS AND THE AGENCY OF DEATH

Abstract author(s): Trinder, Ermelinda (Staffordshire University)

Abstract format: Oral

Burial mounds were the exclusive form of burial during Bronze and Iron Age Albania. Their construction involved extensive work and was frequently accompanied by socialised eating and drinking ceremonies, either prior to burial or afterwards. Traditionally, the study of burial mounds in Albania has tended to focus primarily on the ethnic identity of the people buried within these mounds. Less considered to date, however, has been the role of social elites in the construction of burial mounds. This paper presents the hypothesis that a powerful and wealthy elite within society operated as an Agency of Death. It explores how the Agency of Death aimed to gain, display and sustain their power, authority and control over their community through organising, supporting and providing the resources, craftsmanship and skills necessary for the construction of burial mounds.

Through a series of case studies of Albanian publications, I will demonstrate the significance of natural resources such as stones from mountains and rivers, and how their ritualised meanings transformed these materials into precious and highly prized resources. Building on this, I will explore the role of the Agency of Death in collecting, transporting and distributing these materials and how this process required Agencies of Death at times to connect with, exchange and share materials and ideas with one another. Additionally, in this paper I consider how the Agency of Death could have influenced, organised and supported ritualised eating and drinking ceremonies during the construction of burial mounds to further gain control and to sustain and display their power and authority over the natural and unnatural world.

8 EXOTIC GOODS AND ELITE GRAVES IN ARCHAIC CAMPANIA (8TH-6TH BC)

Abstract author(s): Maudet, Ségolène (Université de Lorraine)

Abstract format: Oral

How can we use grave goods to study Iron age exchanges in a socio-political perspective? This question will be the center of my paper, using mainly examples from an Etruscan site, Pontecagnano, near actual Salerno in South Italy.

Graves are our main source of information about this site and about the whole area at this period. The use of formal methods, especially in a processual perspective, has aroused many debates in protohistoric archaeology. Pontecagnano offers a great opportunity to study funerary variability, since more than 500 graves have been published. I currently study an unpublished sector of 70 Orientalizing graves. How can I qualify the social level of this group? An original methodology, combining formal analysis but also a qualitative analysis using the postprocessual framework has been developed by M. Cuozzo. I will explain how I plan to adapt her methodology to fit the specificity of my data.

A second point of interest of my paper will be the link between allogenous grave goods and elite graves. This preferential link lies at heart of many theories about exchanges and socio-political evolution of Iron Age societies. It tends however to focus on prestige goods and on central Europe. Campania is a great case study to further examine this link, since it is a region deeply embedded in multiple networks of exchange. The diversity of societies (Greeks, Phoenicians, Etruscans, Oscans) also allows to propose a nuanced study of the socio-political distribution of allogenous goods. Some goods seem "reserved" to elite grave, but others are more commonly distributed: how can we establish that, and how can we interpret this diversity? I will present concrete examples from Pithekoussai, Cuma, Pontecagnano and the Sarno Valley, including some unpublished data.

- 9 **PRECIOUS VESSELS FOR THE AFTERLIFE: POLYMATERIC AND ASTARITA TYPE JUGS**
Abstract author(s): Taloni, Maria (Ministry of Cultural Heritage, Directorate-General for education, research and cultural institutes)
Abstract format: Oral
- The experiment of realizing the same object in different materials, stressing the possibilities of that material itself, is well explained by few particular polymateric jugs and their ceramic imitations, better known as Astarita type jugs.
- It was a virtuosity very appreciated, now as then, from the local orientaling élites that commissioned those objects and it presumed high technical skills that were passed on from artisans to artisans. This paper will focus on the morphological analysis of this group of vases and, where possible, on the examination of their contexts of discovery. By contrast, it will use the dataset to move beyond the consideration of the objects in isolation as a chronological marker, instead bringing them into the foreground as an index of the cultural exchange and interactions in the Mediterranean during the 8th and the 7th centuries BCE. The aim is to develop an historical reconstruction of the ancient pre-Roman society in the Italian peninsula and to explore the dynamics that led the jugs to be imported and imitated. Furthermore, the paper will point out the importance of circulating objects in the ancient Mediterranean: this phenomenon deals often with movement of people, techniques and ideas and it is fundamental for the birth of the so-called "Orientalizing period" and the élite networks in central Italy.
- Lastly, it will focus the motif of female heads always represented on their neck, investigating the probable symbolic connotations apropos the vases functions.

- 10 **THE "ORIENTALIZING" CONNECTION: LUXURY GOODS, ELITE CONNECTIVITY, AND THE RISE OF THE "ORIENTALIZING" IRON AGE OF SOUTHWESTERN IBERIA**
Abstract author(s): Gomes, Francisco (UNIARQ - Centre for Archaeology of the University of Lisbon; School of Arts and Humanities of the University of Lisbon; Foundation for Science and Technology - Portugal)
Abstract format: Oral
- In the wake of the first contacts with merchants and settlers hailing from the Eastern Mediterranean during the early first millennium BCE, the local communities of the southwestern Iberian Peninsula underwent a series of social, political, and cultural changes, entering what has been recognized, by analogy with other Mediterranean areas, as an "Orientalizing" Period (9th/8th – 6th/5th centuries BCE).
- The interpretation of this process, and of the "Orientalizing" nature of this chrono-cultural horizon itself, has undergone significant changes, from traditional perspectives predicated on acculturation and emulation models to more recent analyses inspired by post-colonial theory which have stressed the creative and negotiated nature of the new, so-called "Orientalizing" cultural discourses.
- Focusing on luxury goods, this contribution aims to build on that discussion by offering an interpretation of this "Orientalizing" horizon in terms of elite connectivity. It will be argued that local elites, having become embedded in a wide and diverse socio-political network mediated by the Phoenician interface, needed to develop a common language to project and assert their (social) identity and status, and that they relied on discursive resources offered by that interface to do so.
- An attempt will therefore be made to demonstrate that, far from reflecting cultural or even political homogeneity as some researchers have argued, the use of certain prestige elements relating to ritual, dress, adornment and bodily care, acquired or introduced through medium- and long-distance trade, was a function of the active role of local elites in a complex network of macroregional and transregional socio-political connections, but that it cannot be dissociated from local agendas, social discourses and political economies.

- 11 **CONSUMING LUXURY IN IRON AGE PHOENICIAN SOUTH IBERIA (8TH-7TH CENTURIES BCE): THE FUNERARY RECORD**
Abstract author(s): López-Bertran, Mireia (Universitat de Valencia)
Abstract format: Oral
- It is generally agreed among scholars that the Phoenicians were responsible of crafting and trading luxury goods. The written sources, like the Odyssey (15, 118-119) mentions them as skilfully artisans, specialized in luxury items. It has been an implicit definition of luxury objects as non-utilitarian related to the Western idea of art created during the 18th century when the concept was divided into "fine arts" and "crafts" or "popular arts". In this sense, portable luxury arts have been studied offering formal descriptions and iconographic and iconological interpretations to give semantic meaning to visual motifs. This methodology assumes an implicit immateriality to meaning as something that exists outside the object. Instead, contextual analyses of these objects offer an approach of their meaning based on the human-object interaction that strengthen meaning as a social process.
- In this communication, I will explore the use and consumption of luxury objects in the Phoenician far-west, in the south of the Iberian Peninsula between the 8th and the 7th centuries BCE. My approach to luxury is based on the idea of performative practices that participate actively in the collective construction of the cultural identity of status-groups. I contend that luxury is, first and foremost, contingent, and a matter of degree and scale. These ideas will be analysed using the funerary contexts available to date, as tombs are the spaces where the so-called luxury items have been mostly documented, especially alabaster vases, jewellery and

ivory objects. In doing so, I will focus on the consumers of these objects, and how and to what extent luxury intersects with issues of gender, age and living conditions of these communities.

- 12 **PRODUCTION, CONNECTIVITY AND SOCIAL INFERENCE OF THE IBERIAN SCULPTURAL MONUMENTALITY. LOS CUCOS (BOGARRA, ALBACETE, SPAIN) AS A CASE STUDY**
Abstract author(s): García-López, Arturo (University of Alicante; Centro de Estudios de Arqueología Bastetana)
Abstract format: Oral
- This study aims to revisit an architectural, sculptural, stone monumental ensemble from Los Cucos site (Bogarra, Albacete, España), discovered in the 1940s, which has been roughly dated back to the end of the Middle Iron Age and practically forgotten to this day.
- Anchored in the art history conventions, it has not been possible to construct a methodology to overcome the dating by stylistic comparative and symbolic interpretations lacking archaeological empirical support.
- This is the reason why it was proposed to revisit Los Cucos and document by making use of archaeological prospection all the constructive elements and decorative monumental and sculptural fragments re-used on terraces or abandoned in ravines in order to form the necessary empirical basis to work on.
- The characterization of the determined work processes allows us to speak of at least one turriform structure not associable to an archaeological habitat or funerary context.
- That is why, sheltered by the existence of similar structures in the south of the Iberian Peninsula and the north of Africa, we propose the existence of an isolated monument whose vocation would be fundamentally territorial, either signaling or bordering, perhaps linked to the funerary field.
- To verify this hypothesis, we present our case study to the GIS analysis and its link with the organization of the contemporary settlement (late 6th century - early 5th century BC).
- Characterizing this type of spatial functionality structures could help us understand how Iberian culture was related to the territory or how this space is not independent of economic-productive appropriations, both from the exploitation of raw materials and social coercion by the elites.

- A. **SOME GIRLS ARE BIGGER THAN OTHERS. THE REPRESENTATION OF THE IBERIAN FEMALE WORLD THROUGH THE LADY OF DOÑA MENCIA**
Abstract author(s): García-López, Arturo (University of Alicante; Centro de Estudios de Arqueología Bastetana) - Moreno Alcaide, Manuel (Museo Histórico-Arqueológico de Doña Mencía) - Abelleira Durán, Manuel (University of Granada; Centro de Estudios de Arqueología Bastetana)
Abstract format: Poster
- Talking about female representation is currently not a trivial topic, especially in the case of Iberian culture, for which we have the famous stone carvings of the so-called "Ladies" of Elche or Baza. These two refer to very specific models: containers for the cremated remains, in short, funeral urns. These are not the only female representations, since we only have to look for the offering Ladies of the Cerro de los Santos to realize the votive, and not funerary, character of these figures. In general terms, these manifestations can be limited between the 5th and 1st centuries BC.
- Now, determining the nature or chronology of these pieces, even more so if we only know very fragmented remains, can provoke more than daring interpretations.
- This is the case of the one nicknamed the "Iberian Lady of Doña Mencía." It is the fragment of the hairstyle of a round female figure that stands as one of the most notable manifestations of the feminine sphere in the south of the province of Córdoba.
- Although its dating has been intended to advance to the beginning of the 6th century BC. Due to stylistic criteria compared with figures from the Mediterranean area, we believe that only spatial contextualization with the settlement and occupation of the territory can indicate the true chronology.
- And it is that we cannot approach the representation of the feminine world in Iberian times only from a stylistic or symbolic perspective. This exercise in contextualizing an isolated finding cannot be closed without proposing the work processes determined by what this piece has gone through, from the quarry to its consumption and disposal.
- Only in this way can we understand from all possible perspectives a world as complex in the archaeological and symbolic as the representation of the feminine in Iberian culture.

A MARTIAL WORLD OR A DIVERSE COMMUNITY? GENDER, SOCIAL STRATIFICATION AND MINORITIES ON CASTLES

Theme: 6. Material culture studies and societies

Organisers: Atzbach, Rainer (Aarhus University) - Blaich, Markus (Niedersächsisches Landesamt für Denkmalpflege) - Theune, Claudia (University of Vienna)

Format: Regular session

This session seeks to explore the everyday society living in a castle or a palace between the 8th and 17th centuries. While the ostensible major group of inhabitants – usually regarded as men in arms – seems to be well represented in written and archaeological data, other groups are less visible: For example, it is difficult to spot female inhabitants and children, but also minorities like vagrant minstrels, visitors or even the castle's or palace's owner and her/his family members. Another neglected dimension in castle research is religion outside the chapel building. Here, we could regard practices of prayer, the chaplain's living conditions, but we might also face diverging religious groups (Jews, Moslems Orthodox, Catharists, Protestants and further denominations) within the castle walls. In this session, we want to discuss the subsequent questions with a departure point in medieval and renaissance castles and palaces in Central Europe and beyond:

- In how far are specific object types markers for social or religious groups?
- Is it possible to use combinations of objects for their identification?
- How does the interpretation of spatial concepts (e.g. apartment, chapel, bower) contribute to revealing neglected spheres?
- How do archaeological sources witness the temporality of social spheres?
- How does a gender bias influence research?
- In how far does a comparative approach between different European regions improve our knowledge?

Contributions presenting individual case studies or more general surveys on methodical approaches and sources are welcome.

ABSTRACTS:

1 INTRODUCTION

Abstract author(s): Atzbach, Rainer (School for Culture and Society, Aarhus University)

Abstract format: Oral

This session seeks to explore the everyday society living in a castle or a palace between the 8th and 17th centuries. While the ostensible major group of inhabitants – usually regarded as men in arms – seems to be well represented in written and archaeological data, other groups are less visible: For example, it is difficult to spot female inhabitants and children, but also minorities like vagrant minstrels, visitors or even the castle's or palace's owner and her/his family members. Another neglected dimension in castle research is religion outside the chapel building. Here, we could regard practices of prayer, the chaplain's living conditions, but we might also face diverging religious groups (Jews, Moslems Orthodox, Catharists, Protestants and further denominations) within the castle walls. In this session, we want to discuss the subsequent questions with a departure point in medieval and renaissance castles and palaces in Central Europe and beyond:

- In how far are specific object types markers for social or religious groups?
- Is it possible to use combinations of objects for their identification?
- How does the interpretation of spatial concepts (e.g. apartment, chapel, bower) contribute to revealing neglected spheres?
- How do archaeological sources witness the temporality of social spheres?
- How does a gender bias influence research?
- In how far does a comparative approach between different European regions improve our knowledge?

Contributions presenting individual case studies or more general surveys on methodical approaches and sources are welcome.

2 THE MARKERS OF JEWISH PRESENCE BASED ON THE RESULTS OF ARCHAEOLOGICAL EXCAVATIONS IN THE CASTLE OF LORCA (SPAIN)

Abstract author(s): Eiroa, Jorge (Departamento de Prehistoria, Arqueología, Universidad de Murcia) - Martínez Rodríguez, Andrés (Museo Arqueológico Municipal de Lorca) - González Ballesteros, José - Celma Martínez, Mireia (Professional Archaeologist) - Molina Campuzano, Isabel (University of Murcia)

Abstract format: Oral

In 2020, the University of Murcia and the Archaeological Museum of Lorca resumed the interdisciplinary research project in the medieval castle of Lorca (Murcia). An important Jewish quarter has been identified there. The judería was established inside the fortified enclosure in the 13th century and developed substantially in the 14th and 15th centuries, but was suddenly abandoned after the expulsion decrees of 1492. In the last twenty years, more than fifteen houses have been excavated, as well as a craft area,

a butcher's and an exceptional synagogue, all of which allow us to know in some detail the characteristics of this Jewish quarter formed inside the castle.

One of the objectives of the new archaeological research is to define the particularities, from a strictly material perspective, of the Jewish presence. In recent years, some archaeological indicators that allow us to identify the presence of Jews in late medieval domestic contexts have been defined. In particular, the study of both Hanukkah oil lamps and the zooarchaeological record have been developed, which can be understood as clear markers of their presence. The research project carried out in the castle of Lorca last year, confirms their usefulness and attempts to go even further, trying to deepen the anthracological and carpological analysis in order to define the existence (or not) of a specific strategy of exploitation of the natural environment by the Jewish communities.

This paper presents the first results of these studies and introduces them into the general debate on the ability of archaeology to define the record of religious minorities. It also reaffirms the use of certain archaeological markers and attempts to place them in the context of a larger historiographical debate on a European scale.

3 SOCIAL DYNAMICS AND MINORITIES IN THE CASTLE OF MOLINA DE ARAGÓN (GUADALAJARA): AN APPROACH THROUGH ARCHAEOLOGICAL METALLURGY AND ZOOARCHAEOLOGY

Abstract author(s): Hernández-Casas, Yaiza (University of Granada) - García-García, Marcos (University of York) - Murillo-Barroso, Mercedes - García-Contreras Ruiz, Guillermo (University of Granada) - Banerjee, Rowena Y. (University of Reading) - Ros, Jérôme (Centre National de la Recherche Scientifique) - Mattei, Luca (University of Granada) - Brown, Alex D. (Wessex Archaeology) - Alexander, Michelle (University of York) - Pluskowski, Aleks G. (University of Reading)

Abstract format: Oral

This paper presents the preliminary results of interdisciplinary research on the multicultural frontier of Molina de Aragón (Guadalajara, Spain). For the first time, evidence from zooarchaeology and archaeometallurgy are used to explore the social dynamics between spaces such as the Molina castle enclosure and the Jewish quarter located outside, known as Castil de los Judíos.

Being part of the Project "Landscapes of (Re)Conquest: Dynamics of Multicultural Frontiers in Medieval South Western Europe". (AH/R013861/1), our interest in this case lies in integrating the study of faunal remains and metal objects in order to study how the macro-political issues of wars, regime changes and the advance of borders affected everyday life.

On the one hand, by focusing on such a central human activity as eating, the zooarchaeological analysis allowed to shed light into two different spheres such as the production and distribution of animal products and, particularly, the preparation and consumption of meat products. The results reveal remarkable differences between Islamic, Jewish and Christian periods and areas of occupation in Molina, stressing the cultural significance of food consumption patterns and their potential use for identifying ethnocultural identities.

On the other hand, the characterisation of the metallurgical production of both medieval social formations, the Islamic and the feudal, allow to detect origin, technology, distribution and differences between them, as well as documenting the alloying practices and technology developed in the craft area dedicated to the production of copper, iron and possibly glass objects near the synagogue area, where small fires, a basin and abundant slag were found in the Jewish area.

All of this finally means to present new analytical, spatial and socio-cultural results of a settlement whose archaeological record has much to contribute to our knowledge of social dynamics, their minorities and daily life in the Iberian medieval frontiers.

4 SINGING ARROWS –NON-NATIVE SOLDIER IDENTIFICATION INDICATOR ON THE EASTERN SHORE OF THE BALTIC SEA

Abstract author(s): Blaževicius, Povilas (National Museum of Lithuania)

Abstract format: Oral

Weapons and their parts are not rare artefacts in European urban archaeological monuments. Most often, however, these are individual parts or their fragments, less often complete articles – spears, axes, armour plates, etc. The largest number of finds consists of arrowheads fired in attack or lost in defence. These numerous finds attest to the great importance of firearms, and their abundance allows researchers to thoroughly analyse their typological developments, technological peculiarities, chronological and geographical distribution, etc.

This presentation is dedicated to a small and hitherto unexplored group of finds related to non-local archers in the Baltic Sea region. Arrow whistles, whistling arrowheads, archers' rings as well as specific bow arrowheads with widening blades in Lithuania are dated to the end of 13th – beginning of 16th cent. They were mainly found in a few most important centres of political and military power. The presentation aims not only to investigate specific features of these objects, but also to determine their origin. Given the non-indigenous nature of the artefacts and their peculiar features, they could be linked to the expansion of the Mongol Empire in 13th cent. and its influence on the Grand Duchy of Lithuania.

The material investigated helped identify non-local soldiers in castle crews and / or personal protection units of the Grand Dukes of Lithuania, which are also mentioned in written sources. In addition, it can be argued that the analysis of these artefacts also allows for the reconstruction and better understanding of intercultural exchanges of technology and knowledge.

5 A SPECIAL GROUP OF INHABITANTS: VILLAGERS AND THEIR DEAD WITHIN THE CASTLE WALLS

Abstract author(s): Nagy, Szabolcs (Eötvös Loránd University, Budapest)

Abstract format: Oral

Castles in general are not the regular sites for burials in the Middle Ages, except for elite tombs and shrines in the chapel. However, a few excavations unearthed medieval graves at castle courtyards and other unexpected places, deriving mostly from a period prior to the castle walls. Since written sources seldom mention the existence of a preceding church and cemetery at the site, the most important markers for the departed community are the graves and tomb stones themselves – but sometimes only the disarticulated bone fragments, along with a series of finds once interred with the dead. Archaeological investigations revealed a few examples where a constantly used Christian cemetery around the parish church of the village was incorporated by a private castle in the Late Middle Ages. These castles were frequently the fortified and significantly enlarged versions of former noble dwellings which originally stood as manor houses separately but close to the church. The integration of the graveyard into the general layout of a castle also required serious decisions on the mortal remains, that is, the dead relatives of the surviving village community near the castle. Moreover, the annexation of the parish church raised further questions as well. Were these incorporated churches and their cemeteries continuously used by the whole community or became privileged zones with restricted access? Archaeological evidence suggests that sometimes the community outside the castle could have pursued burial practice and perhaps also kept on visiting the church – especially if there are no signs of a substitutive church. This paper aims to analyse the ways of managing incorporated graves of departed with different social background and also deals with the presence of villagers inside the castle attending mass or visiting their dead. The discussion will be built upon a handful of cases mostly from medieval Hungary.

6 ROYAL PALACES (10TH/11TH CENT.) IN LOWER SAXONY - STUDIES ON ARCHITECTURE, INTERNAL STRUCTURE AND INTEGRATION INTO THE LANDSCAPE

Abstract author(s): Blaich, Markus C. (Lower Saxony, State Service for Heritage Management)

Abstract format: Oral

The starting point for this analysis of the royal palaces of the 10th/11th century in Lower Saxony and Saxony-Anhalt are the surviving royal sojourns. These were of varying duration and frequency, but must have occupied the resources on site. During these temporary stays, the royal household comprised – depending on the estimate – between 1000 and 2000 people. What evidence is there for the accommodation and provisioning of these people? And which persons were on site? Can we find indications of the size and tasks of this group?

According to the excavations in Pöhlde, the palace seems to have consisted of a larger ring wall complex and a building complex with a church several hundred metres away. A more recent analysis yielded further results on the architecture, but also on the possible total area of the complex.

A genetic analysis of the Königsdahlum settlement provides initial indications of the integration of the royal square into its immediate surroundings. The focus here is on the question of spatial organisation (villication system) and the demolition of the complex.

For Werla and Tilleda, the evaluation of the excavations provides new insights into the structure of the square, the architecture and its supply from the surrounding area. Considerations on the internal structure of the squares as well as archaeobotanical and archaeometallurgical investigations form the basis for a further environmental archaeological study.

7 WHO USES WHAT? ARTEFACTS AND CASTLE INHABITANTS

Abstract author(s): Krauskopf, Christof (Brandenburg Authorities for Heritage Management and Archaeological State Museum)

Abstract format: Oral

Archaeological excavations at castles usually reveal a multitude of different objects, from weapons to riding equipment and objects of noble leisure activities to kitchen utensils, tools and much more. However, the question of the social structure of the castle society is rarely asked. There are indications from account books, inventory lists and other written sources, but mostly only from the late Middle Ages. Members of the castle population outside the seigneurial family rarely appear in the sources.

In order to identify persons outside the lordly family and the usually easily comprehensible “military” personnel, the archaeological material is useful. It shows the most diverse activities and functions that existed in and around the castle. The question remains who used which objects – does the riding equipment show only the knights on horseback and their squires, or also servants? Did iron strap accessories belong only to servants and those made of other metals belong rather to the lord’s family? These questions already show that there will be no simple answers – not even for special finds such as tokens or jewellery.

To answer this question, it should first be determined which objects could have been used by which groups and where overlaps occur. A clear assignment to individual groups could be achieved through the spatial distribution of the finds, provided that room functions have been identified. For this analysis, however, we will deliberately not use “modern” castle excavations, where there are already individual measurements of finds for spatial analysis, but older excavations, where finds can at least be assigned to excavation sections or excavation areas. In this way, it should be possible to determine, in parallel, to what extent “old excavations” are suitable for straightforward analysis.

85 ISLAMIC ARCHAEOLOGY IN EUROPE AND BEYOND: WIDENING HORIZONS, BLURRING BOUNDARIES. PART 1

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Shingiray, Irina (University of Oxford) - Koval, Vladimir - Belyaev, Leonid (Institute of Archaeology, Russian Academy of Sciences, Moscow) - Govantes-Edwards, David (Newcastle University) - Carvajal Lopez, Jose (University of Leicester)

Format: Regular session

The main focus of the previous EAA sessions dedicated to the Islamic or Islamicate Archaeology in Europe was on the significance and the reassessment of Islamic pasts and their heritage in Europe. The major benefit of these meetings was the sharing of diverse experiences by archaeologists from different countries who work on a wide range of sites, locations, approaches to, and varieties of material culture pertaining to the Islamic past in Europe. At the same time, we have realized that keeping the scope within geographic Europe posed numerous limitations. The 2021 session seeks to widen the horizons and blur the boundaries of Islamic Archaeology in Europe by looking at the interconnections between past Islamic communities of Europe, and beyond, with other Muslim groups and centers, as well as with non-Muslim communities with whom they interacted, exchanged, and cohabited. We invite papers that examine local, regional, and trans-regional Islamic cultures and connections archaeologically by placing them into the context of the Islamic globalization process of the past. We aim for a diverse scope of approaches, methods, and case studies that explore such interconnections in the world of Islam among urban, rural, and nomadic groups, and demonstrate how local and distant cultures, currents, and materials became assembled (and reassembled), entangled, appropriated, acculturated, and transformed through the networks of the wider Islamic world in the past.

ABSTRACTS:

1 TOWARDS A THEORY OF ISLAMISATION: DIFFERENCE AND REPETITION OF THE ISLAMIC

Abstract author(s): Carvajal Lopez, Jose (University of Leicester)

Abstract format: Oral

Islamic archaeology has developed for almost a century with little theoretical discussion pertinent to the status of Islam as a globally connected network. One of the topics that is in need of consideration is Islamisation.

Islamisation has been rarely discussed by archaeologists. For some, Islamisation is the same as conversion, whereas others see it more as a social and cultural change. Some would distinguish between Islamisation (from ‘Islamic’) and Islamicisation (from ‘Islamicate’).

Underlying this confusion about the term there is a much deeper issue that has to do with the question of what Islam is and how the concept can be encompassed within the limits of archaeological enquiry.

In this presentation I will build on the work of Ahmed (2016) and on assemblage theory to achieve two things: first, a critique of current approaches to Islamisation, based mainly on two tenets: a sacred-profane duality as part of Islam; and the need of individual human identities, characteristic of Cartesian dualism. The second part of my presentation will focus on proposals on how to approach the problem of Islamisation without the two tenets above. Ahmed encourages to think of Islam as not bounded by the concept of religion, but rather as the meaning-producing medium that is continuously made by Islamic people and that continuously makes Islamic people, allowing for the creation of paradoxes and contradictions as part of its constitution. Assemblage theory gives us conceptual tools to escape the trap of dualist identity and to find Islamisation in the movement generated by the repetition of the Islamic (repetition that is called ‘reproduction’ under other theoretical perspectives). It is possible therefore to conceive Islamisation not as the transformation that has a beginning and an endpoint, but as the continuous generation of historical circumstances that allow conversion to Islam.

2 ARCHAEOLOGY OF THE MOZARABS ON THE UPPER FRONTIER OF AL-ANDALUS (8TH - 11TH CENTURIES)

Abstract author(s): Brufal, Jesús (University Autònoma of Barcelona)

Abstract format: Oral

The history of the Mozarabs is well known through a corpus of various Arab and Latin documents. These sources have led to detailed research, like that by Cyrille Aillet, into the Mozarab social structure and identity as a group. However, the historiography of the archaeology of the Mozarabs has been short and disconnected from the dynamics of university research. In fact, the most plausible archaeological evidence, the Christian necropolis, has been dealt with from the interpretative reading of Late Antiquity by researchers as prestigious as Iñaki Martín Viso. At the same time, this funerary evidence has been interpreted either as Christian necropolises in the post-conquest feudal historical context or, by an anachronistic historiography that defines these as evidence of Christian redoubts, alien to the Andalusian historical reality.

Either way, the archaeology of the Mozarabs has not been interpreted vigorously enough from the historical reality of al-Andalus. This paper proposal will present archaeological and historical data about Mozarab rural communities, integrated into the Andalusian institutional dynamic between the 8th and 11th centuries. Geographically, the focus is on the land north of the river Ebro, an area

that formed part of the Upper Frontier of al-Andalus, administered by the Andalusian districts of Lleida, Huesca and Tudela. The archaeological argument will focus on the study of the Christian necropolises of which we have obtained sufficient evidence to generate their own register. In practice, that means identifying the Christian funeral ritual with diverse variants, contextualising the individuals with C14, and placing the necropolises in space and time in order to understand the Andalusian configuration of the frontier territory where Christian and Muslim rural communities coexisted.

3 RURAL LANDSCAPE SOCIAL LANDSCAPE. THE PROCESS OF ISLAMIZATION IN THE IBERIAN PENINSULA CENTRE

Abstract author(s): Berrica, Silvia (Universidad de Alcalá)

Abstract format: Oral

Between the 8th and 9th centuries, the Iberian Peninsula experienced an important moment of transition. The arrival of the Arab and Berber populations of North Africa (711 AD) supposed a substantial change in all the peninsular territory.

The study focuses on the central Peninsular area. The Islamization of the rural areas of the Marca Media, as well as the other al-Andalus areas, shows the same material evidence since the first phase of the Arabs' arrival. Nevertheless, in the Marca Media different pottery appears due to the strong regionalization that characterizes this period. Another peculiar difference between the Marca Media is the presence of the Berbers, a North African population that was about to convert to Islam simultaneously to the conversion of the autochthonous population.

Thus, the eighth century highlights a process of gradual transition in society and culture. This transformation is manifested in archaeological study through materiality, architecture, and the profound modification of the landscape, up to a complete reorganization of the territory that begins at the end of the eighth century. It would manifest itself in the mid-ninth century when the strength of the Emirate State Independent showed itself through the urban planning of the peninsular centre.

Through the study of the materiality found in different rural areas of the peninsular centre, it will be demonstrated how the early medieval landscape is extremely dynamic, where through the diversification of the size of the towns, the constructive differences, the presence or absence of crafts activities, the presence of imports can show a hierarchy of the territory and the existence of an elite. Islamization affects the landscape, showing us the different developments that affected the social and cultural dynamics of this territory, during the 8th century.

4 DEFENCE AND SETTLEMENT ON RURAL AL-ANDALUS: THE CASTLE NETWORK OF LA ALPUJARRA (GRANADA AND ALMERÍA, SPAIN)

Abstract author(s): Rouco Collazo, Jorge (Universidad de Granada)

Abstract format: Oral

The aim of this paper is to present the results of my PhD research on the Andalusian rural fortresses of the Alpujarra. The Alpujarra is located in the Spanish provinces of Almería and Granada, being the southern slope of Sierra Nevada, the mountain range with the highest peaks of the Iberian Peninsula. This place has one of the broadest periods of Islamic population in Spain, since the 8th century to the 16th, including the huge Morisco uprising. For this reason, the Alpujarra is an area suitable for analyses from the longue durée.

The main objective of this PhD research was to gather new data about Andalusian rural life through the study of *ḥuṣūn* (rural fortresses), a classic topic of debate in al-Andalus archaeology. These fortifications were studied through Building Archaeology and Landscape Archaeology, along with new technologies of analysis, such as GIS, LiDAR or airborne photogrammetry.

These new perspectives were used to relate the fortresses with the settlement network and the irrigation systems, the productive base of these peasant groups. With the results of these analysis' techniques in the castle network and its landscape we can deepen in the still ongoing debate of how rural communities organized their defence and productive space and their relation with the succeeding Islamic states in this area.

5 BLURRING CULTURAL AND RELIGIOUS BOUNDARIES: A ZOOARCHAEOLOGICAL PERSPECTIVE FROM MEDIEVAL ISLAMIC COMMUNITIES OF GHARB AL-ANDALUS (SW IBERIAN PENINSULA)

Abstract author(s): Aleixo, Patrícia (Independent researcher)

Abstract format: Oral

Zooarchaeology has an important role to understand the human behaviour of the past and its interconnection with the surrounding environment, particularly through the relationship humans had with animals. This study aims to summarize the known zooarchaeological data of medieval Islamic sites of Gharb al-Andalus, the western region of al-Andalus, considering the taxonomic, taphonomic and biometric evidence. The main goal is to understand the relationship between medieval Islamic communities of this geographic area and animals in a sociocultural and economic perspective. In addition, faunal remains analysis can be contrasted with the historic sources to understand questions of cultural and religious identity of several communities, such as the Mozarabs (Iberian Christians who lived under Moorish rule in al-Andalus). The available data indicate a major consumption of domestic mammals, such as caprines and bovids, and also birds like chicken (*Gallus gallus*). In most of the sites wild species, such as cervids are often considered to be a complement, although they had an important role in some sites, especially in military settlements. The presence of swine and equid

remains, in several contexts, (specially with cutmarks) is certainly related with food production and consumption, despite pig (*Sus domesticus*), wild boar (*Sus scrofa*) and donkey (*Equus asinus*) are considered forbidden food (*Harām*) by the Quran. Horse (*Equus caballus*) is considered a disapproved food (*Makrūk*). The presence of fish and mollusk remains in some contexts indicates that aquatic species were also an important source of food, particularly for human communities living in river or coastal areas. This value is also seen in several al-Andalus food treatises.

6 TERRITORIALISATION AND COMMERCIAL INTEGRATION OF THE CITY IN AL-ANDALUS DURING THE 12TH CENTURY: DATA FROM THE ARRIXACA SUBURB (MURCIA, SPAIN)

Abstract author(s): Eiroa, Jorge (University of Murcia) - González, José (Professional Archaeologist) - Hernández, Alicia (University of Murcia) - Celma, Mireia (Professional Archaeologist) - Morales, Jacob (University of Las Palmas) - Velo, Almudena - Molina, Isabel (University of Murcia)

Abstract format: Oral

In the last two years, the University of Murcia has been developing an interdisciplinary research project in the archaeological site of San Esteban, a part of the main arrabal or suburb of the Islamic city of Murcia. This site exemplifies the spectacular growth that the medina, founded in the 9th century, experienced from the second half of the 11th century and, especially, throughout the 12th century.

The urban development of the city of Murcia, like that of other mudun of al-Andalus around the same time (e.g Valencia), can be linked to an intensification of the city's relations with its immediate surroundings and also to a greater insertion in the far-reaching commercial networks.

Both aspects are evident in the archaeological record and can be traced thanks to an interdisciplinary methodological approach. Anthracological and carpological studies show the use and consumption of plant species from the immediate environment, as well as other agricultural products from further afield. On the other hand, the ceramic and vitreous materials are not limited to local production and confirm the acquisition of products from distant geographical contexts. The archaeological data can be linked to information from other archaeological sites in the city of Murcia and its surroundings (Santa Clara palace, Castillejo de Monteagudo) and from Arab and late medieval Castilian written sources, which reveal the presence of foreign commercial minorities in the city at that time and confirm the city's insertion into the commercial networks of the western Mediterranean in the 12th century, whilst also confirming the integration of the medina's productive environments and the definitive 'territorialisation' of urban power.

7 MUSLIMS IN THE 'NATIONAL CRUSADE': MOSQUES AND CEMETERIES OF COLONIAL TROOPS DURING THE SPANISH CIVIL WAR (1936-1939)

Abstract author(s): Ayán, Xurxo (NOVA University of Lisbon)

Abstract format: Oral

The military success of the rebel army in the Spanish civil war was largely due to the contribution of the colonial troops that were nurtured by soldiers from the North of Morocco, Sidi-Ifni and Western Sahara. The 'Moors' (as they were known at the time) fought on the front line in the main battles of the conflict, hence the very high number of casualties in their ranks. During the war, the wounded recovered in cities and towns in the rear. Mosques were built in or near these hospitals for convalescent prayers and cemeteries where the remains of deceased combatants rest. These architectures were the evident proof of a paradox: on the one hand, Franco's propaganda saw in the secular struggle against the 'Moors' ('Reconquista') the origin of the unity of Spain and the Empire. But, on the other hand, these 'Moors' were one of the fundamental supports of the war effort of the rebels. After the conflict these materialities make up an uncomfortable past in which several issues converge. In the francoist regime, these soldiers were colonized and subordinate subjects, and, on the other hand, they had no place in the national Catholic ideology. In democracy the mosques and cemeteries that survived are seen as another material legacy of the victors of the war. They are vestiges of soldiers who also committed atrocities against the civilian population during the civil war.

In this communication we intend to vindicate an archaeology of this contemporary Islamic architecture and address two questions: what factors help to explain the destruction and / or conservation of these remains since the war? And what to do with this heritage from the civil war, what is the role of local communities and administrations in the recent processes of patrimonialization of this recent Islamic past in Spain?

8 BURIAL IN THE ISLAMIC RITE IN SICILY, 9TH-13TH CENTURIES

Abstract author(s): Carver, Martin - Wales, Nathan - Alexander, Michelle (University of York)

Abstract format: Oral

Early medieval cemeteries in Sicily are being studied as part of the ERC project Sicily in Transition: the archaeology of Regime Change. This presentation will focus on burials in the Islamic rite, their form and social, anthropological and biomolecular context. Burials in the Islamic rite begin as expected in the 9th century, consistent with the documented arrival of Muslims in Mazara in 827 and in Palermo in 831. The eleven Islamic cemeteries that have been studied and sampled are presented in four phases. The first Islamic burials in Palermo north of the harbour (9th century), are followed by burials south of the harbour (9-10th century) and then cemeteries associated with Classical period monuments on hilltops and in one case by a former Roman villa (10-12th century). In the final

phase we have sites where both Christians and Muslims were buried in adjacent cemeteries overlapping in time (12-13th century). It will be seen that the Islamic rite does not cease with Islamic governance in the 11th century. The sites can be seen to have adopted a particular 'mortuary language' which makes reference to local Byzantine as well as Islamic practice in the east. Comparative examples are drawn from Spain, the Levant, the Maghreb and east Africa.

Source: ERC Adv. G 693600; publication forthcoming as SICTRANSIT Monograph 3 Remembering the Dead in Early Medieval Sicily at All'Insegna del Giglio, Firenze in 2022.

Authors BioArCh, University of York, except Galassi and Varotto who are based at FAPAB (Forensic Anthropology, Paleopathology and Bioarchaeology Research Centre) at Avola, Sicily and at Flinders University, Australia.

9 FROM VICUS TO MADINA TO CIVITAS: THE BIOGRAPHY OF THE CITY OF MAZARA IN SICILY THROUGH ITS WASTE

Abstract author(s): Molinari, Alessandra (University of Rome Tor Vergata)

Abstract format: Oral

Within the ERC SicTransit project (directed by MOH Carver and me) it was possible to study in a new way a large quantities of finds (ceramics, glass, seeds, fruits, woods, animal bones) and features (wells, cesspits and silos) emerged in previous emergency excavations. The results were surprising and allowed us to understand how a minor settlement in western Sicily became an important Islamic city, in which hygienic rules and food practices adapted to the new religion and culture. For example, a regular system of latrines was established, the prohibition of the consumption of pork was respected, new plants and new sets of ceramics and glass were introduced. After the Norman conquest, significant changes and continuities can be seen in various fields of daily life. For example, plants introduced in the Islamic period continued to be used and eaten, but pork began to be consumed at the same time; a different management of the economy can then be glimpsed from various indicators. Finally, in the fifteenth century everything seems to change in the management of daily practices and agricultural resources.

10 FĀS AL-ĀDĪD. FOUNDATION AND EVOLUTION OF AN ISLAMIC MEDIEVAL CITY IN AL-MAGHRIB

Abstract author(s): Almela, Iñigo (Alexander von Humboldt foundation)

Abstract format: Oral

According to written sources, in 1276 sultan Abū Yūsuf Ya'qūb (1259-1286) founded next to Fes, a city he called al-Madīna al-Bayḍā' (the White City), also known since then as New Fes (Fās al-Ādīd). This ruler was not the founder of the dynasty, but he was the one who consolidated it, hence he undertook the construction of a government city destined to serve as command head for the entire sultanate and symbol of the new dynasty. Fes El Jdid comprises all basic elements of an Islamic city (congregational mosque, government house and main commercial street), as well as walls and residential areas. However, it corresponds to the type of isolated palatine city intended for housing the court and is divided into several sectors (inhabited medina, palatine area, assembly and meeting area, market, jewry and private orchards).

Despite the loss of many historical structures, Fās al-Ādīd has survived largely as an inhabited neighbourhood, whereas the former organization has survived with alterations. Several architectural elements and substructures still remain and reflect the evolution of the city over the course of centuries and the sequence of historical periods. The foundational layout underwent an enlargement during Marinid period and it was later refurbished by Saadian and Alaouite sultans who tried to adapt the city to new administrative roles, defensive features, social organization, and economic circumstances.

11 ISLAM IN SOUTH-EASTERN AFRICA: MATERIAL ENTANGLEMENTS ALONG THE MOZAMBIKAN COASTLINE

Abstract author(s): Moffett, Abigail (University of East Anglia) - Simbine, Celso (University of Cape Town)

Abstract format: Oral

The east African coastline was connected via traders, objects and ideas to Islamic communities in the broader Indian Ocean rim from the later first millennium CE. While the development of Muslim Swahili communities along the coastal regions of modern-day Tanzania and Kenya has received a significant amount of scholarly attention, less is known about the nature of entanglements, religious, material and otherwise, further south, along the Mozambican coastline of south eastern Africa. In this paper we expand on research undertaken along the Mozambican coastline, drawing on earlier studies as well as ongoing fieldwork on Mozambique Island, to explore evidence of connections between this region and the wider Islamic world. In particular, we discuss the assemblage, and reassemblage, of ideas and materials; from imported objects such as glass beads, cotton cloth and foreign made ceramics, to architectural styles, writing traditions and non-material evidence related to the Muslim world within the regional context.

12 BUILD ON DIVERSITY: STATES AND COMMUNITIES IN MEDIEVAL SOMALILAND

Abstract author(s): de Torres Rodríguez, Jorge (Incipit - Institute of Heritage Sciences)

Abstract format: Oral

Between the 11th and the 16th centuries AD, the south-eastern half of the Horn of Africa was home to a number of Muslim states which extended their authority over very diverse geographical and ethnic regions, providing stability for trade and challenging the

powerful Christian kingdom of Abyssinia to the north. During this period, Islam played a key role in two historical dynamics in the region: as a shared space where communities with very different lifestyles could meet and collaborate; and as a binding force used by the increasingly controlling Muslim states which ruled the region.

This paper will present an overview of these two parallel and often overlapping phenomena, taking the region of Somaliland as a case study. On one hand, it will analyse the archaeological evidence of Islam in the groups that inhabited the region (nomads, urban dwellers, foreign merchants) and the importance of this materiality in creating a symbolic but stable frame where key activities such as international trade could be conducted. On the other hand, it will analyse the role of Islam as a political force used by local rulers to generate more cohesive –and controlled– state structures in the region.

Finally, the paper will discuss how this second strategy eventually led to the emergence of a more aggressive interpretation of Islam, which developed into a full scale confrontation with the Christian Abyssinian kingdom. That confrontation, which involved world powers such as Portugal and the Ottoman Empire, ended in the defeat and collapse of the Muslim states and the dismantling of the network of urban settlements and the diversity that characterized the medieval period in Somaliland.

A. ISLAMIC ARCHITECTURE OF KAZAN OF THE KHANATE PERIOD

Abstract author(s): Sitdikov, Ayrat (Kazan Federal University)

Abstract format: Poster

Khazan's stone buildings from the Khanate period (15th-16th centuries) exhibit many characteristic elements of an Islamic city. They include mosques, the Khan's palace, mausoleum, madrasah, and bathhouse, some of which are mentioned in written sources. Recent archeological research contributed much new data about the architecture.

Most stone buildings are concentrated in the fortified citadel. In the northern part the remains of a white-stone basement (18x24 m) in the Khan's Palace were found. The Khan's Mausoleums were excavated to the west of the Church of the Presentation of the Virgin Mary and the Syuyumbike Tower. East of the Mausoleum, the remains of the Khan's Mosque (14x23 m) were discovered.

Excavations near the Annunciation Cathedral revealed an ensemble of stone buildings, mosques and madrasahs, interpreted as the Kul-Sharif Mosque of 1500-1525. Another religious structure west of the Annunciation Cathedral corresponds to the mosque described in the Cadaster of 1565-1568.

Written sources mention architectural structures outside the Kazan fortifications: Otuchev's Mosque in the Kuraish village and Dair's Bath somewhere on the bank of the Bulak River—exact location is unknown. Dramatic construction activity in Kazan at the beginning of the 16th c. is reflected in written sources. Thus, in 1509 Crimean Khan Mengli Giray appealed to Vasily III to return Master Yakub, who had been sent by him to build in Kazan. In 1504, an Italian Architect, Aloisio Lamberti, completed the Khan's Palace in Bakhchisarai and arrived in Moscow following Vasilii III's request. These facts show close contacts in architecture between the three states.

The poor preservation of excavated monuments does not allow a reconstruction of their architectural design. Only external decorative elements found in the excavations (mosaic kashin inserts, gerihs, decoratively carved stones) provide the possibility to imagine the former exteriors of the Kazan Khanate Period buildings to some extent.

B. DEDICATORY INSCRIPTIONS OF MOSCOW STATE OF THE 16TH AND 17TH CENTURIES IN THE CONTEXT OF ISLAMIC ARCHITECTURE AND CALLIGRAPHY

Abstract author(s): Baranova, Svetlana (RSUH)

Abstract format: Poster

The epigraphy of the period of the Moscow Tsardom has been studied rather well. It includes inscriptions made by church wardens of the largest church establishments that placed such inscriptions on facades of buildings. There are inscriptions carved in stone among those inscriptions. They are executed as the text composed of the several lines. Another type of inscription is represented by the inscriptions composed of one line of the glazed tiles. A decorative font is common for all inscriptions performed in vyaz' where letters are interconnected and form pictorial puzzles of a kind. Such inscriptions were distributed in the second half of the 17th century when the pottery industry developed. Among the most known examples of ceramic inscriptions are inscriptions from the New Jerusalem monastery near Moscow. It has been correctly assumed that the vyaz' emerged under the influence of Arabian and Persian calligraphy. However there at least two more indications that point to the same suppositions. All inscriptions are performed in the same style: a dark blue background over which the inscription is executed in yellow ('golden') or white ('silver') letters. Inscriptions made on the facades of Muslim buildings (and not only inscriptions) are made exactly in that manner. They usually have blue glazing as the background. It is unlikely that this happened by chance: rather it was the result of the interaction of cultural traditions.

86 ISLAMIC ARCHAEOLOGY IN EUROPE AND BEYOND: WIDENING HORIZONS, BLURRING BOUNDARIES. PART 2

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Shingiray, Irina (University of Oxford) - Koval, Vladimir - Belyaev, Leonid (Institute of Archaeology, Russian Academy of Sciences, Moscow) - Govantes-Edwards, David (Newcastle University) - Carvajal Lopez, Jose (University of Leicester)

Format: Regular session

The main focus of the previous EAA sessions dedicated to the Islamic or Islamicate Archaeology in Europe was on the significance and the reassessment of Islamic pasts and their heritage in Europe. The major benefit of these meetings was the sharing of diverse experiences by archaeologists from different countries who work on a wide range of sites, locations, approaches to, and varieties of material culture pertaining to the Islamic past in Europe. At the same time, we have realized that keeping the scope within geographic Europe posed numerous limitations. The 2021 session seeks to widen the horizons and blur the boundaries of Islamic Archaeology in Europe by looking at the interconnections between past Islamic communities of Europe, and beyond, with other Muslim groups and centers, as well as with non-Muslim communities with whom they interacted, exchanged, and cohabitated. We invite papers that examine local, regional, and trans-regional Islamic cultures and connections archaeologically by placing them into the context of the Islamic globalization process of the past. We aim for a diverse scope of approaches, methods, and case studies that explore such interconnections in the world of Islam among urban, rural, and nomadic groups, and demonstrate how local and distant cultures, currents, and materials became assembled (and reassembled), entangled, appropriated, acculturated, and transformed through the networks of the wider Islamic world in the past.

ABSTRACTS:

1 NOMADIC BURIALS, WAVES OF SOVEREIGNTY, AND ISLAM IN THE MEDIEVAL NORTH CASPIAN WORLD (LATE 9TH-14TH CENTURY)

Abstract author(s): Shingiray, Irina (University of Oxford) - Panteleev, Sergei (Institute of Archaeology, Acad. of Sciences of Rep. Tatarstan, Kazan)

Abstract format: Oral

From the end of the 9th century, the emergence of the Islamic burial rite (janaza) in the North Caspian Steppe becomes manifest through archaeological evidence derived from nomadic interments in the region. This evidence corroborates information found in 10th-century medieval Islamic sources (such as those by Ibn Fadlan, al-Masudi, al-Muqadassi, etc.) which stress the central role of Muslims in the Lower Volga region. They were involved not only in trans-Caspian and transcontinental trade, but also in local administration, as well as the military and diplomatic affairs of the region that operated under the Khazar imperial sovereignty until the end of the 10th century. After the fall of the Khazar Empire, this region was dominated by nomadic groups of Qipchaqs from the end of the 11th century until the Mongol conquest of the 13th century. Some Qipchaq graves also demonstrate clear traits of the Islamic burial rite, even though the Islamization of the Qipchaqs is poorly understood. In the 13th century, the Mongol conquest brought a new wave of nomads (as well as settlers) into this region, adding to the social and religious complexity of the Caspian Steppe. This process resulted in rapid urbanization, as well as increased Islamization of the nomadic people, who represented the military elite in Ulus Jochi (or the western wing of the Mongol Empire). In this paper, we present a sample of burial evidence from medieval Islamic graves in that region and examine how the political change of the nomadic sovereignty affected Islamic burial rites and practices among the Caspian nomads.

2 NISHAPUR WITHIN THE EAST-WEST EXCHANGE NETWORKS OF THE ISLAMIC WORLD

Abstract author(s): Lorzadeh, Zahra (Independent Researcher) - Laleh, Haeedeh (University of Tehran, Department of Archaeology)

Abstract format: Oral

Nishapur as a metropole of the Eastern Islamic world and one of the main urban centers- and the largest one- in Khurasan, had a broad domain expanded over a vast geographical area whose heartland and hinterland together constituted what can be called the extensive Nishapur. Throughout its apogee from 9th to 12th century CE, Nishapur was a major actor within the multi-continental East-West exchange networks.

Geographically Nishapur can be considered inland to the Iranian plateau, since it lies on the south/southeast of Kopet Dagh and Balkhan mountains that separate the rest of Khurasan from the inner Iranian plateau. Thus, it was through Nishapur that the other parts of Khurasan were connected to the heart of Iran and far to the West. Nishapur was not only an important economic center through the transregional trade of its materials and products, but also a dynamic intellectual and artistic one with global reach in the socio-cultural and political sphere of the Islamic world. The vital interchange of ideas and currents of thought gave Nishapur a special status in East-West interrelations.

3 THE ABBASID NORTH ATLANTIC

Abstract author(s): Ó Ríagáin, Russell (Independent Scholar)

Abstract format: Oral

This paper will seek to reframe our understanding of the early medieval North Atlantic by exploring the impact that the Abbasid Revolution, its aftermath and the processes leading up to it had on the economics and politics of the North Atlantic. The paper will begin with a discussion of the apparent decline of the Atlantic Arc trade network indicated by the presence of Frankish and Mediterranean pottery in archaeological contexts in Ireland and western Britain up until the mid-eighth century was related to either the Umayyad expansion into Iberia, and the subsequent confinement of their power base to the western Mediterranean. However, the principal focus will be on ways in which the series of colonial encounters known as the Viking Age was in part an outcome of Central Asia politics, not least due to the flows of silver, slaves and luxury goods between Western and Central Asia and Northern Europe, and from there to the Atlantic. As first theorised by Klavs Randsborg in 1980 and Alex Woolf in 2007, interruptions in silver production brought about by political crises may have resulted in knock-on effects in the Baltic region, and beyond in the North Sea and North Atlantic. The paper will use the appearance and disappearance of dirhams or darāhim in archaeological contexts in Ireland, Britain and Norway, cross-referenced with the political dynamic in these regions known from other sources to explore the level of global interconnectedness. It will also examine whether or not cycles of raiding in the North Atlantic indicated by material culture and textual evidence correspond to crises in the Abbasid and Tang Empires, and theorise as to whether the decline in these empires corresponded to a major shift in Scandinavia's relationship with the North Atlantic.

4 MUSLIMS IN MEDIEVAL RUSSIA: ELUSIVE TRACES

Abstract author(s): Koval, Vladimir (Institute of Archaeology RAS)

Abstract format: Oral

The Eastern Slavs, who created the state of Rus and adopted Christianity in 988, had contact with Muslims throughout their history. These contacts began as early as the 8th century, when Islam first penetrated the steppes of Eastern Europe, into the territory of the Khazar Kaganate. At this time, Muslim merchants began to travel along the Volga River to buy furs from Slavic and Finnish-speaking tribes. In 921 Islam was officially adopted by the Volga Bulgars, with whom the Russian princes fought and traded. In the 1320s Islam was adopted by the khan of the Mongolian state "Golden Horde", in whose subordination Russia was from 1237 to the end of the 15th century. All this time, Muslims constantly lived on the Slavic territory, and then on the lands of the state of Rus. These people are mentioned in the Russian annals. However, until now, no burials of foreigners, performed according to the Muslim rite, have been found in these territories.

The problem is that Muslims do not have specific attributes of inorganic materials that would help establish their former presence (like Christian crosses). Various items with Arabic script (textiles, jewelry, weapons, etc.) were trade goods and do not mark the presence of Muslims. Christians (up to church hierarchs) used such things also.

One of the possible markers of the presence of Muslims in Russia can be copper and ceramic kumgans (or aftofa) - special jugs with tubular plums that are used by Muslims for ablution before performing namaz. Two such vessels from the 14th century were found in Moscow, one in Novgorod. Finding other evidence of the presence of Muslims in Christian lands is a challenge for future research.

5 ISLAMIC IMPORTS FROM THE EXCAVATIONS OF PERESLAVL (PEREYASLAVL) - ZALESSKY, RUSSIA

Abstract author(s): Zeyfer, Vladimir (Institute of Archaeology Russian Academy of Sciences)

Abstract format: Oral

The first finds of eastern glazed utensils in Pereslavl-Zalesky were discovered in 2012. In 2013, three vast sites in the south-eastern part of the Kremlin were excavated. In the borders of one medieval estate, 357 fragments of kashi pottery produced in the Golden Horde Volga region, China, Iran, Crimea and Syria, dating from the middle to the second half of the 14th century, were found. Four fragments of 14th-century embossed pottery made in Khoresm were also discovered.

We found more than 70 fragments of seven different Syrian and Egyptian vessels of 13th and 14th centuries and 27 fragments of a yellow glass painted Syrian vessel with colored enamel and gold of the mid-13th - the first half of the 14th century. From 2014 to 2017, some fragments of glazed utensils of eastern origin also were discovered. In general, the collection of Islamic ceramics found on the territory of the Pereslavl Kremlin and its historical suburbs has more than 350 fragments. All of them belong to household container utensils. Of the other categories of kashi pottery, one bead and one piece of button with turquoise-like glaze have been found. Analysis of ceramic fragments allowed us to distinguish more than fifty vessels with different decoration techniques.

Thus, the presence within the same estate of high-status items, which are not at that time products of traditional trade, suggests a possible explanation. It likely indicates the probable location of the Golden Horde Mission (embassy) in the excavated area.

6 THE CHEMICAL COMPOSITION OF ISLAMIC GLASS IN THE CITIES OF VOLGA BULGARIA IN THE 10-14TH CENTURIES

Abstract author(s): Valiulina, Svetlana (Kazan Federal University) - Govantes-Edwards, Devid - Duckworth, Chloe (School of History, Classics and Archaeology - Newcastle University) - Koval, Vladimir (Institute of Archeology RAS, Moscow)

Abstract format: Oral

The report is devoted to a comparative analysis of the chemical composition of glass of Bilyar, Suvar and Bolgar, the three main cities of the Volga Bulgaria, - a Muslim state that existed in the 10-14th centuries on the Middle Volga. The analytical sample also includes materials from the workshops of an alchemist, glassmaker and jeweler of the late 12th - early 13th centuries in Bilyar and the products from the glass-jewelry workshop in Bolgar of the first half of the 14th century.

51 samples of glassware, window glass and jewelry were analyzed by EMPA, which confirmed and supplemented the earlier results. In terms of chemical composition, as well as morphology and technology, the glass of local production in the Volga Bulgaria and the main import was Islamic glass. A comparative analysis of the glass from the pre-Mongol cities of Suvar and Bilyar, materials of the central market from the Golden Horde and the Bolgar glass-making workshop of the 14th century made it possible to reveal the technological features of products of two chronological periods. The chemical composition of glass turned out to be one of the indicators of the general paradigm of the development of the Volga Bulgaria culture that changed after the Mongol conquest. In pre-Mongol times, the glass was mainly imported to the Middle Volga from the Middle East, primarily from Iran; local glassmaking in Bilyar appeared within the framework of the Middle Eastern craft tradition. During the period of the Golden Horde, there were vessels and lamps with golden and enamel decoration from Syria and Egypt in the cities of the Volga region, products of workshops in Central Asia. The production of glass beads and rings in Bolgar was established according to the Central Asian technology and style, probably with the participation of Central Asian masters.

7 BETWEEN WEST AND EAST: FORTIFICATION OF THE NORTH BLACK SEA AREA IN XIV-XV CENT.

Abstract author(s): Biliaieva, Svitlana (Institute of Archaeology of National Academy of sciences of Ukraine)

Abstract format: Oral

From the end of the XIV to the beginning of the XV century, due to the expansion of the Grand Duchy of Lithuania, a fortification line with many fortresses was constructed in the North Black Sea region. During the same period, a complex of fortresses in the Moldavian Principality was also erected in order to defend its lands, trade routes, and ports. For instance, the powerful fortress of Chetate Albe (Bilgorod) had a plan of the Constantinople type with a stone construction and a citadel modelled on a European castle. The same structural plan was also used in fortresses of the Grand Duchy of Lithuania in Lithuanian lands, Belarus, and in the fortification line of the Black Sea shore in the Ukraine. The Tyagin fortress was the most eastern of these fortifications. Its structural plan was also close to that of Constantinople: its stone walls contained counterforts and its upper part had a square donjon. The corners of the fortress were flanked by round towers. And the walls were covered with plaster, similar to many fortresses of Poland, Lithuania, and Belarus. One of the towers' outer corner was decorated with a Seljuk-style stone carving, analogies of which can be found in the XIV-XV-century monuments in Crimea, Turkey, and other regions of Islamic culture. The floor of the fortress tower was covered by wood boards; and, in that floor context, the end part of a cannon barrel was found—which so far is the first and the earliest finding of an artillery weapon in the eastern part of the North Black Sea shore. The possible dating of this tower to the first part of the XV century is suggested by the finds of Tatar and Polish coins in it: one of these coins was issued by the King of Poland Wladislav Warnenchik.

8 ISLAMIC ELEMENTS IN MOSCOW GRAVESTONES OF THE 16TH AND 17TH CENTURIES

Abstract author(s): Belyaev, Leonid (Institute of Archaeology Russian Academy of Sciences)

Abstract format: Oral

In the second half of the 14th century, the city of Moscow developed its tradition of gravestone ornamentation. Those gravestones had no inscriptions and were made by a technique that was used in everyday wood carving. At the end of the 15th century gravestones acquired their first inscriptions. Since the 16th century inscriptions became a commonplace and quite promptly developed into a decorative system which was called *vyaz'*, meaning a compound weave of letters. The first gravestones with recessed bottom appeared at the same time. Floral ornamentation supplemented those two elements.

Vyaz' became widespread but those methods of decoration were used rarely. Examples of the use of these methods are concentrated in the period 1630s-1670s. A unique example from the 17th century is known, namely the elaborate compositions for the czars' gravestones in Archangel'skiy cathedral of the Moscow Kremlin. The general interrelation of Russian *vyaz'* and epigraphy and the art of calligraphy of Islamic Orient were noticed by many researchers, who, however did not provide direct evidence for this.

Russian craftsmen could have become acquainted with the art of Islamic calligraphy in the 16th century specifically via masters from Bulgar and Kazan' where the first examples of Islamic ornamentation in the decoration of purely Russian gravestones have been found.

The second source for borrowing from the Islamic tradition is Kasimov, the capital of a tributary Tatar principality on the Oka river. These examples illustrate how the development of art depended on political contacts. At the same time, Islamic carving remains an episode of arts and crafts that was not continued in the 18th century.

9 CERAMIC PRODUCTION AND CONSUMPTION IN CYPRUS DURING THE OTTOMAN PERIOD: LOCAL TRADITIONS IN THE MEDITERRANEAN EXCHANGE NETWORK

Abstract author(s): Živkovic, Jelena (The Cyprus Institute)

Abstract format: Oral

The Ottoman conquest of Cyprus in 1571 brought the socio-economic, demographic and administrative changes to the island. The integration of Cyprus into the Ottoman network in the Eastern Mediterranean and the Middle East influenced means of production, trade and land ownership. However, an impact of the Ottoman conquest on material culture of the island remains largely unknown. This paper aims to explore patterns of common pottery production and consumption in Cyprus during the Ottoman period (1571-1878), focusing on the long-term development of production technology.

This is the first systematic study of the Ottoman-period archaeological ceramics in Cyprus and includes wares excavated at several sites located in Nicosia, Ayia Napa and Larnaca. Around 4,000 ceramic vessels were classified and quantified, allowing the well-contextual examination of consumption patterns during the Ottoman period. For the study of production technology and provenance, selected wares were subjected to petrographic and chemical analyses of ceramic bodies, slips and glazes. The results of macroscopic and microscopic analyses enabled a close examination of the local Cypriot traditions of pottery making as well as networks of exchange in the Eastern Mediterranean between the 16th and 19th centuries.

10 PAST REMAINING SPACES, CONTEMPORARY SOCIAL BEHAVIOR: THE CONTINUITY OF SOCIAL BEHAVIOR ACCORDING TO LATE ISLAMIC ARCHAEOLOGICAL EVIDENCE IN YAZD, IRAN

Abstract author(s): Azizi, Hamid (Archaeology, University of Tehran)

Abstract format: Oral

Cultural and social phenomena in our society have deep roots in the past. In other words, at least in part, the social behavior of current societies has its roots in their past, institutionalized in the subconscious memory of the citizens for hundreds or thousands of years. The cognition of social behavior of past societies and their structures could lead to a deeper and better understanding of contemporary social behavior. One of the most important ways in reconstructing social behavior of people in the past is the study of architectural and urban spaces. In fact, the most important issue here is the continuity of some social behaviors over a long period of time with emphasis on Islamic principles. Considering Iranian cities with historical heritage, the historical texture of the city of Yazd is well preserved. The reconstruction of the social structure of Yazd (emphasizing social communication) according to the remaining spaces from the past, and its possible continuity in contemporary society will be discussed in this paper. It seems that compact neighborhood, and some public spaces such as neighborhood mosques – in shaping of which, climate and economy have also played a role besides Islamic law – could have increased social interaction among neighborhood residents. Increasing the level of social communication, can not only increase the cohesion and solidarity between the residents, but also lead to the creation of a kind of informal social control in the neighborhood. However, some other architectural spaces and the archaeological evidence left by them, indicate the emergence of a different type of social behavior among residents. Some principles of Islamic religion like privacy, executed in private spaces, led to a kind of private life's spread, wholly hidden from the public eye, causing the pretention and dual character, which is still observable in the contemporary society.

11 THE FATE OF THE CHURCHES IN THE OTTOMAN HUNGARY

Abstract author(s): Mordovin, Maxim (Eötvös Loránd University)

Abstract format: Oral

The time of the Ottoman wars in Hungary had a rather heavy impact on all religious buildings in the country. Since before the Ottoman invasion, the population of Hungary was predominantly Christian, the buildings affected by the conflict were churches, chapels and monasteries. Their fate then depended on the circumstances that followed the conquest. The most fortunate case from the point of view of their survival was the rapid occupation of the site by the Muslim military. In this case, the invaders converted almost all of the churches into mosques keeping the main structures and destroying only the decoration and the movables. Much worse was when these buildings stuck in the border zone with the declining number of the local population, which used to maintain them, and with the increasing number of military clashes involving the structure itself. The latter inevitably led to a radical and complete transformation of the building and its closest environment. There were several possible stages of such alterations, from a simple enlargement and adoption of the surviving parts for the new military purposes, up to the almost complete demolition of the medieval structure, reusing only its foundations. In my paper, I present three case studies for each of these transformations. The first is a Franciscan friary in Szécsény, where the building complex became the seat of the local bey. The second case is the former Pauline friary of Gombaszög, transformed into a fortification in the mid 16th century. While the last is a simple, rural parish church at Somogysámson, wholly incorporated in an earth-and-timber fortification.

ISLAMIC EFFECTS IN CHRISTIAN COMMUNITIES IN EUROPE AND THE BALKANS

Abstract author(s): Zear, Asem - Shipoli, Elza (Pázmány Péter Catholic University)

Abstract format: Oral

Throughout its history, Islam has affected the other civilizations, when it expanded to different parts of the world starting in the 7th century. The purpose of this paper is to give an overview of how Islam influenced the culture, politics, economics, and trade growth in Europe and the Balkans area during the medieval period.

The regions considered in this paper include Bosnia, Kosovo, Albania, Spain, Sicily and Malta. Islamic influences reached Europe not just in terms of religion but by a variety of other methods with considerable success.

In this paper, I would like to discuss the newly-emerged Muslim communities in Spain (starting from the 8th century) and their connections with the Christian communities that retained their original religion after Spain accepted the new religion of Islam.

Secondly, I will describe the medieval Islamic naval fleet and its ability to reach the southern coastal regions of Europe like Sicily, the south of Italy and Malta. As a result of these invasions, Muslims were able to share their culture, religion and traditions with the local communities. This is reflected in the present language and the architecture in Malta for example.

Thirdly, in the 14th-15th centuries, the Ottoman Empire brought new Islamic influences into the Balkans—specifically, politics, religion, ideas, and also wars. As a consequence, they all had a profound impact on the Islamic world, reshaping Islamic architecture, including tombs and mosques, and its culture in general.

THE MATERIAL CULTURE OF ATTACHMENT: SOCIAL BONDS, CHILDHOOD AND EMOTIONALLY IMPORTANT OBJECTS

Theme: 6. Material culture studies and societies

Organisers: Lipkin, Sanna (University of Oulu) - Bell, Taryn (University of York) - Väre, Tiina (University of Oulu)

Format: Regular session

Humans are intensely social creatures, capable of forming strong emotional attachments to others throughout life. These bonds emerge during childhood between children and their caregivers, who ideally provide the child with a sense of security, which serves as the foundation of the child's wellbeing and ability to thrive in other relationships in later life. Yet attachment is not exclusively interpersonal, but can also include material culture. Thus, as archaeologists, there is clearly scope to study these attachment bonds using archaeological approaches to material culture.

This session will discuss and theorize the archaeological evidence for attachment bonds, with a focus on both childhood and material culture. How can material culture or osteological evidence provide insights into these bonds or the lack of them? How do difficulties and trauma during childhood affect not only the lives of children but adults as well? What archaeological evidence exists for traumatic experiences to be inherited from one generation to the other? These may be evident through examining the evolution of child-mother bonds during breastfeeding, studying generational and intergenerational effects of conflicts, identifying signs of caregiving in osteological materials, or looking at funerary material through the lenses of attachment and resilience.

Similarly, while attachment is often studied in relation to childhood, this session also welcomes papers which explore the impact of attachment in adolescence and adulthood. Why do certain objects and places become so emotionally significant to us? What long-term impacts do these attachments have on our lives and our relationships with others? How can we, as archaeologists, look for traces of attachment in the archaeological record?

While the expression of attachment may be culturally bound, the theme is intercultural. We are interested in both theoretical approaches and research on and around the topic with wide cultural and temporal scope.

ABSTRACTS:

1 ARCHAEOLOGIES OF ATTACHMENT: UNDERSTANDING SOCIO-EMOTIONAL LIFE IN THE PAST

Abstract author(s): Bell, Taryn (University of York)

Abstract format: Oral

The notion that humans form socio-emotional bonds with other people is an underlying assumption of much archaeological work on social life in the past. Yet we have been slower to recognise the emotional role of nonhumans. From our relationships with objects, animals, religious beliefs and important places, we can gain intense, palpable feelings of security, which impact our cognition and social behaviour, and which provide a wealth of benefits to our mental and physical health and wellbeing too.

In this paper, I discuss how the psychological theory of attachment may provide useful insights into a variety of interpersonal and nonhuman socio-emotional relationships, helping us to understand why and how humans form attachment bonds. I will also discuss the significant, yet understudied, role played by so-called 'compensatory' attachment figures such as companion animals and cherished possessions.

Attachment theory provides a simple, yet useful, framework with which to think about bonds in the past, and so allows us to broaden our conception of who - and what - plays an important role in our social and emotional lives. This has broader relevance in the modern

world (particularly in the wake of the coronavirus pandemic) for how we think about concepts such as emotional resilience, material relationships and the significance of our social lives. Humans are, at heart, intensely social creatures, and thinking about the nature of our social lives and the role of attachment provides exciting insights into life in the past.

2 PHENOMENOLOGICAL APPROACHES TO PREHISTORIC ATTACHMENTS. THE EVIDENCE FROM PREHISTORIC, COMPLETE, ANIMAL BURIALS OF THE EASTERN CARPATHIAN BASIN

Abstract author(s): Daróczy, Tibor (Aarhus University, Department of Archaeology & Heritage Studies)

Abstract format: Oral

One of the most meaningful, but at the same time also neglected aspects of past manifestations are human bonds, which are at the crux of all activities and relations, both in terms of human to human but also human to nature connections. Phenomenology provides possible explanations that take interpretations a step further from traditional material typologies of human bones and of anthropogenic material culture, while also providing us with a method of thinking that would allow the exploration of these faded, emic nuances. Graves are expressions of intense attachments of individuals of past societies, but also serve as beacons in times of emotionally and socially charged events. A way to approach the intensity and importance of these social connections is to look at a category of burials, which normally would be regarded as liminal or in essence, purely gastronomic, but due to the special care given to the disposal of the lifeless corpse, such an interpretation becomes naïve. These are the complete, animal burials, which are either encountered in graves of their possible human companions, in a burial ground but in separate graves or in a single standing burial ground. A phenomenological approach to the research of the funerary landscapes of the prehistoric Eastern Carpathian Basin revealed precisely such a group of burials, which, albeit non-human, indicate intense attachments between what we would call owners and their pets, attachments that were honoured and respected by the living. While the documented species change through the millennia, the strong bond is unaltered and can serve to provide further nuance as to the material culture of attachments in non-literary times.

3 MEN'S BEST FRIEND: NOTES ON ATTACHMENT BASED APPROACHES TO DOG BURIALS IN LATE NEOLITHIC SOUTHWEST IBERIA

Abstract author(s): Castanheira, Patricia (Universidade de Lisboa)

Abstract format: Oral

In recent years, dogs represent an important focus of attachment studies, both as subjects (Payne et al., 2015) and as figures of attachment (Rockett and Carr, 2014). But what about prehistoric dogs? Focusing on attachment in adulthood, specifically on attachment-based approaches to grief (Shear et al., 2007), we will try to perceive social bonds through the materiality of late Neolithic dog interments in southwestern Iberia.

Since the dawn of their domestication, with similar care to that recorded in human burials (and by care we do not mean a careful handling, rather the postmortem treatment they've both been subjected to), dogs appear to be more common than deviant in the funerary record of late 4th/3rd millennia BCE. The aim of this paper will thus be to compare dog and human burials, using an attachment-based line of inquiry: a) were these dogs figures of attachment? b) could the objects associated to them be representative of a bond of sorts? c) can we infer attachment bonds, object-relating and object-use (following Winnicott, 1969) from dog burials?

Focusing on three case-studies from the Alentejo hinterland, namely Horta da Morgadinha 2, Corça 1 and Alto de Brinches 3 (all in Serpa, Portugal), we will try to rehearse an interpretative exercise sustained mainly on archaeoethnological readings. The main objective will be to explore the possible scope of attachment-based approaches to the interpretation of human-animal bonds in Late Neolithic Iberia.

4 CARING, COMPASSION AND CLEMENCY – A CASE OF FICTIVE KINSHIP

Abstract author(s): Tuovinen, Saara (University of Oulu)

Abstract format: Oral

A family bond is one of the strongest formed and known in human societies. It is often seen as an essential and ideal unit for child rearing, socialization and survival in general. The traditional family in the Western Christian world contains a wife, a husband and their offspring. This is a model that has been idolized as the most traditional family model but is now crumbling down due to new ideas, divorces and marriage becoming less and less common. However, this situation is not new, since many families in the past also had different kinds of relationships among them. Mostly because of the deaths of parents, spouses, children or siblings, but also because some social ties formed by caring, compassion and clemency were even more complicated forming fictive kinship. This presentation is a case study of a non-traditional family and household of Clementeoff's from the early half of the 19th century Finland. With archaeological material and historical records, we can unfold a case of a foster family that was not typical for its own time.

5 FRAGILE AND RESILIENT: MOTHER-INFANT BONDS IN 18TH TO 19TH-CENTURY FINLAND

Abstract author(s): Lipkin, Sanna (University of Oulu)

Abstract format: Oral

The emotional bond between the primary caregiver and the child serves as a foundation for an individual's wellbeing both during childhood and later life. The evolution of these bonds may be a fragile process and is largely dependent on the caregiver's actions and mental wellbeing. Historically the primary caregiver has usually been the mother of a child. An avoidant and distancing mentality is usually inherited from a mother to her child and has long historical roots between generations. This paper will look into the roots of indifference and rejection that mothers have directed towards their children. Neglect may be due to both personal and social traumatic events, such as wars or famines, as well as every day repetitive trauma. A combination of historical sources and archaeological evidence provide a base for discussing mother-infant bonds both from theoretical and factual perspectives. In this presentation cultural perceptions towards and practices related to high infant mortality, stillborn infants, infant and child death as well as burial and commemoration will be discussed based on the 18th to 19th-century evidence from Finland. To examine the generational effect, this information will be examined through the experiences and practices of those who survived childhood and became parents themselves.

6 DETACHED MOTHERS?

Abstract author(s): Väre, Tiina (Archeology, University of Oulu)

Abstract format: Oral

Breastfeeding is held in high regard as the foundation of lifelong somatic but also psychological wellbeing. It profoundly effects the formation of attachment between the infant and the primary caregiver. Much like the current official recommendations, in the past, full breastfeeding was typically encouraged. Yet, it is known to have been avoided out of vanity as well as necessity. The breastfeeding practices during the 18th and 19th centuries in certain areas of present-day Finland and the related massive infant mortality raised concerns. However, instead of worries over the wellbeing of children, the motivation behind statements made over the matter at the time was the dissatisfactory rate of population growth. The stable isotope studies of dentin collected from archaeological remains dating to the period may bring clarity to the problem of whether the mothers indeed neglected childcare. In addition, these results allow further considerations on the topic of investment in parenthood and caretaking in the populations concerned. They can function as a base for conversation on how children were perceived as members of the family and society at large in different geographic areas during different periods. Full breastfeeding happens at the expense of maternal energy balance and fertility. Therefore, in many traditional societies lacking effective contraceptives, typical weaning ages reflect the reproductive and parenting strategies at the population level.

94 DECISION-MAKING IN ARCHAEOLOGICAL HERITAGE MANAGEMENT: MOVING FORWARD

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Verschuur, Marjolein (Cultural Heritage Agency of the Netherlands) - Kreiter, Eszter (Castle Headquarters Ltd.)

Format: Regular session

In March 2018 the Europae Archaeologiae Consilium (EAC) published its Making Choices report on decision-making in archaeological heritage management. This was a result of a survey that sought to understand the way in which decision-making in archaeological heritage management was undertaken in the context of the Valletta and FaroConventions. The survey made clear that four major themes needed to be explored further:

- Guidance on assessing and articulating significance
- Developing national research frameworks
- Making the case for development-led archaeology - public benefit of archaeology
- Managing archives – guidance on selection in archaeological archiving and the digital archiving

Since then the EAC has established working groups that aim to give guidance on these topics. In this EAA session the results of the working groups will be presented. We will also present the outcomes of the EAC annual meetings discussions on Covid-19 and archaeological heritage management. Furthermore we invite speakers to present their own research regarding these themes. Aim of the session is to share the results of the working groups, but also to share experiences and good examples on any of the themes.

ABSTRACTS:

1 ARCHAEOLOGY AND PUBLIC BENEFITS: MAKING THE CASE

Abstract author(s): Sloane, Barney (HE - Historic England; European Archaeological Council)

Abstract format: Oral

The 1954 European Cultural Heritage Convention (the 'Paris Convention') the 1969 European Convention on the Protection of the Archaeological Heritage (the 'London Convention') and the 1992 Valletta Convention have incrementally connected the fostering of unity in the European community with the appropriate management of archaeology in the context of land development and state

planning procedures. As a result 'Development-led' archaeology, whether state-sponsored or privately funded, is now a fundamental feature of the practice of archaeology across Europe. Expenditure across the whole of Europe has never been accurately calculated but it will almost certainly have exceeded €1Bn in 2018.

Representing archaeological heritage management of 33 member states, EAC recognises that collectively we have been poor at providing the evidence of the range of tangible public benefits (economic and social) arising from this very significant sum. This is an important consideration in the light of recurring and occasionally very significant state pressures to relaxing planning laws or to constrain public spending. This paper will provide a short summary of the work EAC is doing to ensure that state decision-makers, land developers, archaeologists – and of course the public – can be clear about the tangible benefits of this large investment; and to equip them with the evidence for advocating its continued support in policy and practice.

2 INTERACTING WITH THE PUBLIC TO MAXIMISE BENEFIT FROM ARCHAEOLOGY: NEW APPROACHES ON DEVELOPMENT-LED WORK

Abstract author(s): Watson, Sadie (MOLA)

Abstract format: Oral

We have spent the last few years discussing the need to increasing the public benefit of our work as archaeologists, with a renewed focus on our positive impacts for society. The Europae Archaeologiae Consilium (EAC) are partners on a 4 year research project intended to provide useful and relevant ways of measuring and evaluating our public benefit. Sadie will outline this project, its progress so far and aims for the future. She will also present initial results from a large public survey launched in 2021 to assess the level of interest in development-led archaeology and how we can better target our efforts from a social justice and well-being perspective. Arguably, the best determinants of public benefit are the publics themselves, as they are aware of their strengths, as well as the outcomes they desire from any work happening in their area. The research project adopts a social justice paradigm, seeking to promote greater access to, and decision-making power in, developer-led archaeology, particularly for those who have traditionally been excluded members of society.

3 SELECTING ARCHAEOLOGICAL ARCHIVES – AN OLD TOPIC STILL TO BE DEALT WITH

Abstract author(s): Novak, David (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic) - Oniszczyk, Agnieszka (National Heritage Board of Poland)

Abstract format: Oral

Archaeologists deal with choices every step of their professional way: from defining what an archaeological site is, through the choice between the in situ preservation and intrusive fieldwork and selection of research methodologies, up to compiling archives for permanent storage. Whatever these choices are, they should be explicit and conscious. They should result from a clearly formulated selection and retention strategy. Selecting for archaeological archives has been much discussed in recent years, mainly due to the pressure on storage space at archive repositories that has arisen from increasing archaeological activity. It is important that archaeologists are not drawn into debates on finances, where they may have little influence, but instead establish an archaeological approach to alleviate this problem. We should, first, overcome certain prejudices towards selection of archaeological archives, because the term often seems to be identified with throwing away archaeological artefacts. Discarding finds is not obligatory but it is obligatory to consider selection in every archaeological project. After all, it is not only about finds and samples but also the documentary archive in traditional and digital form. Clear formulation of strategies, explaining what is going to be kept in perpetuity and why, will allow archaeologists, curators and heritage managers to justify archaeology – related expenditures to developers, authorities and the wider public. Transparent, explicit and well-founded argumentation for preserving certain elements of archaeological heritage for the future will contribute to strengthening archaeology as a science and translating the value of archaeological heritage to non-archaeologists.

4 MAKING CHOICES: DEVELOPING GUIDANCE ON NATIONAL RESEARCH FRAMEWORKS

Abstract author(s): van der Jagt, Inge (Cultural Heritage Agency of the Netherlands) - Miles, Daniel (Historic England)

Abstract format: Oral

This presentation will highlight the work undertaken so far to provide a suite of guidance to support those people who are considering developing national research frameworks. The results of the EAC Making Choices survey showed that only a few national research frameworks existed across Europe, but the need for information, guidance and support on how to develop one was flagged up as a priority. The working group was set up and has been working collaboratively to create a number of resources and supporting materials. These resources include:

- Reviews of current frameworks – to show the different types, format, content, scope and ownership that exist. This will help showcase the broad nature that the frameworks can take and that can support different needs and situations.
- Setting out the strategic value of research frameworks – why have one, who they are for, what can they be used for?
- Case studies of European countries that are interested in developing a research framework to highlight their individual situations and their requirements
- Web-based practical guidance on the process of creating a framework.

5 SCARED OF MAKING CHOICES? DEFINING ARCHAEOLOGICAL HERITAGE BETWEEN POLICY AND PRAXIS IN ITALY

Abstract author(s): Benetti, Francesca (Historic Environment Forum)

Abstract format: Oral

Archaeological heritage is usually deemed important for the nation and it is considered to have public interest. On these premises, European countries developed specific legislation about it, even though in different time frames. However, the notion of archaeological heritage is not so easy to be defined legally. This presentation deals with the legal definition of archaeological heritage in the evolution of Italian legislation, compared with the development of the archaeological discipline. It will demonstrate that the legal notion of archaeological heritage in Italy is still blurry and open to different interpretations. For example, 20th-century archaeological heritage (such as WWI heritage) is not always treated as "archaeological", not only in practice but also in legislation. This blurry definition was probably born to leave room for the state to designate sites according to the current advances of the disciplines. However, it can also denote a fear of "making choices". This has also significant consequences in assessing public benefit and significance. This presentation aims to foster a discussion with the other participants in order to compare the different definitions of archaeological heritage in Europe.

6 STAKEHOLDER MANAGEMENT IN THE FLEMISH ARCHAEOLOGICAL SECTOR

Abstract author(s): Bornauw, Freija (KU Leuven; VUB) - Hermans, Rosalie (VUB Maritime Cultures Research Institute - MARI) - Dooms, Michael (VUB department of Business - BUSI, Unit Management and Strategy)

Abstract format: Oral

Over the last two decades, archaeological practices have transformed dramatically. From 1992 onwards, the Valetta Treaty led to a major increase in development-led archaeology in Europe. Several scholars have since then expressed their concerns and critiques regarding the national practices that have resulted from the Valetta Treaty. Past critiques have addressed problems with knowledge enhancements, deficits in quality management and a lack of public outreach.

Many past contributions briefly mention the stakeholders who are involved in archaeological practice, but only few have thoroughly focused on these stakeholders. Such stakeholders include archaeologists, government employees, developers and the general audience. The aim of this research was to better understand these stakeholders and their relationships, both internal and external, as well as their (perceived) power and interest.

In Flanders, too, archaeological excavations are paid for by developers. There is a commercial framework in which the government determines both criteria for 'archaeological obligation' and quality standards. For this study, respondents were questioned from four stakeholder groups in Flanders, more specifically the government (both the Flemish Heritage Agency and local players), academics (from three different Flemish universities), commercial archaeologists (both umbrella organizations and small businesses) and developers.

Following the theoretical stakeholder framework of Ackermann & Eden, the power and interest of each stakeholder group was mapped in relation to other stakeholder groups. Several novel conflicts could be identified regarding these interrelationships, such as the altering role of governmental players and the lack of transparent communication between several actors. We are convinced that a better understanding of these relationships and conflicts of power and interest is a condition for improving development-led archaeological practices not only in Flanders, but on a European level.

7 TO DIG OR NOT TO DIG? TO PRESERVE OR NOT TO PRESERVE? CONTEMPORARY DILEMMAS OF ARCHAEOLOGICAL HERITAGE MANAGEMENT IN ROMANIA

Abstract author(s): Bors, Corina Ioana - Damian, Paul (National History Museum of Romania - MNIR)

Abstract format: Oral

Although member of the European Union, since more than a decade Romania's is no longer active in the framework of the Europae Archaeologiae Consilium (EAC), despite the fact that such a participation is more than obviously needed. Only if to think that there are still gaps in the way the Valletta Convention was implemented in the specific Romanian legislation concerning the protection of the archaeological heritage, but also the fact that no public debate about the necessity for ratifying of the Faro Convention was ever initiated by the relevant public authorities. Or considering that throughout the last 15 years the government agenda includes a specific aim for the Code of the Heritage. But constant delays and adjournments occurred in setting a much more appropriate framework for the archaeological heritage, while the general development rhythm of the country in various perspectives determines a much more applied and conscious approach regarding this sensitive issue, as well as adequate strategies for it. The authors of the paper will present the results of their research on a series of specific aspects, such as determining and understanding the significance of the archaeological heritage in the framework of development-led archaeology, the use of historic archives in documenting the presence of archaeological vestiges or the public benefits of development-led archaeology etc.

8 FROM ARCHAEOLOGICAL EXCAVATIONS TO PERMANENT EXHIBITION SPACE: THE THIRD LIFE OF THE NEBELIVKA TEMPLE

Abstract author(s): Videiko, Mykhailo (Kyiv Borys Grinchenko University) - Motorzhyna, Mariia (Department of Culture and tourism of Kirovograd Domain State Administration)

Abstract format: Oral

The Nebelivka temple (20 by 60 meters size) was the largest public building in the Cucuteni-Trypillia Culture 6000 years ago. Its study was part of a British-Ukrainian archaeological project in 2012-2014. The project was presented at the EAA meeting in Istanbul in 2014. Now is the time to prove by his example the possibility of public benefit from archaeological research. The current project envisages a re-exposition of a permanent exhibition space to present achievements of archeological investigations. The ancient cult building will be recreated graphically and reflected with authentic elements of architecture and decoration. Material remains will demonstrate the purpose and role of the building in the religious and social life of ancient society. The new exposition will reflect the geographical coordinates of cross-border cultural routes between Ukraine, Romania and Moldova which have at their territory more than 4300 sites of Trypillia-Cucuteni Culture. The realized goal of the project will allow to rethink the social role of cultural heritage and will open its economic potential for community development and formation of a creative environment around archeological objects.

The uniqueness of the project lies in the reproduction of architectural monuments, namely - a cult building that existed 6,000 years ago. Given the creation around the tourist network, later, the creation and implementation of a virtual tour of the object, as the next stage of development. In the future, this approach will open access for people with disabilities to see the unique world of ancient history, without leaving home to see and feel the grandeur of ancient times. The main goal of the project is to adapt and reproduce archeological finds, using IT technologies, scientific information about the archeological object from the Copper Age.

95 ARTS IN WORK: ABOUT THE INTERACTION OF SOUNDSCAPES AND TASKSCAPES IN ANTIQUITY

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Garcia-Ventura, Agnes (Universitat Autònoma de Barcelona) - Bellia, Angela (Institute of Heritage Science at the Italian National Research Council) - Ferrer Martin, Meritxell (Universitat Pompeu Fabra) - López-Bertran, Mireia (Universitat de València)

Format: Regular session

Working and music/sounds are two topics of research that have been almost unexplored together so far in studies of material culture, especially due their ephemeral nature. On the one hand, when dealing with music, working environments are not usually considered. On the other hand, when dealing with work and production the focus is often on administrative and economic aspects, as well on the so-called chaîne opératoire, but not on soundscapes. In this session we aim to fill this gap discussing several aspects of the interaction between working and music/sounds through a fresh look of material culture that shed light on the potentialities of objects and architectures as creators of a wide array of sounds that participated in the creation of taskscapes in working environments. Notice that we use indiscriminately and intentionally music and sounds as synonyms as we also aim at discussing the definition of their boundaries. In doing so, we aim to include in the debates on soundscapes issues as diverse as work songs, traditionally considered "music", but also the crackle of fire or the pounding of mortars, to name two examples, traditionally considered "sounds" (or even "noise"). How do we define these conceptual borders in working environments? Why? Are they useful for our analysis or they hide more than what they show?

To discuss all these issues we encourage contributions by scholars dealing with any period and geography as well as various perspectives: history of religion, archaeomusicology, archaeoacoustics, sound archaeology, ecoarchaeology, classics, anthropology, and art history. Interdisciplinary and multidisciplinary research will be welcome, especially research on archeoacoustics based on contemporary analysis like Soundshed Analysis GISTool among others.

ABSTRACTS:

1 INTRODUCTION: THE MATERIALITY OF SOUNDSCAPES AND TASKSCAPES

Abstract author(s): López-Bertran, Mireia (Universitat de Valencia) - Bellia, Angela (Institute of Heritage Science at the Italian National Research Council) - Ferrer, Meritxell (Universitat Pompeu Fabra, Barcelona) - Garcia-Ventura, Agnès (Universitat Autònoma de Barcelona)

Abstract format: Oral

The study of soundscapes and taskscapes are two topics of research that have a rather short history in the archaeological debates of the last thirty years. However, the results are multiple and varied. On the one hand, we follow T. Ingold's (1993) definition of taskscapes as a socially constructed space of human activity which is always in process, and recognizes that all tasks are interlocking. We find this term useful as allows a comprehensive approach of working environments. On the other hand, the study of sound archaeology and soundscapes points out the importance to consider the complete acoustic ecology of any site in order to recover the significance of this trait in the human activities for a wide array of reasons (subsistence, ritual, working and so on). In this Introduction

we want to highlight the relation between the two concepts and show the potentialities of their connection in order to analyse social aspects of the past societies such as the gender constructions when singing during work activities, the role of gossiping in working environments as mechanisms of social control and the exploration of ritual and daily soundscapes alike to recreate a more vivid idea of the aural environment. We are certainly aware that in order to succeed, it is necessary to use different methodologies like the analysis of the lyrics of worksongs, organological and archaeoacoustical studies, spatial analysis, phenomenological perspectives as well as the application of GIS technology to model soundscapes in order to know how people heard their wider working surroundings.

2 WORK AND SOUND ENVIRONMENTS IN ETHNO-MUSICARCHEOLOGICAL PERSPECTIVES

Abstract author(s): Stomberg Lund, Cajsa (Linnaeus university)

Abstract format: Oral

This paper will deal with work situations and their sound environments in music-archaeological perspectives, which also include ethnomusicological and historical aspects. A small selection of contextual studies of ancient working and sounds will be discussed. They are presented in the form of snapshots. The studies are based primarily on archaeological finds of various musical instruments and sound tools in sea as well as on land, such as boatswain's call, drum, bell, buzz disk, buzz bone, hazelnut whistle, bone flute and fiddle. These were found in different places in Europe, such as the Nordic and Mediterranean countries, respectively, and are dating from different times, for example the Mesolithic, the Middle Ages and the 17th century. Ethno-musicarchaeological methods, problems and approaches concerning ancient soundscapes and sound environments will be in focus. A basic question will be the music-archaeological concept of music: what is music, what is not any longer music, what is not music!

3 WOMEN'S WORK IN THE 'WEAVING HOUSE': SOUNDSCAPE AND TASKSCAPE IN THE SANCTUARIES OF SOUTHERN ITALY (VIII C. B.C.)

Abstract author(s): Bellia, Angela (Institute of Heritage Science - National Research Council of Italy)

Abstract format: Oral

Current studies on sound experiences and musical practices pay insufficient attention to the role of sound and music within the sphere of work in the sacred context. Whenever scholars do turn to sound and music in sacred sphere, they generally focus on certain types of music and/or choral performances. What they have particularly overlooked are spaces in sanctuaries and sacred structures dedicated to work where sound events and music activities were performed. These activities as well as their relation to working practices and religious experiences, have been given little thought. In addition, insufficient attention has been paid to the role of musicians and dancers at festivals, processions and rituals related to relevant ancient working activities.

This paper aims to address these lacunae by bringing together considerations on woman's work in the sanctuaries in Southern Italy, where weaving activities related to female divinities took place. It will be addressed the following questions: a) What archaeological evidence of music and dance performances linked to weaving activities at sanctuaries exists? b) Which "cultic soundmark" was distinctive to the cults' locale, where women worked? c) Who were the music and dance performers at festivals related to weaving activities? Which instruments were played in these ceremonies? d) What was the sonic experience like in these sacred and work spaces?

Thanks to the analysis of a case-study in the Oenotrian-Achaean regions in Southern Italy (VIII c. B.C.), it will be explored how sound-scape might have enhanced the relationship between working environment and social interactions.

4 THE SOUND OF ¿SILENCE? MUSIC AN OTHER SOUNDS IN THE RITUAL AND FUNERARY WORSHIPS

Abstract author(s): Niveau-de-Villedary, Ana María - López-Sánchez, Natalia (University of Cadiz)

Abstract format: Oral

In this communication we focus on two specific contexts from the Phoenician-Punic funerary and ritual landscape of Gadir (Cádiz, Spain): the Phoenician cremation necropolis dated in the 6th century BC, and the so-called Punic ritual wells used in the 3rd century BC. Is it possible to talk about "soundscapes" in these contexts where the emotional and experiential component is very present?

Although these two contexts have been traditionally considered as silent spaces, where prevailed the absence of sound, in this study we suggest that this was not completely true. In both cases different sounds adapted to the different sensory and emotional experiences of the participants interact with silence. The soundscape is product of both, the sensu stricto ceremonial activities, as well as the different ancillary tasks carried out during the "ritual operative chain".

Regarding the cemetery, the sound of cutting wood, stacking the firewood, clearing the bushes of the area or, the crackle of the fire of the funeral pyre would have been mingled with the distinctive silence of the funeral environments. In these examples, the prayers of the officiants and the weeping of the relatives would have also participated in the funerary soundscape. In the case of the ritual wells, it is possible to discriminate those activities -and their sounds- performed inside these structures from those executed outside them. Besides, the former ones would be modulated by the special acoustics of these underground structures -echoes and reverberations that could be added to the low sounds of the aerophones. Moving to the sounds from outside, they would have been dominated by the laments, the noise of the sacrificed animals or the bustle of the feasting. In short, studying these two contexts from this perspective presents a new space to be explored, felt... and to be listened to.

5 SOUNDSCAPES OF ANCIENT KUSH: EXPLORING CULT-RELATED, ARTISANAL AND PASTORAL SOUNDS AT MUSAWWARAT ES-SUFRA (SUDAN)

Abstract author(s): Kleinitz, Cornelia (German Archaeological Institute - DAI, Commission for Archaeology of Non-European Cultures - KAAK)

Abstract format: Oral

Current research on the multi-sensory experience of cult at the major Kushite sacral site of Musawwarat es-Sufra (Sudan) includes a study of its ancient soundscape. This concerns, for example, acoustic properties of the circular valley of Musawwarat, which may have influenced the location of temples and other buildings, as well as investigations of the built structures themselves, which acted as foci for the various cult performances. Activities related to cult will have taken place at various scale on a day-to-day basis and on exceptional occasions with greatly varying sound effects and volumes. Constructing, maintaining and supplying the cult-related infrastructure at Musawwarat necessitated a number of specialised working environments in the valley of Musawwarat, such as quarries, work areas, workshops or kitchens, with their respective sounds. While these aspects of the Musawwarat taskscape are quite easy to define and study on the basis of the archaeological record, others are less tangible. This includes pastoral activities, which are more difficult to pinpoint archaeologically. The appearance of cattle motifs in temple reliefs, where they appear in relation to what appear to be local cult activities, or the rich record of pictorial graffiti on temple walls, suggest that pastoralism played a significant role at the site and/or its vicinity. This paper presents an initial investigation of the soundscape of Musawwarat by focusing on cult-related, artisanal and pastoral working environments of the past as well as taking the soundscape of the valley of Musawwarat of today as a guide to better understanding less tangible multi-sensory aspects of taskscapes of the ancient past.

6 MUSIC AND WORK IN ANCIENT EGYPT

Abstract author(s): Köpp-Junk, Heidi (University of Trier; Egyptian Archaeology at the Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences Warsaw)

Abstract format: Oral

In ancient Egypt, the fact that certain works in pharaonic time were accompanied with music is known on the basis of different representations. For example, clapsticks were used for wine pressing and flutes for grain harvesting in the Old Kingdom (about 2500 BC). The earliest of these scenes of musical accompaniment of work date to Dynasty 4 (ca. 2600 BC) and is the most unique one: It shows the female musician Meri on a boat with seven rowers and two other people at the helm. This is the only scene throughout Egyptian history showing work accompanied by music performed by a woman and the only one depicting the musical support of the rowing process. The lecture discusses the reasons for that in the context and background of the other work scenes in which music occurs.

But also songs should support the expiration of work procedures like e.g. the carrying of a sedan chair with the sedan chair song. In addition, shepherds' songs, Nile boatmen's songs, fishermen's songs and craftsmen's songs have been handed down. The texts of these work songs consist of accompanying texts to the corresponding scenes. The question arises to what extent the address as "song" is actually justified. Is it possible to determine whether the texts were sung or shouted? Are the texts to be understood as vocalizations at all, or rather as explanatory or illustrative asides to work scenes? Why are only scenes showing male workers accompanied by those "songs"?

These topics have not been in focus in previous research as intended in this lecture. The period under study extends from the Old Kingdom to the New Kingdom (2600-1070 BC).

7 SOUNDSCAPES AND TASKCAPES IN GRINDING PRACTICES: A CASE STUDY OF THE ANCIENT NEAR EAST

Abstract author(s): Garcia-Ventura, Agnes (Universitat Autònoma de Barcelona) - López-Bertran, Mireia (Universitat de València)

Abstract format: Oral

Work songs are privileged sources to discuss several aspects of the interaction between working and music/sounds. So far, they have been studied mainly in two geographical and chronological contexts: contemporary United States of America on the one hand, and in the Aegean, dealing in this case with ancient Greek sources and with 20th century CE evidence. However neither work songs nor the interaction between soundscapes and taskscapes have been considered as themes for research in ancient Near Eastern studies.

It is our intention to cover this gap by analysing a case study of the second half of the third millennium BCE in ancient Mesopotamia. More specifically, we will consider the task of grinding grain through the "The song of the Millstone", a composition where a miller woman urges the millstone to work fast and to keep on moving so that she can finish her work. The analysis of the lyrics will allow us to focus on the interaction between soundscapes and taskscapes highlighting the materiality of this task. In addition, we will do it from a gender perspective as grinding grain was a task mainly carried out by women in the Ancient Near East not only in domestic contexts, but also in institutionalized spheres, as recorded by administrative texts and archaeological materials alike.

8 ANCIENT GREEK WORK MUSIC, SONGS AND DANCES

Abstract author(s): Liveri, Angeliki (Greek Ministry of Education and Religious Affairs)

Abstract format: Oral

This article presents literary sources and images of people in Ancient Greece, who worked listening to music (performed by a musician), singing and/or dancing, if their activity allowed dance movements. This human behavior is already mentioned by Homer. It is also confirmed by representations in various artistic works, such as vase-paintings and figurines. Domestic, agricultural or other work activities could be made more enjoyable with the accompaniment of music and songs, either individually or collectively. The music sounds were mixed with work sounds/or noise produced a particular soundscape in the available space. This paper will examine music, dances and work songs during female and male activities, such as e.g. preparing food and bread (grinding cereal grains, sifting flour, kneading and making bread), wool processing, creating threads and then weaving on the loom, and water transfer to vessels from a spring, viticulture, pressing grapes, grazing and guarding herds. We aim to classify the musical entertainment in work according to the activity and the gender. Therefore, it would be possible combining both written sources and archaeological evidence to reconstruct the Ancient Greek customs during work and to understand better the interaction of the aforementioned soundscapes and taskscapes.

9 MAYA SOUNDSCAPES. SOUNDS DURING THE CONSTRUCTION OF THE TEMPLE OF THE GREAT JAGUAR OF TIKAL

Abstract author(s): Vidal Lorenzo, Cristina (Universitat de València. Departamento de Historia del Arte) - Muñoz Cosme, Gaspar (Universitat Politècnica de València. Centro de Investigación Pegaso)

Abstract format: Oral

Maya artistic expressions have several iconographic elements that represent concepts related to hearing, sight and smell. Through their contemplation ancient Maya could invoke these senses, and at the same time convert these artworks, imbued with living qualities and soul, into active agents during the celebration of their religious ceremonies. The most important ones were performed in the public arenas of the big urban centers, and were conducted by the rulers and priests at the top of the pyramid temples. One of the most emblematic is the Temple of the Great Jaguar, built in the city of Tikal as the funerary temple of King Jasaw Chan K'awil. To recreate these events of the past, which were attended by hundreds of people and where colors, music and aromas played an important role, is an exciting topic that has been investigated in depth by the so-called "archaeology of the senses" in recent decades. But, how to recreate the sounds that were heard during the construction of this temple that was built by a large number of workers? We are aware that it is not easy to recreate them with total certainty, but as a result of our field experience during the research and restoration of this building, which we carried out between 1993 and 1996, we will attempt in this contribution to describe in detail these sounds that accompanied us every day in this working environment in the middle of the tropical forest. Sounds like those of the howler monkeys at dawn and those of the myriad of birds and other animals at dusk, or the sounds produced by the work tools, the murmur of the workers, the crackling of the fire blended with the smell of the corn tortillas at lunchtime, or the sounds of the intense rainfall during the wet season.

10 SURROUND SOUND: SONIC ECOLOGY, COMMUNITY IDENTITY AND CERAMIC PRODUCTION IN BRONZE AGE CRETE

Abstract author(s): Day, Jo (University College Dublin) - Minos, Chase (Knossos Research Centre, British School at Athens)

Abstract format: Oral

Bronze Age Crete is renowned for the abundance and variety of ceramics recovered over the century since 'Minoan' civilisation was first discovered. This material has been subject to a wide variety of analyses, ranging from stylistic to archaeometric to experimental. Our understanding of the actual manufacture of this pottery on the island in the third-second millennia BC also has increased as excavations and studies reveal workshops, kilns, and other production-related materials. Drawing on our research into the experimental reproduction of Minoan pottery and the study of a third millennium BC kiln and its associated features excavated at Priniatikos Pyrgos in eastern Crete, we present here the first study of soundscapes relating to ceramic production in the Aegean Bronze Age. While recognising that 'sound' is culturally constructed, consideration of diachronic and regional contrasts in ceramic production allows us to explore and embed the sonic ecology of craft activity within the shifting social relations on Crete. We investigate differing regional ceramic traditions, comparing that of the south coast around Phaistos with the northern Mirabello area, as well as the change from hand-made pottery to the use of rotative devices and the intensification of ceramic production in relation to the rise of palaces. Changes within and between each of these unique soundscapes are considered as key developments that had implications for the diverse 'communities of sense' that inhabited the island during the Bronze Age.

11 FEMININE TASKSCAPES AS ARENAS OF SOCIAL CONTROL: A VIEW FROM THE MEDITERRANEAN IRON AGE

Abstract author(s): Ferrer-Martín, Meritxell (Universitat Pompeu Fabra)

Abstract format: Oral

Some Greek and Phoenician literary and iconographic references, as well as archaeological evidences, allude to certain tasks specifically carried out by women that not always belong to the same household group. These tasks -such as water collection, grain milling, textile weaving or food baking- are usually presented as monotonous actions undertaken in a reiterative sounding atmosphere: the roaring of the water, the pouring of the mills or the clinking of the loom weights. In the hegemonic narratives, these tasks are traditionally belittled because of their subsistence nature and their strong relationship with the feminine sphere, being usually considered as irrelevant actions, without any importance in the social and political dynamics of the community.

Conversely to these interpretations, the main aim of this paper is to visualize the importance of these feminine taskscapes in relation to the economic, social and political dynamics of the household groups to which their main agents belong to, and by extension to their communities. To do this, on one hand, I will present the importance of these activities for the survival and the wellbeing of the household. On the other, I will present these taskscapes as social arenas which actively participate in the political and social configuration of the community through the informal transference of private information among different households, the reaffirmation of social norms and even the creation of some resistance practices.

97 REDRAWING LINES IN THE SAND: NEW ARCHAEOLOGICAL APPROACHES TO ADDRESSING CLIMATE IMPACTS [CCH]

Theme: 2. Pandemics and climate change: responses to global challenges

Organisers: Martens, Vibeke (NIKU - Norwegian Institute for Cultural Heritage Research) - Ayers-Rigsby, Sara (Florida Public Archaeology Network, Florida Atlantic University Anthropology Department) - Graham, Elinor (Department of Archaeology, School of Geosciences, University of Aberdeen)

Format: Regular session

The pandemic and the global response has brought modern society's resilience and capacity to change into sharp focus and forced us to confront our ability to respond effectively – or not – to such global crises. Modern climate change poses an even greater and more fundamental challenge. It is already affecting our society with far ranging impacts. These can be mild, such as people having to alter commutes due to heavy rains, or severe, such as entire communities forced to move permanently or at least evacuate temporarily. Climate change is radically altering cultural heritage as well. Impacts to historic properties and archaeological sites are destroying legacies of communities across the globe, and these impacts will worsen as temperatures and sea levels rise.

This session aims to reflect on how archaeology as a sector can adapt to these challenges and contribute to a wider societal response. It will examine how archaeologists can adjust our approaches and embrace innovative techniques to help us more effectively respond to increasingly urgent climate driven threats. This session will invite papers which consider issues such as prioritisation in the face of unstoppable loss, how to ensure representation of a diversity of voices in assessing the significance of heritage, and the development of pro-active approaches to address the threat of loss.

ABSTRACTS:

1 INTRODUCTION TO REDRAWING LINES IN THE SAND: NEW ARCHAEOLOGICAL APPROACHES TO ADDRESSING CLIMATE IMPACTS

Abstract author(s): Martens, Vibeke (NIKU - Norwegian Institute for Cultural Heritage Research; CCH - Climate Change and Heritage) - Ayers-Rigsby, Sara (Florida Public Archaeology Network; Florida Atlantic University Anthropology Department) - Graham, Elinor (Department of Archaeology, School of Geosciences, University of Aberdeen)

Abstract format: Oral

Climate change is radically altering cultural heritage. Impacts to historic properties and archaeological sites are destroying legacies of communities across the globe, and these impacts will worsen as temperatures and sea levels rise, permafrost thaws, precipitation changes, droughts, wildfires, landslides and erosion become more frequent.

This session wishes to attempt to answer how archaeology as a sector can respond and adapt to the challenges posed by the effects of climate change on heritage, and how these responses may be applied at a wider societal response to crises. How to we prioritise in the face of unstoppable loss? How do we ensure representation of a diversity of voices in assessing the significance of heritage? And how do we develop pro-active approaches to address the threat of loss?

We are hoping that the oral presentations from and possible posters attached to this session may provide at least the start of answers to these crucial questions.

2 COASTAL CHANGE AND MANAGING LOSS THROUGH DRONE BASED SURVEY METHODS

Abstract author(s): Graham, Ellie (University of Aberdeen)

Abstract format: Oral

As archaeological sites face the increasing impacts of climate-driven change, heritage managers must make difficult decisions. Where demand outstrips resource, systems of prioritisation and frameworks of loss must be developed to support informed decision making about how and when interventions can and should be made.

At the Scottish coast, rapid surveys (1996-2010) over 35% of the coastline recorded the archaeological resource, desk-based prioritisation (2010) highlighted those most vulnerable to erosion and loss, while a citizen science project (SCHARP, 2012-2016) updated and ground truthed site records, highlighting those most threatened, most significant, and most valued by local communities.

Building upon this work by the SCAPE Trust, new doctoral research aims to deploy emerging remote sensing and drone-based survey methods to examine some of these sites in greater detail, track past coastal change, and project climate change impacts on the coast to explore the potential extent of future loss. Extension of survey into hinterland areas which are vulnerable but not yet actively eroding will inform our understanding of as-yet-unknown archaeological resources and assist in the pro-active planning of interventions in advance of threat. Site and landscape-level assessment aims to resolve the scalar issues of national assessments of erosion threat, develop a methodology to help understand the most threatened resources and assist in the management of heritage threatened by climate-driven coastal change.

3 CLIMATE CHANGE: IMPACT ON HUMAN REMAINS

Abstract author(s): Roshem, Irmine (University of Aberdeen)

Abstract format: Oral

The interest in the impacts of climate change on archaeology has mostly concentrated on built archaeology because of its touristic value. Therefore, here the focus is placed on buried archaeological human remains, and in situ preservation in the future in light of predicted climate changes. This research aims to highlight the importance of the combination of archaeological and environmental data to predict bone preservation. This study was carried out by using the Pictish phases from two sites in Scotland, Laig and Dunkeld. In combination, the 90th percentile model of the high emission scenario generated by the 'United Kingdom Climate Projection 2018' tool was used as a climate model. The key factors of bone decay considered are temperature, water and pH. The results revealed that the annual temperatures, as well as rainfall percentage, were expected to rise at both sites; however, the differences between winter and summer seasons become more significant with time. Therefore, under this worst-case scenario, by 2100 the survival of the remains is highly unlikely. The increasing climate differences between summers and winters might affect bones in one of two ways. Either the annual decay rate will stay fairly constant as summers slow down the process of decay while winters accelerate it, or the frequent oscillations between dry and wet seasons will cause great damage to bones and accelerate decomposition. The results suggest that in situ preservation is not a sustainable solution for archaeological materials, emphasising the need for methods to prioritise sites for optimal resource use (workforce, funding).

4 IDENTIFYING AND MITIGATING CLIMATE CHANGE IMPACTS IN THE DERWENT VALLEY MILLS WORLD HERITAGE SITE, UK

Abstract author(s): Knight, David (York Archaeological Trust; Derwent Valley Mills World Heritage Site Research Group) - Howard, Andy (Landscape Research & Management)

Abstract format: Oral

The Derwent Valley mills and their associated infrastructure of workers' housing, schools, churches, canals, railways and other built remains were inscribed on the World Heritage List in 2001 in recognition of their importance for the early development of the factory system. These heritage assets and the environment within which they are set are especially vulnerable to the impacts of climate change upon the frequency and magnitude of flooding and landslides. Key issues include flood damage to historic mills and their associated water management structures, erosion of lead smelting, mining and other archaeological sites on valley slopes impacted by high surface runoff, and the potential for the release from deposits disturbed by fluvial erosion of pollutants associated with lead mining and other industrial activities. The DVMWHS Management Plan for 2020 to 2025 highlights the need for initiatives to raise community awareness and for risk management and disaster planning to mitigate the potential impacts of climate change upon the cultural heritage resource, ensuring that owners and partners have plans in place to accommodate natural disasters. Attention will be focused upon recent initiatives to develop methodologies for assessing the potential impacts of predicted climatic changes upon geomorphological processes and heritage resources, the identification of areas which are high priorities for action and some of the mitigation strategies that are being developed within and upstream of the World Heritage Site.

5 DEVELOPING PRO-ACTIVE APPROACHES TO ADDRESS THE THREAT OF LOSS: HISTORIC SITES AT SVALBARD THREATENED BY NATURAL DECAY AND TRAMPLING TOURISTS

Abstract author(s): Flyen, Anne-Cathrine (NIKU - Norwegian Institute for Cultural Heritage Research)

Abstract format: Oral

Arctic Archipelago Svalbard is commonly regarded as one of Europe's last wilderness, but people have left their mark here for more than 400 years. To this day, the archipelago is rich in historic sites that testify to how whalers, fur hunters, miners, and others have utilized the natural resources of this barren and rough landscape. According to the Svalbard Environmental Law all human traces dating from before 1946 are automatically listed. These historic traces are threatened by nature and human wear. As climate change in the Arctic is currently accelerating more than anywhere else on the planet, the effects on cultural heritage additionally might reveal what to expect elsewhere.

Based on field work at four historic sites on west-coast Spitsbergen this paper outlines how heritage sites at Svalbard are threatened by fungal decay, coastal erosion and tourism. The fieldwork clarified that these three degradation parameters are among the most serious and the assessments revealed highly degraded wood, coastal erosion that undermines buildings and other cultural monuments and tourists having difficulties understanding the cultural remains and thus wearing them down by trampling on them and using parts as wood for the fire.

Pro-active methods that are tested in the case areas and reviewed in the paper are 3D documentation of the cultural environments, various measurement methods for monitoring fungal decay and training and awareness of guides and tourists. The paper also presents monitoring methods using drone.

6 SVALBARD ARCHAEOLOGY UNDER THREAT: RUSSEKEILA HUNTING STATION

Abstract author(s): Martens, Vibeke (NIKU - Norwegian Institute for Cultural Heritage Research; CCH - Climate Change and Heritage)

Abstract format: Oral

Russekeila hunting station at the mouth of the Linné River at the western end of the Ice Fiord (Isfjord) in Svalbard was first used by Russian seasonal hunters from a. 1700-1859, then by Norwegian hunters from a.1860. The Russian Pomor people hunted walrus, furred animals, gathered eider down, fished, and utilised all the natural resources – and so did the Norwegian seasonal hunters when they took over the site.

The remains consist of (more or less) clearly visible house structures, one of the largest sites of this kind in Svalbard. The site also holds a large number of graves and foundations for large crosses (grave markers), in addition to refuse layers.

This paper presents some of the archaeological remains from these settlements and their changes in preservation caused by modern climate change. It also looks at the impacts of increasing Arctic tourism on these fragile remains. The paper discusses the most imminent threats to the site and possible management and adaptation measures to answer these problems.

7 THE NORTH AMERICAN HERITAGE AT RISK PROJECT

Abstract author(s): Miller, Sarah (Florida Public Archaeology Network) - Cochran, Lindsey (University of Georgia) - Gaillard, Meg - Smith, Karen (South Carolina Department of Natural Resources) - Lee, Lori (Flagler College) - Murray, Emily - Dietrich, Emma (Florida Public Archaeology Network)

Abstract format: Oral

The North American Heritage at Risk (NAHAR) Project began during the pandemic as a result of monthly meetings to discuss developing a standardized system of identifying, monitoring, documenting and triaging at-risk cultural sites prior to loss. Partners in Florida, Georgia, and South Carolina developed a working group that expanded to 55 members as of early spring 2021 in other states and countries.

Approximately 11,109 cultural resources located on the southeastern Atlantic coastline are at risk due to erosion from storm surge and rising sea levels with just a 1 m increase in sea level (Anderson et al. 2017). In addition to the known risks, southeastern coastlines are experiencing sea level rise six times higher than the global average (Valle-Levinson et al. 2017:7878), increasing the urgency to address this looming threat.

The vastness of the Atlantic coastline and shores negate the ability of professional archaeologists to actively address the increasing threat to cultural resources. The NAHAR Project, building from models established by global organizations like SCAPE and with predictive models from SLAMM/MEM, will establish a standardized identification, monitoring and documentation protocol in collaboration with tribal representatives, the Gullah Geechee Corridor Commission, statisticians, geographers, geologists, climatologists, hydrologists, biologists, cultural anthropologists, coastal engineers, and information science to name a few. Once this protocol is established, citizen scientists, residents and tourists alike, will be asked to join professional archaeologists in their efforts. The purpose of this project is to encourage non-specialists to identify at-risk resources and continue to revisit those sites to document the rate and type of site erosion and destruction. When rapid or triage-level excavations are required, professional archaeologists will work with citizen scientists to extract data prior to total loss. Effectively establishing postmortem collections of cultural heritage for future research, interpretation, and outreach.

8 MONITORING, MODELING AND COMMUNITY CONVERSATIONS: ADDRESSING CLIMATE IMPACTS THROUGH FLORIDA'S HERITAGE MONITORING SCOUTS (HMS FLORIDA) PROGRAM

Abstract author(s): Murray, Emily - Dietrich, Emma - Miller, Sarah - Boggs, Robbie - Kemp, Kassie - Meyers-Gidusko, Patrisha (Florida Public Archaeology Network)

Abstract format: Oral

The Florida Public Archaeology Network (FPAN) utilizes a wide variety of tools and methods to document heritage at risk through Heritage Monitoring Scouts (HMS Florida). This program, founded in 2016, aims to engage citizen scientists to help understand and track impacts at sites throughout Florida. Volunteers collect data including confirming site locations, noting observable threats, and providing an overall site condition, as well as take photographs to help visually document the site at that point in time. This data is collected in the HMS Florida Arches database, accessible to researchers, land managers and other stakeholders. In addition to basic monitoring efforts, staff also seek to gain a more nuanced understanding of the most at-risk sites by using tools like an Arrow 100 GNSS receiver to map and track shoreline erosion and migrating marshes, and a FARO Focus 350s terrestrial laser scanner to digitally document sites.

Florida's archaeological sites are at extreme risk and archaeologists are left making tough decisions on which sites to prioritize for triage and mitigation efforts. The data collected through the HMS Florida program can be used to help guide these decisions moving forward. However, this data only provides one point of view centered around archaeological significance and threat levels. In order to take a more holistic approach to site prioritization, staff are seeking to gain a wider understanding of how the community values their local sites through a workshop series, Community Conversations on Heritage at Risk. Each workshop asks the local community to answer the same questions about their local heritage, what it would mean to lose it, and what their aspirations are for it in the face of climate change impacts.

This paper summarizes these community-based engagement programs and includes lessons learned along the way.

9 SMALL GOVERNMENT PRIORITIES: ARCHAEOLOGY AND CLIMATE CHANGE AT THE COUNTY LEVEL

Abstract author(s): Ayers-Rigsby, Sara (Florida Public Archaeology Network) - Ransom, Jeff (Miami-Dade County)

Abstract format: Oral

Climate change is at the forefront of local government policy in South Florida. The built environment is threatened and local leaders must make decisions about where to place critical infrastructure and develop areas in a sustainable way. These decisions will impact cultural resources spanning 9000 years. While all cultural resources have historical significance not all levels of significance are equal. As such difficult decisions are going to have to be made regarding the level of mitigation necessary both inter and intra municipal borders.

This paper will explore prioritization of threatened archaeological sites, discuss the South Florida Regional Climate Change Compact, and explore how prioritization can inform academic research as well as infrastructural improvements. Case studies from Palm Beach County and Miami Dade will be explored in order to highlight how archaeologists and regional planners collaborate to form a sustainable future that incorporates the historical and archaeological record while preserving current lifeways.

10 SALT MARSH AND INTERTIDAL SITE VULNERABILITY AND NATURE-BASED RESILIENCE: THE DELAWARE BAY, USA

Abstract author(s): Wholey, Heather - Nikitina, Daria (West Chester University)

Abstract format: Oral

The Delaware Bay is the second largest estuary along the U.S. Atlantic coast and has been occupied by humans for approximately 22,000 years. Most of the estuarine shoreline is fringed by salt marshes that are being lost at a rate of up to an acre per day due to sea-level rise (SLR). There are over 2000 known coastal archaeological sites along the Bay, many of which are buffered from SLR by marshlands. We have applied the probabilistic approach to sea levels (Kopp et al. 2019) using the Representative Concentration Pathway (RCP) climate scenarios consistent with IPCC AR5, and projected hurricane threats using the Sea Level Affecting Marshes Model (SLAMM). Dozens of cultural resources are likely to be jeopardized by SLR, coastal erosion, and tidal flooding in the next decade, and hundreds more by 2100. Landscape planning and management tends to operate with little consideration for cultural aspects (Eliasson et. al. 2018), and communities, towns, and governments typically disassociate cultural/historical resources from natural resources in planning and development (Brabec et.al. 2015). We argue that research and reporting of archeological sites that is aligned with scientific assessments of risk hazards may enhance the visibility and impact of coastal archaeological research and management. Where appropriate, site prioritization schema should align with conservation programs, particularly those that utilize natural infrastructure and nature-based solutions. Such approaches are motivated to protect and enhance the resiliency of coastal communities by providing human well-being and biodiversity benefits. Heritage resources arguably enhance human well-being by providing historic time depth, place identity, and an integration between culture and nature. Case studies from the Delaware Bay illustrate how archaeology and heritage could be incorporated with existing natural infrastructure development and estuarine ecosystem management and restoration programs to mitigate the impacts of storm surge and coastal erosion on those resources.

11 PRIORITIZING WHAT WE DON'T KNOW: CLIMATE CHANGE AS A CATALYST FOR UPLAND SURVEY

Abstract author(s): Nash, Carole (James Madison University)

Abstract format: Oral

The upland forests of the Appalachians are among the most diverse natural communities in the temperate world, providing the setting for a study of change and flexibility as an essential feature of existence, both for pre-contact and historic cultures. However, upland archaeology has lagged due to the long-held belief that upland sites have limited signatures and are thereby less likely to provide significant information on cultural processes. Currently, archaeological sites here are compromised by climate change processes such as drought and high winds that create conditions for frequent wildfires, as well as extreme precipitation events that lead to severe erosion, flash flooding, or rapid mass wasting. The lack of research makes it difficult for decision-makers to develop prioritization plans in the face such threats. A GIS-based analysis of settings that are most likely be impacted by catastrophic climate-related events, coupled with archaeological models of pre-contact site locations, provides a process for identifying areas in the greatest need of survey. Such work is being carried out in Shenandoah National Park, where archaeologists ground truth the geospatial analysis to further refine decision-making for future work.

100 TO GENDER OR NOT TO GENDER? EXPLORING GENDER VARIATIONS THROUGH TIME AND SPACE [AGE]

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Gaydarska, Bissierka (Durham University) - Rebay-Salisbury, Katharina (Austrian Academy of Sciences) - Ramirez-Valiente, Paz (University of Nottingham) - Fries, Jana Esther (Niedersächsisches Landesamt für Denkmalpflege)

Format: Regular session

A recent controversial study of Neolithic gender as opposed to Bronze Age gender in Europe (Robb & Harris 2018) necessitates further discussion. In a field encompassing enormous gender diversity through time and space, it is important to tease apart social constructions (is there 'gender?') from analytical categories (what kind of gender?). Defining the relationship between sex/gender/identity/society through time has left some commentators believing that mainstream gender archaeology argues for a single understanding of 'gender' across time and space.

One of the aims of this AGE session is to refute such a claim, in overcoming binary thinking as the guiding principle of exploring gender and inviting case-studies with representations of binary, as well as non-binary, gender symbolism. Two types of contributions are invited:

1) Theoretical papers discussing whether a structuralist approach is justified by the need to have a 'fixed' category of gender that will enable meaningful comparison between different times and places. Is there really a moment in human development when we can no longer speak of sex-based behaviour but rather of gender-based behaviour? And if yes, when did it happen and why? Did this happen just once or at different times at different places? And was it uni-directional or are there cases of reversed behaviour from gender-based to sex-based? Did the size of the group affect the sex-based and gender-based behaviour and what were the implications for gender diversity? Answers to these questions can come from a wide range of case studies with broad spatial and chronological coverage.

2) Zooming into European Prehistory - can we really say that Neolithic gender is exclusively contextual and fuzzy, while Bronze Age gender is exclusively cross-contextual and binary and Copper Age gender represents a transition from one to the other? Presentations of case-studies exploring such a trichotomy are encouraged from across Europe.

ABSTRACTS:

1 UNBRIDLING THE NARRATIVE: INFLUENCES OF GENDER ASSUMPTIONS ON THEORIES OF REINDEER DOMESTICATION

Abstract author(s): Hull, Emily (University of Oulu)

Abstract format: Oral

Reindeer have been a keystone species for survival of many peoples in the circumpolar North, and domestic reindeer herding makes up a fundamental part of the culture and history of the people of Fennoscandia. Theories about reindeer domestication, however, make many assumptions about reindeer and human interactions, many of these predicated on gendered norms within the societies of the zooarchaeologists who study these regions. Many of these studies ascribe a single, gendered behavioral norm to animals according to biological sex, and do not account for the fluctuations in behavior and socialization through periods of annual hormonal change. The area which captures the interest of most theorists is in fact the time period of shortest duration; that of mating season. Reindeer behavior and the subsequent behavior of the peoples hunting and herding them is not limited to this small period of their lives, and the inappropriate gendering of animal behavior leads to several wide gaps and even mischaracterizations in theories of domestication. This study seeks to examine the points in which human expectation of animal "gender" overrides the behavior of animals themselves, and thus blinds us to alternative theories of animal domestication.

2 GENDER DIFFERENTIATION IN LIFE AND DEATH: SOCIAL REPRODUCTION IN HUNTER-GATHERER-FISHER SOCIETIES OF THE SOUTHERNMOST TIP OF THE AMERICAN CONTINENT

Abstract author(s): Carracedo Recasens, Robert (Universitat Autònoma de Barcelona)

Abstract format: Oral

This paper focuses on the analysis of social norms, and specifically on the sexual division of labour between hunter-gatherer-fisher societies through the study of funerary practices. Norms, like sexual division of labour, are neither intangible nor immaterial and are shaped by the relationships between men and women. The main question are how we can shape gender differences in hunter-gatherer societies and how can we access to the social norms through the study of funeral practices in hunter-gatherers' societies. We propose an ethno-archaeological approach to sexual division of labor in Hunter-gatherer societies through the analysis of ethnographic literature and archaeological funerary contexts. This involves the dialectical confrontation between theoretical developments on one side, and the archaeological practice on the other, as well as the use of ethnography in known historical hunter-gatherers' societies.

The present research is focused on three historical societies from the southernmost tip of the American continent: the Kawésqar, the Yámana and the Selk'nam, as well as their respective zones of occupation. In all three cases, the ethnographic data provide information about the strict sexual division of labour and the discrimination of women. Moreover, several funerary contexts localized in this region from different chronologies allow to analyze the treatment of bodies. The confrontation of both sets of data allow to discuss on the archaeological visibility of gender differences.

The work have the aim of shaping a theoretical and methodological structure relevant to the archaeological study of past societies. The results show that it is possible to get to know the sexual division of labour in hunter-gatherers' societies through the research of funerary practices and the materials associated to them.

3 GENDER IDENTITIES IN MESOLITHIC, EARLY AND MIDDLE NEOLITHIC IN CENTRAL EUROPE

Abstract author(s): Nordholz, Daniela (none)

Abstract format: Oral

Researchers into the past carefully articulate their conclusions, with an awareness that they are only transitional. This certainly holds true for gender archaeology, which evolved from focusing on man the hunter to focussing on woman the gatherer, settling briefly on woman the hunter, and eventually arriving at the realisation that gender is

flexible. Despite this progress, however, there is still a faint echo of 'division of labour', of 'male and female spheres' and 'male and female grave goods'. The questions therefore are: was there gender identity in the Mesolithic, and if so, was it fully formed, just as we presume for modern societies or was it still in its 'infancy'? Did it change and evolve during the course of the Mesolithic? How did it present itself in the Neolithic? Was it similar? Or totally different? In this paper, I will compare gender identities and gender relations in a sample of Mesolithic, Early and Middle Neolithic burials in Central Europe through the number and definition of grave goods and changes therein.

4 NEOLITHIC GENDER VIEWED FROM FRANCE. ANTHROPOLOGICAL AND THEORETICAL FRAMEWORKS, FIRST RESULTS AND LIMITS

Abstract author(s): Augereau, Anne (INRAP - National Institute for Preventive Archaeological Research)

Abstract format: Oral

Gender studies are not common in French Neolithic archaeology. However, in recent years, some archaeologists dealing with pre-history and the Metal Ages developed such an approach, basing their studies on anthropological and ethnological knowledge and studies of gender theory developed in Anglo-Saxon countries. By integrating those frameworks, in this paper, we shall show how the material culture of the first farmers can be used in a gender archaeological study, First, we shall define the categories and manifestations of gender (identities, roles, sexual division of labor, gender apprenticeship and construction, power and inequalities, etc.) and their materializations in archaeological finds. Then, we shall present the first results of such an approach for the Neolithic Linearbandkeramik culture (LBK), which extended from the Carpathian Basin to the Paris Basin. Based on individual burials, we shall try to identify relevant axes of differentiation within the population and thus determine the system of social segmentation at work during the emergence of the productive economy. Finally, a comparison with sociological and anthropological studies, where gender is observed in living populations, highlights the limits of the perception of gender in archaeology.

5 TO GENDER OR NOT TO GENDER? INSIGHTS FROM ASEXUAL AND DOUBLE-SEX FIGURINES OF THE NEOLITHIC AEGEAN

Abstract author(s): Ramirez Valiente, Paz (University of Nottingham)

Abstract format: Oral

Traditionally archaeologists have interpreted Neolithic figurines as representing predominantly women, significantly influenced by Gimbutas's "Mother Goddess" theory (1989). This theorisation has subsequently led scholars to various interpretations regarding women's role and gender difference in the Neolithic. However, the categorisation of sex in existing scholarship has followed ques-

tionable criteria. The presence of voluptuous bodies, protrusion of buttocks or ample hips and thin waist have been used as sole indicators of the female sex (e.g., Kokkinidou and Nikolaidou 1997; Marangou 1992; Mina 2005). A reassessment of those criteria may reveal a different picture to the "clear" predominance of female figurines, suggesting that a considerable percentage lack any representation of sex.

Furthermore, focusing on the male/female dichotomy restricts and neglects the multiplicity and fluidity of gender constructs that could characterise Prehistoric societies. Asexual and double-sex figurines are the most interesting categories regarding sex, raising questions such as:

- Did asexual figurines just represent a general shape of the human body?
- Did asexual or double-sex figurines represent a different gender category than male/female, i.e. a 'third gender'?
- Was the representation of sex unimportant in Neolithic societies?
- Did double-sex figurines represent different gender roles?
- Could the lack of sexual traits be an allusion to a specific age group?

This paper will put forward a working hypothesis for the different interpretation avenues for asexual and double-sex figurines, moving beyond the binary dichotomy. It will focus on two case studies from the Neolithic Aegean. In Neolithic Crete, female and asexual figurines predominate, and other axes of differentiation may be at play, such as age rather than gender. In Neolithic Thessaly, double-sex figurines are represented similarly to Male figurines, perhaps suggesting a similar gender role. The approach to understanding the meaning of figurines needs to be a contextual analysis and an emphasis on intersectionality to go beyond gender.

6 EVERYTHING YOU WANTED TO KNOW ABOUT SEX, BUT WERE AFRAID TO ASK: NON-BINARY GENDER SYSTEMS AND ASSYMETRIES IN PREHISTORIC GREECE

Abstract author(s): Mina, Maria (University of the Aegean)

Abstract format: Oral

When gender archaeology emerged in the 1980s, it was expressly committed to studying gender identities. In the decades that followed, postmodernist theory led to the deconstruction of gender and the critique of the epistemological orthodoxy of fixed definitions, such as 'male' or 'female'. Undoubtedly, the introduced relativism exposed traditional gender stereotypes on the grounds of the indisputable 'sex' and highlighted the pluralism of gender-related experiences. Regrettably, the pursuit of embodied social identities led the proponents of cultural relativism to criticise gender archaeology for imposing a predefined set of social categories to past societies. Such an emphasis on individual experiences, has undermined the validity of a gender approach, and gender, as a culturally arbitrary and elusive construct, has been replaced by the concept of embodiment.

In the proposed presentation, a case is made in favour of gendering the past in a way that is sensitive to time and space. We can continue to employ gender as an analytical category, while maintaining the necessary check on our inherent biases, by examining gender-related patterns which are specific to the period, region, and culture under study. The argument will draw on archaeological evidence from prehistoric Greece to explore whether binary gender systems were in place, and whether such structures may have hindered or favoured the development of gender asymmetries. Furthermore, the observed gender system can provide the basis from which we can revisit some of the questions originating from the feminist past of gender archaeology, which to this day remain valid. When did patriarchal social order emerge and what are the conditions that may foster its development? Finally, it is proposed that prehistoric gender systems will need to be viewed within the constraints of the operating social structures to which members are expected to conform, a point that postmodern theory tends to overlook.

7 THE RELATIONSHIP BETWEEN GENDER AND A NESTED IDENTITY APPROACH TO THE NEOLITHIC AND CHALCOLITHIC OF OLD EUROPE

Abstract author(s): Chapman, John (independent scholar)

Abstract format: Oral

Robb & Harris' (2018) paper on the changing form of gender relations in the Neolithic, Chalcolithic and Bronze Age implies the growing significance of gender through time by showing increasing diachronic clarity of definition and separation of binary genders. But is it possible to highlight gender in social relations in this way without taking other aspects of identity into account?

In my synthesis, "Forging identities in Balkan prehistory: dividuals,

individuals and communities, 7000 – 3000 BC" (Sidestone, 2020), I seek to develop a person-centered relational approach to identity by identifying four widely applicable nested components of identity – the individual, the dividual, the communal and global – local relations. A conclusion perhaps surprising to some was the fundamental importance of dividual relations. But how does gender fit into this scheme?

In this paper, I wish to examine contrasting examples of the interface between gender and the four components of identity. The evidence for the contribution of gender relations in global-local relations is the hardest to find, although the future combination of isotopic and aDNA studies of the sex of exotic persons who were long-distance specialists could provide useful indicators. Communal values were often underlined through burial traditions and settlement planning but gender relations were strongly dependent on community size. Examples of dividual relations were the most common, whether in the strongly gendered mortuary zone or in the four forms of personhood defined for Old Europe. The wider question for the narrative of individuality is the degree to which

each person can be considered an 'individual'. However, the individualizing tendencies of the costume graves at Varna remind us that individual personhood played an important role within the network of individual biographies. There are also good grounds for the identification of gendered individuals in Old Europe in the realm of 'portrait' figurines.

8 EXPLORING GENDER AT POLGÁR-CSŐSZHALOM, A LATE NEOLITHIC SITE IN NE HUNGARY

Abstract author(s): Anders, Alexandra (Eötvös Loránd University, Institute of Archaeological Sciences, Budapest) - Nagy, Emese (Déri Museum, Debrecen)

Abstract format: Oral

Polgár-Csőszhalom is one of the key sites for gaining a better understanding of European history in the fifth millennium BC owing to its complexity incorporating a single-layer and a tell settlement as well as a multiple and a double enclosure system, its long occupation between 4920–4460 cal BC, the intensity of its occupation and the relatively high number of excavated graves totalling 147 burials. Taken together, the site offers an exceptional possibility for exploring gender in a Late Neolithic community. The burials were uncovered in different areas of the site and they represent all age groups. The mortuary rite as well as the richness and diversity of the objects deposited in the burials provide the necessary background to exploring gender identities in detail.

In this presentation, we shall integrate the findings of the archaeological assessment and the archaeometric analyses in order to gain a better understanding of the salient features of this key site. What levels of gender representation can be discerned in the mortuary domain? How was gender constructed from childhood onward, were there any changes during an individual's lifetime? Was the strict binary system, which affected both the ritual and the grave goods, truly as exclusive as it appears at first sight? Why are gender/sex and certain age groups under- or over-represented on the site as a whole and even more so in certain locations? How were various artefacts and personal adornments used for expressing gender? While addressing these questions, we shall also show how our perception and interpretation of these issues changed during the past decade.

The research project is funded by a grant from the National Research, Development and Innovation Fund (Grant K124326).

9 GIRLS WHO WANT BOYS WHO LIKE BOYS TO BE GIRLS –THE FUZZINESS OF SEX AND GENDER IN BURIAL ARCHEOLOGY

Abstract author(s): Pape, Eleonore - Ialongo, Nicola (Georg-August-Universität Göttingen)

Abstract format: Oral

When based on prehistoric burials, numerous hypotheses regarding sex and gender in Prehistory build up in most parts on data provided by two interdependent disciplines: physical anthropology and archaeology. While the former relies on the morphological and metric traits of skeletal remains and refers to what we consider biological sex, the latter draws inferences of what could be understood as gender, based on archaeologically sexed objects. The critical aspect of such an interdependence is that validation is often mutual, thus increasing the risk for circular arguments.

Although archaeological gender interpretations are being increasingly questioned, it seems as if anthropological sex determinations are rarely critically considered by archaeologists.

We, the archaeologists, tend to rely on the results of our anthropologist colleagues as if we would with an accountant calculating our taxes, perhaps diminishing the scientific value of their work. At the same time, critical appraisal is limited by the fact that the raw data of and the argumentations for anthropological determinations are rarely – if ever – made accessible to their full extent for the majority of the published burial sites. This inevitably leads to a lack of transparency and reproducibility and, to more 'radical' interpretations of critical anthropological data by the archaeologists themselves.

We suggest that gender and sex are always fuzzy, in the Neolithic as well as in the Bronze Age, and that such a fuzziness is not only dependent on cultural factors. Based on a selection of Neolithic and Bronze Age burial sites in Central Europe, we will show the difficulties of comparing sex and gender determinations. We will discuss how they affect archaeological interpretation and explore possible solutions.

10 BIOLOGY AND CULTURE IN GENDERED BURIALS OF THE BRONZE AGE

Abstract author(s): Rebay-Salisbury, Katharina (Austrian Academy of Sciences)

Abstract format: Oral

The analysis of sex-specific gene segments and sex-specific protein fragments in dental enamel have recently contributed to the accuracy of identifying the genetic sex of a buried person. Whilst intersex variations and disorders of sex development still cannot easily be recognized, this presents a major stepping-stone for the investigation of gender.

Morphological characteristics of the skeleton are shaped by biological, social, and environmental interaction and are no suitable indicators of sex for children before puberty. This obstacle for the investigation of sex-b(i)ased differential treatment of children can now be overcome by the wide application of genetic sex determination.

Since sex and gender of a person may or may not be relevant for all aspects of life and death, including nutrition, health status, access to material culture and burial treatment, the scientific advances present new research opportunities.

This paper will present case studies from Bronze Age communities of present-day Austria, and investigate gendered burial practices such as different body placement for females and males and gender-typical material culture in the light of the results from testing for sex-specific peptides in dental enamel.

The aim of the paper is to discuss how sex, gender and age interlinked in Bronze Age Central Europe, and raise the broader question if and how an ever more accurate understanding of a buried person's sex lead to a better understanding of gender.

11 GENDER IN BECOMING THROUGH THE NEOLITHIC/BRONZE AGE TRANSITION IN IRELAND AND SCOTLAND?

Abstract author(s): Haughton, Mark (University of Cambridge)

Abstract format: Oral

This contribution traces the development of gender representation in the burials of the later Neolithic and earlier Bronze Age in Ireland and Scotland. Although it is clear that a binary gender system did not replace a non-binary one during this transition, some wider trends do suggest a relation to the broader story developed by Robb and Harris (2018). However, hints of complication and dynamism suggest the negotiation of gender extending well into the Bronze Age and local pictures tell radically different stories.

This apparent contradiction will be resolved by a careful attention to the actions of local communities at the graveside. Taking a different approach to Robb and Harris, this paper investigates gender representations from the bottom up, privileging the local scale of lived experience. Burials are affective creations for those who partake in and/or witness them, and this realisation is key to understanding the gendered stories which they present. Overall, this evidence does suggest some relation to the broader narrative traced by Robb and Harris, but this is shown to be complicated and variable, in ways which hint at Bronze Age gender dynamics which are more open than is often acknowledged. Ultimately, this paper reflects on the privileging of grand narratives in the study of pre-history, and the consequences for our understandings of prehistoric life.

12 GENDER ANALYSIS IN EUROPEAN LATE PREHISTORY: BROADENING THE SOCIAL AND GEOGRAPHICAL SCOPE

Abstract author(s): Gonzalez-Marcen, Paloma (Centre d'Estudis del Patrimoni Arqueològic de la Prehistòria; Universitat Autònoma de Barcelona) - Diaz-Zorita, Marta (University of Tübingen; Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters)

Abstract format: Oral

Approaches to the analysis of gender identities in European late prehistory have tended to be constructed in terms almost exclusively of funerary evidence and taking as a fundamental reference only the archaeological record of certain European regions. We will argue that this perspective leads to an oversimplification of the complexity of social practices and of the cultural structuring of their agents, at the same time that concrete sequences of continuity and change are projected as general models of historical interpretation.

This contribution aims, on the one hand, to broaden the analysis of gender identities to other types of variables that are articulated with the social and cultural organization of these communities, including elements of analysis that complement the funeral information. On the other hand, we intend to provide archaeological information that suggests historical trajectories different from those that make up the interpretive mainstream of European late prehistory, specifically from existing studies on the Neolithic and Bronze Age of Iberia.

13 TO GENDER IN AL-ANDALUS: MAINTENANCE ACTIVITIES IN THE FUNDUQ

Abstract author(s): Hernández Robles, Alicia (University of Murcia) - Celma Martínez, Mireia (Professional Archaeologist)

Abstract format: Oral

The dichotomy between the binomials male-public Vs. female-private had always been approached as a theoretical premise in traditional Medieval archaeology, as well as in all Social Sciences. However, recent studies have been emerging to defend a greater interrelation in the use of both public and private spaces.

The aim is to revise the maintenance activities that were carried out in the fanādiq (pl. of funduq) of al-Andalus and to determine the agents who carried them out. Specifically, the structures' spatial distribution and the bio and archaeological remains recovered are analysed to define private and public rooms in the funduq of the Arrixaca neighborhood excavated in San Esteban Archaeological Site (Murcia, Spain) (www.sanesteban.um.es).

Documentary sources report the activities in the daily life of the fanādiq in medieval Mediterranean cities, where travelers and merchants could lodge, deposit their merchandise, and trade. Apart from merchants and travelers, other people participated in the fanādiq such as widows, prostitutes, and homosexual men because of certain economic circumstances, civil status, or heteronormativity break affected them. There were fanādiq in which guests had to bring their own food and wood to cook in there, but in other fanādiq, where widows permanently lived, women could be in charge of the maintenance activities. These buildings used to have a large interior courtyard and more than one floor, a fact that would not make it difficult the balance between the public and the private sphere, where other not so moral and socially unaccepted activities would be carried out too.

The detailed study of the phases and the analysis of the archaeological record suggests agents' indicators linked to maintenance activities in these buildings facing the results of the written sources for the gender archaeology research in Medieval Ages.

101 ON THE SHOULDERS OF PROMETHEUS: INTERNATIONAL COLLABORATION AND THE ARCHAEOLOGY OF THE SOUTH CAUCASUS

Theme: 7. From global to local: Baltic-Pontic studies

Organisers: Everill, Paul (University of Winchester) - Intagliata, Emanuele (Aarhus University)

Format: Regular session

Despite some high-profile exceptions, the archaeology of the South Caucasus remains marginalised and often overlooked - not receiving the wider exposure it deserves. Its higher current profile probably owes as much to conflict in Syria and Crimea, which has forced a range of international projects to relocate to more favourable locations, as it does to greater awareness. This situation is partly a consequence of decades of occupation and academic isolation, and partly because of an unfortunate, and incorrect, perception that the South Caucasus is simply peripheral to the archaeologies of Europe and Asia.

This session will showcase examples of collaborative working in the South Caucasus, projects which have enabled a sharing of ideas and scholarly traditions, helping to develop new methodologies, and bringing new technology and scientific advances to bear on regional archaeological debates. This session is a celebration of both the archaeology of the South Caucasus, and of the power of scholarly cooperation to bridge divides and widen horizons.

ABSTRACTS:

1 REMAINS OF ANCIENT WINEMAKING FROM KVEMO KARTLI AND KUTAISI (GEORGIA)

Abstract author(s): Hamburg, Jacek (Krukowski Polish-Georgian Interdisciplinary Research Center) - Jalabadze, Mindia (Georgian National Museum) - Isakadze, Roland (Georgian National Museum; National Agency For Cultural Heritage Preservation of Georgia, Kutaisi Historical Architectural Museum - Reserve; Akaki Tsereteli State University)

Abstract format: Oral

Since 2014, in the framework of the international project called Georgian Vine and Wine Investigation, carried out archaeological research at Gadachrili Gora and Shulaveris Gora. Neolithic sites dated to 6th Millennium BC are located near the village of Imiri (Marneuli municipality) on Kvemo Kartli plain in southeastern Georgia. The project was made with the support of the Government of Georgia, National Wine Agency, Georgian National Museum, Georgian Wine Association and the University of Toronto.

Since 2017, in the framework of the Polish-Georgian Expedition for the Kutaisi Archaeological Landscape (EKAL Project), interdisciplinary research was carried out in the area around the Gabashvili Gora and Dateshidze Gora located in the heart of Kutaisi city.

Archaeological excavations in all of these sites and the interdisciplinary analyses of organic remains and ecofacts from different periods are one of the main goals of both projects. Scientists from research laboratories and universities around the world (Georgia, Canada, Poland, Israel, USA, France, Italy, Denmark and Finland) participate in both of them. All samples taken from excavations were sent for several analyses like chemical, biomolecular, radiocarbon, palaeobotanical, palynological, genetic and palaeoecological.

According to the results of interdisciplinary research, it was established that in the 6th Millennium BC Eastern Georgia and Kvemo Kartli itself was the region, where the wild vine was cultivated and the history of grapevine and wine production have 8000 years old. Thanks to the archaeological research in Kutaisi, the presence of charred grape seeds and grapevines is also confirmed in the western part of Georgia, in the Imereti region, where the Late Bronze Age Colchian culture developed in the second half of the 2nd Millennium BC.

Cooperation between Georgian and foreign specialists continues, and the results of joint archaeological research bring more innovations in the history of the ancient viticulture in Georgia.

2 THE IMPORTANCE OF ARMENIAN GOLD FOR CULTURAL DEVELOPMENT IN BRONZE AGE CAUCASIA

Abstract author(s): Kunze, Rene (Martin-Luther-University Halle-Wittenberg)

Abstract format: Oral

The Gegharkunik region on the south eastern edge of Lake Sevan (Armenia) is a part of southern Caucasia uniquely suited to demonstrate the intensive interchange between pre-Christian settlement and gold mining. The enclosed landscape can be seen in this regard as a prehistoric terra incognita due to the wholesale lack of archaeological and archaeometallurgical investigations to date. It has been proven that there was major exploitation of gold from the defined geographical area in antiquity. One of the largest gold mines in Middle East is still located there today. The mines position on the Sotk pass, which is the direct connection between southern and eastern Caucasia and thus has a strategic importance for the entire region, is also of significance. Initial approaches revealed outlines of the prehistoric settlement patterns which could be placed in relation to contemporary gold mining in a clearly delineated natural corridor along this superregional communication and trade route. The intention is to implement an intensive holistic-archaeological and archaeometallurgical investigation of the settlement network in the surroundings of the gold mine and an interdisciplinary attempt to imbed these structures in the larger ecological and anthropogenic environment. The existence of placer

gold in several local rivers as well as ancient mining traces has already been demonstrated. The findings of placer gold, along with the geochemical fingerprinting of primary and secondary gold sources from this region make it possible to analyse the origins of golden artefacts found in the wider vicinity of the area. The opportunity to study gold items from numerous Age finds from Armenia, e.g. from Lori Berd and Metsamor, allow for an extensive reconstruction of the early use of gold and its importance in ancient Near Eastern cultures.

3 THE EAST GEORGIAN SANCTUARIES OF THE LATE BRONZE AND EARLY IRON AGES

Abstract author(s): Arnhold, Simone - Blocher, Felix (Martin-Luther-Universität Halle-Wittenberg) - Bukhrashvili, Paata (Ilia State University, Tbilisi) - Davitashvili, Shorena (Martin-Luther-Universität Halle-Wittenberg; Ilia State University, Tbilisi)

Abstract format: Oral

During the Late Bronze Age to Early Iron Age, several sites are concentrated in what is present-day East Georgia, consisting of a round to oval enclosure, which are conspicuous for their sometimes rich find material and have no direct connection to settlements or cemeteries: the so-called sanctuaries.

After most of the known sanctuaries were uncovered in the 1960s and 1970s in the course of rescue excavations, work on these sites has been resumed since 2017 in a Georgian-German cooperation project. For the first time, not only the central enclosure could be recognised as an architectural element of a sanctuary, but the Nazarlebi and Samreklo ruins show that the surrounding area was also elaborately designed. Here, wide surrounding terraces stretch around the hill of the same name, which were secured by stone packs and still strikingly characterise this and other sites today. Further characteristics are the rich deposits of up to several hundred metal objects and a remarkable accumulation of miniature pottery in various contexts.

Due to a still crude chronological model and a lack of radiocarbon dates, a more precise dating of the sites is only rudimentarily possible from the middle of the 2nd millennium BC to the first centuries of the 1st millennium BC. Current research at Ilia State University, Tbilisi and Martin Luther University, Halle-Wittenberg is presently dedicated to two of these sites in the Shiraki Plain in the extreme east of Georgia and, due to their exposed construction, also suggests that the sanctuaries had a long-distance effect. Further research on the sanctuaries is ongoing.

4 PRESSING CONCERNS: MISSING URARTIAN WINE PRESSING EQUIPMENT

Abstract author(s): Newson, Victoria (University of Sheffield)

Abstract format: Oral

Armenia has a long and significant history of grape cultivation and wine production, such that 8th century BCE Urartian kings referred to it as "the land of vineyards". Likewise, Assyrian armies marvelled at the vast quantities of wine and chose to take wine as tribute rather than precious metals. The most notable 'stains' that grapes and wine made on ancient economies and societies occurred in three distinct periods: 1) the Chalcolithic/Early Bronze Age, specifically at the site of Areni-1; 2) the Iron Age Urartian wine economy and 3) the Medieval Period (Christian wineries).

However, the archaeological evidence of wine production from the Urartians period (9th-6th centuries BCE) has mainly been textual (primarily Urartians and Assyrians) and ceramic based (i.e. karases), with minimal evidence of the technology of grape processing and winemaking (i.e. archaeobotanical data in association with specific wine production equipment). To help fill this gap in the archaeological record, the (minimal) chronology of wine production equipment in Armenia will be explored, along with contemporary production equipment from surrounding areas (eastern Mediterranean and the Levant). The ethnography of production equipment will be used as a heuristic tool to explore the possible locations for wine production and what types of production equipment were utilized to create such a significant wine industry during the Urartian Period.

5 NOKALAKEVI-ARCHAEOPOLIS: TWENTY YEARS OF ANGLO-GEORGIAN COLLABORATION

Abstract author(s): Everill, Paul (University of Winchester) - Murgulia, Nikoloz (Georgian National Museum) - Lomitashvili, Davit (National Agency for Cultural Heritage Preservation of Georgia) - Colvin, Ian (University of Cambridge) - Lortkipanidze, Besik (Georgian National Museum)

Abstract format: Oral

The ruins in the small village of Nokalakevi in Samegrelo, west Georgia, have attracted scholarly interest since the first half of the 19th century. They were first excavated in 1930, confirming their identification with the remains of the fortress of Archaeopolis described in early Byzantine historical sources, also known as Tsikhegoji (the fortress of Kuji) or 'the triple-walled fortress' by the Georgian chroniclers. The fortifications, on the northern edge of the Colchian Plain, enclose a naturally defensible area of approximately 18ha, with a steep limestone gorge carved by the River Tekhuri to the north, west and (to a lesser extent) the south. A hilltop citadel stands more than 200m above the lower town - a strip of relatively level ground between the hill and the river on which most of the known buildings were situated. The modern name of the village, Nokalakevi, translates as "ruins where a town was", and while this might refer to the Byzantine ruins it is perhaps not coincidental that it was known as Archaeopolis (ancient city) to those who built even those, suggesting that the remains of the Hellenistic period settlement may still have been visible at that time.

The site has seen significant excavation since 1973 including, since 2001, a collaborative Anglo-Georgian project that has trained over 250 Georgian and British students in modern methods. As the longest running collaborative project in Georgia, the expedition

has played a key role in bridging scholarly traditions and fostering a spirit of friendship and cooperation between the two nations that continues to this day.

6 NEW FINDINGS ON THE PELTA-SHAPE ORNAMENTS FOUND ON THE ROMAN LAMPS DISCOVERED DURING POLISH-GEORGIAN EXPEDITION IN ASPAROS (GONIO, GEORGIA)

Abstract author(s): Jaworska, Maria (University of Warsaw)

Abstract format: Oral

In 2014, a Polish team from the University of Warsaw joined the Georgian expedition to carry out excavations at the Roman fort at Apsaros (modern Gonio, Adjara, Georgia). During that period several new findings such as the praetorium with a room decorated with a mosaic floor as well as many small artefacts including coins, glass and pottery vessels were discovered. Recent exploration conducted in the two sectors directly east of the centrally located principia brought to light two terracotta lamps adorned with three evenly distributed pelta shapes on the base.

The paper presents the latest research on the distribution of pelta-shape motif on various types of lamps dated from the 1st up to the 3rd century AD. Current literature regarding the lamps found in Apsaros and research conducted at the Batumi and Gonio museums have not yielded any information on the lamps decorated with the discussed motif. It seems that this type of decoration of the lamp base had previously been unknown in Colchis, therefore, conclusions regarding its chronology and potential provenance yield new information concerning the exchange and movement of everyday goods in the coastal fort of Apsaros and, in a broader context, its history and the connections of the whole region with other areas of the Roman Empire, especially with Asia Minor and Crete.

7 EARLY CHRISTIAN (4TH-6TH CENTURIES AD) MONUMENTS OF THE KINGDOM OF LAZIKA, WEST GEORGIA

Abstract author(s): Murgulia, Nikoloz (Georgian National Museum) - Lomitashvili, Davit (Georgian National Museum; National Agency for Cultural Heritage Preservation of Georgia) - Lortkipanidze, Besik (Georgian national Museum)

Abstract format: Oral

At the beginning of the 4th century AD, the Roman Empire was weakened by the growth of foreign powers, including Goth and Hun attacks on Roman territory; and the strengthening of Persia. As a result, Rome lost control of its eastern provinces, including West Georgia. In this period one of the most powerful West Georgian tribes, the Laz, appear to have seized the opportunity presented by Rome's weakness, and annexed the neighbouring tribes, uniting West Georgia and creating the new Kingdom of Lazika (also referred to by its Georgian name, Egrisi).

Many early Christian (4th-6th cc AD) temples have been discovered and studied in West Georgia as part of long-term archaeological investigations since the mid-20th century, for example at Nokalakevi-Archaeopolis (capital of Lazika), Vashnari, Petra, Pitsunda, Kutaisi and other contemporary sites. The results of these investigations indicate the following:

1. The first Christian communities appeared along the Black Sea east coast (e.g. Pitsunda) as early as the 2nd-3rd cc. AD
2. Christianity seems to be the state religion of Lazika from the beginning of the 4th century, with ruins of churches excavated in the royal area of the capital, which are dated to the early 4th century;
3. However, according to archaeological and written sources, Christianity had not spread throughout the country until 523 AD, and even then local kings used religion as a political tool in their dealings with two great empires – Rome/Byzantium (Christianity) and Sassanid Persia (Zoroastrianism);
4. Archaeological investigation shows that a number of churches, at several locations across Lazika, had been destroyed and rebuilt over a short period in the 4th-5th centuries. This destruction does not appear to be the result of war, but most likely represents a complex relationship between religion and socio-political elites, including the nobility, and military, etc.

8 PRAYING AT THE FOOT OF THE GREATER CAUCASUS. PRELIMINARY RESULTS OF THE EXCAVATIONS AT MACHKHOMERI (KHOBİ MUNICIPALITY, WESTERN GEORGIA)

Abstract author(s): Intagliata, Emanuele (Centre for Urban Network Evolutions, Aarhus University) - Papuashvili, Revaz (Georgian National Museum) - Naskidashvili, Davit (Ivane Javakhsishvili Tbilisi State University) - Chitaia, Gogita (Khobi Municipality)

Abstract format: Oral

This contribution aims to present the results of the excavations conducted in 2019 and 2020 at Machkhomeri (Khobi Municipality, western Georgia) by the Georgian National Museum, Khobi Municipality and the Centre for Urban Network Evolutions – Aarhus University. The site is traditionally believed to have played an important role as part of the defensive system of the Kingdom of Lazika in Late Antiquity (4th–6th centuries CE). The excavations have targeted the site's fortifications and a church. The excavations of the church has exposed a central nave, a narthex and an annexed multi-burial chamber to the north of the apse. Comparanda for the church at Machkhomeri include case studies from cities along the eastern Black Sea coast. This reflects the role of urban settlements as nodes for the transmission of building traditions in the region. The numerous Greek inscriptions recovered in 2019 and 2020 provide clues of the significant religious role of Machkhomeri and support the hypothesis that the site was more than a simple fort.

9 SAMSHVILDE - UNTAPPED ARCHAEOLOGICAL SITE IN GEORGIA (SOUTH CAUCASUS)

Abstract author(s): Berikashvili, Prof. David (the University of Georgia)

Abstract format: Oral

Samshvilde, a settlement in southern Georgia, is a complex and multi-period archaeological site. The historical city occupies a strategic and impregnable location on a basalt cape flanked by the gorges of the Khrami and Chivchava rivers. This distinctive landscape position, combined with environmental conditions that include a mild climate and an abundance of natural resources, have attracted human occupation for millennia. Samshvilde and its surroundings may have been inhabited since the Neolithic era, but the urban complex dates mainly to the medieval period, under the control of Georgian Royal family, when it became the region main fortress and political-economic centre. Proximity to the northern branch of the Silk Road further increased the site's importance. Samshvilde was therefore a place where various ethnic groups and cultures converged. Despite the site's importance and longevity, until recently there has been little concerted archaeological study of Samshvilde.

In 2012 the Samshvilde Archaeological Expedition was initiated by the University of Georgia (Tbilisi, Georgia) which has taken a multi-disciplinary approach to the site. Future expansion of the project is envisaged through cooperation between the University of Georgia and research institutions and individual specialists who will bring new perspectives to the study of the medieval occupation in the Armenian-Georgian border region. The main features, chronological phases and crucial artefacts discovered in Samshvilde in last 3 years will be presented on the conference. The challenges and problems connected with the study of this unique site will be also presented.

111 PRESERVING TRANSFORMATIVE 'PALIMPSESTS': THE ROLE OF DIGITAL HERITAGE AND PARTICIPATIVE APPROACHES IN CURRENT URBAN ARCHAEOLOGY

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Guttormsen, Torgrim (Norwegian Institute for Cultural Heritage Research. NIKU) - Pastor Perez, Ana (University of Barcelona) - Guzman, Paloma (Norwegian Institute for Cultural Heritage Research. NIKU) - Fouseki, Kalliopi (UCL - University College London, Institute for Sustainable Heritage) - Bonacchi, Chiara (University of Stirling)

Format: Discussion session

Towns and cities are complex, densely populated settlements that are in constant transformation. However, many of the strategies undertaken to conserve and disseminate the value of heritage sites within present-day cities does not value transformation. Differently, they tend to prioritize certain historical periods whilst others remain overlooked. This results in the discontinuity of historical layers and the loss of integrative dialogues and descriptions of day-to-day life.

We argue that cities as archaeological palimpsests are 'deep cities' - the depth of which needs to be explored, identified and promoted in a participatory and socially inclusive manner (JPI 'Deep Cities' project www.deepcities.eu). This session will search for more socially inclusive forms of preservation and management of urban heritage. By exploring new participative methods to preserve urban multi-temporal palimpsests, as theoretical approach to understand temporality in a relative manner (Lucas 2005). Under the concept of deep cities, we aim to broaden the understanding of historical continuity through the layers of social values and multivocal narratives. We are looking for conceptual frameworks and empirical case studies that draw on digital tools, co-production and archaeological research. The narratives that can arise from this debate and how they can be integrated into the objectives of a broader social archaeology, could also be discussed.

In short, this session will address key questions including but are not limited to:

- How are current archaeological practices embedded in urban transformations?
- What is the role of heritage management professionals and archaeologists in valuing social dimensions in heritage conservation within constantly changing urban contexts?
- How can participatory, people-centred, and digital approaches contribute to the ongoing transformation of deep cities? What new sustainable futures can open up for our cultural heritage?

Lucas. (2005). *The Archaeology of Time*. London: Routledge.

ABSTRACTS:

1 BORN-DIGITAL, DIGITISED AND 'ANALOGUE' METHODS TO ASSESS THE SOCIAL VALUES OF URBAN HERITAGE

Abstract author(s): Bonacchi, Chiara - Jones, Sian (University of Stirling)

Abstract format: Oral

This paper presents initial results of the quantitative and qualitative analysis undertaken online and offline to capture and assess social values associated with urban heritage. It evaluates the effectiveness of different born-digital, digitised and 'analogue' methods. These include web data analysis, surveys and participatory approaches such as crowdsourcing, rapid ethnography and photo elicitation within focus groups. These were developed and applied to the case study of a rapidly changing neighbourhood: Woolwich, in London, UK. The aim is to inform the negotiation between different sets of values to support sustainable urban transformations.

The authors will draw on the research they undertook on this topic with researchers Elizabeth Robson and Alex Hiscock (University of Stirling), as part of the 'Deep Cities project' (2020-2),* funded by the JPI-CH scheme and involving partners from the Norwegian Research Institute for Cultural Heritage Research (Norway), the University of Barcelona (Spain), the University of Florence (Italy) and UCL (UK).

*<https://curbatheri.niku.no>

2 TO KEEP OR NOT TO KEEP: PUBLIC ART DOCUMENTATION AND THE ARCHIVAL MEMORY

Abstract author(s): Xiridakis, Polyna (University of the Aegean; Urban Layers) - Kyriakopoulou, Emmanouela (National and Kapodistrian University of Athens; Urban Layers)

Abstract format: Oral

According to the historian Pierre Nora, "modern memory is, above all, archival". In modern society, we are constantly overwhelmed with a plethora of stimuli, which compete with each other for our scarce attention. Our decision to hold on to some traces from the abundance of events that surrounds us, is the way that the fabric of collective memory is being created. This paper is focusing on these decision-making practices and the documentation strategies, which are dealing with the ongoing history of now. Along this procedure, UrbanLayers will be used as a case study. UrbanLayers' goal is to develop a community for the "survival" of the thoughts, ideas, and anxieties of society depicted upon the city's walls. UrbanLayers' vision is the development of a digital platform for public art, which will record street art pieces through time (4-dimensional documentation), supported by community-based activities. The act of writing on public walls is multidimensional, omnipresent and continuously changing, so it emerges as one of the most suitable fields to test the methods which are applied to the creation of an archive. UrbanLayers is being used as the starting point and as a model for the documentation strategies and the way they can be applied in the field of street art history. We will examine how the results of the documentation process can be presented to the public and finally explain why, within our decentralized society, a practice that seems really beneficial for the creation of a part of the body of social memory is to open up the archival processes to a diverse audience. Every community is interwoven with its history, which is being shaped in the here and now, so the multivocality is being turned into an essential component regarding the development of modern archives and, ultimately, the identity of urban space.

3 UNPACKING PARTICIPATION IN BARCELONA

Abstract author(s): Pastor Pérez, Ana (University of Barcelona; Group of Public Archaeology and Heritage) - Castillo Mena, Alicia (Complutense University of Madrid) - Díaz-Andreu, Margarita (Catalan Institution for Research and Advanced Studies - ICREA; University of Barcelona)

Abstract format: Oral

Participatory processes are one of the main tools for the socialisation of heritage. In recent years, participatory governance has been introduced in some local authorities led by political parties supporting the anti-austerity movement. The scope of this paper to discuss the participatory strategies related with urban transformations and heritage that have been implemented in Barcelona over the last five years. In 2016 Barcelona City Council created the Decidim Barcelona platform, a digital tool aiming to channel participatory governance. It is meant to allow associations and individuals to debate with the municipality about issues related to the running of the city.

So far, the implementation of participatory governance in Barcelona has represented a before and an after in decision-making processes at administrative level, and this has resulted in some examples related to urban heritage conservation strategies. Yet, in Barcelona the safeguarding and caring for spaces related to cultural urban heritage had traditionally been undertaken by self-managed neighbourhood groups. With the arrival of Decidim Barcelona controversies have arisen given that it is being perceived by associations as a way to remove their already established bottom-up processes and self-managed sense of ownership. Some citizens argue that local authorities and experts are hijacking their decisions.

In this paper we analyse how successful has participatory governance been in Barcelona. We try to answer whether participation is actually being taken into account or whether it is being used to endorse already taken institutional decisions about urban heritage. We would like to explore if a sector of non-expert voices are being silenced and how we could, as academics and experts, turn this participation towards horizontality, recovering its previously established grassroots essence. In the later part of the paper we reflect on the future of participation in urban heritage processes.

114 1200 BC FROM THE ATLANTIC TO ASIA: SOCIAL COLLAPSE AND RESILIENCE IN REGIONAL PERSPECTIVE. PART 1

Theme: 2. Pandemics and climate change: responses to global challenges

Organisers: Molloy, Barry (University College Dublin) - Vandkilde, Helle (Aarhus University) - Yasur-Landau, Assaf (University of Haifa) - Orfanou, Vana (University College Dublin)

Format: Regular session

East Mediterranean societies in the 13th century reached a zenith of connectivity and material affluence. This globalised world suffered a dramatic collapse around 1200 BC in less than 100 years. A comparison of East Mediterranean between 1300 and 1100

BC reveals fundamentally different places in terms of social organisation and connectedness. At around the same time social crises and collapse took place within several parts of Bronze Age Europe. Such rapid, transformative phenomena had a wholesale effect on domestic, subsistence, mortuary, ritual, economic and political spheres. The contemporaneity of such rapid developments across a broad region suggests possible causal connections.

A basic tenet of archaeology is to explain how such sharply punctuated changes transform the material features of an established socio-political order. However, simple mono-causal models explain poorly why and how societies collapse. Longer-term, integrative perspectives that explore the lead up, unfolding and aftermath of collapse horizons may better reveal the character of material and social change. Alongside papers that explore what is lost during crises, a core tenet of collapse studies, contributions exploring the nature of resilience in social change are also sought for this session.

A comparative approach to Late Bronze Age societies between the Atlantic and southwest Asia within a narrow window of time (1300-1000 BC) will be developed. This enables exploration of factors shaping change that go beyond the parameters of any given social network. Uniquely, this session draws upon contemporary complex urban and non-urban case-studies. Our contributors will focus on the pace, nature and physical markers of social change in the decades around 1200 BC using a variety of evidence from Europe, southwest Asia and north Africa. We will explore theoretical approaches which seek to explain rapid and catastrophic cultural change, and ultimately, how this specific period of crisis unfolded on a large geographic scale.

ABSTRACTS:

1 NEW OPPORTUNITIES IN TURBULENT TIMES: ATTICA IN THE 12TH C. BC

Abstract author(s): Salavoura, Eleni (Greek Ministry of Culture)

Abstract format: Oral

Mycenaean civilization survived the disasters of ca. 1200 B.C., however the 12th century on Mainland Greece and the Aegean was clearly a period of upheaval. The centrally administered palace economies of the 13th c. gave way to more dispersed forms of economic organization. Athens was not highly centralized, and the Attic countryside, especially its western, eastern coast and the plain of Mesogaia, flourished in the palatial times. In the 12th c., the continuity of occupation in Athens and the eastern coast of Attica indicate a region that did not suffer a major destruction or abandonment. The fragmented landscape of the Postpalatial Aegean points to the existence of new decentralized coastal and maritime networks, which frequently consist 'small worlds'. Any narrative of collapse in Attica has to be compatible with the foundation and century-long life cemetery of Perati, a site with imports from Cyclades, Dodecanese, Crete, Cyprus, Egypt and Syria. A second Late Helladic IIIc chamber tomb cemetery, 2 km western from Perati, at Porto Rapti: Drivlia, as well as Mycenaean finds from nearby sites of the eastern coast indicate that Attica participated in long-distance trade, but it was also incorporated in a mainland-looking network.

This paper will focus on the networks around the Saronic and Euboean gulf, and their connectivity with the wider Eastern Mediterranean world. In order to understand the ascendance and decline of these regions and microregions, and even individual sites, network analysis will be used, attempting to identify the changes of the maritime networks from Palatial to Postpalatial times, as well as to the transition to the 11th century BC. The study of the archaeological finds along with the changes detected in the settlement pattern will contribute to review Attica's role, suggesting that times of crisis and recession are also times of new opportunities.

2 HEGEMONY AND FRAGILITY: THE CASE OF MYCENAEAN GREECE

Abstract author(s): Middleton, Guy (Newcastle University)

Abstract format: Oral

Whilst a series of high profile studies (eg. Kaniewski et al. 2019; Kaniewski and Van Campo 2017) have maintained a rigid fixation on finding evidence for climate change that can then be blamed for the c. 1200 BC collapse of the Mycenaean palace societies, a number of recent studies on collapse have shifted the focus away from the identification of external causes and towards a recognition of the inherent structural fragility of many ancient states and empires (Scott 2017; Yoffee 2019; already Kaufman 1988). Fragility studies force us to acknowledge that complex societies and political units can and do collapse without any impact from climate change or indeed any external drivers – collapse can take place within distinct culture zones and/or political units for purely historical and particular reasons. This is clearly the case, for example, with some of the Classic Maya polities (Demarest 2014), and 'empires' within Mesopotamia (Yoffee and Seri 2019).

Rather than focusing on external causes and constructing narratives of apocalyptic collapse, a much more simple and local explanation for the Mycenaean collapse c. 1200 BC may be more plausible. That is, that in competing with each other and seeking to extend hegemony and influence, the activities and ideologies of the palace states and their rulers resulted in mutual and eventually self-destruction, resulting in an end to the palace-system and its culture. In addition, it could be plausibly suggested that the social fallout from this period may have been an increasingly egalitarian social ideology.

3 DIFFERING TRAJECTORIES OF COLLAPSE IN THE LATE BRONZE AGE ARGOLID: MYCENAE AND TIRYNS FROM 1250 BC TO 1100 BC

Abstract author(s): Zeman, Piotr (Adam Mickiewicz University in Poznań, Faculty of Archaeology)

Abstract format: Oral

Argolid was one of the core regions of the Mycenaean civilization, which dominated the Aegean in the Late Bronze Age (Late Helladic period = LH, 1700 – 1050 BC). In the 14th century BC it formed a locally specific palatial culture and entered an era of complex, urbanized, functionally and structurally organized settlement networks, centred around palatial towns, formed of palaces and lower towns surrounding them. In the Argolid, a Mycenaean state developed around the site of Mycenae, with another palatial town at Tiryns, serving probably as a secondary capital and a main harbour. However, this dynamic changed in the 13th century BC, when a series of events started to unfold that ultimately lead to the collapse of the Mycenaean palatial system around 1200 BC. Although both natural disasters and human agency contributed to the fall of the palaces, the chain of events and their results seem to differ in Mycenae and Tiryns. In the post-palatial period (LH IIIC, 1200 – 1050 BC) Mycenae experienced a gradual loss of political and economic status, while Tiryns soon expanded as a settlement and became the main centre of the region. This paper, built on a comparative perspective, aims at elaborating and explaining differing trajectories of collapse and resilience, of both palatial towns of the Argolid. Drawing from the systematic, relational approach to settlement studies and urbanization, as well as the entanglement theory, I discuss the disintegration of palatial culture and urbanized settlement networks as a long-term, multi-causal and gradual process of de-urbanisation and disentanglement of the social and economic networks organized around the palaces, which in the same time formed a new, post-palatial Mycenaean world.

4 VULNERABLE MYCENAEANS? A HUMAN-ENVIRONMENT PERSPECTIVE

Abstract author(s): Weiberg, Erika - Finné, Martin (Uppsala University, Department of archaeology and ancient history)

Abstract format: Oral

The breakdown of the seemingly thriving Mycenaean palatial societies on the Greek mainland around 1200 BCE has received a lot of attention, not least because similar processes played out in other areas in the Eastern Mediterranean at roughly the same time. A combination of internal and external drivers been suggested as contributing to the outcome, including a recent focus on the possible negative effects of climate change. However, any effects of climate change, negative or positive, depend on the societal as well as environmental settings in the study area. It is thus crucial to consider a broad spectrum of factors and the co-evolution of changes leading up to 1200 BCE events. Few attempts have been made to understand the breakdown of the Mycenaean palatial societies in view of the preceding periods during which the Mycenaean ways of life first emerged and thereafter consolidated over time into the scenario that can be reconstructed for the final decades of the palatial period, and for its post-palatial repercussions. In this paper, we take on a human-environment perspective, assessing evidence for climate change, in parallel with a discussion of the overall scale of human activity and resourcefulness, socio-political control functions, societal cohesion and land use. Such factors likely contributed to the vulnerability load of these societies, affecting their inherent sensitivity and adaptive capacity and making them more or less able and willing to adapt to and to utilise changing environmental conditions stemming from climate change.

5 CHANGE AND ADAPTABILITY DURING THE LATE BRONZE TO IRON AGE TRANSITION: INSIGHTS FROM RADIOCARBON AND POTTERY IN THE SOUTHERN LEVANT

Abstract author(s): Webster, Lyndelle (Austrian Academy of Sciences) - Kleiman, Sabine (Tübingen University)

Abstract format: Oral

The transition from the Late Bronze to Iron Ages in the southern Levant has been the subject of intense debate concerning the timing and nature of major, multifaceted cultural and political changes. During this period, local communities suffered a series of catastrophic events, witnessed the stepwise collapse of their centuries-old city-state system and observed the nonlinear decline of Egyptian 'colonial' rule; in addition, they were confronted with new cultural influences and migrating/displaced peoples.

Key to elucidating the complex chain of events and adaptive response of societies during the Late Bronze/Iron Age transition, are ceramic studies and radiocarbon dating (14C). An accumulating body of 14C data now enables an absolute chronological framework that is independent of external factors such as Egyptian texts and foreign material parallels. It confirms some aspects of the traditional chronology while challenging others and bringing clarity to the most debated issues. The date of widespread destruction events, the end of Egyptian rule, and the introduction of local Aegean-style (so-called 'Philistine') material culture can each be addressed in considerable detail.

Pottery studies, on the other hand, can illuminate the relative chronological framework of the Late Bronze/Iron Age transition. Ceramic studies in the southern Levant – specifically the coastal 'Philistine' heartland and adjacent Shephelah region – have tended to emphasize new foreign elements at the expense of the indigenous 'Late Bronze-style' pottery traditions. However, close examination of the latter provides particular insight on how communities preserved and adapted their traditions through the tumultuous 13th–11th centuries BCE. It seems that the local artists were influenced by the appearance of foreign potters and adapted their own traditions within the indigenous ceramic workshops. Such insights allow a fine-tuning of relative chronology that neatly corresponds the 14C evidence, while also providing a crucial window on the resilience and adaptability of southern Levantine society.

6 GENETIC CHANGE AND POPULATION MOVEMENT C. 1200 BCE: A VIEW FROM THE NORTH AND WEST

Abstract author(s): Armit, Ian - Bleasdale, Madeleine - Büster, Lindsey - Fischer, Claire-Elise (University of York) - Booth, Tom (The Francis Crick Institute) - Patterson, Nick - Isakov, Michael (Harvard University) - Evans, Jane (British Geological Survey) - Hamilton, Derek (SUERC) - Reich, David (Harvard University)

Abstract format: Oral

The last centuries of the second millennium BC were a period of intense connectivity in Central and Western Europe. This is clear from studies of material culture that demonstrate the widespread distribution of specific objects, the exchange of raw materials, and shared patterns of deposition.

A new study of whole genome ancient DNA from Bronze and Iron Age populations, focusing on Britain but including substantial new datasets for areas of continental Europe, has also identified major genetic changes in the Middle-Late Bronze Age (c. 1300–800 BCE). In Britain specifically, a rise in ancestry derived from Early European Farmers (EEF) appears to represent an influx of people from a region most likely located in present-day France. Due to a paucity of aDNA coverage in the potential source region(s), it is presently impossible to determine whether the movement of people was reciprocal or unidirectional. It is striking, however, that many of those who moved appear to have been female. Similar genetic changes are evident in the Netherlands and Czechia, although based on fewer samples, while in Iberia we see a decrease in EEF ancestry.

Taken together, the genetic data suggest a period of complex connectivity between regions in Central and Western Europe, including significant movements of people. The underlying social processes are likely to be complex and not reducible to the simple outward spread of a single population. While there is presently no genetic evidence to link these population movements with upheavals seen in the east Mediterranean c. 1200 BCE, their chronological proximity is striking. This paper will discuss the recent genetic results in the context of broader archaeological understandings of the period in Central and Western Europe and consider their potential relevance to events further afield.

7 WHEN THE PENDULUM SWINGS BACK: THE 12TH CENTURY BCE AS THE BEGINNING OF A PERIOD OF GROWING EUROPEAN INTEGRATION

Abstract author(s): Gorgues, Alexis (University of Bordeaux Montaigne)

Abstract format: Oral

As the title of this session clearly emphasizes, the beginning of the 12th century BCE is considered in the Eastern Mediterranean as the first step in the quick dismantlement of the sophisticated Late Bronze Age social and political structure. Such a point of view would likely be dismissed by an archaeologist studying Western European Late Prehistory. In western context, the 12th century may rather be considered as the beginning of increasing connectivity (thus giving birth to wide complexes such as the Atlantic one), growing technological complexity (development of copper alloy sheet hammering and lost-wax technique), dynamic social changes, etc.: the beginning of a new dynamic that would last until the 10-9th centuries BCE at least, with strong regional variations. In some regions, as in the north-western Mediterranean, it is probably the beginning of *longue durée* processes, that will develop well into the Late Iron Age.

This paper will defend the idea that the "collapse" observed in Greece will mark the beginning of a period when social and political structures were more akin to forms observed elsewhere in Europe, in particular in Western Mediterranean Europe. Last, this paper will question the possible dynamics of this process (without trying to provide an explanation to the fall of the Palaces!) and to broadly assess its consequences. This will lead us to have a glance beyond the threshold of the 2nd millennium into the first centuries of the 1st millennium BCE, if the organizers allow me.

8 1200 BC: A PERSPECTIVE FROM THE NILE DELTA

Abstract author(s): Franzmeier, Henning (Università di Bologna; Roemer- and Pelizaeus-Museum Hildesheim)

Abstract format: Oral

The reliefs of Ramesses III's temple at Medinet Habu are still being used as a central argument in many if not the most, broader discussions of the period around 1200 BC in the Eastern Mediterranean. In addition, texts and archaeological evidence are brought in which in their vast majority come from Upper Egypt, especially the Theban area. Archaeological evidence from the Nile Delta is rarely referred to, even though the region is central to one of the most important events – the battles between the Egyptian forces and the sea peoples.

The lecture will take the perspective from the site of Pi-Ramesses, Egypt's capital during this time and discuss the results of more than 40 years of archaeological research and their implications for the discussion. While no large-scale destruction layers can be observed, the end of the New Kingdom seems to have been preceded by an end of monumental construction in the capital. Moreover, official buildings seem to have been used as squatter residences. These results will be analyzed within the framework of the general historical development in Egypt.

One of the central points which need to be discussed is whether the events around 1200 BC and their aftermath were really behind the end of New Kingdom Egypt which took place only about 100 years after the end of the Late Bronze Age.

9 DECENTRALISED COMMERCIAL STRATEGIES IN THE MEDITERRANEAN AFTER 1200 BC AND THE ROLE OF CYPRUS

Abstract author(s): Georgiou, Artemis (University of Cyprus)

Abstract format: Oral

The spectacular collapse of the majority of the palatial and imperial political regimes in the eastern Mediterranean ca. 1200 BC, and the disintegration of the centralised commerce that characterised interregional connectivity in the previous centuries, had a profound impact on the Cypriot communities, whose prosperity relied heavily on the extra-insular bulk transshipment of copper. The transformations of the island's settlement pattern and material culture notwithstanding, the 12th century BC in Cyprus does not correspond to the disruption of the island's idiosyncratic politico-economic forms. For instance, the persistence of the indigenous syllabic writing system indicates an impressive level of continuity. More importantly, it was during this transformative era that the Cypriot communities rose to the forefront of the emergent interregional commercial strategies in the Mediterranean, which were characterised by entrepreneurship in smaller and regional spheres.

The presentation will elaborate on the transformed character of copper trade in the eastern Mediterranean, aggregating new data from contexts within Cyprus and beyond. The study will also focus on the commercial links between Cyprus and the Levant, as evidenced by the deposition of Cypriot finewares in Levantine contexts. Finally, a critical indicator of the uninterrupted trading connections between Cyprus and the rest of the eastern Mediterranean are the large numbers of imported Maritime Transport Containers recovered in Cypriot contexts of the 12th century BC. The sheer quantities of these ceramic containers, predominantly "Canaanite Jars" produced in various centres of the Levant, but also Egyptian Jars and Minoan Transport Stirrup Jars, are indicative of the scale of maritime trade during the post-"crisis" era. The contribution ultimately aspires to address the transformations in the character of interregional connectivity in the Mediterranean after ca. 1200 BC, and to highlight the role of Cyprus as an important nexus within the emergent decentralised commercial strategies.

10 USING MACHINE LEARNING TO ILLUMINATE SOCIAL CHANGE: INTEGRATING DATA SETS FROM 1300-1000 BC FROM THE ATLANTIC TO SOUTHWEST ASIA

Abstract author(s): Bell, Carol (UCL)

Abstract format: Oral

Advances in machine learning have yet to find widespread application in Archaeology even though this technology is used extensively to identify patterns in, for example, economic, financial and medical data. The ability to sift efficiently through the enormous, and rapidly growing, literature on Late Bronze Age and Early Iron Age Eurasia, from the Atlantic to Southwest Asia, using machine learning could be an important step in advancing understanding of how the scope and intensity of long-distance interactions and external factors, such as climate change, contributed to cultural change over time.

This paper evaluates the potential of applying machine learning to identify and correlate the markers of cultural change and societal resilience between 1300 and 1000 BC across Eurasia. It will highlight the value of this method in rapidly extracting meaningful trends from academic literature and digital sources written in multiple modern languages and across multiple disciplines (archaeology, philology and all relevant scientific disciplines including climate, provenance studies and ancient DNA analysis). Assembling relevant evidence efficiently in this way paves the way for resources to be directed towards evolving research questions and building, and testing, explanatory hypotheses for cultural change in Eurasia between 1300 and 1000 BC.

11 RADICALLY DIFFERENT? RESPITE AND RESILIENCE OF THE BRONZE AGE IN THE NORDIC REGION

Abstract author(s): Ahlqvist, Laura - Vandkilde, Helle (Aarhus University)

Abstract format: Oral

The paper discusses the extent to which '1200 BC' impacted S. Scandinavia. The Nordic Bronze Age was utterly reliant on European metal trade and should logically respond to interrupted channels of metal transfer. Indeed, significant changes occurred in the North during this tumultuous time: they tie up with European-scale crises, but were also rooted in the preceding period. An environmental downturn is observable immediately prior to 1200 BC, seemingly linked to generations of unsustainable, aggrandizing mound construction (land) and house-building (timber). The Lössen glacial maximum (c. 1300-1100 BCE) may be understood as an overall background of environmental instability.

In Scandinavia, the time around 1200 BC appears generally less troubled by collapse and crisis than other parts of the Bronze Age world. The 'fall' of 1200 BC in the North marks a significant threshold out of which the culturally distinct Nordic Bronze Age (c. 1600-600 BC) appeared born anew through the integration of rooted tradition with Urnfield and Mediterranean ideas. Especially the period 1000-750 BC was a booming climax driven by European partnerships and political control of metal trading until interrupted c. 750-700 BC when deep crisis began to manifest likely connected to the Göschenen glacial maximum (c. 800-700 BCE).

The paper asks how susceptible Scandinavia was to change and collapse in the Bronze Age world through complex explanatory models. A *longue-durée* approach looks for continuity and disruption, degrees of success and failure. Should the Nordic region be

regarded as 'respite' or 'resilience'? Drawing on evidence from mortuary traditions, hoarding, conflict, landscape use as well as ritual and spiritual developments, glimpses of crisis as well as resilience transpire. These fluctuations appear intertwined with accelerating influx of impulses from the Urnfield region and even further away, which encourages a renewed cultural frame of reference for people in the Nordic region.

115 1200 BC FROM THE ATLANTIC TO ASIA: SOCIAL COLLAPSE AND RESILIENCE IN REGIONAL PERSPECTIVE. PART 2

Theme: 2. Pandemics and climate change: responses to global challenges

Organisers: Molloy, Barry (University College Dublin) - Vandkilde, Helle (Aarhus University) - Yasur-Landau, Assaf (University of Haifa) - Orfanou, Vana (University College Dublin)

Format: Regular session

East Mediterranean societies in the 13th century reached a zenith of connectivity and material affluence. This globalised world suffered a dramatic collapse around 1200 BC in less than 100 years. A comparison of East Mediterranean between 1300 and 1100 BC reveals fundamentally different places in terms of social organisation and connectedness. At around the same time social crises and collapse took place within several parts of Bronze Age Europe. Such rapid, transformative phenomena had a wholesale effect on domestic, subsistence, mortuary, ritual, economic and political spheres. The contemporaneity of such rapid developments across a broad region suggests possible causal connections.

A basic tenet of archaeology is to explain how such sharply punctuated changes transform the material features of an established socio-political order. However, simple mono-causal models explain poorly why and how societies collapse. Longer-term, integrative perspectives that explore the lead up, unfolding and aftermath of collapse horizons may better reveal the character of material and social change. Alongside papers that explore what is lost during crises, a core tenet of collapse studies, contributions exploring the nature of resilience in social change are also sought for this session.

A comparative approach to Late Bronze Age societies between the Atlantic and southwest Asia within a narrow window of time (1300-1000 BC) will be developed. This enables exploration of factors shaping change that go beyond the parameters of any given social network. Uniquely, this session draws upon contemporary complex urban and non-urban case-studies. Our contributors will focus on the pace, nature and physical markers of social change in the decades around 1200 BC using a variety of evidence from Europe, southwest Asia and north Africa. We will explore theoretical approaches which seek to explain rapid and catastrophic cultural change, and ultimately, how this specific period of crisis unfolded on a large geographic scale.

ABSTRACTS:

1 THE CULMINATION AND DECLINE OF MONUMENTAL ARCHITECTURE DURING THE NORDIC EARLY BRONZE AGE (1500-1200 BC) IN JUTLAND, DENMARK

Abstract author(s): Egelund Poulsen, Martin (Museum Sønderjylland)

Abstract format: Oral

During the Nordic Bronze Age Period II and early Period III, 1500 - 1200 BC, South Scandinavia experienced an increase in the construction of barrows and longhouses. In the westernmost region, the peninsula of Jutland, longhouses were particularly large robust structures. Especially in the western and southern parts of Jutland, house walls were constructed using the bole-wall technique that demanded a large quantity of timber resources. Here, the largest and richest turve-built barrows were constructed as well. In recent years, new excavations and radiocarbon dates have confirmed that monumental architecture in Jutland reached its peak in late Period II or the 14th century BC. Thereafter, a gradual decline occurred during early Period III.

The construction of barrows had the most dramatic effect on the landscape, demanding thousands of grass and heather turves from the surrounding areas for each mound. The timber-consuming bole-walled longhouses were constructed in regions that already lacked suitable timber resources. Hence, the building material was most likely imported from forested regions further east. In contrast to other contemporary house types, the bole-walled construction represented an architecture of conspicuous consumption. Beside its resource consuming character with imported timber, the settlements with bole-walled houses were placed at visible and communicative locations along important land-routes and waterways.

Around 1200 BC the tradition of bole-walled architecture had come to an end along with monumental barrow and house building in general. Barrows hereafter were smaller and fewer in number. At the same time house architecture became less resource demanding and had a more ephemeral character. This radical change is often interpreted as the result of an extensive ecological crisis caused by the tradition of conspicuous monumental architecture. However, it should be explained by the collapse of established regional and international exchange networks as well.

2 SETTLEMENT, ECONOMY AND SOCIETY IN LATE BRONZE AGE EASTERN HUNGARY: THE START OF A NEW RESEARCH PROJECT

Abstract author(s): Szeverenyi, Vajk - Priskin, Annamária (Déri Múzeum, Debrecen) - Czukor, Péter (Móra Ferenc Múzeum, Szeged) - Szalontai, Csaba (Hungarian National Museum, Archaeological Heritage Protection, Budapest)

Abstract format: Oral

The period around 1200 BC saw significant transformations of many aspects of the life communities living in Eastern Hungary – and generally the Carpathian Basin: major changes occurred in settlement forms and patterns, multiple aspects of material culture, burial forms and depositional practices. The aim of our paper is to present the starting point and aims of a new research project investigating these changes focusing on settlement patterns and socio-economic change in Late Bronze Age eastern Hungary. We present briefly the evidence available on fortified megaliths in southeast Hungary that appear around 1300 BC and are abandoned around 1100 BC and their relationship to smaller secondary fortified centres and non-fortified sites, and some of the evidence for socio-economic organization at this time. Our main questions include why such a pattern with forts of such immense size emerged and then collapsed, and how this relates to the wider changes around 1200 BC in western Eurasia.

3 A NEW PLAYER IN 13TH C. BC OF SOUTHEAST AND MEDITERRANEAN EUROPE? THE TISZA SITE GROUP IN ITS REGIONAL CONTEXT

Abstract author(s): Bruyere, Caroline (University College Dublin) - Jovanović, Dragan (City Museum of Vršac) - Molloy, Barry (University College Dublin)

Abstract format: Oral

At the same time as the Mycenaean palaces and the Terramare, a dense settlement system was developing in the South Carpathian basin along the lower Tisza. Between 1500 – 1200 BC, after a transition period of divergence from classical MBA traditions, large enclosed settlements up to 200+ ha were established in an area that hadn't been substantially populated in the Middle Bronze Age. This group, which we have called Tisza Site Group (TSG), has 70+ sites and counting. With the pattern of distinguishing features shared by TSG sites only recognized a few years ago, research is still in its early stages. In archaeology, periods of crisis and collapse are often characterised through site abandonment or depopulation. In the 13th century, the South Carpathian Basin was linked through increasingly standardized material culture, yet current absolute dates at a limited number of published LBA sites indicate a reduction of activity or abandonment of settlements before 1200 BC. As a unit within this wider cultural zone, the TSG was necessarily involved in this pattern. It is well understood that collapse is multi-causal and in this presentation we will focus on the social dynamics involved with new data from our project SILT (Survey in the Lower Tisza). The basic tenet of our approach is that to understand collapse, we must understand stakes and stakeholders in a community. Hence, new C14 dates, material from survey and excavation, and spatial analysis data generated on the ERC "The Fall of 1200 BC" project (GA#772753) are integrated with the aim to characterize the TSG in its wider cultural context.

4 CONTINUITIES AND DISCONTINUITIES IN LUXURY GOODS: THE CASE OF GLASS IN POST-PALATIAL MYCENAEAN GREECE

Abstract author(s): Nikita, Kalliopi (Ephorate of Antiquities of East Attica)

Abstract format: Oral

The proposed paper deals with the production, exchange and use of glass in post-palatial Mycenaean Greece, namely in the LHIII period (12th-11th centuries BC). The flourishing glass industry of the principal Mycenaean period saw the consequences of the destruction of palatial centres and the collapse of Linear B administration system. Distinctive blue glass jewellery, mass-produced in the Mycenaean palaces, was widely distributed across the Aegean and in Cyprus during Late Helladic IIIA-B (14th-13th centuries BC). In post-palatial contexts, Mycenaean glass beads either rarely occur or they are unevenly distributed whilst the main bulk of glass seems to have been imported either from an eastern or from a western producing centre.

Material evidence from the cemeteries of Perati in Attica and from Elateia-Alonaki in Phthiotis will be used as a means for understanding the occurrence of glass as a luxury good in its context. The paper aims to trace continuities and discontinuities in the manufacture of glass beads in mainland Greece as well as in the importation of glass from contemporaneous glass-producing centres in the Eastern Mediterranean and in Italy. Owing to the quantity and quality of glass found in both sites their comparative study will shed light on continuities and discontinuities in the use of glass coming from earlier palatial traditions as well as in the role that glass had in the new elites that appeared in post-palatial Mycenaean society.

5 MORS TUA VITA MEA? NURAGIC'S RESILIENCE STRATEGY AFTER THE 1200 BC COLLAPSE OF METAL-TRADING NETWORKS

Abstract author(s): Matta, Valentina - Vandkilde, Helle (Aarhus University)

Abstract format: Oral

While 1200 BC represents a time of social and economic upheaval and collapse for many Mediterranean societies – following the 14th-13th centuries BC peaks – crisis does not seem to manifest markedly in Nuragic Sardinia. The island's Bronze Age witnesses two apparently diverging phenomena: on the one hand, an internal socio-economic crisis transpires in the reorganization of settle-

ments toward nucleation, and on the other hand, a remarkable maritime-trading expansion began. These two phenomena could well be connected. After 1200 BC, while Mycenaean polities were unable to continue successful commodity trading, Nuragic Sardinia rather adapted to the East Mediterranean crisis by changing its strategy and trading partners, thence creating new advantages for Nuragic communities.

What are the actual archaeological proxies for Nuragic resilience after 1200 BC? Researchers have addressed the Sardinia's resilience in several different ways. We argue that tracking the metal-led networks inside and outside the island has the potential to reveal changes over time in Nuragic society. We also argue, however, that there is a dire need for Sardinian high-precision chronology to establish a frame for trailing the changes and continuities in settlement habitation and in founding central sanctuaries. Firstly, we evaluate how the resilience concept has been addressed in the context of Nuragic Sardinia and its network. Secondly, we discuss signs of change, internally and externally, in Nuragic political economy over the Late/Final Bronze Age into the Early Iron Age. Thirdly, we propose a model of interaction spheres to hypothesise the island's changing role after the collapse of the Aegean polities.

6 BRONZE AGE SETTLEMENT DYNAMICS IN THE NORTH-EASTERN PO VALLEY (ITALY). THE CHRONOLOGICAL AND CULTURAL BACKGROUND OF A 1200BC RESISTANCE PHENOMENON

Abstract author(s): Dalla Longa, Elisa (Dipartimento dei Beni Culturali, Università di Padova)

Abstract format: Oral

The North-Eastern sector of the Po Valley (Italy) is known for being a crucial region in the development of the palafitticolo-terramarico culture, that evolved in the whole Po Valley between the Early and the Recent Bronze Age. After the EBA settlement phenomenon of pile-dwellings around the southern shore of Garda Lake and its intra-morainic basins, in that North-Eastern sector of the Po Valley an occupation of the plain zones occurs. During the Middle and the Recent Bronze Age this settlement phenomenon continues, with the first terramare sites and significant variations in the number of settlements, maybe also ascribable to local climate-driven hydrographic variations. A progressive preference emerges for settling in the southern- and eastern-most areas. Since the MBA3/RBA phase a polity of terramare sites develops in the lowlands of Verona province. These sites, and in particular their central place Fondo Paviani, show traits of peculiar richness and a central role in long distance exchange routes, connecting the Alps and Central Europe - through Adige river system - to the Po and the Mediterranean. At the end of RBA, a peculiar settlement dynamic interests the area: while the Southern Po Valley terramare system collapses, the North-Eastern sector, even if experiencing a crisis, resists and continues to be occupied in the Final Bronze Age, with a new settlement distribution and a territorial shifting of the central pole on Frattesina settlement, on the Po delta. Moving from the general analysis of this settlement trend, the present contribution aims at examining how specific human choices (as typologies of settlements and punctual locations of sites) alter following the trend. The resistance phenomenon after 1200 BC crisis can be better understood through the analysis of the nuanced changes of settlement aspects and settlement distribution occurred during the whole Bronze Age.

7 THE TERRAMARE CRISIS BETWEEN COLLAPSE AND RESILIENCE. PARALLEL BUT DIFFERENT HISTORIES AT NORTH AND AT SOUTH OF THE PO RIVER

Abstract author(s): Cupitò, Michele - Vicenzutto, Daivid (dBC - Università di Padova)

Abstract format: Oral

Between 16th and mid-12th century BC, the historical trajectory of the terramare actualized in the Central-Eastern Po Valley. The phenomenon was characterized by the fast diffusion of fortified settlements, together with the formation of a farmland provided with complex hydraulic infrastructures and the affirmation of an intensive agro-pastoral economic exploitation of the territory. The terramare culture had made Po Valley one of the more advanced sector of all Bronze Age Europe and the mediator between this area and the Aegean and Eastern world. Between the end of 13th and the beginning of 12th century BC, this civilization got into a crisis due to a series of correlated anthropic and environmental factors that rapidly lead to the collapse of the system. The crisis fell down on the whole territory, but its outcomes North and South of the Po river show many differences. In fact, while the Southern Po Valley system completely imploded and the territory depopulated, the Northern Po Valley one underwent a contraction but also put in place some resistance processes – and, in some ways, some resilience processes – that lead to the formation of totally new territorial entities, first of all the one pivoted on the international central place of Frattesina. The presented contribution aims at the first systematic analysis on the reasons that determined such different reactions and historical outcomes, despite the cultural and socio-economical homogeneity of the initial context. From the methodological point of view, the analysis will focus essentially on the plain zones and it will follow a comparative approach, following two integrated lines of inquiry. The Northern Po Valley sector and the Southern Po Valley one will be compared in parallel both from the cultural profile and for the environmental one, with the specific objective of highlighting analogies and differences between the two systems.

8 NOT ONLY TERRAMARE. THE 12TH CENTURY BC CRISIS AMONG THE THE PILE-DWELLINGS OF THE EASTERN SHORE OF LAKE GARDA

Abstract author(s): Albertini, Ilaria - Cupitò, Michele - Vicenzutto, David (dBC- Università di Padova)

Abstract format: Oral

As it is known, between the end of 13th and the beginning of the 12th century BC the terramare system underwent a crisis and collapsed within a few generations. This system had dominated the Central-Eastern Po Valley for 400 years ca., making this sector of the plain one of the most advanced of all Bronze Age Europe and the mediator between this area and the Aegaeon and Eastern world.

Thanks to the studies and the critical works performed in the last twenty years, the reasons that lead to the collapse of the system – an historical break of fundamental relevance for Italian and European protohistory – and the different ways in which the phenomenon occurred in the diverse areas – first of all, between the areas at North and at South of the Po river – were delineated in a sufficiently clear way.

However, in the general overview of this issue there is an aspect that the critical works have only superficially examined, without giving any overall synthesis: the development trend of a system that was distinct and different from the terramare one, but also intimately linked to it on the cultural and socio-economical level. We are talking about the wet environment settlements gravitating around Lake Garda.

The presented contribution aims to give the first precise definition of the entire historical trajectory followed by the Lake Garda pile-dwellings system – and in particular its Eastern sector – integrating all available archaeological, dendrochronological and paleo-environmental data. The specific objective is to highlight analogies and differences with the trajectory followed by terramare system and its behaviour in the crucial moment of the crisis. In this sense, a specific detailed study about the fundamental settlement pole of Peschiera will be performed.

9 COMPARATIVE TRENDS OF ITALIAN SOCIETIES BETWEEN 1300 AND 1100 BCE

Abstract author(s): Vanzetti, Alessandro - Palazzini, Flavia - Pizzuti, Elisa (University of Rome “La Sapienza”)

Abstract format: Oral

Italy and the Central Mediterranean were intensely involved in the boom-and-crisis phase of the Mediterranean Late Bronze Age. It has been highlighted that Mediterranean connectivity did play a role in the development of new material productions, economic strategies and possibly social structures in the Central Mediterranean, even if the scale of the foreign influence is still disputed. At the end of the connective boom, the Mediterranean crisis around 1200 BCE saw differential responses in the different interconnected areas of Italy and the main surrounding islands: in some areas crisis was evident; in other neighbouring territories resilience or even prosperity was the case. What more, the innovations that came into use during the former connective boom were somewhere totally rejected, somewhere instead maintained or developed.

Arguments discussing these outcomes have focused in the past mainly on the social structure of the Italian communities, arguing for a higher resilience by more hierarchical and structured societies. This can be partially maintained, but it seems that another factor should be considered in connection with social structure: the capacity of societies to assume change as a relevant factor of their adaptive strategy.

It can be argued that societies more open to change did result in a better global resilience than self-referential social milieux. We will present some cases to describe comparatively the proposed arguments.

10 TAKING THE PULSE OF BIOMOLECULAR AND BIOARCHAEOLOGICAL INSIGHTS INTO MOBILITY AND CHANGE CA. 1200 BC IN SOUTHEASTERN EUROPE

Abstract author(s): Molloy, Barry (University College Dublin) - Fibiger, Linda (University of Edinburgh) - Michael, Dimitra (University College Dublin) - Nafplioti, Argyro (Ancient DNA Lab, Institute of Molecular Biology & Biotechnology - IMBB; Foundation for Research & Technology - Hellas - FORTH)

Abstract format: Oral

Mobility is commonly linked to social change in archaeology, though in more recent years we have returned to discussions of mobility and population change. As the pendulum has swung back towards the movement of people as a catalyst for social change, fresh debates are emerging particularly around cases where there is a history of debate about migration in archaeology. The East Mediterranean and southeastern Europe is one of these important venues – from tales of Dorian Invaders to Sea Peoples, migration has been seen as a fundamental component of collapse since the early days of archaeology. While the debate remains simmering, it is due for a robust revival in the coming years as a number of projects currently analysing ancient human DNA are published.

This paper takes the pulse, so to speak, of where we are currently with respect to models of mobility and the current, quite limited, state of the art of palaeogenomics and stable isotope research for this specific period of crisis and change. Our intent is two-fold, to reflect on what kinds of questions archaeological-led enquiry may pose and in so doing, to consider the potential insights biomolecular research may contribute. We run a real risk as these data come online of invoking problematic stale old paradigms for migrations or at the very least, not adequately accommodating current theoretical models which are already breaking down inflexible culture-historical identities such as Minoan or Mycenaean. Moving beyond fixed models of (material) cultural identity, it is

also obvious that people were not constrained by genetics or places of origin, but by lifeways, experiences and choice. Since these are things not accessible through biomolecular research, we will assess how they can be made relevant when evaluating if or how mobility played a role in crises and ultimately collapse around 1200 BC.

11 RETHINKING THE “CRISIS YEARS” IN THE SOUTHERN LEVANT: CANAANITES, PHILISTINES, CONTINUITY AND CONNECTIVITY CA. 1250-1050 BCE

Abstract author(s): Yasur-Landau, Assaf (University of Haifa)

Abstract format: Oral

New data from fieldwork on land and underwater in Israel, a decade of experimentation with new scientific methods in archaeology, and new methodologies for addressing questions of mobility and networks allow re-assessment of the transition from the Bronze to Iron Age in the southern Levant. Initial results indicate a long and turbulent period of transformation ca. 1250-1050 BCE, rather than a clear-cut watershed event around 1200. A wave of destructions does occur but it begins already in the 13th century, while a growing number of large sites continue well into the 12th century. The migration of the Philistines into the southern coast and the creation of a multicultural society with the local Canaanites should be seen as part of highly variable and region-specific phenomena of Mediterranean mobility over land and sea. Furthermore, maritime trade does not end ca. 1200 yet shift its scale and gradually and the directionality of traded goods, with the Carmel coast continues to be a hub for maritime connectivity.

12 FROM COLLAPSE TO CREATIVE DESTRUCTION IN THE LATE BRONZE AGE SOUTHERN EUROPE AND THE EASTERN MEDITERRANEAN

Abstract author(s): Orfanou, Vana (University College Dublin)

Abstract format: Oral

During the last 20 years, the empirical applications of resilience theory in archaeology have intensified. A combination of current social and environmental challenges, alongside the ever-evolving discussions of past crises and collapse episodes have provided a solid impetus for archaeologists to explore past societal resilience. Mass population movements, social upheavals, extreme climatic and environmental phenomena, and public health crises have marked past societies, as they are currently affecting our global community. According to the adaptive cycle model, often used alongside resilience theory, societies follow iterations of cycles of growth, conservation, release, and reorganisation. The nature and duration of these iterative loops are determined by varying degrees of connectedness and potential of each cultural unit (Bradtöller et al. 2017). According to the adaptive cycle model, a form of creative destruction (release) is needed for the reorganisation of cultural systems. However, often in archaeology we still talk in terms of crises and collapse as the end of a linear process, instead of as a necessary regenerative step in the life history of a society. Based on an overview of case studies of empirical applications of resilience theory in the study of past social collapse episodes, I aim to explore the potentials and limitations of such approaches for revisiting the collapse of the Late Bronze Age highly hierarchical and centrally organised social systems in southern Europe and the eastern Mediterranean. I will also discuss how definitions of societal resilience emerge from empirical studies in archaeology, as resilience theory and the adaptive cycle model tend to encompass fluid definitions.

Reference:

- Bradtöller, M., Grimm, S., and Riel-Salvatore, J., 2017. Resilience theory in archaeological practice - An annotated review. *Quaternary International*, 446, 3-16.

116 THE ARCHAEOLOGY OF MAGYAR RAIDS IN WESTERN AND EASTERN EUROPE

Theme: 6. Material culture studies and societies

Organisers: Lemm, Thorsten (Centre for Baltic and Scandinavian Archaeology, Stiftung Schleswig-Holsteinische Landesmuseum) - Hedenstierna-Jonson, Charlotte (Department of Archaeology and Ancient History, Uppsala University) - Katona, Cséte (Department of Medieval Studies, Central European University) - Kalmring, Sven (Centre for Baltic and Scandinavian Archaeology, Stiftung Schleswig-Holsteinische Landesmuseum)

Format: Regular session

In the 9th and 10th centuries Western and Eastern Europe suffered from the raids of highly mobile Magyar horsemen. Only with the Battle at the Lech in 955 the East-Frankish King Otto put an end to nomad incursions into Western Europe, while attacks on the Byzantine Empire continued until 970.

Whereas the contemporaneous “Viking raids” are almost omnipresent in the scholarly and public discourse, the “Magyar raids” are comparably little established. Nevertheless, material evidence of the Magyar can be found both as direct evidence in the context of single finds and graves and as indirect evidence in the form of fortifications as attempts of countermeasures. In various regions the interaction between Magyar and other ethnicities is archaeologically visible through a hybridisation of material culture, in particular relating to weaponry and martial attire. On the Eastern spheres of the continent e.g., evidence of Viking and Magyar warfare even merge in joint campaigns and court services performed in territories from Scandinavia to the Kievan Rus and Byzantium.

This session – which originally was accepted for the EAA Conference in Budapest 2020 – wants to discuss the Magyar evidence in Western and Eastern Europe between the poles of warfare and cultural adaptation (in the light of the written sources) during the

period preceding the settlement of the Carpathian Basin and especially at the dawn of the Kingdom of Hungary. The session will address the following questions:

What is the material evidence of the Magyar within the Carpathian Basin? How do we interpret Magyar armoury from different contexts found outside their homelands? What made the Magyar raiders so successful? What countermeasures were undertaken by their opponents? Is it possible to identify plundered objects from Eastern and Western Europe in the Carpathian Basin? Can we pinpoint the interfaces of technology transfer and cultural adaptation?

ABSTRACTS:

1 THE TENTH-CENTURY MAGYAR MILITARY CAMPAIGNS AND THEIR ARCHAEOLOGICAL LEGACY

Abstract author(s): Langó, Péter (Research Centre for the Humanities, Budapest; Pázmány Péter Catholic University, Budapest) - Bácsatyi, Dániel (Research Centre for the Humanities, Budapest, Hungary) - Bede, Ilona (Sorbonne, Archaeology Department)

Abstract format: Oral

The tenth century is a vital period in European and Hungarian history. Modern Western historiography traditionally viewed the Magyar raids in a European context as a phenomenon which triggered social and economic developments. Apart from regarding Magyar raiders as brutal nomadic tribute collectors who interrupted local economic boom, it has been recognized that these incursions served as catalysing factors for the centralization of the people of the continent, an important step on the way of becoming a nation for many.

After the antecedents of the 1960s, in the last decades newer approaches question both the significance and the destructiveness of the Magyar incursions, quite akin to the effects of similar invasions like that of the Normans'. In the light of such investigations, mistrust in the written sources increased (e. g. Albert D'Haenens). Nevertheless, scepticism towards the importance of the Magyar campaigns could sometimes lead to hypercritical results (Hervé Mouillebouche). In the present paper, we side with the approach that generalizations ignore the specific historical and geographical contexts of these military undertakings and thus they should be avoided. Instead each and every source should be examined in its own context. In the second part of the paper, we will concentrate on the archaeological legacy of the Magyar raids in Western Europe, which offer new results in Austria (Gnadendorf), Germany (Lechfeld) and France (Aspres-lès-Corps). We will present the latest research on the route of Magyar military campaigns, as well as evaluate the material remains that may indicate such operations. To sum up, the presentation will review the material findings and the written evidence associated with Magyar military campaigns and will summarize the lessons learned so far.

2 ADVERSARIES OF THE MAGYARS IN THE WEST – RECONSTRUCTING THE OTTONIAN CAVALRY

Abstract author(s): Lemm, Thorsten (Centre for Baltic and Scandinavian Archaeology)

Abstract format: Oral

The topic of Magyar incursions into the East-Frankish Kingdom under Ottonian rule is inevitably related with two military incidents – the victories of the kings Henry I and Otto I at Riade in AD 933 respectively at the Lech in AD 955. The latter finally ended nearly 100 years of Magyar raids into Central and Western Europe once and for all. Although at both occasions the East-Frankish army very likely for the largest part consisted of foot soldiers, the cavalry was essential in order to counter the highly mobile Magyar warfare based on sturdy horses and mounted archers on the battlefield. In line with this, the mounted fighting men were highlighted in the written sources – such as Liudprand of Cremona's *Antapodosis* (II, 31), according to which Henry I prior to the battle of Riade gave his cavalymen specific orders on how to charge the enemy – and still today dominate people's ideas on Ottonian warfare.

However, a reconstruction of the Ottonian cavalry regarding the weaponry and equipment proves to be rather difficult – at least from an archaeological point of view alone. The absence of burials with grave goods within the former borders of the East-Frankish realm can only to a limited extent be compensated by stray finds and objects from fortresses or settlements. Hence, a reconstruction to a high degree has to rely on archaeological material from neighbouring regions that were strongly influenced by the East-Frankish Kingdom. Moreover, besides the archaeological evidence and a few historical documents especially pictorial sources have a special role to play. This applies particularly to the 10th century *Book of Maccabees*, which contains several realistically portrayed battle scenes.

The paper will discuss the possibilities of reconstructing the Ottonian cavalry based on a combination of these sources.

3 SILK AS BOOTY OF THE TENTH-CENTURY MAGYAR RAIDS

Abstract author(s): Harangi, Flórián (Pázmány Péter Catholic University, Institute of Archaeology) - Langó, Péter (Pázmány Péter Catholic University, Institute of Archaeology, Budapest; Research Centre for the Humanities, Institute of Archaeology, Budapest) - E. Nagy, Katalin (Independent researcher) - Türk, Attila (Pázmány Péter Catholic University, Institute of Archaeology, Budapest)

Abstract format: Oral

Written sources describing tenth-century Magyar raids in Western- and Southwestern Europe suggest that besides captives and objects made of silver and gold, the most valuable booties for the marauding Magyars were clothes and items made of silk.

These products were buried in the graves of Old Hungarians later in the Carpathian Basin in the 10th century. We know several graves and cemeteries among them which are extremely rich in silver objects and in these graves, under metal objects often small fragments of textiles-often silkfragments- were discovered.

Most of the silk finds recovered so far have been 'samite', almost without exception, demonstrating that this was a generally widespread type of fabric this period. These weft-faced compound twill silks are well known from Western European treasuries and written sources from the 10th century. These facts and the archaeological heritage of the 10th century in the Carpathian Basin (such as the presumably solitary grave at Fonyód) suggest that, these silks could be the booty of the Western raids.

A different type of silk (taqueté,weft-faced compound tabby) was excavated first at Tarpa (in 2012) and then in 2016 at Derecske. These taqueté silk remains are absent from Western Europe or the famous Viking finds in Northern Europe. Maybe this type of textile has arrived in the Carpathian Basin from the Near East on the Transeuropean trade route(s). All this suggests that Hungarians had access to a different sources of silk in the 10th century beside the Western raids, but their role is not negligible.

The dirhams and the taqueté silk finds suggest, that Old Hungarians kept their trade contacts with Central Asia even after their conquest in the Carpathian Basin in 895 AD.

4 ARCHAEOLOGICAL TRACES OF THE MAGYARS IN SLOVENIAN TERRITORY: SMALL FINDS FROM VARIOUS CONTEXTS

Abstract author(s): Karo, Špela (Institute for the Protection of Cultural Heritage of Slovenia, Centre for Preventive Archaeology)

Abstract format: Oral

Only few artefacts that can be related to the Magyar presence in the territory of present-day Slovenia have been discovered so far. These finds encompass items of equestrian equipment, as well as weapons: iron stirrups of various forms, heart-shaped pendants, parts of belt sets and straps, arrowheads, and the remains of an arrow quiver. They originate from various types of findspots: hilltop sites, settlements, cemeteries, and a river. The prevailing type, however, is hilltops (Gradišče above Trebenče, Ljubična above Zbelovska Gora, Gradišče above Bašelj, Veliki gradec near Drežnica, and Zidani gaber above Mihovo). In the majority of cases the finds were discovered with metal detectors and therefore come without precise location data or stratigraphic contexts. The iron stirrup discovered in the Ljubljanica river is also a chance find. In rare cases, Magyar finds have been discovered in systematically investigated sites such as Ajdna above Potoki, Tonovcov grad near Kobarid, and Pristava in Bled. Arrowheads from debris or charred layers in these settlements likely testify of Magyar invaders. Magyar burials in Slovenian territory are an exception. Only two graves from the Ptuj Castle cemetery can allegedly be ascribed to the Magyars.

The collected artefacts from Slovenian sites are therefore studied predominantly from the typological perspective and dated on the basis of comparable sites and artefacts from neighbouring regions, especially from graves in the Carpathian Basin. Their presence in Slovenian sites can be explained by frequent Magyar incursions to the west between the end of the 9th and the middle of the 10th century, which crossed also territory of present-day Slovenia and are reported in historical sources.

5 MILITARY CO-OPERATION OF STEPPIC AND VIKING WARFARE IN EASTERN EUROPE

Abstract author(s): Katona, Csete (Central European University)

Abstract format: Oral

Viking retinue members in Eastern Europe – known as Varangians and/or Rus' in contemporary sources – were present in Constantinople, the Kievan Rus and the Khazar capital, Itil. Even though firm evidence is lacking, there is a possibility that Scandinavians entered local service in three other areas, namely Poland, Hungary and Volga Bulgaria. In all these places, the written sources testify that alongside mercenaries of Scandinavian ethnic backgrounds, people of Turkic origin also took service at the same time. Courts in Eastern and South-Eastern Europe could have become first hand cultural transfer zones for Scandinavian retainers and nomadic warriors might have had an effect on Viking retainers in a military-cultural sense. During common guard duties and military campaigns, steppic warfare techniques were introduced to the Scandinavians. While Vikings originally preferred to fight on foot in closed combat, some contextual and archaeological evidence suggests that Vikings became accustomed to fighting alongside an ally of horsemen and that some of their groups might have acquired nomadic fighting habits, including archery or mounted warfare. Attention will be devoted to Scandinavian type of weapons with typical Eastern embellishments, and nomadic weapons with Nordic decorations found in Eastern Europe, as well as grave furnishings of 'mixed' cultural ties. All these imply that ties between some Scandinavian and Turkic groups might have been quite close.

6 MAGYAR AND ORIENTAL ARTEFACTS FROM HEDEBY

Abstract author(s): Kalmring, Sven (Centre for Baltic and Scandinavian Archaeology)

Abstract format: Oral

In the Historical Sources, the northernmost Magyar raid is documented for the year AD 915 to Bremen in Lower Saxony. In maps on the Hungarian Invasions of Europe, though, often one arrow even points into Danish Southern Jutland. While the basic 15th century AD-account certainly needs to be doubted in its source-critical reliability, in Scandinavia some astonishing finds of Magyar origin are recorded. These, however, only cluster in East-Central Sweden and the area of Lake Mälaren. In Birka, Magyar and Steppe Nomadic finds are generally being tied to the shifting networks of the early town from Western- to Eastern Europe, i.e. the Rus', Byzantium and

the Arabic World after AD 860. Viking-age Denmark instead, due to its topographical situation, predominately maintained contacts with Anglo-Saxon England and the Continent and thus appears to be far poorer in Eastern artefacts in general. Thus it seems only consequent that neither in Hedeby, being virtually situated on the border between Viking-age Scandinavia and Continental Europe – and despite Magyar raids reaching as north as Bremen (and possibly even Denmark) – any Magyar finds have hitherto been acknowledged. Yet despite the fact that the grave goods from Hedeby's burials are comparably poor due to early Christian influences, upon closer inspection a few individual artefacts of Magyar origins can be identified among the settlement finds. Were they a result of direct contacts with the Magyars raiding in Western Europe prior to the Battle at the Lech in AD 955, obtained in a process of hybridisation the vast Rus' and Steppe Nomadic expanses on the Road to Byzantium or do they even witness Scandinavian mercenaries in the army of the Byzantine Emperors until AD 970? The paper will present and discuss Hedeby's eastern artefacts and its closer find contexts.

7 THE SCANDINAVIAN MAGYAR (OR THE MAGYAR SCANDINAVIAN)

Abstract author(s): Hedenstierna-Jonson, Charlotte (Dep. of Archaeology and Ancient History, Uppsala University; The Swedish History Museum)

Abstract format: Oral

The interactions between Scandinavians and Magyars can be traced in the material culture, both within Scandinavia and in present day Hungary, especially in connection to the warrior and martial society. Although the material, at present, is limited, it contains highly interesting evidence of hybridisation that begs the question of how this material and its users were considered. How do we discuss objects in terms of culture, ethnicity and affiliation when they convey a complex mixture of all these aspects? The material provides important and noteworthy indications of interaction between different cultures, but also the development of something new. The intensity of these interactions has left traces both in the material culture, but also in more complex contexts like particular battle techniques and its designated weaponry. The aim of this paper is to discuss the character and outcome of the interactions that lay behind this hybrid expression of material culture and reflect upon if the bearers considered themselves Magyars, Scandinavians or something completely different.

8 MAGYAR EVIDENCE IN THE MORDVA BURIAL GROUNDS ON THE LOWER OKA

Abstract author(s): Zelentsova, Olga (Institute of Archaeology Russian Academy of Sciences)

Abstract format: Oral

The Magyars affected many peoples of the forest zone in Eastern Europe as they walked across the East European steppes to the west, to Pannonia. They made a distinctive mark on their history. We can see it in material culture and funeral rites. We find the evidence of such contacts in the soldiers' graves in the burial grounds of Mordva on the Lower Oka. In the Armory there is a quiver of arrows, swords and daggers. These weapons, as well as the horse equipment in burials, is the evidence of borrowing military traditions of the nomadic world. Innovations appear in men's clothing too. Earrings or Saltov earrings as a marker of military status. Military costume accessories included belts decorated with silver or gold-plated overlays, and waist bags. Buttons prove the use of a caftan that was not traditional for Mordva. All these clothing and equipment details of Magyar warriors became popular with the Finno-Ugric people of Pooch at the end of the 9th-first half of the 10th century.

In Mordva, such items were found in almost half the male graves of that time. We cannot make a reliable conclusion about these warriors' ethnicity. These people were buried according to the customs that were typical of the local population. We can't classify them as nomads. In this case, we might be dealing with the hybridization of material culture, when the effectiveness of Magyar raids caused the fashion for "Magyar" jewelry, and also encouraged the spread of weapons and tactics of warfare. This does not exclude that some Magyar raiders were part of the local army, which played a special role on the North-Eastern border of Khazaria. Such an example is the burial of a man with silver eyecups in the Armiyevsky Mordva burial ground.

9 RESEARCH OF DOUBLE EDGED SWORD FROM THE 10TH-CENTURY CARPATHIAN BASIN. RESULTS AND PERSPECTIVES

Abstract author(s): Zágórhidi Czigány, Bertalan (Pázmány Péter Catholic University, Institute of Archaeology, Budapest) - Langó, Péter (Pázmány Péter Catholic University, Institute of Archaeology, Budapest; Research Centre for the Humanities, Institute of Archaeology, Budapest) - Katona, Csete (Central European University) - Harangi, Flórián (Pázmány Péter Catholic University, Institute of Archaeology, Budapest)

Abstract format: Oral

The study of tenth-century double-edged swords has a long tradition both in international and Hungarian research. Nevertheless, the topic still has several unexplored aspects which became the subject of recent research in Hungary. While many archaeologists have dealt with these objects during the 20th century, an up-to-date monography about the 10th century swords from the Carpathian Basin is still absent, despite the huge number of discovered specimen (around 140 in number).

Our newly formed research group (including students and colleagues from the Pázmány Péter Catholic University, the Janus Pannonius Museum, the University of Miskolc and Central-European University) aims to fill this gap. The research groups will attempt to answer questions regarding the origin of these objects, the date of their appearance and distribution in the Carpathian Basin, the social background of their owners, as well as the significance of swords in burial contexts. In a broader perspective, the historical

aspects related to the use of such weapons in combat will be examined with a particular focus on the tenth-century Magyar raids. Special attention will be devoted to fighting techniques, and the problematics of the so-called „sabre hilted swords”, a special typological variation of weapons with a straight-doubled-edged blade and a curved sabre handle. An archaeometallurgical study of the weapons in question will be presented by specialists of the research group in a separate conference paper.

10 METALLOGRAPHIC EXAMINATIONS OF THE DOUBLE-EDGED SWORDS FROM THE 10TH CENTURY CARPATHIAN BASIN – PRELIMINARY RESULTS

Abstract author(s): Tóth, Boglárka (Pázmány Péter Catholic University, Institute of Archaeology, Budapest) - Haramza, Márk (Janus Pannonius Museum, Department of Archaeology, Pécs) - Török, Béla (University of Miskolc, Institute of Metallurgy, Miskolc)

Abstract format: Oral

The complex examination of medieval double-edged swords has been a significant research area during the 20th century in Europe. Despite the popularity of this research field, a general work on double-edged swords from the 10th century Carpathian Basin supplemented by archaeometallurgical examinations, is still missing. Within the framework of a multiannual project, the major aim of our research is the interdisciplinary investigation of these weapons.

In the study of double-edged swords, the examination of technological features of weapons using laboratory techniques is a quite well-established method. In addition, several archaeological interpretations of archaeometallurgical results have been published (Košta-Hošek 2015; Mehofer 2006; Moilanen 2015). With this in mind, it is considerable to acquire adequate knowledge of the material, manufacture process and mechanical properties of the swords we are investigating.

The examinations of the swords using archaeological and archaeometrical methods (portable XRF, optical microscopy, SEM-EDS, Vickers hardness test) have provided new results, that are relevant to both archaeology, and military as well as technical history. In narrower aspects, exploring of the traces of processing in order to characterize the possible manufacturing technology and to model the presumable technological transfer is also an important object of the research.

Despite the fact that some similarities (e.g. the fine pearlitic structure) can be observed in the microstructure of examined swords, we can also establish that the used techniques and technologies during the manufacturing process are diverse. Comparing our results with those of international research will provide a deeper insight into the history of 10th century European sword manufacture.

11 BOJNÁ - ANONYMOUS' MYSTERY HILLFORT BANA?

Abstract author(s): Robak, Zbigniew (Slovak Academy of Sciences; Römisch-Germanisches Zentralmuseum Mainz)

Abstract format: Oral

Based on the results of archaeological excavations at the hillfort Bojná (Slovakia) and information from written sources about the Moravians role in the Hungarian raids in Europe in the first half of the 10th century, the presentation attempts to answer the question whether the hillfort could be the mysterious Bana stronghold known from the Anonymus' Gesta Hungarorum. Furthermore, the author will consider the role of the hillfort in the defensive system from the times of Great Moravia collapse and Hungarian conquest of the Carpathian Basin.

The oldest known Hungarian chronicle, Anonymus' Gesta Hungarorum, describes the Hungarian conquest of the northern part of the Carpathian Basin in the first quarter of the 10th century. Previously, the area was an integral part of Great Moravia, referred to as the Nitra Principality (today's Western Slovakia). Among Great Moravian hillforts captured by the Arpadian troops, there is a mysterious hillfort: Bana. Unlike other defensive objects mentioned by the chronicle, the hillfort has not been successfully identified yet. Despite the existence of information indicating approximate location of the Bana hillfort, historians and archaeologists ignored Bojná as a potential candidate.

This omission was most likely caused by old erroneous dating of the site suggesting that the hillfort was used only at the beginning of the 9th century. Recent archaeological research on the Great Moravian hillfort Bojna, including dendrochronological analysis, suggests that the object continued to be used still in the first half of the 10th century—i.e., precisely the times mentioned by the chronicle. Apart from the dating, also the hillfort location is consistent with the information provided in Gesta Hungarorum. Not to mention a similar name as well. Another factor that corroborates the hypothesis is the abundance of deltoid arrows typical for the nomads found in the hillfort and its vicinity.

12 ANCIENT HUNGARIAN SIEGE OPERATIONS IN THE WESTERN CARPATHIANS: THE ARCHAEOLOGICAL EVIDENCE

Abstract author(s): König, Tomáš (Comenius University in Bratislava)

Abstract format: Oral

Archaeological finds from the territory of south Moravia allow us to clearly associate the demise of the Great Moravian empire with the invasion of the ancient Hungarian army, evidence of which comes in the form of destruction layers accompanied by the discovery of flat tanged arrowheads at several local fortified settlements, but above all, at the central fortified lowland settlement of Mikulčice.

In contrast, the territory of Slovakia has not thus far been associated in the literature with the destructive raids of the ancient Hungarians. The prevailing image derived from an interpretation of the text of the high medieval chronicle is that the conquest of the southwest part of Slovakia happened only after the demise of Great Moravia.

Southwest Slovakia was a peripheral zone of the territory settled by the ancient Hungarian population. This extended into the immediate vicinity of Nitra, one of the Great Moravian central lowland settlements, but no evidence of fighting with the ancient Hungarians has been found there to date. However, arrowheads of ancient Hungarian origin have been found at other fortified positions, especially at hillforts in the mountainous regions of Slovakia.

The concentration of ancient Hungarian military equipment in an area away from the settlements of this population is probably direct evidence of military operations, the objective of which was to quell the hotspots of armed resistance by domestic elites defying the ancient Hungarians. In addition to their own army, the ancient Hungarian military powers also had the support of allies among the Great Moravian elites with their central seat in Nitra. Thus, Nitra not only avoided destruction but became a stable centre of power that later played a role in the foundation of the Kingdom of Hungary.

119 ON CLASS, ELITISM, AND POVERTY: ARCHAEOLOGY AND SOCIAL CLASS

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Ribeiro, Artur (Kiel University) - Ion, Alexandra (Institutul de Antropologie “Francisc J. Rainer”)

Format: Discussion session

One of the most confounding issues of our age concerns ‘social class’. Does it still make sense to talk about social class today? Does the tripartite class system separating the lower/middle/upper class represent current and social and economic reality? Or are we perhaps being deceived into thinking that we are all just middle-class?

In a discipline where gender and ethnic politics play a big role, we question why the topics of social class, elitism, poverty, have not had the same amount of discussion. This is particularly strange when we take into consideration that Marxist theory, and its examination of class, remains one of the most popular theoretical approaches used in archaeology. In fact, in recent years, the rise of anarchist theory in explaining past economic behaviour should have inspired discussion on class politics, but this has yet to happen. Likewise, recent aDNA studies has generated some discussion on populist movements across Europe but not much of this discussion has focused on class, elites, or poverty.

The aim of this session is to generate that discussion. This means a twofold focus – we wish to examine whether it remains useful to archaeology to think of past societies in terms of social class, namely can we see past (e.g. prehistoric) elitism and poverty as we understand those terms today; additionally, we want to discuss the social class of current archaeological practitioners. In particular, our aim is to analyse subtle class disparities, such as that separating contract archaeologists from academics; we also want to discuss differential access to funding within Europe and what that means to our understanding of transnational archaeological phenomena; and finally, we also want to discuss where archaeologists come from, in terms of their general social and economic background.

ABSTRACTS:

1 ARE WE THE BADDIES? WHY WE NEED TO TALK ABOUT CLASS

Abstract author(s): Ribeiro, Artur (Christian-Albrechts-Universität)

Abstract format: Oral

Archaeology, especially in academia, seems remarkably aware of difficulties when it comes to issues concerning gender and ethnicity. From adherence to the #metoo movement to projects of decolonization, archaeology continues in its identity politics struggle. But as many events of these last years have demonstrated, from Trump’s rise and fall to the effects on the economy caused by Covid-19, there seems to be a general reluctance to address the thorny issue of class politics.

In general, there seems to be an acceptance that everyone is now middle-class, with the exception of the insanely rich (e.g., Bezos, Musk), but is this really accurate? As Owen Jones demonstrates in his insightful book “Chavs”, in the UK at least, there is still a working class, which the higher classes have demonized and scapegoated for everything that is going wrong in that country (e.g., xenophobia, Brexit, sexism). Similarly, in the US, the rise of Trump is blamed on “rednecks” and “boomers”, many of which belong to the lower/working class. In archaeology, there are claims of misuse of aDNA information by the “populist right”, even though populism, as argued by the likes of Chantal Mouffe and Thomas Frank, has been primarily a left-wing project.

To stoke discussion, I ask: how did the political left, so well represented at universities, lose the working class? Is academia the very elite that the working class wants to topple over? Can a working-class person actually make it through the ranks of academia? There are subtle signs of elitism In European archaeology, from outdated rites of passage, which are used to demonstrate social superiority, to the dismissal of commercial archaeology by academics, to private excavations (and universities) that only those with deep pockets can attend. Have we, in academia, become “the baddies”?

2 SURVEYING THE NEXT GENERATION OF ARCHAEOLOGISTS: WHAT WE LEARNED ABOUT ACADEMIC PRACTICES, INEQUALITY AND POVERTY

Abstract author(s): Brami, Maxime (Johannes Gutenberg University Mainz) - Emra, Stephanie (Ludwig-Maximilians-Universität München) - Milić, Bogdana (Koç University) - Muller, Antoine (Hebrew University of Jerusalem) - Malagó, Aldo (Römisch-Germanische Zentralmuseum)

Abstract format: Oral

ECA is a grassroots initiative of the European Association of Archaeologists, designed to listen to, and communicate the issues that particularly affect early career archaeologists (earchaeologists.com). In 2021, we organised an online survey to identify the challenges faced by postgraduates, postdoctoral researchers and non-salaried scientists who plan to stay in academia. We asked a broad range of questions, from academic status to level of earnings, periods of unemployment and under-employment, career breaks, mobility, and more subjective questions about professional and personal outlook, bullying and gender discrimination. The responses have been overwhelming and paint the picture of a disenfranchised generation that has been badly let down by academia, especially through the Covid-19 pandemic. This contribution will focus on the background to the ECA initiative and the statistical results of the survey. Further work will examine the working lives of archaeologists from other fields, such as commercial, public archaeology and museum work.

3 AND WE HAVE TO FEEL BAD FOR BEING PRECARIOUS, BECAUSE AT LEAST WE DO WHAT WE LIKE

Abstract author(s): Almansa-Sanchez, Jaime (Incipit, CSIC)

Abstract format: Oral

Precaire defines archaeology today. We suffer many problems such as unstable work, both in academia and contract; very limited funding that hardly manages to cover basic costs of research, nor to talk about low salaries; increasing requirements that make people overwork until they burn out or settle (in a context where privilege has a lot to do with the final outcome); just to name a couple of scenarios.

We could be comforted in the fact that the whole world is lately like this. But “the sorrow of many is a fool’s consolation” (as we say in Spain). This situation is a result of the neoliberal drift in contemporary Western societies, and in general, the world. Archaeology is becoming embedded into the global economy, and we have become unable to fight against this. If anything, we do the opposite. Once we settle, we empower the system because we believe that since it was difficult for us, it should be just as difficult for those who follow.

We know what is failing, over the last forty years critical archaeologies have called for action, since the political turn of the 80s to the latest movements on gender, disability or colonialism. Still, the discipline keeps going towards a less reflexive practice as part of some sort of machine that needs to keep running for the benefit of... who?

And while some would say: “that’s not my reality”, nevertheless, I believe this is the reality in most of Europe and the world, and we need to call for a halt and reconsider the path archaeology is taking. We control most of the process, so why are we not even considering changing it?

4 CLASS-BASED DIVIDE IN CURRENT ARCHAEOLOGICAL FIELDWORK: THE CASE OF GREECE

Abstract author(s): Giamakis, Christos (University of Sheffield)

Abstract format: Oral

For scholars fascinated by class structure, elites and power dynamics, archaeologists are often incapable of identifying these very same issues within the discipline itself. Present social movements such as Black Lives Matter and theoretical frameworks such as postcolonialism have successfully revealed the various forms of inherent discriminations against past people in archaeological contexts. Yet, despite their accomplishments, these approaches have failed to address more subtle discriminations such as those based on class or wealth. The aim of this paper is to explore notions of class and elitism in current archaeological practitioners by focusing on archaeological fieldwork in Greece, a country which has been aptly described as a crypto-colony. More specifically, this presentation will focus on a number of foreign-led excavations conducted in Greece in recent years as well as field schools organised by the same institutions. Particular emphasis will be given on examining the supposed proclaimed cultural exchange between foreign and local students and the alleged dissemination of new techniques to local archaeologists by the foreign ones. By analysing data regarding the ratio of foreign to local students and participation fees in archaeological projects in Greece this paper will argue that ‘we are not all middle class’. Social class, personal wealth, access to resources and networking have substituted, at least to a certain extent, merit and knowledge. Consequently, archaeology especially in the academic sector, still largely remains a privileged person’s occupation. Both foreign and local students from disadvantaged social backgrounds have limited access to experiences which would prove to be crucial for their future professional development. Therefore, a new approach, one that would encourage people from the lower social strata wanting to join archaeology to do so is indeed needed in order to turn the tide and really assist archaeology in re-inventing itself.

5 A BEGGAR'S BANQUET: RECONSTRUCTING THE LIVES AND MOVEMENTS OF MARGINALIZED GROUPS IN THE ANCIENT ROMAN CITY

Abstract author(s): Siegenthaler, Sarah (Institute of Classical Archaeology, University of Basel)

Abstract format: Oral

Since the beginnings of classical archaeology there has been a strong focus on upper-class spheres. Partly due to a lack of material finds but also due to a former lack of interest connected to many archaeologists' own social standing, poverty and marginalized groups remained underrepresented in research. As a result, social history encompassing lower classes is a comparatively young branch within classical archaeology. In this talk, I aim to illustrate this correlation of social backgrounds and research interests and the need for more diversified perspectives to more accurately shape our perception of the past.

To this end, I will incorporate the example of my MA thesis as a new type of research in progress, where I focus on the role of street-beggars in Roman antiquity, who are a common part of every modern urban landscape as well as in antiquity. Nevertheless, they have always been an invisible group to archaeologists, since – apart from a potential lack of research interest – we do not have any material remains of their lives and their voices also remain silent in the textual sources. I will connect the images (statuettes, terracottas, reliefs, oil lamps) of individuals associated with begging with textual sources mentioning beggars and try to reconstruct possible locations or movements of this marginalized group within a cityscape. Considering current sociological discourses on beggars in major cities today, I will further try to retroactively infer conclusions on the behavior of beggars and the public perception of them in Roman antiquity.

6 WHY EAST-WEST INEQUALITIES MATTER IN EUROPEAN ARCHAEOLOGY

Abstract author(s): Ion, Alexandra (Institute of Anthropology Francisc I. Rainer)

Abstract format: Oral

In my talk I aim to address two issues which stem from my experience as an Eastern European in transnational archaeology. 30 years after the fall of the Iron Curtain we still see important inequalities between the East and the West, which I think are often absent in the EU public discourse. On the one hand, there is inequality in accessing large grants, such as European Union research funding, which turns Eastern researchers in “lower class” researchers. This is mostly due to structural issues, with lack of investment in several countries, or well-equipped universities and laboratories, which in turn make candidates coming from Central and Eastern Europe less likely to win large grants. According to a paper by Quirin Schiermeier on www.nature.com (22.12.2020), in the last Horizon 2020, out of the €60 billion funds, 40% were shared by “the EU's three biggest economies: Germany, France and the United Kingdom”, whereas “Poland, Slovakia, Bulgaria and Romania were among the least successful participants, securing a combined total of just over €1 billion”. I want to discuss why this is the case, and how this impacts contemporary archaeology, where access to funding is tied up with prestige and academic success. At the same time, on a theoretical level, there is a growing trend that values local knowledge and indigenous voices, destabilising the “western point of view”. In reality though this trend seems to focus almost exclusively on former colonies, even though non-Western countries comprise a large number of the EU population, their local values and ways of thinking about archaeology are still overlooked.

120 WHAT IS “SOCIAL” IN SOCIAL ARCHAEOLOGY? RE-EVALUATING SOCIAL THEORY AND ITS IMPACT IN EUROPEAN PREHISTORY

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Staniuk, Robert (Kiel University, Institute of Pre- and Protohistoric Archaeology) - Ion, Alexandra (Institute of Anthropology of the Romanian Academy) - Ribeiro, Artur (CRC 1266)

Format: Regular session

In their attempt to interpret past social dynamics, archaeologists still mostly rely on theories produced in the 1980's and 1990's. But this has become increasingly challenging when trying to incorporate new data on aDNA, globalized interaction, emergence of innovation and logic of change. Additionally, the different sociological concepts and terminologies are embedded in larger theoretical frameworks, which sanction the existence of dichotomies such as agency and structure, actors and communities, or state formation and anarchist flexibility. However, in archaeology this conceptual capacity often becomes the means of classifying archaeological data and not necessarily explaining the studied phenomena.

With this session we want to discuss whether the ideas derived from social theory actually help us conceptualize the lives of past societies and if the concepts we normally use allow us to investigate what is “social” about the past. We are interested in integrating new archaeological data into traditional social theory concepts and, should this generate obstructions, examine the possible solutions. From a spatio-temporal perspective we are especially interested in papers discussing these aspects from the perspective of Chalcolithic and Bronze Age Eurasia.

ABSTRACTS:

1 INVENTING TRADITIONS: FROM EXPLANATORY MODELS TOWARDS EXPLORATORY RESEARCH

Abstract author(s): Staniuk, Robert (Institut für Ur- und Frühgeschichte CAU Kiel)

Abstract format: Oral

The idea of tradition as repeated instances of social engagement has been used to explain the presence of persistent choices of prehistoric communities. In other words, whenever a continuity is observed, it has been assumed that this continuity can be explained by tradition.

Following this premise, prehistoric phenomena or groups were treated in an essentialist fashion, perceived as constituted by an inherent set of characteristics or attitudes prevalent irrespective of individual historical trajectories or events. From this perspective, the explanatory potential of tradition is reduced to re-affirming pre-defined assumptions, as well as avoidance of any potential explanation why societies would remain unchanged.

However, if tradition is considered a phenomenon characterized by constant re-construction – an established referential system justified on the basis of temporality – then continuities remain open for exploratory research, which requires addressing why certain aspects should become treated as traditional. In addition, it creates a possibility to determine inventions of traditions and use that information to try to understand the historical processes of coming together and explaining why things do not last.

2 PERSPECTIVES ON THE HOUSEHOLD – SEARCHING FOR THE SOCIAL IN AN AMBIGUOUS CATEGORY

Abstract author(s): Wunderlich, Maria (Institute of Pre- and Protohistoric Archaeology, University Kiel)

Abstract format: Oral

As one of the of main category of material remains within the prehistoric archaeological record, settlement sites are of special interest when it comes to the interpretation of socio-political organization of past communities. Within this framework, settlements can be seen as a hub, in which economic strategies, communal structures and also political interaction influence and merge into each other. As such the different parts of a prehistoric settlement are of special interest for the exploration of the social within the broader organization of a settlement.

Connected to the description and analyses of settlement organization are different levels of inquiry and description. One social unit which received a high degree of attention is certainly the household. But what are we trying to address with reference to the household and by which levels of inquiry are we trying to do so? This paper aims to explore the analytical and interpretational attention and perception the household was and is given in prehistoric research. To address this aim, selected examples of the analysis and interpretation of households are given in a diachronic framework, focusing on the modern areas of western Slovakia, eastern Austria and southeastern Czech Republic. Within this comparison, it will be addressed how the perception, description and interpretation of households vary within different prehistoric phases and research traditions.

The difficulties to detect and explain the social within the archaeological unit of a house or household are obvious. In order to address potential misconceptions and shortcomings of archaeological perceptions of households, socio-cultural anthropological data on characteristics of households will be used to address the specific forms of social interaction observable in recent contexts.

3 FROM ‘COMMUNITIES OF PRACTICE’ TO ‘TRANSLOCALITY’ – REVIEWING TWO CONCEPTUAL TOOLS REGARDING THEIR SOCIAL ARCHAEOLOGICAL POTENTIAL

Abstract author(s): Heitz, Caroline (University of Oxford, School of Archaeology; Institute for Archaeological Sciences, University of Bern)

Abstract format: Oral

The paradigm of cultural history and the equation of archaeological cultures with peoples, ethnic groups or whole societies still have an influence on how the social is imagined in the Archaeology of the prehistoric past. Even if the ethnic interpretations of cultures have long been rejected, the prevention of replacing them with more sound approaches to the social has led to a blind spot, which was filled unintentionally by top-down projections of social categories onto the past. Accordingly, there might be still a lack of discussion on what determines different forms of organizing social life and how they could be approached epistemologically in archaeology.

In recent years, two concepts deriving from the intersection of sociologically, learning theory and geography have become popular in the archaeology of Neolithic Central Europe: ‘Communities of practice’ (Lave/Wenger 1991) and ‘translocality’ (Greiner/Sakdapolrak 2013). From the bottom-up, I would like to discuss their potential and limitations as conceptual tools for gaining a deeper understanding of the material traces of spatial and temporal social configurations and thus social archaeology (cf. Meskell and Preucel 2004) by drawing on Neolithic wetland sites of the Alpine Foreland.

4 QUESTIONING PREMISES OF SOCIAL ARCHAEOLOGY: A POSITIVE VIEW ON CLASSLESSNESS IN PAST SOCIETIES

Abstract author(s): Szilagy, Kata (Mora Ferenc Museum) - Furholt, Martin (University of Oslo, Institute of Archaeology, Conservation and History)

Abstract format: Oral

One of the most prominent habits of archaeologists is to take something that exists today and trace 'its roots' in prehistory, i.e. the first appearance or the oldest letter, alphabet, writing, burial, monument, enclosure system, etc, thus generating a teleological narrative which mostly leads to glorification or even naturalisation of our current conditions. This is very much the case for the emergence of social inequality, stratified society, chiefs and elites, often portrayed as an evolutionary process of gradual unfolding of a natural, or unavoidable social state. This critique is directed both at the Liberal as well as the Marxist tradition. Recent theory, for example in the context of Degrowth and Post-colonialism, has objected that these traditional schools of thought presuppose a universality of material extraction, the accumulation of material goods, and an imperative of growth as the main values underlying the formation of social systems, and pointed out that these are in fact not human universals but specific historical characteristics of the modern capitalist world-system. Similarly, Anarchist perspectives in anthropology, history and archaeology have pointed to a second set of faulty premises baked into traditional Political Economy accounts, namely the idea that competition, dominance behaviour, war, racism and xenophobia would be the main drivers of history, while the empirical evidence and experience of cooperation, mutual aid, altruism, solidarity and common property are systematically ignored as factors shaping social systems. We want to use these insights to discuss the alternative scenarios of social organisation such a change of perspectives will have for our view of prehistoric social organization.

5 THE DILEMMAS OF OLIGARCHIC ELITES AND APPROACHING ANARCHIC SOCIETIES WITH ANARCHIST THEORY

Abstract author(s): Araque Gonzalez, Ralph (University of Freiburg)

Abstract format: Oral

Prehistoric societies rarely left unambiguous clues on their political organization, and their records often reveal puzzling dynamics. Archaeologists often use the term "society" interchangeably for "community" in typically decentralized contexts. Collective accomplishments, such as monument building or the maintenance of long-distance exchange networks, have been ascribed to "elites." This fashionable term is still used indiscriminately for an ill-defined ruling class, rather resembling an oligarchy, especially in narratives of the Bronze Age. Institutional authorities have been regarded as an anthropological precondition for cultural complexity. Correspondingly, Marxist archaeology analyzed prehistoric societies according to historic materialism, despite problems in recognizing social classes. On both sides, alternative approaches are still being suspiciously eyed.

However, some archaeologists shifted their paradigms in recognition that societies cannot be classified by traditional typologies. Notions of heterarchy and anarchist theory were exemplary novel approaches. Harold Barclay (1993) conveniently defined anarchic societies as "having leadership but no government or true legal sanctions." Nonetheless, the term has connotations causing great reluctance as well as confusion of "anarchic" (condition) and "anarchist" (ideology). I want to address these dilemmas and the often haphazard use of terminology in social archaeology that sometimes obstructs relevant analysis.

I propose that collective undertakings in prehistory must be examined for indicators of cooperation based on trust and reliability that could only be obtained through shared interests of the participants. The concept of centralized power in the distant past is often used to rationalise contemporary political and economic structures by considering them essential for humanity's social evolution. This is why critical social archaeology is of relevance for the present world. The importance of cooperation for human societies has to be reconsidered instead of anticipating a competitive system, inevitably evolving into capitalism. However, archaeologists must clarify some relevant concepts and basic terminology.

6 "THE SOCIAL" IN SOCIAL THEORY AND PHILOSOPHY: SOME MAIN LINES OF THOUGHT AND THEIR APPLICATION IN ARCHAEOLOGY

Abstract author(s): Arponen, VRJ (Institut fuer Ur- und Fruehgeschichte Kiel)

Abstract format: Oral

This contribution charts two main lines of social theoretical and philosophical thought about "the social". Modern linguistic philosophies often conceptualise "the social" in terms of the "social ontology" of socio-culturally shared mental dispositions to perceive social processes in particular ways (e.g. Searle, Elder-Vass). An alternative conceptualisation –and one that is currently perhaps somewhat out-of-fashion– sees value in thinking of "the social" as a meso or macro level structure (Marx, Parsons) or "social fact" (Durkheim) over and above, and more than the sum of, micro level individual perceptions. The implications, strengths, and weaknesses of these approaches are discussed with reflective and critical reference to some archaeological interpretations given of Chalcolithic and Bronze Age social processes. For example, social memory, ideology, and identity based interpretations hark back to something akin to social ontology approaches. By contrast, on the face of it, assemblage, emergence, and relationality based interpretations would seem to evoke the older structuralist sensitivities even while the proponents of these views might dispute such connections. Finally, in archaeology and social theory alike –sometimes associated with the concept of structuration from Gid-

dens– dualisms of all kinds from agency and structure to anthropocentric and non-anthropocentric and beyond, have been sought to be transcended in favor of some hybrid positions.

7 THE CHALLENGES AND SOLUTIONS FOR A COMPREHENSIVE EPISTEMOLOGY IN CONTEMPORARY ARCHAEOLOGICAL THEORY

Abstract author(s): Radchenko, Simon (University degli studi di Torino; New archaeological school, Ukraine)

Abstract format: Oral

The latest advances in archaeological theory are based on the new concepts of 'ontological turn', mainly multiple ontologies, actor-network theory and object-oriented ontologies. Indeed, the concepts, proclaimed by this new movement affect our understanding of social interactions between humans and things in a crucial way. However, since it is entirely ontological, e.g. focused on being rather than cognition, it requires additional epistemological instruments to fit into current theory of interactions in archaeology. The main reason for that demand is a distinction between the ideas of "archaeological complex" (that is distant from the researcher in the 21st century) and "archaeological assemblage" that also includes all actors who are interconnected with the artifacts, both ancient and contemporary ones.

For culture and literature studies such obstacle has been overcome by an epistemological approach that is developing of post-post-modern, mainly metamodern philosophy, introduced recently by Dutch philosophers Timotei Vermeulen and Robin van der Akker. In fact, unlike previous epistemological paradigms, metamodernism requires a consensus of the social interconnections inside one system. This consensus is necessary due to the idea of multiple ontologies as it is the only way to reach a theoretical and ontological agreement between the different elements of archaeological assemblage — researchers, ancient actors and artifacts.

Though contemporary social theory and archaeological theory in general is focused on ontological concepts, a comprehensive epistemological paradigm is needed to make the whole theoretical system work. I argue that metamodernism proposes a basis for such paradigm. Moreover, it fits a number of different theoretical models and issues (i.e. a concept of transdisciplinarity, the use of big data for archaeological research, the concept of time in archaeology and the previous advances of archaeological epistemologies) into one holistic frame that is still to be developed.

8 CAN POSTHUMANISTIC AND NEW-MATERIALISTIC THEORIES PROVIDE FRESH INSIGHT INTO THE SOCIAL ASPECTS OF CONTEMPORARY BURIALS?

Abstract author(s): Shay, Talia (Technion, Israel institute of technology, dept.of humanistic studies and arts)

Abstract format: Oral

Developments in science and technology have brought about, in recent decades, a shift in the attitudes toward materiality and the natural sciences in archaeology. These developments, hailed by some as the third scientific revolution are attractive both to conventional archaeologies, which still embrace modernistic ideals of an objective positivistic science, and to new-materialistic and posthumanistic archaeologists, who oppose the older anthropocentric ideas that maintain strict boundaries between the human, the animal, and the technological. Additionally, archaeologies have always been interested in the social and cultural aspects of the material remains. For that reason, it is essential to inquire whether new-materialistic and posthumanistic theories can provide fresh understanding of the socio-cultural and political spheres of archaeology.

This question is examined through an analysis of the contemporary mortuary practices of Russian-Jews who migrated in the 1990s from the former USSR to Israel, where as a minority, they encountered difficulties from the authorities in burying their loved ones. Recently I completed a comprehensive study of the burial customs of several communities of Russian-Jews (Shay 2021) based on the general categories of mortuary practices - the cultural-demographic features, burial treatment and after-burial treatment - corroborated by interviews with relatives of the deceased. My conclusions were that each community of Russian-Jews living in Israel maintained a singular and distinct assemblage of burial features dependent upon its specific history, time and space.

The present paper will examine the question whether methodologies informed by new-materialistic and posthumanistic theories can provide new insight into questions of power, inequality, conflict or change reflected in the burial practices of the communities of these Russian-Jews.

130 BIG-BIO: OPPORTUNITIES AND CHALLENGES OF BIG DATA WITH A FOCUS ON BIO-ARCHAEOLOGY

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Fulminante, Francesca (Bristol University; University Roma Tre) - Salses, Kevin (Université Libre de Bruxelles; Université de Bordeaux) - Farinetti, Emeri (University Roma Tre)

Format: Regular session

A series of recent enterprises and collaborations produced rich datasets of archaeological information achieved due to the intensive work undertaken by both academic and commercial archaeologists in excavations (e.g. ARIADNEplus; Fasti-online), surveys (e.g. the Roman Hinterland Database Project), and also, more specifically, bio-archaeological data (e.g. the IsoArch initiative) or comprehensive interfaces (e.g. ManLand, Kiel; the Oxford Roman Economy Project, Oxford).

In this session we would like to explore the impact of data from large archives and synthesis projects and discuss the opportunities and the challenges for archaeology in a number of ways: from practical, theoretical and methodological issues in data collection, management, use and interpretation, to examples of impact or potential impact of such datasets to identified or foreseeable difficulties in maintaining and further developing these datasets.

Specifically, this session will examine what the strategy and good practices are in dealing with large datasets? What opportunity do they offer for a better contextualization of present challenges for example through datamining or modelling (e.g. the PANDORA/IsoMemo initiative; Alan Turing Institute in London)? And especially how on-line accessibility (with or without simple/essential restrictions for preservation of vulnerable sites) might help dissemination of knowledge and initiate further research especially when mobility and visits to physical or digital archives are limited or impossible (e.g. pandemic situations, countries in war, etc.). Hence, we invite contributions and experiences across different geographical and chronological settings and from different fields of expertise.

ABSTRACTS:

1 SESSION INTRODUCTION

Abstract author(s): Fulminante, Francesca (Bristol University; University Roma Tre) - Salesse, Kevin (Université Libre de Bruxelles; Université de Bordeaux) - Farinetti, Emeri (University Roma Tre)

Abstract format: Oral

A series of recent initiatives have produced large archaeological databases as a result of intensive and collaborative works between archaeologists of all horizons. In this session, we will explore the impact of data derived from large repositories and synthesis projects and discuss the opportunities and challenges for archaeology in a number of ways: from practical, theoretical and methodological issues in the collection, sharing, management, and use of data, to examples of (potential) impact of such newly constructed datasets, to identified or foreseeable difficulties in maintaining and further developing the databases.

Specifically, this session will examine what the strategy and good practices are in dealing with large datasets? What opportunity do they offer for a better contextualization of present challenges? How can data mining or modelling applied to large datasets bring new understanding to archaeological questions? How online accessibility might help dissemination of knowledge and initiate further research especially when mobility and visits to physical or digital archives are limited or impossible (e.g. pandemic situations, countries in war, etc.). How to manage sensitive information and the preservation of vulnerable archaeological sites? With a strong attention to bioarchaeological data, the session will welcome contributions from different fields (zooarchaeology, archaeobotany, anthropology, etc.) and focus (osteology, funerary archaeology, science-based approaches, etc.). This paper will introduce these different initiatives and share some views about best practices in open science through the example of the IsoArch database (www.isoarch.eu).

2 PRACTICAL AND THEORETICAL ISSUES ON THE METHODOLOGICAL IMPLEMENTATION OF THE EPISTEMOLOGY OF SPACE: DATASETS AND ANCIENT CITIES

Abstract author(s): Filippi, Dunia (Faculty of Classics - University of Cambridge)

Abstract format: Oral

In recent years Lefebvre's and epigones' theories on space challenged current studies on ancient cities. The essential approach is that space is a process, and therefore researchers can meaningfully de-codify it as such. Building on this assertion I have implemented the Lefebvrian epistemological paradigm through a methodology that permits to classify data relating to spatial inquiries. In order to examine and interrelate ancient spaces, I built up a relational database (DBMS) reflecting this theoretical approach and linked the data to their geo-referenced graphic representation using GIS, which makes possible to investigate ancient space as a product of physical and social parameters. Here I will discuss the structure of the database, along with the methodological and theoretical issues, using the Roman Forum: this case study permits to test the DBMS in terms of quality (it is a complex long term site), and of quantity (the availability of enormous quantity of data). I will analyse the process of structuring the DBMS in a step to step approach: the realization of an holistic archive of available sources (geological, archaeological, literary, epigraphic, iconographic, etc.) via a source-critical assessment; aggregations of screened data in meaningful components of space, i.e. the planning of an open area (the square as a project = component of conceived space), the construction of the square (the square as built space = component of perceived space), the interactions taking place there (the social use of the square = component of lived space). The main issues are related to the origin of data (direct/indirect) and in reducing a social action to a string of attributes, but only entering the specificity of empiric reality, it is possible to reach the intimate logic of the social world.

3 THE ROMAN HINTERLAND DATABASE PROJECT

Abstract author(s): Jongman, Willem (University of Groningen)

Abstract format: Oral

Roman studies have a tradition of detailed analysis of fragmentary information to extract as much information as possible. However, zooming out may be a better strategy to overcome the chronic lack of data than zooming in because it gives both more data and avoids random error. Also, bigger stories may be more interesting than small ones.

This is all the more obvious with Roman field survey data. Many projects were focused on the local, and thus were not concerned with the interoperability with other survey datasets. Thus, these prime data for the history of the Roman countryside have barely made it into the larger historical narratives. The Roman Hinterland Project was an attempt by an international consortium to develop a methodology to integrate initially three large survey datasets from around the city of Rome covering a period of more than a millennium, the Tiber Valley Project, the Suburbium Project and the Pontine Region Project. We took the lid off these datasets, homogenized periodization and site and object classifications as much as possible, often down to the level of individual finds, and created a new integrated database that includes almost all of the original detail, and can be analyzed for both larger trends and regional differences.

In the next phase we will extend our geographical scope with other high quality survey data from elsewhere in Italy, and later also from elsewhere in the Empire. We also hope to incorporate archaeobotanical and zoological data, even if we do not yet know how to do that best. This is important because people in the country were primarily farmers. What were small peasants growing, and what big farmers, and what was grown where? Did any of this change over time?

<https://comparativesurveyarchaeology.org/>

4 MEETING THE NEEDS OF ROME (SUB)URBS. MATERIAL CULTURE AND CHANGING LANDSCAPES FROM MID-REPUBLIC TO LATE-ANTIQUITY

Abstract author(s): Capanna, Maria - Carafa, Paolo - Ferrandes, Antonio (Sapienza Università di Roma)

Abstract format: Oral

In ten year of systematic and intensive survey, that has covered an area of about 200 sq km, equal to 17.65 % of the territory of the Municipality of Rome, the Roman Suburbium Project has collected a large data-set with a great deal of records: nearly 6000 Topographical Units and more than 330.000 pottery fragments.

Surveyed areas are in a different part of the Roman Suburbium – on North of the Anio, between the via Salaria and Nomentana, in the southern-east suburb, between the via Latina and Casilina, and on the right bank of the Tiber, along with the via Aurelia -, and they have revealed different histories.

In this contribution, we will show the changing landscapes in the Roman Suburbia, from Mid-Republic to Late-Antiquity. We will analyse the rural settlements, their types, characters and functions and the relationship between the settlements and pottery distribution.

The analysis will be focused on five classes (Black Glaze, Thin-walled, Terra Sigillata Italica, African Red Slip and Amphorae), with a large number of typologically identified fragments, which allowed us to tell the story of (sub)urban supply, both as regards local products and imports.

5 ROMAN ARCHAEOFAUNAL AND ARCHAEOBOTANICAL DATA INITIATIVES

Abstract author(s): Schmidtova, Dominika - Klontza-Jaklova, Vera (Faculty of Arts, Masaryk University) - Zach, Barbara (Department of Archaeology, Max Planck Institute for the Science of Human History) - Marinova, Elena (Laboratory for Archaeobotany, State Office for Cultural Heritage Baden-Wuerttemberg) - King, Anthony (University of Winchester) - Fernandes, Ricardo (Faculty of Arts, Masaryk University; Department of Archaeology, Max Planck Institute for the Science of Human History; School of Archaeology, University of Oxford)

Abstract format: Oral

Food consumption beyond being essential to sustain human life intercepts multiple facets of human societies such as forms of social organisation, technological developments, cultural traditions, or trade. The research of past human subsistence relies on multiple lines of evidence, including, the study of archaeofaunal and archaeobotanical data. The availability of significant volumes of such data determines the necessity for creation of standardized databases which allow us to explore the bioarchaeological datasets for studies covering large spatial (and temporal) scales.

We will present initiatives that aim to bring together a community of data compilers and experts on Roman archaeofaunal and archaeobotanical remains. These initiatives are part of the Pandora network which bundles an array of historical and archaeological databases devoted to the study of the human past. In particular, we will describe and bring to discussion the efforts made to achieve common data standards for Roman archaeofaunal and archaeobotanical data.

Preliminary uses of compiled data will be presented in selected case studies. These will highlight how collaborative data collection efforts can offer major insights into Roman socio-economic structures, developments in agricultural practices and trade, or in religious and wider cultural practices.

6 THE URKESH GLOBAL RECORD (UGR): OVERVIEW AND ZOOM ON THE BIOANTHROPOLOGICAL DATA

Abstract author(s): Kharobi, Arwa (Bournemouth University; University of Bordeaux) - Kelly-Buccellati, Marilyn (University of California) - Buccellati, Giorgio (Cotsen Institute of Archaeology, UCLA) - Buccellati, Federico (Freie Universität Berlin)

Abstract format: Oral

The ancient city of Urkesh (Tell Mozan) was occupied starting in the Halaf period and reached its greatest moment of prosperity during the second half of the third millennium (2350-2100 BC). From the beginning, the strategy of the excavation presupposes a

scholarly organization of data where each element must be documented using a set of pre-defined parameters. This method has brought about the creation of a formal management system called Urkesh Global Record (UGR). In the field, each observation is registered using pre-printed forms according to parameters defined by the application of the model of the grammatical categories of reference. Afterwards, in the lab, the existing traditional paper format documentation is re-written in the digital format of an ASCII program, then saved in the server used for the final on-line data entry. Each file must include: – the excavation area; – the current data (date of entry into the system, initials of the person who acquired the documentation on the field); – a short definition of its contents; – the extension of the file. As a final step, a browser edition available on (www.urkesh.org) has been created in a way to allow updating the contents in any moment, without costs. Hence, the UGR becomes an exhaustive instrument which allows specialists to access complete archaeological documentation, as well as an easy vehicle of communication to reach the wider public, thus demonstrating that these different types of users are not incompatible. This online database is the pivot around which this paper revolves with a particular interest into the bioanthropological data derived from the funerary space of Urkesh (Bronze age 2000-1600 BC) within hundreds of individuals and primary graves. The UGR is part of a broadly based approach to digital publishing, which, in the case of archaeology, has a unique epistemological status.

7 BUILDING THE BASICS WITH BIG DATA: SEX ESTIMATION AND BIOARCHAEOLOGY

Abstract author(s): Bethard, Jonathan - Bews, Elizabeth - Reeves, Vanessa (University of South Florida)

Abstract format: Oral

Bioarchaeologists routinely reconstruct the past through the contextualized analyses of human skeletal remains recovered from archaeological sites. In many instances, generating demographic estimates of individuals and/or populations is a compulsory first step in the bioarchaeological process. Additionally, bioarchaeologists recognize that human skeletal remains embody intersectional realities of the lived experience influenced by myriad sociopolitical factors. In both of these examples, bioarchaeological datasets comprised of metric dimensions of the post-cranial skeleton are useful for investigating these questions. For example, Ruff and colleagues (2017) amassed a large, freely available dataset in a ten year study focused on documenting broad changes in skeletal form from the upper Paleolithic to the twentieth century. In this landmark volume, researchers examined numerous questions related to functional morphology and also generously provided metric postcranial data for other scholars to use. Additionally, other researchers have assembled a large volume of postcranial data for studies related to ecogeographic variation (e.g., the Goldman Osteometric Dataset). In this presentation, we will demonstrate how these datasets are useful to bioarchaeologists interested in creating simple tools for sex estimation and the examination of sexual dimorphism across time. We demonstrate that bioarchaeologists working in understudied regions of Europe may find that this is an easily adoptable approach and we highlight the benefits related to shared osteological data.

8 AN ONLINE REPOSITORY FOR EARLY MEDIEVAL BURIALS IN AUSTRIA -THANADOS

Abstract author(s): Brundke, Nina (Austrian Archaeological Institute) - Eichert, Stefan (Natural History Museum)

Abstract format: Oral

THANADOS - The Anthropological and Archaeological Database of Sepultures - aims on providing data on early medieval burial grounds in nowadays Austria and present them in a modern way to researchers and the broader public.

From the early Middle Ages, mainly burial grounds are known in the area of today's Austria - settlements have been archaeologically investigated to a much lesser extent. They are thus the main source of information about everyday life in the early Middle Ages. About 500 cemeteries can be assigned to the period between the 6th and 11th centuries. The information published on them is normally available in the classic form of catalogs and plates. Working with the data out of the box is therefore not possible. In order to provide easier access, the information given in the publications is recorded in a structured way (CIDOC CRM), georeferenced, and made available online with images and persistent identifiers within THANADOS. Information on 251 cemeteries can already be accessed on thanados.net. In addition to archaeological parameters, results of anthropological analyses and scientific data can also be accessed. In addition to multiple options for downloading data, queries within and between sites are possible. Furthermore, diagrams and statistics provided in the dashboards allow easy exploration of the data. In addition, network visualizations can be created for each burial ground.

Great emphasis is placed on open source, open data, and FAIR principles. Thus THANADOS enables the dissemination of archaeological and anthropological data in a modern form and easily accessible to all.

9 FORTH TO THE PAST: MODELING COMPLEX SCIENTIFIC ANCIENT DNA PROTOCOLS

Abstract author(s): Theodoridou, Maria (Information Systems Lab, Centre for Cultural Informatics, Institute of Computer Science, Foundation for Research and Technology - Hellas, Heraklion, Crete) - Vassou, Despoina (Ancient DNA lab, Institute of Molecular Biology and Biotechnology, Foundation for Research and Technology - Hellas, Heraklion, Crete) - Felicetti, Achille (PIN, University of Florence) - Tabakaki, Eugenia - Psonis, Nikolaos - Kafetzopoulos*, Dimitrios (Ancient DNA lab, Institute of Molecular Biology and Biotechnology, Foundation for Research and Technology - Hellas, Heraklion, Crete)

Abstract format: Oral

The development of high-throughput sequencing (HTS), as well as advances in the recovery of ancient DNA (aDNA), have revolutionized aDNA analysis. Protocols and methods for the analysis of precious and unique archaeological biological findings are con-

tinuously being improved and expanding, aiming to extract the maximum information such specimens have to offer. Analysis of ancient DNA involves several steps, starting from estimating the suitability of a specific sample, sample preparation, documentation, different steps of analysis, data generation, exploitation of the results etc. Ancient DNA analysis protocols are precise scientific investigation methods that allow for inferring, approximating or excluding causes from measured or observed effects. In the context of ARIADNEplus project, we analyzed informal descriptions and formal metadata related to the scientific aDNA analysis workflow in order to produce a suitable application profile based on AO-Cat, CIDOC-CRM and the family of its compatible models. Modeling scientific workflows usually focuses on the digital data produced and ignore the experimental steps that are described only in the scientists' lab-books. In our approach, we analyzed all steps of an aDNA project, starting from sampling, storage, DNA extraction, genomic library construction, sequencing, bioinformatics analyses, interpretation of the results and conclusions up to the publication of results. Moreover, we are working on the alignment of the aDNA application profile with CRMhs, another application profile, designed for heritage science and the modelling of scientific analyses (e.g. C14 or XRF) carried out on biological objects and cultural artefacts. Our goal is to specify an adequate form and extent of metadata that allows for effective control of provenance ensuring quality, validity, and FAIRness of data. Making data findable, accessible, interoperable and re-usable is essential for building the ARIADNEplus research ecosystem for digital archaeological research where scientific data such as aDNA, C14 or XRF data have a significant role to play.

10 CREMATIONS, URNS AND MOBILITY IN PREHISTORIC AND HISTORIC BELGIUM: INTERLINKED ARCHAEOLOGICAL AND BIOLOGICAL INFORMATION IN THE CRUMBEL DATABASE

Abstract author(s): Capuzzo, Giacomo (Research Unit: Anthropology and Human Genetics, Faculty of Science, Université Libre de Bruxelles) - Snoeck, Christophe (Research Unit: Analytical, Environmental & Geo-Chemistry, Department of Chemistry, Vrije Universiteit Brussel; Maritime Cultures Research Institute, Department of Art Sciences and Archaeology, Vrije Universiteit Brussel) - Dalle, Sarah (Department of Archaeology, Ghent University; Maritime Cultures Research Institute, Department of Art Sciences and Archaeology, Vrije Universiteit Brussel) - De Mulder, Guy (Department of Archaeology, Ghent University) - Hlad, Marta (Maritime Cultures Research Institute, Department of Art Sciences and Archaeology, Vrije Universiteit Brussel; Research Unit: Anthropology and Human Genetics, Faculty of Science, Université Libre de Bruxelles) - Sabaux, Charlotte (Department of Archaeology, Ghent University; Research Unit: Anthropology and Human Genetics, Faculty of Science, Université Libre de Bruxelles) - Salesse, Kevin (Research Unit: Anthropology and Human Genetics, Faculty of Science, Université Libre de Bruxelles; UMR 5199: "PACEA - De la Préhistoire à l'Actuel: Culture, Environnement et Anthropologie", Université de Bordeaux) - Stamatakis, Elisavet (Maritime Cultures Research Institute, Department of Art Sciences and Archaeology, Vrije Universiteit Brussel; Research Unit: Anthropology and Human Genetics, Faculty of Science, Université Libre de Bruxelles) - Veselka, Barbara (Maritime Cultures Research Institute, Department of Art Sciences and Archaeology, Vrije Universiteit Brussel; Research Unit: Analytical, Environmental & Geo-Chemistry, Department of Chemistry, Vrije Universiteit Brussel) - Vercauteren, Martine (Research Unit: Anthropology and Human Genetics, Faculty of Science, Université Libre de Bruxelles)

Abstract format: Oral

The CRUMBEL project studies the collections of cremated bone found in Belgium dating from the Neolithic to the Early-Medieval period using state of the art analytical and geochemical analyses. Due to its multidisciplinary character, a large variety of qualitative and quantitative data is treated and produced within CRUMBEL, such as archaeological information, osteoarchaeological results, isotopic values and elemental concentrations, FTIR data and radiocarbon dates. The organization of this big amount of data (n. sites>1050; n. osteological reports>650; n. samples>1300; n. 14C dates>1100) required the development of a database that could store, preserve, and provide easy access to the information to PIs, post-docs and PhD students involved in the project.

A relational database composed of five different tables, which allows to identify and access data in relation to another set of data in the database, was chosen as a backbone of the project. The database was developed in FileMaker Pro 18 due to its user-friendly interface that enables to introduce data and modify the database structure by people with various skill levels in database design and management, and to ensure the possibility of an easy link with most used GIS software.

The five tables contain information, respectively, on the "Sites" where cremations between ca. 3000 BC and 700 AD were recovered in Belgium, the features of the "Burials", the results from "Osteoarchaeology", all the biogeochemical and infrared analyses analyses carried out on "Samples" and the "Radiocarbon" dates. The users can query the data stored and interlinked in these different tables, thus obtaining new knowledge that can foster novel interpretations on past social dynamics.

11 CHALLENGES AND POTENTIALS OF INTEGRATING HETEROGENEOUS RESEARCH DATA: THE LANDSCAPE ARCHAEOLOGY GEOPORTAL 'LANDMAN'

Abstract author(s): Stroh, Steffen (Department of Computer Science, Kiel University - CAU) - Hamer, Wolfgang (Department of Geography, Kiel University - CAU) - Renz, Matthias (Department of Computer Science, Kiel University - CAU)

Abstract format: Oral

With every year passing more and more research data is generated or becomes available. In order to utilize the acquired data, researchers need to deal with questions about storing, maintaining, updating and analyzing their data. This data does not only include the premises of their analyses, but also obtained results. While this holds for a lot of disciplines in general, it is also a specific challenge for the members of "CRC1266 – Scales of Transformation" at the Kiel University (CAU). One of the cornerstones of managing

and integrating research data in the DFG-CRC1266 is the Landscape Archaeology Geoportal (Landman), where data from different projects is integrated into a single data base with the goal of enabling cross domain research. In this presentation we focus on presenting the approach behind Landman. At first, challenges of integrating heterogeneous data from diverse fields, e.g., archaeobotany, archaeology, geophysics, ecology and others will be highlighting our motivations. Then the design and current progression of Landman is presented, which is already part of the answer to those challenges. In a third step the potentials but also limits of transforming the data into a heterogeneous information network representation will be illustrated from the perspective of archaeoinformatics and data science.

12 PRESENTING PANDORA: A BIG DATA INITIATIVE FOR THE STUDY OF THE HUMAN PAST

Abstract author(s): Fernandes, Ricardo (Max Planck Institute for the Science of Human History; University of Oxford; Masaryk University)

Abstract format: Oral

It is often difficult to identify the main driving causes that explain historical developments. Human societies make up complex systems which themselves can be categorized into sub complex systems across multiple spheres (e.g. social, economic, cultural) and are also part of a larger environmental complex system. These systems are intertwined, often in non-linear manners and subject to loop feedback mechanisms. Under these circumstances, the accurate reconstruction of historical causal webs requires the collection of large amounts of data representative of multiple disciplines which can then be subject to modelling by powerful machine learning tools.

The Pandora initiative aims at reconstruction past causal webs by: 1) promoting the uncentralized and non-hierarchical creation of databases and networks of databases on diverse subjects (e.g. artefacts, isotopes, aDNA, archaeobotany, archaeofauna, osteology, written sources) devoted to the study of the human past; 2) promoting and undertaking data collection efforts. This includes offering the necessary data infrastructure, including methods to recognize research efforts involved in both data production and data collection; 3) developing modelling tools easily accessible by the research community particularly within the field of artificial intelligence. This work is done in tandem with the IsoMemo initiative.

In this presentation, Pandora's philosophy, organisation, and infrastructure will be presented. The Pandora initiative is also involved in multiple interdisciplinary projects that exemplify at various scales its research potential. Several of these examples will be presented.

131 THE PLACE OF QUEER THEORY IN CURRENT ARCHAEOLOGICAL DEBATES: ALL T, NO SHADE? [AGE]

Theme: 6. Material culture studies and societies

Organisers: Jensen, Bo (Kroppedal Museum) - Matić, Uroš (Austrian Archaeological Institute)

Format: Regular session

Some 25 years ago, queer theory emerged as a field of critical theory. Building upon feminist and gay/lesbian deconstructions of essentialist understandings of gender and sexual identity and their consequences, it found its way into archaeological debates in the 1990s and early 2000s. Most of the pioneering work done under the umbrella term "queer archaeology" focused on deconstructing heteronormative assumptions about the past, or on investigating past understandings of sex and gender which may have differed from modern heteronormative sex/gender bind. Few other topics were extensively debated, leading some critics to dismiss "queer archaeology" as being limited to the search for same-sex practitioners in the past. Three decades later, archaeological debates are more or less dominated by postcolonial approaches (subalterns; creole; hybridity; mimicry; third space), by the so called "third science revolution" (aDNA; stable isotopes; big data; large funding) and by the ontological turn (non-human agency; entanglement; cosmological perspectivism). Outside of academia we are witnessing rises in nationalism, racism, and homophobia. Gender studies are under attack for being ideological, and relevant academic programmes are being shut down. Scientific racism plays a role in these developments. If the crucial characteristic of queer theory is its instability and its potential to constantly re-invent itself in response to changing definitions of normativity, then its use for archaeology should be equally re-invented. The aim of this AGE (Archaeology and Gender in Europe) session is to reflect on how queer theory in archaeology can contribute to other questions than those related to LGBT and situate the role of queer theory in current archaeological debates, to ask what is normal in these debates, how this norm came to exist and who is excluded or oppressed by this normality. We invite all contributions which investigate normal and abnormal archaeologies and pasts in the vast network of modern states, capitalism, neo-colonialism, heteronormativity and homonationalism.

ABSTRACTS:

1 SESSION INTRODUCTION

Abstract author(s): Jensen, Bo (Independent) - Matić, Uroš (Austrian Archaeological Institute)

Abstract format: Oral

In this introduction, we introduce the background to this session, the vast network of modern states, capitalism, neo-colonialism, heteronormativity and homonationalism. We briefly present some of the dominant themes in current archaeological debates: post-

colonial approaches (subalterns; creole; hybridity; mimicry; third space), by the so called "third science revolution" (aDNA; stable isotopes; big data; large funding) and by the ontological turn (non-human agency; entanglement; cosmological perspectivism). We also introduce political trends beyond academia, specifically nationalism, racism, and homophobia. Here, gender studies are under attack for being ideological, and relevant academic programmes are being shut down.

We argue that if the crucial characteristic of queer theory is its instability and its potential to constantly re-invent itself in response to changing definitions of normativity, then its use for archaeology should be equally re-invented. We argue that queer theory can contribute to other questions in archaeology than those related to LGBT and situate the role of queer theory in current archaeological debates, to ask what is normal in these debates, how this norm came to exist and who is excluded or oppressed by this normality.

2 TO BOLDLY GO WHERE NO QUEER THEORIST HAS GONE BEFORE

Abstract author(s): kok, marjolijn (Bureau Archeologie en Toekomst)

Abstract format: Oral

In this paper I want to imagine what queer theory could be in the future. How can we move beyond the binary? How do we extend the notion of diversity without the necessity of hierarchy? In my opinion queer theory could not only be an interesting perspective for doing gender archaeology but should extend to the field of archaeology as a whole. We may need to think in new ways decoupling characteristics from judgement. Following our chains of relations and refiguring if the paths we take have validity. Are our conclusions based on prejudices or actual archaeological evidence? How often can we be surprised by another woman warrior?

In what way do societies organize themselves and how open are we for recognizing cooperation or resistance? Are there moments of refusal? What if entanglement is our framework? How do we deal with affect? The framework I will propose is theory embedded in method, where the researchers question themselves every step of the way. Queerness is about thinking carefully about how we engage with the world without assuming too much from the start about all the entities we encounter.

3 HOW QUEER WERE CROSS-ONTOLOGICAL SEXUAL ENCOUNTERS IN ANCIENT EGYPT?

Abstract author(s): Matic, Uros (Österreichisches Archäologisches Institut)

Abstract format: Oral

This paper takes a queer turn on the ongoing discussions on flat ontology by exploring various forms of erotic encounters between humans and deities in ancient Egypt. According to available textual and iconographic evidence, deities were part of erotic networks during festivals. Direct sexual intercourse, which crosses ontological boundaries, was (exclusively) restricted to a god and a woman, i. e. the mother of the king. Egyptian gods Amun and Osiris prefer married women or non-virgins. Erotic encounters between mortal men and goddesses were considered dangerous and were therefore avoided. What immediately catches attention is the gender structure of what was considered to be normative cross-ontological sexual intercourse. An intercourse between a god and a woman as normative, contrasts an intercourse between a man and a goddess. In fact, the normative cross-ontological intercourse was not widespread but restricted to deities and women of the royal family. Bearing in mind the overall supremacy of men in ancient Egypt and the avoidance of intercourse between a human male and divine female, one wonders if the reason behind this is the danger of reversing the ontological order and hierarchy through penetration. A goddess penetrated by human male would not only be a passive and subordinate partner but also the mother of a child of a human father with all of its accompanying rights. This and many other problems with cross-ontological sexual encounters in ancient Egypt should not only be described in order not to assume any ontological primacy (sensu Latour) but also thought through in order to understand the gender structure behind them. Consequently, when some are excluded from such encounters and others frequently experience them, we should indeed think about the primary agency, possibly even ideology, a queer word in discussions on ontology in archaeology and anthropology.

4 NO SAME-SEX FOR THE WICKED ROMAN SOLDIERS: EXPLORATIONS INTO THE MASCULINITY AND SEXUALITY OF THE ROMAN ARMY SOLDIERS

Abstract author(s): Ivleva, Tatiana (Newcastle University)

Abstract format: Oral

Within the archaeological scholarship on gender and sexuality in the Roman provinces there is nearly no critical discussions about dimensions of gender and variability in sexual relations in provincial settings. Queer theory has not penetrated the Roman provincial scholarship with scholarly preference confined to gender and sexualise provinces by formal analogy, such that the nature of provincial sexual relations, including marriages and other relationships, has been studied almost exclusively from a heteronormative perspective.

This paper investigates same-sex sexual relations of the Roman soldiers serving and living in northwest provinces and frontiers of the Roman Empire in the first-third centuries A.D. Using epigraphic evidence it focuses on how male sexual identities were expressed in performances of masculinity in Roman military settings by arguing that traditional heterosexual reading of the data was based on the androcentric narratives and gender stereotypes. Furthermore, by discussing the sexual norms, roles, and practices from the empire's core, and comparing and contrasting it with the evidence deriving from the provinces and frontier, the paper

proposes a new framework for conceptualising and studying masculinity and sexuality in the Roman army and Roman provinces by emphasising how Roman soldierly masculinity and sexuality were not two sides of the same coin.

5 USES AND MISUSES OF QUEER THEORY IN FUNERARY ARCHAEOLOGY

Abstract author(s): Algrain, Isabelle (Université libre de Bruxelles) - Mary, Laura (Recherches et Prospections archéologiques)

Abstract format: Oral

The study of funerary contexts offers to archaeologists a privileged access to a specific individual and, through funeral offerings, to certain elements constituting his/her identity, as it was considered by the group that buried him/her. For ancient societies where gender was strictly binary, the presence of stereotypical objects such as jewelry or weapons in funerary material often prompted researchers to assign a gender to the deceased, without even resorting to osteological or DNA analyzes. However, when these analyzes and the objects seem to mismatch - most of the time when a woman is buried with rich material and/or weapons - some archaeologists have preferred to use queer theory rather than revising their positions on the roles of women in these societies. On the other hand, some other cases have been overlooked by archaeologists but might shed some light on occurrences of non-binary, fluid or occupational genders, for example in Greek or Merovingian societies. Through a reflective and theoretical approach, and on the basis of a few case studies, this paper considers the question of non-binary genders, gender fluidity and transidentities in ancient societies that are a priori strictly binary and examines how archaeologists have misused and should use these gender diversities into the interpretation of funerary contexts.

6 HOW QUEER IS THAT? HOW IS THAT QUEER? WOMEN VIKING WARRIORS, ADNA AND MODERN UNEASE WITH PAST IDENTITIES

Abstract author(s): Jensen, Bo (Independent)

Abstract format: Oral

In this talk, I address bold claims that aDNA may finally resolve the old discussion of women warriors in the Viking Age. I suggest that whereas aDNA provides important new data, these are not qualitatively different from those already available from oestrogenology. Moreover, I argue that epistemologically, this research forecloses any discussion of the social meaning of gender, reducing gender to mere biological sex. In effect, we can finally know if people "were" men or women, at the cost of giving up ever understanding what this meant in their time and society. We can know the fact of "woman" (sub specie aeternae) if we sacrifice all hope of understanding the meaning of "woman" (in the local, contemporary context).

Moreover, the status of aDNA evidence for women warriors hinges on a premature resolution of the vexed question of warrior identity. Again, we may know the fact a "warrior" by giving up all hope of ever understanding what this label meant.

I think not.

Here, I propose a different approach: let us unsettle, let us queer the debate and ask, why do modern researchers and readers engage so passionately with this? Why are women warriors so popular and controversial today? What is so queer about this sexed biology in combination with those grave-goods, and what does this tell us about the observer paradox? Why are our colleagues so eager to close discussions at existence, instead of proceeding with the important work of understanding where, when and why women warriors, and women ritual experts, may be visible in some communities, invisible in others? I suggest that the queerness of the past is much more widespread, much more profound and much more radical than simple transgressions of Victorian gender norms.

7 THE CARETAKER AND THE MILITARY: WOMEN WITH THEIR OWN AGENCY IN A MILITARY HOSPITAL ENVIRONMENT IN MODERN LISBON

Abstract author(s): de Carvalho, Liliana (Research Center of Anthropology and Health, University of Coimbra) - Henriques, Susana (EON-Indústrias Criativas) - Amarante, Ana (Centre for Functional Ecology, University of Coimbra) - Wasterlain, Sofia (Research Center of Anthropology and Health, University of Coimbra; Centre for Functional Ecology, University of Coimbra)

Abstract format: Oral

When studying funerary contexts, it must be acknowledged that the history of death and social history are inseparable. The attitudes surrounding death consistently mirror the worldview and organization of a given society. When looking at osteological material from large contexts with a marked demographic bias, such as necropolises in monasteries or those related to military contexts, bioanthropologists have an interesting opportunity to surpass the female-male dichotomous analysis provided by the usual sexual diagnosis, that gives us no more than biological sex. Such approach looks at individuals whose biological sex was in the minority, generally neglecting elements outside the social norm. In this perspective, these minority individuals would be the helpers of the opposite sex, like the monastery's handmen, who would be tolerated out of necessity. An alternative approach requires looking not only at the biological sex per se, but also to the context, and this is where the possibility of thinking about gender identity arises.

In the present study, the necropolis excavated in Rua do Recolhimento 7/9, in São Jorge Castle (Lisbon, Portugal), and the cemetery of the Military Hospital, located nearby (active between the 16th and 18th centuries) will be analysed. In the second and third excavation phases, 948 individuals were exhumed, and of the 642 that allowed sexual diagnosis, 96.6% were male. Although the remaining 22 individuals were diagnosed as females (from the point of view of the bioanthropology), apparently, they presented similar funerary rituals to the male ones, either in terms of deposition, type of funerary goods, and even location in the necropolis.

Two possible readings, one focused exclusively on biological sex and one integrating gender identity on the analytic framework to approach the presence of women, men, and others in between in a powerful masculine environment will be performed.

140 COMPENSATION IN ARCHITECTURE AND ARCHAEOLOGY - ON COMPENSATION AS A CONCEPT, METHOD, AND PROFESSIONAL PRACTICE

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Rönn, Magnus (Kulturlandskapet, Chalmers University of Technology) - Teräväinen, Helena (Aalto University) - Kalakoski, Iida (Tampere University) - Kouzelis, Athanasios (National Technical University)

Format: Session with precirculated papers

This session focuses on compensation as a concept, method, and professional practice in the transformation of cultural environments. Compensation represents a significant challenge reflected in a myriad of environmental laws and in local policies. The concept has many definitions and, from a planning perspective, can be defined as overall demands, specific measures, actions and changes of design taken in order to appease criticism.

The transformation of environments can be approached from two main perspectives. On the one hand, there is a risk of negative impacts on cultural heritage when exploitation interests are in power. Project developers, reinforced by political interests, can ignore the values and architectural qualities of cultural heritage in places subject to exploitation. A protected milieu, thus, can be perceived as an obstacle to development rather than a common resource of public interest. On the other hand, there have been calls for a rethinking of compensation as means to recreate and safeguard cultural and architectural values and qualities affected by developments. In such approaches, how can issues related respect for the history and protection of cultural heritage, be combined with a reconstruction of the values associated with and the adaptive re-use of buildings?

This session calls for a multidisciplinary approach to compensation. How should it be understood as a concept, method, and practice by architects, architectural conservators, and archaeologists. The session welcomes papers discussing compensation as (a) a part of the measures and functions aimed at restoring lost cultural values and architectural qualities, (b) conservation and protection through rules and regulations in city plans and urban planning, (c) requirements for design of new buildings, (d) tools and methods for balancing interests between exploitation and preservation and (e) problem solving approaches to modify proposals that impact cultural environments.

ABSTRACTS:

1 CULTURAL HERITAGE COMPENSATION

Abstract author(s): Rönn, Magnus (Kulturlandskapet) - Grahn Danielson, Benjamin (Picea)

Abstract format: Oral

"Cultural heritage compensation" is a proceeding from a research project in Sweden. The project investigating how compensation is expressed in designing detailed development plans in areas with heritage values and architectural qualities. The overall objective has been to produce new knowledge about heritage compensation as a concept, method, and tool in planning processes. The practical benefit lies in the development of empirical findings of how professionals handle cultural heritage and architectural qualities in the transformation of sites and environments.

Ten scholars from Finland, Norway, Denmark, Sweden, United Kingdom, and Greece present findings in the proceeding on compensation in alterations that have impacts on heritage values and architectural qualities. Their contributions are developed from an international workshop - called "Architecture, cultural environment, and compensation in planning processes." The workshop took place at Gothenburg, 16-17 September 2019, and was organized as a joint venture between Kulturlandskapet and Chalmers University of Technology. The theme in the invitation to the workshop was summarized in the following way: On compensation as a concept, method, and professional practice by architects, architectural conservators, and archaeologists in planning processes.

Compensation comes from the Latin word *compensare* and is used in the environmental code in Sweden. The concept is used in the sense of indemnifying, balancing, settling, restoring, and reaching a balance, etc. One controversial issue is whether heritage values and qualities are unique and always fixed to a specific plot, or whether they are mobile and can be redesigned at another site. Architects, architectural conservators, archaeologists, and other heritage professionals work differently and have different approaches to this issue in the transformation of areas. In the Swedish context, there is a strong connection among professionals to introduce compensation as problem-solving actions in the planning and design of environments with cultural values and architectural qualities.

2 ARCHITECTURE AND COMPENSATION - RENEWAL AND EXPANSION OF THE CITY LIBRARY IN GOTHENBURG

Abstract author(s): Rönn, Magnus (Kulturlandskapet)

Abstract format: Oral

The paper deals with renewal and preservation in a combined architecture and detailed development plan-project, including cultural values and architectural qualities. The focus is on how compensation actions, cultural values, and architectural qualities are ex-

pressed in the expansion of the City Library in Gothenburg. In this case, the detailed development plan regulates both land-use and architectural design. The transformation of the City Library occurred in an area with heritage values of national interest.

The objective is to investigate, analyze, and discuss compensation in architecture and planning processes. The specific goal is to produce knowledge on how key players practice compensation and understand heritage values and architectural qualities. The research is based on a single case study. From a selection of 39 contemporary detailed development plans obtained from the City Planning Office in Gothenburg, one plan has been chosen for investigation in this paper. The motive behind this selection is that the expansion provides both an interesting background to quality issues and raises important questions concerning the renewal of a public building at a site of great value for citizens.

Key documents in the case study have been analyzed through close-reading. Knowledge has also been developed through analyses of drawings, illustrations, site visits, and discussions at seminars.

The detailed development plan can be understood both as a product and a process. Seen as a product, compensation measures are embedded in the plan as fixed regulations to support renewal as well as to safeguard values and architectural qualities. These regulations concern both land-use and architectural design. Compensation thinking as part of the planning process is expressed through changes based on comments from key-actors, starting with the design of the expansion of the library, and is continued in the transformation to make the renewal possible through the detailed development plan.

3 NARRATIVES OF FISH, TRADE AND COASTAL COMMUNITIES: USE AND RESOURCE MANAGEMENT AS A TOOL FOR HERITAGE AND ENVIRONMENT COMPENSATION

Abstract author(s): Davies, Tom - Smith Wergeland, Even (Oslo School of Architecture and Design) - Standal, Anja (Norwegian University of Life Sciences)

Abstract format: Oral

To be entered under: Compensation as a tool, method and measure for protection, restoration, reconstruction and relocation of cultural values and architectural qualities in areas of exploitation.

Building on the inherent reappraisal of priorities from tangible to intangible, this paper considers use and resource management, through the medium of Norwegian coastal communities, as a transdisciplinary tool for heritage and ecology. The preconditions of natural resources these coastal localities (islands, coastline and

fjords), essentially their limits of exploitation in sustaining communities are appraised as the basis for a transdisciplinary approach. It considers how relative permanence and impermanence of such environments and the opportunities afforded by ample cod-stocks and other fish and the maritime trade have defined these

communities over time. Arguably starting with the development of Norway's West and North Coast from the 1200s with the Hanseatic League to the present day, this has determined these cultural landscapes and the lives of their communities. This provides the basis for enquiry to consider what lessons communities determined by their environment and opportunities to such an extent can provide for today's challenges for both heritage and environment.

Examples are drawn from literature review, ongoing teaching and professional work, looking at the Fjord Landscape of West Norway supported by other reference studies. The study considers changing land and sea use over time drawing on historic maps and written sources, early film and photography and a variety of current community and municipal projects looking to recover coastal communities from the decline they typically experienced in the late 20th Century. As part of which current challenges and opportunities for livelihoods and conservation are considered within the context of the overall narrative.

4 HOW TO COMPENSATE THE IRREPLACEABLE? A CASE STUDY OF TWO PROTECTED BUT ENDANGERED BUILDINGS

Abstract author(s): Teräväinen, Helena (Aalto University)

Abstract format: Oral

Old Paukku in Lapua, Finland is a former cartridge factory, which was transformed into a culture centre in 1990's (Teräväinen 2006, 2009, 2018, 2020). In the beginning the cultural heritage of the industrial buildings was not recognized, but later it was listed on national level heritage (RKY 2009).

2020 the town started again to revise the plan of Old Paukku to cancel the conservation regulations and then to demolish the only wooden building in the area, the Canteen. The planning documents show a suggestion, taht another city-owned wooden building from school yard to be pulled down and then re-place the Canteen. Both buildings have been neglected and empty, and Lapua has several times tried to get exceptional permits to dismantle these protected buildings.

According the negotiation notes from planning meetings the provincial museum, representing The Finnish Heritage Agency, seemed to accept the Canteen to be demolished, in consequence of the poor condition it should be mostly re-built and accordingly the authenticity of the building would disappear. Removing the other building from its original place was not seen as crucial, and the museum sounds satisfied: "at least one of those endangered buildings could be saved". It is difficult to imagine who now would use and pay the re-placement (compensating) building, because the town's culture division haven't found any use for the Canteen in two decades.

The aim of this paper is to investigate the place, the authenticity and the compensation thinking (Grahn Danielson 2015, Rönn 2018, 2020) in the planning context. The cultural heritage in the environment has both tangible and intangible parts, and so it should be understood together with the place and the identity, not only counting the amount of new pieces in the renovation.

5 ADULIS ARCHAEOLOGICAL SITE: HERITAGE VALUES AND CONTEMPORARY CULTURAL LANDSCAPE IN ERITREAN COASTAL LOWLANDS

Abstract author(s): Bortolotto, Susanna - Cattaneo, Nelly (Politecnico di Milano) - Massa, Serena (Università Cattolica del Sacro Cuore di Milano)

Abstract format: Oral

Since 2011 an Eritrean-Italian research has been conducted on Adulis Archaeological site (Eritrea). Its position represented a key factor in the development of the main emporium town of the Horn of Africa between the III century B.C. and the VII A.D., when a natural catastrophic event destroyed it. The project is led by the Eritrean Ministry for Culture and Sport and by the Research Centre on the Eastern Desert, in collaboration with Italian Universities, and aims at enhancing the site also through the creation of an archaeological park.

Adulis is of great interest for researchers worldwide, nevertheless its current context is peripheral and marginal to the main Eritrean centres. The local inhabitants are committed to subsistence farming and goat breeding in a semiarid context. The unexcavated archaeological area itself has been a common grazing land. The balance between livelihood and local scarcity of resources represents an intangible heritage shaped in centuries, enhancing the diversification of activities and the community over the individual, thus ensuring a high level of resiliency.

What would happen to this local intangible heritage when the main trigger for economic development is an archaeological site of international interest? The socio-economic process promoted by tourism industry, as suggested by many cases worldwide, can endanger a heritage whose values have not been acknowledged or whose loss has been considered an acceptable side-effect of development. To prevent from this irreversible loss, the current project VITAE, started in 2020-21, has considered the understanding of local cultural values as part of the actions, promoting local economy and community ties. Beside addressing the wide literature dealing with compensation in the field of archaeological risk assessment, the contribution aims at reflecting on the concept of compensation and mitigation when applied to intangible heritage and to cultural values which rely on processes more than artifacts."

6 DESIGNING WITH DECAY

Abstract author(s): Kalakoski, Iida (Tampere university)

Abstract format: Oral

The subject of this study the former hospital area of "Kulkutautisairaala" (infectious disease hospital) in proximity of Tampere city center, Finland. The existing buildings were built in several phases from 1890's to 1950's. After their original use, the buildings have served for example as student apartments. Now, most of them are unused, in a very bad condition and waiting for planning decisions.

Taking into consideration the topicality of the site and the challenging state of the buildings, we decided to take the district for the project site of the Management of Built Heritage course in Tampere University in spring 2021. The students were encouraged to widen their perception of architectural conservation in order to preserve some qualities of the site and at least one of the buildings using creatively methods of transformation, preservation, renewal and infill building.

This study explores the spectrum of different practices suggested by 24 group works done by over 60 Finnish and international students. The investigated practices are juxtaposed with the concept of and definitions of compensation.

7 THE OPEN-AIR ARCHAEOLOGICAL MUSEUM AS A MODEL OF CULTURAL COMPENSATION

Abstract author(s): Kouzelis, Athanasios (N.T. Univ. of WA, Athens)

Abstract format: Oral

Our inquiries concerning the cultural design praxis are shifted by a flow of considerations in the field of its utility. There are some factors that affect us to think how a proper design method can draw a practical usability from the terms of compensating losses in architectural and cultural inheritance. Cultural heritage is not only just about the past – it also defines who we are and shapes the future. Archaeological evidence demonstrates that heritage assets serve as a catalyst, not only for conservation, historical cohesion, cultural development and education, but also for design job creation, infrastructure development, investment and economic development.

The design management of archaeological and cultural sites has become an important and major component of heritage discourse. It inspires and gives context to modern design and planning approaches as well as it constitutes a source of cultural compensation.

Given that archaeological heritage is a material record of past human activities, it constitutes an outstanding instrument for a better knowledge of the past and for introducing cultural novelty that emerges within a given territory's historical 'genius loci'. As such examples we can consider the use of the reconstructed ancient Panathenaic stadium in Athens, the theatre of Epidaurus and the initiatives for the reconstruction of Plato's Academy in the same place of its ancient location.

8 HERITAGE COMPENSATION IN CHANGING ENVIRONMENTS: THE CASE OF THE WEST LINK INFRASTRUCTURE PROJECT, GOTHENBURG

Abstract author(s): Dore, Maitri (Gothenburg University; Heriland research and training network)

Abstract format: Oral

Major urban infrastructure projects in old cities often encounter material historical features during planning or execution, presenting several challenges for local heritage management. Using the case of the West Link in Gothenburg, Sweden, this paper discusses compensation as an approach to integrating heritage conservation with new urban development.

Compensation, in this understanding, denotes a rethinking of heritage values and qualities, and fosters new development directions. While recognised as an important planning instrument (Grahn Danielson, et al, 2013; Rönn, et al, 2017), compensation more broadly, also includes thinking of heritage in terms of the heritage paradigm (Ashworth, 2011), as a vector in spatial planning (Janssen, et al, 2017), and more. The paper analyses how all these approaches reflect in practice in one specific case.

The West Link is a railway line currently under construction in Gothenburg. It burrows through the city's 17th century fortifications, ancient agricultural properties, and historical parks – all of which are 'national interests' with architectural historical value. Since the project is deemed to be a threat to the cultural heritage, the Swedish Transport Administration (STA) – responsible for the project – and the City of Gothenburg are in talks on how best to work with the heritage. Their proposals for adapting it reflect their ideas about its values and qualities. The STA seeks to minimise heritage damage, while the City additionally proposes to 'strengthen' its value through new urban design programmes and increased accessibility to hidden sites.

The paper situates their proposals and positions within the wider discourse on compensation. It further highlights the potential of cultural heritage to not only coexist with new development, but even become a decisive force in shaping future cities in moments of major transformation.

This work forms part of a PhD on heritage planning in changing environments resulting from infrastructure projects.

9 COMPENSATORY MEASURES IN ARCHAEOLOGICAL HERITAGE MANAGEMENT - OVERCOMING THE NATURE-CULTURE-CULTURE DIVIDES

Abstract author(s): Hueglin, Sophie (Newcastle University; University of Basel; University of Tübingen)

Abstract format: Oral

To reduce, avoid or offset the potential adverse environmental consequences of development the EU Environmental Impact Assessment (EIA) Directive mentions three mitigation measures: preventative, corrective, and compensatory measures. The third and last resort in case of unavoidable impact – compensatory measures – so far have not been demanded by archaeologists as it seems to contradict their conventional conservation concept. They think archaeological heritage should be protected and if that is not possible excavated or possibly relocated, but how could it be compensated?

To understand this, heritage policies must be thought through to their extreme ends. Here two policies will be contrasted: the site-centered vs. the landscape concept. The site-centered concept would identify a site, classify it, put a fence around, restore and try to upkeep it. The landscape concept would describe a historic environment, characterize its elements, but involve the stakeholders of a specific planning process to evaluate it. In this latter concept heritage potentially is everywhere and could possibly even be (re-)created during development through compensatory measures.

Using examples from Germany and all over Europe, the weaknesses of current practices of heritage protection will be demonstrated. Alternatives – including compensatory measures – will be proposed. Archaeologists would profit from adopting strategies from nature preservation. To be successful, they must seek constructive co-operation in planning and conservation processes with the public as well as other major nature and culture conservation organisations.

10 SAVE WHAT CAN BE SAVED AND TELL THE STORY – BALANCING DAMAGE ON INDUSTRIAL HERITAGE BY ARCHITECTURAL INTERPRETATION

Abstract author(s): Nilsson, Urban (Nyréns Arkitektkontor)

Abstract format: Oral

It takes more than preservation of buildings to convey the history of a site to residents, visitors and users of a new district. To clarify the narrative of the heritage its matter has to be shaped by architectural means thus interpreting it.

When the pervasive conversion of the industrial site Lövholmen is completed many years have passed. This long process holds many participants – from property owners over experts in different fields to citizens. The latter as practitioners of their democratic rights. Through this large teamwork it is possible to take care of physical remains that are carriers of cultural significance and to convey the history of the site through architectural interpretation.

Lövholmen in central Stockholm is an ongoing planning process and it will be used as a case study. One of the conditions for this development is hash exploitation figures which will lead to the demolition of several buildings. However a critical mass of the physical heritage will be reused and the loss will be compensated for by the telling of the history of the site.

The study focuses on different ways of interpretation by architectural means using the existing bedrock, landscape, structures and buildings as basis for the design. Through landscape architecture the remaining rock of the archipelago can be highlighted. Squares

can be paved with designed patterns, maps of the cement distribution network for instance. The concrete industry Cementas plant used the key for transshipment distributing cement to building sites around Stockholm. To reuse parts from the silos in new contexts or to use the forceful architecture of the silos as inspiration for the design of new housing blocks are other examples.

Tomorrow, when the conversion is carried through, Lövholmen will still reflect significant cultural values and tell stories about the people who lived and worked there.

141 BETWEEN BONES AND BELIEFS: HUMAN-BIRD RELATIONS IN CENTRAL AND NORTHERN EUROPE IN THE 1ST MILLENNIUM AD

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Karpinska, Klaudia (Museum of Cultural History, University of Oslo) - Smallman, Rebecca (HumAnE Bioarchaeology, University of Exeter) - Oehrl, Sigmund (Department of Archaeology and Classical Studies, Stockholm University)

Format: Regular session

Human-avian relationships developed in many ways throughout the Iron Age, particularly in the 1st millennium AD in Central and Northern Europe. These airborne animals foraged and scavenged close to settlements, inviting interactions – wild birds were hunted, and domesticated poultry were bred for meat, feathers and eggs; other birds were kept for entertainment or sport, with raptors trained for falconry. Aves also played significant roles in pre-Christian beliefs and rituals of Iron Age societies: they were sacrificed as votive offerings, included in funerary rites, used for divination, and feature as symbols in both pre-Christian and early Christian iconographies.

Bird remains are frequently recovered from a range of everyday and ritual contexts (e.g. settlements, pits, wells, graves). Avian iconography features on many objects (e.g. jewellery, weaponry, carved stones) in different manners (e.g. Germanic animal styles). Written sources – such as Roman (e.g. Pliny the Elder's The Natural History) and Medieval accounts (e.g. Old Norse literature) – tell of the roles birds played in these cultures.

The main aim of the session is to discuss interdisciplinary research on human-bird relations in the 1st millennium AD in Northern and Central Europe. During the session, we will examine the roles of birds in daily life and their symbolic meanings in pre-Christian and early Christian belief systems of Iron Age cultures, including Roman influences. Papers regarding Eastern and Mediterranean parallels are also welcome. We would like to invite researchers who study such themes not only in the scope of archaeology, anthropology, and zooarchaeology, but also history, art history, history of religions, and philology.

ABSTRACTS:

1 FROM SPECIAL ANIMALS TO CHICKEN DINNER: EXPLORING THE CHANGING ROLE OF CHICKENS

Abstract author(s): Best, Julia (Cardiff University) - Doherty, Sean (University of Exeter) - Foster, Alison (Freelance)

Abstract format: Oral

Chickens are the world's most widespread and abundant domestic animals. They number more than 23 billion and provide much of the world's primary meat and egg resources. However, the timing and circumstances of their spread across the globe, and their transition into a food resource have been poorly understood. During the 1st millennium AD chickens underwent something of a revolution. This paper combines c14 dating, proteomics, and zooarchaeology to discuss the chicken's shift from a rare, exotic, special bird to a common food source. We present new evidence for the timing of the spread of chickens across Europe, and their use on arrival. We use tarsometatarsal spur fusion and metrics to reconstruct age profiles and sex demographics of domestic fowl in Britain during this period, uncovering the advanced age that cockerels often lived to. Using proteomics and medullary bone studies we also explore the creation of repeated egg laying and its impact on the chicken's role in food production. Combined these approaches investigate the changing dynamics of human-chicken relationships.

2 FEATHERS FOR THE AFTERLIFE. INVESTIGATING SPECIES COMPOSITIONS OF FEATHERS FROM SCANDINAVIAN IRON AGE BURIALS REVEAL NEW PERSPECTIVES ON HUMAN-AVIAN INTERACTIONS

Abstract author(s): Berglund, Birgitta (Norwegian University of Science and Technology - NTNU, University Museum, Department of Archaeology and Cultural History) - Rosvold, Jørgen (The Norwegian Institute for Nature Research)

Abstract format: Oral

Several Late Iron Age high-status burial sites where the buried individuals were lying in beds stuffed with feathers are known in Northern Europe, a.o. Sutton Hoo in England, Jellinge in Denmark, Birka in Sweden and Oseberg in Norway. According to written sources, feathers were harvested in Northern Europe in the Faroe Islands and at the coast of Northern Norway at least from the 15th century. The North-Norwegian chieftain and seafarer Othere told king Alfred in England in the 9th century that the Saami payed him feathers as taxes. At the coast of Helgeland in North-Norway, people have for centuries built nesting houses for Common Eiders to obtain feathers, thus building a close relationship between man and birds.

The species composition of the ancient feathers in six burial sites in Norway, from Oseberg in the south to Øksnes in the north, were investigated microscopically and the results are presented here. While Anseriformes (duck, goose and swan) are most common, the

species compositions were varied and with some distinct geographical differences. The results were compared with a corresponding investigation of feathers from the pagan cemetery at Valsgårde in Central Sweden.

The species composition of the feathers revealed that it was not accidental which species the feathers came from in the bed-clothes. The investigations gave new perspectives on the interactions between man and birds in the Late Iron Age Scandinavia. Norse mythology indicated that the feathers may have had a deeper meaning.

3 WHY DID THE CHICKEN CROSS THE NORTH SEA? THE INTRODUCTION OF CHICKENS INTO NORWAY; NEW EVIDENCE FROM THE BORGUND KAUPANG

Abstract author(s): Walker, Samuel (University Museum of Bergen, The Department of Natural History) - Hansen, Gitte (University Museum of Bergen, The Department of Cultural History)

Abstract format: Oral

The domestication of chickens has been hugely successful, and due to their size and ease of transportation, they have become established across the globe. It is estimated that there are now 25 billion chickens inhabiting earth at any one time. Given this, it seems surprising that they have not always been present and were in fact a relatively late introduction to Norway.

Despite Norway's incredible links to trade it is a mystery as to why chickens were such a late introduction in this country. We have identified that by 1300 CE chickens become more common place on sites, and prior to this they are present in small numbers from the beginning of the Medieval period (1030 CE). Pre 1000 CE we have very little evidence for chickens in Norway. We believe that our recent work on the deserted Viking Age/Medieval town Borgund, outside today's Ålesund holds some of the answers to this mystery. It has been possible to significantly add to our knowledge of domestic fowl in Norway through the NFR funded Borgund Kaupang Project. Through inter-disciplinary research we now have securely dated chicken remains from Viking Age contexts.

The earliest domestic fowl from Borgund have been C14 dated to 887–986 CE. Currently representing some of the earliest chickens in Norway. Borgund was a main trading site on the west coast of Norway, with connections to Britain, Germany, France, amongst others. Borgund may have been one of the routes by which chicken were introduced to Norway. As the Borgund project continues we believe we will be able to link these remains with the pottery and other exotic items to help identify possible origins for the importation of chicken into Norway. This research has significant implications to human-avian relationships in Norway and Scandinavia.

4 HUNTING WITH RAPTORS IN THE OLD NORSE SOCIETY - UNDERSTANDING THE PRACTICAL SIDE OF FALCONRY IN THE VIKING AGE

Abstract author(s): Hagen, Ellen (Arkeologisk museum, Universitetet i Stavanger)

Abstract format: Oral

As a raptor leaves the glove of a falconer, nature enfolds on proximity. A brief chase between predator and prey, both evolved to catch or escape each other. Birds of prey, with or without a falconer, hunt daily to survive. The role of the falconer is to care, train and serve the raptor, it is a lifestyle and artform, on which the Holy Roman Emperor, Frederick II, finished a book on in the 1240s, and that is recognized as an Intangible Cultural Heritage by UNESCO. Falconry is hunting with a raptor in a particular human-animal relationship. However, physical remains of falconry in history can be hard to find.

The few traces of falconry from the Norse society in Norway are therefore of high importance, and by looking closer at archaeology, skaldic poetry, picture stones, laws, Norse mythology and language linked with birds of prey, it is possible to describe the practical daily care of the raptors in historical falconry - how and where the raptors were kept, fed, and trained, and which species were used for what kind of hunting, trade, and status. It is even possible to understand how the mere presence of a raptor has been of influence on all these levels.

A core element of falconry is the connection to nature, and the old hunting kings, 'veidekonger', were masters of various hunting styles, and having the skills of a falconer was seen as a good trait of a leader. A raptor needs to be served because it will obey no master, therefore, falconry is a noble art, as the raptor is the true judge of a falconer's character.

5 'FALCONER BURIALS' REVISITED (SWEDEN AND NORWAY, GERMANY, CZECH REPUBLIC AND ESTONIA; 500-1000 AD); ON THE DIFFERENCES IN EVIDENTIAL VALUE

Abstract author(s): Grimm, Oliver (Centre for Baltic and Scandinavian Archaeology - ZBSA)

Abstract format: Oral

Burials with birds of prey (mainly goshawks) which date to the second half of the first millennium AD have been known since a long time in Sweden and Germany. However, it is only in the past decades that this has found broader reception, triggered by one particularly well-preserved burial from mid-east Sweden: the one from Ríceby, north of Stockholm, a wealthy warrior's grave from the seventh century AD, excavated in the year 1980. This burial has very high evidential value for falconry inasmuch as three raptors typically used for this kind of hunting (goshawk, sparrowhawk and peregrine falcon) have been recorded plus hunting dogs plus potential prey.

Against the background of Ríceby, the c. 40 Swedish 'falconer burials' will be shortly highlighted as a group with distinct features before turning to the much less numerous materials from Norway (royal ship grave from Gokstad with goshawks) and Germany (a few burials, with goshawks). In addition, woman's burials from Germany and the Czech Republic with falconry imagery have to be taken

into account, and this also includes the Salme ship finds from Estonia with records of birds of prey (with the ships understood as depositions made by victorious domestic forces).

Thus, the total number of 'falconer burials' may amount to around 50 in parts of Northern and parts of Central Europe. What about differences in evidential value?

6 FUNERARY PRACTICES MOST FOWL: PATTERNS OF SYMBOLIC CHICKEN DEPOSITION THROUGHOUT IRON AGE AND ROMAN BRITAIN

Abstract author(s): Smallman, Rebecca (HumAnE Bioarchaeology, University of Exeter)

Abstract format: Oral

Recent studies are revealing that domestic fowl (*Gallus gallus domesticus*) first arrived in Britain during the Iron Age, becoming widespread with Roman occupation – and that chickens held sociocultural significance far beyond their nutritional value, including roles in cockfighting and ritual practices. Details of British Iron Age and Roman rural sites were collated to map the arrival, spread and depositional contexts of chickens, examining temporal and regional patterns of funerary and ritual deposition. While the majority of early chicken-human graves occur in southern England, notable early chicken depositions were also seen in northern England contrary to previous expectations; such early co-burials are seen to testify to the 'exotic' value of the newly-arriving species. Ritual depositions of chickens show continuity of some Iron Age practices into later Roman periods, as well as Roman votive and sacrificial offerings of domestic fowl, and potential burials of prized cockerels; presence of other domesticates and wild birds in some depositional contexts additionally suggest interlinked animal symbolism and worldviews.

7 EGGSTRA QUESTIONS ANSWERED: USING PROTEOMIC APPROACHES FOR EXPLORING THE RELEVANCE OF DOMESTIC CHICKEN IN VIKING AGE POST-CREMATATION RITES

Abstract author(s): Jelacic, Anna (Stockholm University) - Demarchi, Beatrice (University of Turin)

Abstract format: Oral

The rarity of eggshell finds originating from cremation graves and the traditional lack of interest in cremation-related organics, combined with the small and fragmentary samples collected and available for analysis, limit the current state of understanding regarding many facets of past egg use in burial rituals. However, methodological advances in biomolecular archaeology can heighten the informative potential of this traditionally overlooked object category. This study demonstrates the advantages of peptide mass fingerprinting techniques (also known as "ZooMS" - zooarchaeology by mass spectrometry) in obtaining information on very small eggshell fragments, especially those originating from old excavations and thus with unclear excavation and post-excavation histories. Samples of ten eggshells from Viking Age cremation burials of Central East Sweden, excavated during the period 1873-2003, are analyzed in order to determine the biological origin of the fragments. As a result of this effort, enhanced interpretation is now possible on issues such as the preferences with regard to the avian species targeted, the treatment of the eggs prior to deposition, the issue of time-depth of post-cremation practices, and the phenomenon of inclusion of non-pyre-related objects into the cremation sequence.

8 AVIAN ICONOGRAPHY ON THE GOTLAND PICTURE STONES – VENDEL AND VIKING PERIOD BIRD SYMBOLISM

Abstract author(s): Oehrl, Sigmund (Institutionen för arkeologi och antikens kultur, Stockholms universitet)

Abstract format: Oral

Birds are omnipresent in the art and iconography of Late Iron Age Scandinavia. All kinds of birds, in particular raptors, corvidae and water fowl, are frequently depicted in the Migration Period, Early Medieval, and Viking animal styles. Bird images occur on jewelry and weaponry, rune stones, textiles, amulets, and coinage, sometimes emblematic, sometimes as ornament or incorporated into narrative scenes. In many cases, these images of birds can be interpreted on the background of intercultural parallels and written sources, in particular Old Norse poetry. They can be regarded as servants of gods or as deities in bird shape respectively, as symbols of regeneration or symbols of death, as companions of heroes, eating the corpses on the battlefield and drinking the blood of the slain, as cosmological beings and symbols of power. Pagan, Christian, as well as secular seeming contexts are to be considered. The possible meanings and functions of birds and bird images in Germanic and Viking Age iconography and world view are numerous and remarkably diverse.

In this paper, the diversity and the possible meanings of bird depictions will be discussed based on the example of the Gotlandic picture stones. The picture stones from the Baltic isle of Gotland are among the internationally most famous archaeological monuments from Sweden. These richly ornamented memorial stones, dating to about AD 400–1100, offer a unique source for studies of Late Iron Age material culture and, most importantly, they constitute an unparalleled source for information on pre-Christian cults and religions. On Vendel and Viking Period Gotlandic picture stones, different birds species occur in various contexts, as helpers during the journey of the dead, representing valkyries, among the beasts of the battle field, as companions of gods and heroes, and in the context of hunting.

BIRDS IN PRE-CHRISTIAN SLAVIC ICONOGRAPHY AND RELIGION

Abstract author(s): Szczepanik, Pawel (Institute of Archaeology Nicolaus Copernicus University in Torun)

Abstract format: Oral

The studies of early medieval Slavic religion, beliefs and magic have a very long tradition. The scholars focused primarily on analysing negligible written sources, archaeological sources and finally on ethnographic and linguistic materials. In this paper I would like to show small part of animal studies, focused on the role of birds in Slavonic religion and beliefs. The simple, but complex world of the early medieval Slavic iconography shows birds both, as the independent artefacts, and as the elements of larger representations. Both categories were probably related directly to the mythical reality, showing the role of birds in myths, rituals and beliefs. One of the most excited context is the Slavic cosmology, where in some examples birds play roles of creators of the universe. Selected iconographic representations from various categories of artefacts (e.g.: bronze fittings, jewelry, images on ceramic vessels, images on stones) as well as information from the pages of written sources, will be discussed. In written sources we can find information about swallows having a nest on the breast of Rugiaevit. Also we can find medieval texts informed us about the sacral roles of birds and their functions in the divinations. The corpus of artefacts constructed in this way, will be examined from the comparative perspective. All of this will allow for an anthropological interpretation of birds in the religion of early medieval Slavs. This research is a part of the Project financed by National Science Centre in Poland - "Religions and their things. Comparative analysis of early medieval objects connected with religiosity discovered on the territory of Poland".

LAST CROWS: GAMEFOWL IN VIKING AGE FUNERARY PRACTICES AND BELIEFS

Abstract author(s): Karpinska, Klaudia (Museum of Cultural History, University of Oslo)

Abstract format: Oral

During the Viking Age, people interacted with various species of birds. These animals were observed during daily works and distant traveling (e.g. perching birds), hunt for meat (e.g. ducks), trained for falconry (e.g. Northern goshawks), or breed (e.g. geese). Some of these feathered beings were also significant parts of rituals and beliefs (e.g. common raven, eagles). Among this great variety of bird species, were also wild and domesticated gamefowl (order Galliformes). Animals belonging to this order were not only connected with everyday human life but they were elements of funerary ceremonies. Domestic chickens were sacrificed during cremation and inhumation rituals, and their eggs were placed in different graves. Wild galliforms (e.g. black grouse, peafowl) were killed during elaborate inhumation burials. Furthermore, gamebirds are also mentioned in Ibn Fadlān's Risāla, Saxo Grammaticus' Gesta Danorum, and several Old Norse written sources as sacrifices during elaborate funerals, mysterious offerings and occupants of the otherworld.

As current research has shown, wild and domestic gamefowl remains were present in the humble and very elaborate graves of women, men and children. Bones of domestic chickens (both hens and cocks) and wild galliforms have also been documented together with the remains of other birds (e.g. raptors) and mammals (e.g. dogs, horses). Interestingly, some of the chickens were not burnt on pyres and placed later in the grave pits with ashes.

The main aim of this paper is to discuss the different aspects of interactions between humans and gamefowl in the scope of funerary rituals in Viking Age Norway and Sweden. This paper will take into account not only new analyses of Viking Age graves with remains of gamefowl but also the descriptions of these airborne beings known from Eddic poems, sagas and non-Scandinavian written sources.

A. VIKING FALCONRY – A NEW TAKE ON THE RAPTOR REMAINS AT THE VIKING SETTLEMENT OF WOOD QUAY, DUBLIN

Abstract author(s): White, Hilary (Irish Hawking Club; International Association of Falconry and Conservation of Birds of Prey)

Abstract format: Poster

Wood Quay remains one of the most important Viking settlements uncovered outside of Scandinavia. Dating from the arrival of the Vikings in the 9th Century, the site tells an unprecedented amount about the people who settled there and established the city over generations. Huge amounts of artefacts were found preserved in the wet riverside mud. Among animal bones there were also various raptor species, presumed to be food stuffs and or for arrow quills.

However, one artefact possibly sheds new light on the presence of falconry remains at Wood Quay. A satchel, presumably from a monastery, contained a raptor's foot which was estimated to have belonged to an eagle. The design of the bag is exactly like the hunting bag that every falconer around the world uses to this day – a large over-the-shoulder pouch into which hunting equipment and game can be carried out of sight of the possessive hunting bird. I am in the process of tracking down these bones to have them re-examined. It is plausible that the bone fragments inside are not those of an eagle species but one of the larger falconry species that we know the Vikings availed of – a hawk or a falcon. A large female goshawk or gyrfalcon would have a very large foot, and if the remains were only fragmentary, it could be that they were misidentified as an eagle. Falcon remains were also found at the Fishamble side of Wood Quay where a bustling marketplace stood at that time. Vikings harvested falcons and traded these birds as a commodity, and my theory is that the raptors at Wood Quay might also have been intended for falconry. The presence of these remains is worthy of discussion in the context of falconry activities in Hiberno-Norse trade.

DENDROARCHAEOLOGY: WOOD SCIENCE FOR THE RECONSTRUCTION OF PAST LANDSCAPES AND HUMAN-ENVIRONMENT INTERACTIONS BASED ON ARCHAEOLOGICAL AND HISTORICAL STUDIES OF WOOD REMAINS

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Shindo, Lisa (ROOTS cluster of excellence, Christian-Albrechts Universität, Kiel) - Wazny, Tomasz (Nicolaus Copernicus University, Toruń)

Format: Regular session

Wood has been used by many human societies as a basic building material and for everyday life. On archaeological sites, it is found in various forms: waterlogged, dry or carbonised, and in various dimensions: from small particles to large-sized constructions. Numerous disciplines related to archaeology are dependent on investigations of wood remains. Dendrochronologists, anthracologists, wood anatomists, historians, engineers and representatives of other disciplines provide information on ancient silvicultural and wood-technological practices, and make it possible to reconstruct past landscapes shaped by various forms of human activity.

Because of their quantity, variety and good preservation, waterlogged wood remains are the most suitable material for this type of study. But what about dry and carbonised wood? How can studies not only at the single site scale, but more complex and over a large area contribute to our knowledge about past societies and their use of wood?

We invite all researchers who study wood to present and compare their analyses from all periods. We want to identify the extent to which dendrology and dendrochronology can play a part in the investigation of past human-environment interactions and then extend our current knowledge in an interdisciplinary framework.

ABSTRACTS:

1 A QUESTION OF METHOD AND PLACE? COMPARING METHODS OF DENDROARCHAEOLOGY, ANTHRACOLOGY AND ROUNDWOOD ANALYSIS

Abstract author(s): Bleicher, Niels (Underwaterarchaeology / DendroLab City Of Zürich)

Abstract format: Oral

Dendroarchaeology in the Northern Alpine Foreland has repeatedly postulated the existence of managed woodland as early as during the Neolithic. This hypothesis is based on dendrotypological results. Dendrotypology is a combination of archaeological typology and dendroecology. For the study of woodland management practices based on historic and early modern material, however, dendroecologists adopted different approaches.

The typological idea was then taken up and adapted by anthracologists who endeavor to reconstruct modes of fuelwood exploitation based on small fragments of charcoal. Similar to dendrotypology, anthracotypology compares archaeological datasets to modelled data of idealised woodland types and the remains that these are expected to produce in the archaeological record.

Recently, the idea of managed woodland has been challenged on the basis of diameter/age analyses of waterlogged wood from different sites in Europe.

Thus, four approaches from three disciplines are being used for similar questions and give sometimes different answers. This talk compares the methods and offers a possible solution to apparent contradictions, based on landscape archaeological considerations.

2 ANTHRACO-TYOLOGY AS A METHOD OF UNDERSTANDING FIREWOOD EXPLOITATION AND WOODLAND MANAGEMENT PRACTICES THROUGH ARCHAEOLOGICAL CHARCOAL FRAGMENTS

Abstract author(s): Picornell-Gelabert, Llorenç (Universitat de les Illes Balears) - Dufraisse, Alexa (Sorbonne Universités, CNRS, Muséum national d'Histoire naturelle. UMR 7209 Archéozoologie, Archéobotanique: sociétés, pratiques et environnements) - Coubray, Sylvie (Sorbonne Universités, CNRS, Muséum national d'Histoire naturelle. UMR 7209 Archéozoologie, Archéobotanique: sociétés, pratiques et environnements; INRAP Centre-Ile-de-France) - Alcolea, Marta (Universitat Autònoma de Barcelona) - Girardclos, Olivier (Université de Franche-Comté; CNRS, UMR 6249 Laboratoire de Chrono-Environnement)

Abstract format: Oral

Anthracology has been largely developed as the archaeobotanical discipline dealing with charcoal fragments as archaeological remains of past woodlands and human-forest interactions. In doing so, the discipline has faced diverse challenges, as the difficulty to move beyond taxonomical identification in order to build a comprehensive approach to woodland management practices. In this sense, dendro-anthracology has recently emerged as a prospective venue to deepen the interrogation of anthracological assemblages through the analysis of tree-ring width and convergence of ligneous rays. In this context, the aim of this presentation is to show the diverse dendro-anthracological tools and parameters developed to further interrogate the minimum diameter estimation (charcoal-pith distance), radial growth patterns (tree-ring width), and heartwood formation. By combining these three parameters for each charcoal fragment we have defined the anthracotypology approach as an intuitive way to organize dendrological information and to characterize the studied assemblages, especially tree organ provenance (i.e., trunk vs. branch). We have built up referential datasets and adapted the anthracotypology approach to wood anatomy of both broadleaved trees (*Quercus petraea/robur*) and

gymnosperms (*Pinus halepensis* and *Pinus sylvestris*) from temperate Europe and Mediterranean ecosystems-. This methodology allows us to decipher key issues from archaeological charcoal assemblages, such as the characterisation of wood exploitation practices in contexts broadly dominated by one single species, the evaluation of the occurrence or not of species overrepresentation in burnt contexts, the identification of timber remains among charcoal fragments assemblages or the characterisation of tree-growing conditions and human clearing of trees affecting forest physiognomy. Accordingly, anthraco-typology constitutes a relevant tool to improve the interrogation of archaeological charcoal assemblages to define past woodland management and to assess human influence on forests.

3 AUTOMATED 3D TREE-RING DETECTION AND RING-WIDTH CALCULATION FROM X-RAY COMPUTED TOMOGRAPHY

Abstract author(s): Martinez, Jorge (Lucerne University of Applied Sciences and Arts, School of Engineering and Architecture, Horw) - Stelzner, Ingrid - Stelzner, Jörg (Römisch Germanisches Zentralmuseum Mainz) - Gwerder, Damian - Schuetz, Philipp (Lucerne University of Applied Sciences and Arts, School of Engineering and Architecture, Horw)

Abstract format: Oral

Tree ring analysis is essential in the understanding, modelling and assessment of the evolution of wood samples over time. It provides quantitative data about the whole ring structure which can be used, for example, to measure the impact of the fluctuating environment on the tree growth, to support global vegetation models and for the dendrochronological analysis of archeological wooden artefacts. There currently exist several methods for tree-ring detection and tree-ring parameters estimation from imaging data. However, despite advances in computer vision and edge recognition algorithms, detection of tree-rings is mostly limited to 2D datasets and performed in some cases manually. This contribution presents a new approach to extract the whole 3D tree-ring structure directly from X-ray computed tomography data and illustrates how average tree-ring widths can be estimated from it. The approach relays on a modified Canny edge detection algorithm, which detect fully connected tree-ring edges throughout the measured image stack. The obtained results show that the approach performs well on six tree species having conifer, ring-porous and diffuse-porous ring boundary structure. In our study image denoising proved to be a critical step to achieve accurate results.

4 RECONSTRUCTION OF FOREST DEVELOPMENT IN THE MEDIEVAL ORE MOUNTAINS: PROS AND CONS OF USING WOOD DENSITY OF MINING TIMBER

Abstract author(s): Ahlgrimm, Svenja - Scharnweber, Tobias (University Greifswald)

Abstract format: Oral

The Ore Mountains are one of the most important medieval mining areas in Europe. Interdisciplinary approaches have been used to understand the development of the area as a highly dynamic cultural landscape. During excavations of mining complexes from the 12th and 13th centuries a remarkable amount of thousands of construction timbers were recovered and dendrochronologically dated.

In addition to tree-ring width, we also measured annual maximum latewood density (MXD) on a subset of historical wood samples. This parameter shows better correlations to summer temperatures and can be used to cross-date shorter tree-ring sequences. Furthermore, the positive relationship between elevation and latewood density can provide a basis for reconstructing origin of timbers and thus helps in dendroprovenancing.

However, wood decay and post-sedimentary processes such as concretions of iron or manganese in wood can bias the measurements. Therefore, we studied different extraction techniques and quantified their impact on absolute/relative wood densities and on element concentrations. Our results reveal that especially medium (decadal) time frequency signals in annual wood densities are affected by metal concretions. In order to reduce this bias, we propose a new extraction technique.

Despite these methodological limitations, this unique archive can provide new insights into aspects of landscape and climate history. Focusing on the parameter of wood density, we would like to discuss how our dataset can contribute to our knowledge of the composition and resilience of the medieval Saxon primeval forest as well as human interventions.

5 BEYOND CHARCOAL ANALYSIS. WOOD USES AND WOODLAND MANAGEMENT FROM BRONZE TO IRON AGES IN NORTHERN IBERIA

Abstract author(s): Martin Seijo, Maria (Universidad de Cantabria)

Abstract format: Oral

Charcoal is the most common archaeobotanical remain recovered from archaeological contexts dated to Bronze or Iron Ages in northern Iberia. Up to now, a large number of charcoals have been analysed in the last decade providing an excellent opportunity to test the possibilities of going beyond taxonomic identification. In our research we have systematically combined charcoal analysis in tandem with registering dendrological and taphonomic attributes. This has provided information to better characterise the kind of wood resources managed, the combustion process, the state of wood before burning and the depositional and post-depositional processes affecting to archaeobotanical assemblages. But it has also been obtained information about wood uses, woodland management practices, and even about the relationship established between people and their environment. This presentation will

summarise the results obtained from several case-studies dated from the Bronze to the Iron Ages in the northern part of the Iberian Peninsula which have allowed the identification of specific uses of wood as well as sylvicultural practices.

6 MIDDLE AGES DENDROPROVENANCING: MAPPING WOOD EXPLOITATION AND CONSUMPTION FOR SAN ESTEBAN ARCHAEOLOGICAL SITE IN THE 12TH AND 13TH CENTURIES

Abstract author(s): Celma Martínez, Mireia - Baño López, Ana (Professional Archaeologist) - Eiroa Rodríguez, Jorge (Departamento de Prehistoria, Arqueología, Historia Antigua, Historia Medieval y Ciencias y Técnicas Historiográficas Facultad de Letras, Universidad de Murcia) - González Ballesteros, José Ángel (Professional Archaeologist) - Hernández Robles, Alicia - Haber Uriarte, María (Departamento de Prehistoria, Arqueología, Historia Antigua, Historia Medieval y Ciencias y Técnicas Historiográficas Facultad de Letras, Universidad de Murcia)

Abstract format: Oral

This research has focused on the probable dendroprovenance of woody taxa determined for San Esteban (<http://sanesteban.um.es/>) archaeological site through charcoal analysis, the revision of the medieval written sources, GIS proposal, and the complementary bioarchaeological analysis as an interdisciplinary synthesis.

4,620 charcoal from different contexts (maqbara, main streets, funduq, building II) were analysed and resulted in 36 woody taxa. The determined taxa correspond to different ecological and plant-bearing realities. The current topographical layout presents an ecological niche at the bottom of the valley through which the Segura river flows, and where Medina Mursiya was founded. The local acquisition is considered from the basis of bioclimatic stages natural environment of the determined taxa for the Thermo-Mediterranean, Meso-Mediterranean, Supra-Mediterranean, and typical riverside vegetation, in addition to the orchard fruit-tree production and if they were all able to grow in the surrounding territory.

The aim is to approach the site into the woods and cropland nearby environment woody taxa available and to analyse the demanded trade input when a lack of timber and wood fuel existed in every developed activity.

Firstly, a combined methodology analyzing charcoal from both by hand and light/heavy floatation fractions, introducing soft sieving to divide the remains into >2 mm and > 4mm, allowed to deepen increasing the number of taxa and the possibilities for further paleoecological and paleoeconomic interpretation for all contexts. Secondly, a review of the synchronic medieval written sources was gathered to explore traded wood and its provenance. Thirdly, a GIS was developed to locate taxa on its ecological environment and bioclimatic stages according to the historical transformation of the landscape. Finally, complementary bioarchaeological analyses are being produced to review and connect the archaeological record with the geographical chemical indicators, and to revise the reliability of the written sources.

7 MODERN TAR KILN FROM THE BIAŁOWIEŻA PRIMEVAL FOREST. ARCHAEOLOGICAL AND DENDROLOGICAL STUDY

Abstract author(s): Szubski, Michal - Szubska, Magdalena (Cardinal Stefan Wyszyński University in Warsaw) - Klisz, Marcin (Forest Research Institute) - Wojnar, Joanna (Cardinal Stefan Wyszyński University in Warsaw) - Langer, Jerzy (Faculty of Chemistry, Adam Mickiewicz University in Poznań)

Abstract format: Oral

The Białowieża Primeval Forest is one of the largest forested areas in Poland, it occupies nearly 1500 km² of which 42% is in Poland and the rest is located in Belarus. Significant part of this area is covered by various types of protected zones including the Białowieża Forest World Heritage site.

As part of the project "Cultural and natural heritage of the Białowieża Forest", over 1700 archaeological features with preserved anthropogenic relief were discovered with archival query and aerial laser scanning. Many of them are remnants of the modern charcoal production - over 250 charcoal kilns and 54 tar kilns have been located. They often occur near prehistoric barrows, creating a palimpsest-like cultural landscape.

The tar kiln in the Łozice Forestry has 20 meters in diameter. A trough-shaped depression (tar kiln) is surrounded by a circular heap, approx. 50 cm high, which is ditched in the southern part by a channel that drains tar to three reservoirs. During the field excavations, the remains of a burnt wooden structure were discovered, as well as a tar tank coat with clay and fragments of tar. The pottery shards obtained during the research allow the site to be initially dated to modern times (18th century).

The obtained samples were then itemized by specialist analyzes. The preserved pieces of wood were dendrological analyzed, while tar substances were studied with microscopic and Fourier Transform Infrared (FTIR). Additionally, the soil from the tar kiln area was sent for chemical composition analyzes.

This first attempt of interdisciplinary research of this kind of kiln in the Białowieża Primeval Forest show us big opportunities of investigating modern features and will be continue in the future. They are an example of human interaction with the forest for the production of tar and charcoal, which is still visible in the landscape.

8 NEOLITHIC WOOD USE AT THE SCHELDT RIVER BANKS IN BOUCHAIN (HAUT-DE-FRANCE)

Abstract author(s): Leroy, Gilles (DRAC Hauts-de-France, Service régional de l'archéologie – UMR 8164 Halma - CNRS) - Jaouen, Gwénaëlle (Independent Researcher) - Tegel, Willy (Institute of Forest Sciences, Chair of Forest Growth and Dendroecology, Albert-Ludwigs-University Freiburg) - Salvador, Pierre-Gil (Univ. Lille, Univ. Littoral Côte d'Opale, ULR 4477) - Boulen, Muriel (Palynologist, Institut National de Recherche en Archéologie Préventive - INRAP – UMR 7209 - CNRS-MNHN) - Salavert, Aurélie (UMR 7209, Archéozoologie, Archéobotanique: sociétés, pratiques et environnements - CNRS-MNHN)

Abstract format: Oral

Archaeological sites with wetland or waterlogged conditions provide excellent preservation conditions for organic material, particularly wood, making one of the most important prehistoric sources for dendroarchaeological studies available. Dendroarchaeological research allows detailed insights into ancient technologies, wood selection and utilisation. Furthermore, annual resolved dendrochronological dates can deliver important information on the spatio-temporal development of prehistoric occupations.

The site of Bouchain (Haut-de-France, dep. Nord) is located on the bank of a paleochannel close to the Scheldt river, which flows from south to north into the North Sea. As a result of regularly floods with different intensity, the site conditions are waterlogged leading to formation of peat. Archaeological evidence reveals activities between the Middle Neolithic and the end of the Late Neolithic (4260 to 2475 cal BC). Six excavation campaigns between 2014 and 2019 discovered vast amounts of wooden remains. Wooden artifacts have been sampled for dendroarchaeological analyses within an interdisciplinary program, further involving palynological, carpological and anthracological studies. A total of 1450 individual wood objects were studied including architectural elements (posts, stakes and planks), tools (axe handles), hunting weapons (arrow shafts and bows, throwing sticks, slingshot balls), tableware, production waste from woodworking (chips) and finally two log boats. In addition, natural wood residues from peat and alluvial layers were collected in order to obtain a more comprehensive picture of the Neolithic forest vegetation on-site.

The dendroarchaeological investigations combined with other environmental studies will provide first results regarding environmental reconstructions, the dating of various Neolithic occupations, the management of wood resources and wood working techniques.

9 FROM DENDROCHRONOLOGY TO BRONZE AGE WOODLAND AND COSMOLOGY: TWO TIMBER CIRCLES ON ENGLAND'S EAST COAST

Abstract author(s): Robertson, David (Forestry Commission England)

Abstract format: Oral

In the late 1990s two timber circles were discovered on a north Norfolk beach. The one now known as 'Seahenge' was fully excavated; the second circle was recorded over the next fifteen years as it was gradually destroyed by the sea. Peat and waterlogged conditions ensured excellent preservation of timbers in both structures, providing insights into the ways wood was utilised in practical and potentially symbolic ways. Dendrochronology dated the felling of the trees used to build both monuments to the spring or summer of 2049 BC, a few centuries after the introduction of metal tools. Studies of Seahenge's timbers revealed the largest assemblage of Bronze Age toolmarks then known from the United Kingdom.

This paper will explore how Seahenge's timbers can help us understand the species, size, age, and number of the trees used in its construction. It will use this information, and associated palaeoenvironment remains, to attempt a reconstruction of the Bronze Age woodland in which they stood prior to felling. It will go onto consider the layout, dating and direct association of the two circles, offering one possible explanation for their erection and use. In the process the paper will touch on how the treatment, positioning and orientation of timbers may reveal Bronze Age beliefs associated with the sky, celestial bodies, and an underworld.

10 WOODLAND MANAGEMENT IN THE PILE DWELLINGS OF THE LJUBLJANSKO BARJE, SLOVENIA, IN THE ENEOLITHIC?

Abstract author(s): Out, Welmoed (Moesgaard Museum, Dept. of Archaeological Science and Conservation, Højbjerg) - Hänninen, Kirsti (BIAX Consult, Zaandam) - Merela, Maks (University of Ljubljana, Biotechnical Faculty, Department of Wood Science and Technology, Ljubljana) - Velušček, Anton (Research Centre of the Slovenian Academy of Sciences and Art, Institute of Archaeology, Ljubljana) - Vermeeren, Caroline (BIAX Consult, Zaandam) - Čufar, Katarina (University of Ljubljana, Biotechnical Faculty, Department of Wood Science and Technology, Ljubljana)

Abstract format: Oral

Woodland management, i.e. coppicing and pollarding, is regularly suggested to have taken place in Europe from the Mesolithic or at least the Neolithic onwards. Is this actually the case? This study focuses on prehistoric pile dwellings in the Ljubljansko barje (Ger. das Laibacher Moor), Slovenia, dating to the Eneolithic period, between 3700 and 2400 BC. These settlements were inhabited by people of different cultural groups and are all characterized by a highly developed copper metallurgy. Due to waterlogged conditions, organic material at these sites has remained preserved through time.

Archaeological excavations since 1995 have enabled systematic collection of waterlogged wood for dendrochronological dating. This resulted in the collection of a large data set of over 8,500 wood samples from 16 pile dwellings, allowing a regional analysis of wood exploitation. The wood assemblage includes 11 genera and is dominated by ash (*Fraxinus excelsior*) and oak (*Quercus robur* and *Quercus petraea*). Earlier analysis of ash and oak piles from one of the sites, Stare Gmajne, indicates the exploitation of unman-aged wood during 3160-3110 BC (Out et al. 2020). The aim of the present work is to investigate the characteristics of wood ex-

ploitation at the other sites that date both to earlier (3700 -3330 BC) and later (ca. 2800-2400 BC) periods. We focus on woodland management at two clusters of sites that were during some periods populated simultaneously.

11 SASANIAN WOODLAND USE IN TREELESS LANDSCAPES

Abstract author(s): Shumilovskikh, Lyudmila (Georg-August-University Göttingen)

Abstract format: Oral

Palaeobotanical data from radiocarbon-dated sediments and archaeological excavations represent important source of information for our understanding of human-environment interactions. Compilation of palynological, wood anatomy, charcoal and botanical macroremain analyses provide new insights into woodland management in the treeless landscapes of the Gorgan Plain (NE Iran) during the Sasanian era. Palynological research points to natural origins of the open steppe vegetation in the Gorgan Plain. During the Sasanian period, local sources provided enough firewood for kilns in short-term use, but were insufficient for fortifications which required additional supplies from the Hyrcanian forests. These forests provided the main source of firewood for sites located close to the Alborz Mountains. Cultivation of trees was widespread during the Sasanian Empire for fruits, shadow and possibly moriculture for silk production. The palaeobotanical records are still very rare in the Gorgan Plain. New data are a high desideratum to gain further insights into woodland use before, during and after the Sasanian Empire.

12 A 19TH CENTURY WHALER IN PATAGONIA, ARGENTINA: DENDROCHRONOLOGICAL ANALYSIS OF THE BAHÍA GALENSES SHIPWRECK

Abstract author(s): Mundo, Ignacio (IANIGLA-CONICET) - Murray, Cristian - Grosso, Mónica (PROAS, Instituto Nacional de Antropología y Pensamiento Latinoamericano, Buenos Aires) - Rao, Mukund - Cook, Edward (Tree-Ring Laboratory, Lamont-Doherty Earth Observatory, Columbia University, New York) - Villalba, Ricardo (Laboratorio de Dendrocronología e Historia Ambiental, IANIGLA-CONICET, Mendoza)

Abstract format: Oral

Since the late 18th century, the demand for products derived from the exploitation of cetaceans and pinnipeds led North American and European vessels to explore new hunting areas in the southern oceans. Numerous historical sources accounts for these commercial activities involving a great number of vessels. Many of these ships were lost at sea and their precise locations remain unknown.

In 2002 the remains of a wooden shipwreck were discovered on the coast of Golfo Nuevo, northern Patagonia, Argentina. The wreck was named "Bahía Galenses" after the historical name of the cove where it was found. The results of the archaeological research carried out so far indicate that it would be a whaler built in the 19th century employing northern hemisphere timbers.

Some archaeological and written evidence suggest that it could be the Dolphin, a whaler built in Warren, Rhode Island, USA, in 1850 and shipwrecked in 1859 at Golfo Nuevo. To test this hypothesis, using dendroarchaeological provenance methods and a novel approach based on the gridded North American Drought Atlas (NADA), we found highly significant correlations between the wreck's tree-ring width series and oak and pine chronologies from eastern US. Our findings indicate that the Bahía Galenses shipwreck have the same origin and historical moment of construction of the Dolphin. As far as we know, this research would be the first study conducted in South America to date and determine the origin of a shipwrecked whaler through dendrochronological methods.

The results of this study stimulate further interdisciplinary projects to study the large number of unidentified wooden shipwrecks found along the extensive Patagonian coasts of the South Atlantic Ocean, many of which may have been involved in the exploitation of marine resources during the 19th century.

A. ARCHAEOLOGICAL AND DENDROLOGICAL STUDY OF TWO TYPES OF CHARCOAL KILNS IN THE BIAŁOWIEŻA PRIMEVAL FOREST

Abstract author(s): Wojnar, Joanna (Cardinal Stefan Wyszyński University in Warsaw) - Klisz, Marcin (Forest Research Institute)

Abstract format: Poster

Located on the eastern part of the country the Białowieża Primeval Forest is one of the largest forested areas in Poland. The whole forest complex occupies nearly 1500 square kilometres. Around 42% of it is located in Poland and the rest in Belarus.

Archaeological research in Białowieża Forest discovered thousands of features with preserved anthropogenic relief including many remnants of the modern charcoal production. All of them were detected with airborne laser scanning archaeological reconnaissance and verified in the field.

Here we present the preliminary results of archaeological and dendrological studies of samples from selected charcoal kilns. The analysed samples were collected from two different types of charcoal kilns located around one kilometre from each other. Features differ in term of morphology – one is rounded with shallow ditch, second is plain mound without ditch.

The preserved pieces of wood and charcoal were analysed by dendrological and wood anatomical methods to establish the tree-ring chronology of each charcoal kiln and to determine the tree species of wood samples used in both types of analysed charcoal kilns.

144 THE EVER CHANGING COAST: INTERACTIONS OF PEOPLE, LANDSCAPES AND ENVIRONMENT ALONG EUROPE'S SEAS IN HIGH-RESOLUTION

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Kristiansen, Søren (Department of Geoscience, Aarhus University; Center of Urban Network Evolution - UrbNet, Aarhus University) - Stamness, Arne (Norwegian University of Science and Technology The NTNU University Museum Department of Archaeology and Cultural History) - Verhegge, Jeroen (Department of Archaeology, Ghent University)

Format: Regular session

Our ability to understand human development along the coastlines of Europe is dramatically improving, both above and below the present sea level. Recent advances are based on improved understanding of past climate change, extreme events, biosphere interactions, and include precise records of sea-level variation since the last glacial period. These fast-developing records of key components of the Earth system have huge potential for improving our understanding of gradual changes, abrupt shifts and resilience in coastal societies from local to continental scales.

In this session, we invite contributions focusing on human-environment interactions along the changing shores of Europe's seas and lakes. Archaeological periods can range from Paleolithic to Modern, while scales can range from single site investigations to regional and continent-wide studies. Both marine-based and on-shore studies are welcomed.

Of particular interest are studies of coastal landscapes and archaeology using one or a combination of methods to investigate the human-environment interconnections. Examples are high-definition dating (radiocarbon, optically stimulated luminescence (OSL), geo-archaeology (coring, soil science, sedimentology), archaeological databases, geophysical mapping both on-shore and off shore (seismic, GPR, magnetic and electrical methods), and upscaling these using paleo-landscape modelling and remote sensing (lidar, aerial photography, optical and radar satellite data) approaches. Invited archaeological investigations can be both above and below the present sea level as long as they provide new knowledge of relevance for both the environment and humans living along the ever changing coasts of Europe.

ABSTRACTS:

1 LINDISFARNE LANDSCAPES: GEOARCHAEOLOGICAL APPROACHES TO HUMAN-ENVIRONMENT INTERACTIONS ON HOLY ISLAND (NORTHUMBERLAND, UNITED KINGDOM)

Abstract author(s): Kahlenberg, Raphael - Andrieux, Eric - Bailiff, Ian (Department of Archaeology, Durham University) - Lloyd, Jeremy (Department of Geography, Durham University) - Shillito, Lisa-Marie (School of History, Classics and Archaeology, Newcastle University) - Milek, Karen (Department of Archaeology, Durham University)

Abstract format: Oral

The Holy Island of Lindisfarne is a small tidal island in North-East England and is well-known as the scene of one of the first Viking raids on the British Isles in 793 AD. It had an eventful history, both in terms of cultural changes and landscape evolution. During the periods that are best attested in the archaeological and historical records, from the Anglo-Saxon period (5th to 11th centuries AD) onwards, it has seen phases of high religious and economic importance but also temporary abandonment. At the same time, profound changes in vegetation, land use and dune formation took place. While these developments are well-studied in the north of Lindisfarne around the Anglo-Saxon Period settlement of Green Shiel, little paleoenvironmental data is available for the rest of the island, including the parts immediately adjacent to the presumed location of the early medieval priory, the village and the castle.

This paper presents the first results of an interdisciplinary study combining geophysical prospection (electrical resistivity tomography and ground-penetrating radar), coring and multi-proxy analysis of palaeosols and sediments, including phytolith and foraminifera analyses. It is likely that medieval soils are preserved at various locations across the island, sealed by layers of aeolian sand which accumulated during the Little Ice Age (16th-19th centuries AD) and reach a thickness of up to 40 cm. Peaty deposits below these palaeosols suggest a transition from a wetland environment to drier conditions. This observation raises the question of whether parts of coastal wetlands on Lindisfarne have been actively reclaimed under monastic control in (early) medieval times. If this dating and the anthropogenic character of the processes can be confirmed, our study will shed new light on how Lindisfarne's landscapes have been used, transformed and perceived while the island was home to one of England's most influential monasteries.

2 LUMPS AND BUMPS! RECONSTRUCTING A BURIED LANDSCAPE USING LEGACY DATA AT TRONDHEIM, NORWAY

Abstract author(s): Cadamarteri, Julian (NIKU - Norwegian Institute for Cultural Heritage Research)

Abstract format: Oral

The medieval city of Trondheim, Norway is situated on a river bend promontory in the delta estuary of the river Nid in the middle of Norway. The river and the promontory created an ideal harbour in the Viking and medieval era. Situated in a river delta means that the landscape is shaped by the river, erosion and landslides in the river valley as well as the sea and isostatic sea level change. The medieval city centre is today a seemingly flat level area, today's topography reflects 1000 years of levelling and infilling masking the natural landscape underlying the urban area. Since the early 70s data on the height of the natural subsoil have been regularly

documented in connection with archaeological excavations in the city centre. Leading to a database of over 1500 measurements. Converting the data to xyz coordinates makes it possible to build a GIS terrain model of the delta landscape through interpolation. The natural landscape lies underneath up to 5 m of cultural layers and the terrain model makes it possible to understand the original landscape which the earliest human occupation took place in and the landscape the city was founded in during the viking age. The model also enables a new understanding of medieval use of the promontory and the medieval town plan in relation to the landscape, hydrology and vegetation. The model shows that the human occupation up through the iron and medieval age adapted to the landscape in a greater degree than earlier appreciated.

3 LARGE-SCALE POST-BATTLE TREATMENT OF DEAD IRON AGE WARRIORS IN DENMARK: COASTAL, SETTLE AND LAND-USE CHANGES

Abstract author(s): Hertz, Ejvind (Museum Skanderborg) - Munch Kristiansen, Søren (Geoscience, Aarhus University)

Abstract format: Oral

Coasts along the sea have always attracted people but also the coasts of lakes have been attractive. Just after the birth of Christ a large scale battle took place in East Jutland, Denmark after which thousands of human bones was deposited along the coast of a small lake, present-day Alken Enge, next to larger Lake Mossø as evidence the post war aftermath. Here a sandy coastal spit system evolved in the centuries before the birth of Christ and was around the bone sacrifice at the first half of the first century AD a very prominent in-land shallow, calm water with sandy beaches cut by a small stream with deeper water. These special landscape elements are probably the reason why the sacrifice was performed right here in Alken Enge.

The traces on-site are especially indicators to new rituals of sacrifice of minimum 380 individuals, while as example, pollen studied indicates that the post-battle land-use rapidly transformed from grazing and farming into forest after the deposition of the dead warriors. In a regional perspective, conflict related sacrifices continue from 200 to 450 AD in another small lake upstream in the Illerup valley, now with a focus on the weapons and warrior's personal equipment. These rich weapon sacrifices in the small lake, with no clear evidence of white beaches, have their example in the way the Romans treated equipment from conquered armies, but with a special variant with sacrifices in lakes in Southern Scandinavia. Throughout an approximately 500-years period following the sacrifice at Alken Enge the Illerup Valley have in the local communities collective memory hence been perceived as a "Sacred Valley" to which was brought large and significant sacrifice to the gods while, at the same time, the land-use was intensified and the near settlement structure seems to disappear.

4 NIDA COASTAL SITE IN AEOLIAN ENVIRONMENT. NEW RADIOCARBON AND ANTHRACOLOGICAL DATA FOR CHRONOLOGICAL REINTERPRETATION AND ENVIRONMENTAL RECONSTRUCTION

Abstract author(s): Pilkauskas, Mindaugas (Lithuanian Institute of History) - Peseckas, Kęstutis (Nature Research Center)

Abstract format: Oral

Investigations at Nida Stone Age settlement on southwestern coast of the Baltic Sea counts almost two centuries. During this long research period the knowledge about the site changed with new data available. Extensive radiocarbon dating indicates that it has been inhabited during the period of 3500 – 2500 cal BC. This period can be divided into Subneolithic and Neolithic epochs, represented by shell tempered and mineral/grog tempered pottery respectively. The site is situated at the Curonian Spit a narrow peninsula (0.5 – 5 km width) which separates Baltic Sea from the Curonian Lagoon and is composed mainly from aeolian sand. Currently, Nida Stone Age site is further away from the sea or lagoon shores, but the latest research which included intensive boring, GPR profiling and stratigraphy analysis lets us to draw a conclusion that during Subneolithic and Neolithic the site was on the shore of Curonian Lagoon.

Excavations were renewed in 2020. Aims of the latest research at the site were firstly to gather samples from stratified layers for age modelling and secondly to collect direct data on site paleoecology. A large collection of wood charcoals was obtained by hand-picking during excavations and from soil samples using flotation method. Anthracological analysis was carried out to determine the best samples for radiocarbon dating and to reconstruct past woodland composition.

The results from the latest research lets us cautiously reinterpret the previous notions of chronology and environment. New radiocarbon dates indicate different chronological view and together with freshwater reservoir age correction narrows down the Neolithic period of Nida settlement and distinguishes it from Subneolithic. Analysis of charcoals from cultural layer indicates different environment than previously thought with higher than expected percentage (>50 %) of deciduous broad-leaf trees (Quercus, Alnus, Acer, Corylus).

5 INVESTIGATING HUMAN-ENVIRONMENT INTERACTIONS USING ARCHAEOLOGICAL SHELL PROXIES: THE CASE OF THE FRANCHTHI CAVE AND ITS SUBMERGED NEOLITHIC SETTLEMENT

Abstract author(s): Theodoraki, Danaï (Römisch Germanisches Zentralmuseum - RGZM)

Abstract format: Oral

The molluscan record can provide significant evidence on prehistoric human-environment interactions, as the coastal foraging and early farming communities were closely connected with the immediate marine environment. Broad-scale paleoenvironmental and climate proxies have been widely used when addressing the subject of the liminal phase of the late Mesolithic towards the Early

Neolithic period. However, the shell record is able to contribute valuable site-specific evidence when employed as a paleoclimatic and seasonality proxy in order to investigate long-term trends and extreme short-term paleoclimatic events. This presentation is part of a PhD project that intends to examine the ways in which the inhabitants of prehistoric coastal sites in the Mediterranean that bear witness to this transition, such as the site of Franchthi in the Argolid in Greece, were affected by fluctuations in the local paleoenvironmental conditions and sea-level change in terms of subsistence and social practices using the archaeological shell record and inherent high-resolution paleoenvironmental datasets. Thus, environmental variability of the Mesolithic/Neolithic interface will be employed to illuminate important aspects of the coastal communities, while considering different scales of spatial and temporal analysis. Overall, the environmental proxy data of this on-going study have the potential of providing important information on the submerged agricultural landscape of the site.

6 THE MARINE PREHISTORY SAMPLER (MPS), SEARCHING FLINTS IN MOST UNREACHABLE AREA'S

Abstract author(s): Muller, Axel - Waldus, Wouter (ADC archeoprojecten) - Smit, Bjørn (Cultural Heritage Agency)

Abstract format: Oral

Collecting data about prehistoric occupation from submerged landscapes is common practice in Dutch archaeology. Especially in the west of the country, there are many examples of surveys in drowned landscapes, in areas that are reclaimed (polders). The last decennia, progress has been made in methods and practices for detecting late Pleistocene and early Holocene sites.

Fieldwork in areas that are still open water is very rare. But recent sand and gravel extraction and a commission from the Cultural heritage Agency of the Netherlands gave an opportunity to search for solutions or to improve existing methods and practices. In recent years there have been archaeological surveys of submerged landscapes in one of the large lakes of central Netherlands (Markermeer). In collaboration with important stakeholders, like the Cultural Heritage Agency of the Netherlands, a new sampling technic was developed for sampling areas of a submerged landscapes underwater. Due to this project progression was made in the practical challenge of collecting artefacts from a difficult to reach place (underwater submerged and covered prehistoric landscape), but also in the process of assessment and evaluation of survey data to get a better view of occupation and land use in submerged landscapes. Combined geoarchaeological research and newly developed large sampling methods results in mapping Mesolithic sites in, until recently, unreachable places.

In this presentation we want to show how the MPS was used to detect Mesolithic sites and discuss possibilities and limitations for use in other environments.

7 WASHED AWAY – THE IMPACT OF STORMS DURING THE LATE LITTORINA TRANSGRESSION PHASE ON PALAEO TOPOGRAPHY AND ARCHAEOLOGICAL SITES

Abstract author(s): Enzmann, Jonas (Lower Saxony Insitute for Historical Coastal Research)

Abstract format: Oral

It is known that storms could have a massive impact on the formation of coastal landscapes. Nevertheless, their remains are not often discussed in the archaeological community so far. Most sites from the Mesolithic period that are described well, show more or less undisturbed or fluvial influenced waste-layers in ancient shallow waters. At the site Strande LA 163 in the Baltic Sea near Kiel, Northern Germany the opportunity arose to study how archaeological material and palaeotopography is impacted by heavy storms. The site was discovered in 2011 nowadays at 6 m water-depth around 1 km in front of the modern coast. A first excavation campaign in 2012 and a survey in 2014 on the site dating to the aceramic phase of the Ertebølle-Culture had very promising results, which led to the current project. Under the title: „Subsistence strategies, settlement structure and communication during the terminal Mesolithic exemplified by a submarine micro-region in the Bay of Kiel” the German Research Foundation (DFG) granted a three years project to the Lower Saxony Institute for Historical Coastal Research (NIhK).

In four diving campaigns excavation, coring and geophysical data could be obtained and merged through a special measurement system that delivered a rarely achieved precision in underwater archaeology. On that basis C-14 dating, pollen analysis, find compositions and the progression of layers through different datasets could be discussed in detail. In the end it was possible to describe a site formation process in which sediments and finds from around 5300-5000 BCE were deposited in a depression around 5000-4800 BCE. Most likely a second eroded settlement phase after the storm event could be verified by few finds in the modern-day sand layer.

8 MAPPING THE CHANGING COASTLINE OF THE SWEDISH VIKING AGE SITE OF BIRKA THROUGH HIGH-RESOLUTION ARCHAEOLOGICAL PROSPECTION

Abstract author(s): Trinks, Immo (Vienna Institute for Archaeological Science, University of Vienna; Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology, Vienna) - Wallner, Mario (Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology, Vienna) - Nau, Erich (Norsk institutt for kulturminneforskning, Oslo) - Löcker, Klaus (Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology, Vienna; Zentralanstalt für Meteorologie und Geodynamik, Vienna) - Doneus, Michael (Department of Prehistory and Historical Archaeology, University of Vienna; Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology, Vienna) - Gabler, Manuel (Norsk institutt for kulturminneforskning, Oslo) - Hinterleitner, Alois (Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology, Vienna; Zentralanstalt für Meteorologie und Geodynamik, Vienna) - Verhoeven, Geert - Klimczyk-Lugmayr, Agata (Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology, Vienna) - Neubauer, Wolfgang (Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology, Vienna; Vienna Institute for Archaeological Science, University of Vienna)

Abstract format: Oral

Background and Aim:

The UNESCO World Heritage Site Birka and Hovgården is located on the neighbouring islands of Björkö and Adelsö in Lake Mälaren, Sweden. Due to post-glacial rebound, the land has risen by up to six metres over the past 1,200 years, causing substantial changes to the coastline. A comprehensive archaeological prospection case study aims to explore the site to reveal buried settlement remains and Viking Age burials in unprecedented imaging resolution, while at the same time testing and advancing archaeological prospection techniques.

Material and Methods:

Remote sensing in form of aerial photography and airborne laser scanning as well as ground based non-invasive near-surface geophysical prospection methods have been adapted and utilised to collect extensive high-resolution datasets for archaeological prospection. A dedicated LiDAR survey was flown using a Riegl LMS-Q680i full-waveform laser scanner mounted in a Cessna 182 light airplane. The scanner acquired in average 12 points per square metre with up to 20mm ranging accuracy. Efficient motorised, ground-penetrating radar measurements were conducted with a motorised 16-channel 400 MHz MALÅ Imaging Radar Array on the ground. The collected datasets were integrated and analysed in a GIS using a specially developed toolbox.

Results:

A highly detailed digital terrain model has been generated from the LiDAR data after removal of vegetation and modern constructions using the SCOP++ software package (TU Wien). Topographically corrected georadar depth-slices have been computed to map and image the subsurface in-depth. The post-glacial uplift of the land has been reconstructed using both the digital terrain model as well as the subsurface information derived from georadar measurements.

Conclusions:

The large-scale archaeological prospection approach revealed not only numerous buried archaeological remains and permitted the mapping of the topography of the World Heritage Site in unprecedented resolution, but provided detailed information on the changing shoreline and corresponding human-environment interactions.

9 DETECTION, VISUALIZATION AND ANALYSIS OF PALAEO-BEACHES FOR HIGH-RESOLUTION CHRONOLOGICAL AND SPATIAL ARCHAEOLOGICAL INVESTIGATIONS – GEOPHYSICAL CASE STUDIES FROM NORWAY

Abstract author(s): Stamnes, Arne (NTNU University Museum, Department of Archaeology and Cultural History) - Kristiansen, Søren (Department of Geoscience, Aarhus University)

Abstract format: Oral

A combined landscape- and geoarchaeological approach has great potential for illuminating the interaction between land-water divides and for landscape reconstruction. Such “landscape gradients” where elements meet were often preferred locations for settlement and human activity globally. In addition to the archaeological information, large scale, high-resolution geophysical surveys have tremendous potential as a source of paleoenvironmental information by detecting former beach ridges, palaeochannel systems, palaeotopography and geomorphological processes, as well as providing information on relative chronology of archaeological observations and landscape changes.

The study of beach ridges, in particular, has the potential to provide additional information on relative landscape chronology and be used to create new relative sea-level curves, but often relies on singular ground-penetrating radar (GPR) sections and or visible beach ridges, sometimes detected by Lidar-analysis. Large scale, high-resolution geophysical survey examples demonstrate how a much more detailed impression of the temporal landscape development is achievable. Such high-resolution in 3D from the combined surface and subsurface investigations have to a large degree not been utilised for paleoenvironmental and -landscape mapping, as the survey parameters are often targeted to much larger scale but at a considerably lower resolution. A GPR approach, combined with terrain models derived from Lidar-data, provides new information on landscape developments. Therefore, it is applicable to study sites from all archaeological time periods and may be especially useful for lake and sea coastal areas next to or below the ice shields of the Last Ice Age.

This paper present examples from several archaeological coastal sites from Norway that demonstrate the archaeological possibilities and technical feasibilities of a high resolution and detailed view of the relative changes in sea level by revealing sub-surface paleo-landforms. This combined information can form the foundation for an integrative high-definition, multi-scalar understanding of human-landscape interactions, resilience-studies and large-scale settlement studies.

10 DESTROYED IN 1362 AND CONSERVED UNDER SEDIMENTS: INTERDISCIPLINARY INVESTIGATION OF SUNKEN MEDIEVAL SETTLEMENTS IN THE WADDEN SEA (NORTH FRISIA, GERMANY)

Abstract author(s): Majchczack, Bente (Christian-Albrechts-Universität zu Kiel; ROOTS Cluster of Excellence) - Blankenfeldt, Ruth (Zentrum für Baltische und Skandinavische Archäologie) - Hadler, Hanna (Johannes-Gutenberg-Universität Mainz) - Kloöß, Stefanie (Archäologisches Landesamt Schleswig-Holstein) - Wilken, Dennis (Christian-Albrechts-Universität zu Kiel)

Abstract format: Oral

The tidal flats, marsh islands and sand barriers of the southern Wadden Sea area of North Frisia (Germany) cover the extended remains of a sunken cultural landscape. From the Early Medieval Period on, settlers have occupied a natural landscape of marshes, river embankments and fenlands. With rising sea-levels and recurrent floodings, a systematic reclamation and cultivation, alongside with construction of extensive coastal protection measures set it from the 12th century and led to a fundamental transformation into a cultural landscape. Large-scale peat quarrying and drainage led to subsidence of the ground-level in many areas, creating an additional vulnerability of settlements and farmland towards flooding. This led to a pattern of destruction and land-losses through major storm surges, notably the extremely destructive flood of 1362, countered by adaptations like reclamation or abandonment. While past research largely depended on random finds, uncovered by tidal erosion, we approach the area with a combined geoarchaeological, geophysical and archaeological methodology to produce a high-resolution reconstruction of the landscape dynamic, the Medieval settlement patterns and land-use in an area, which is difficult to access with traditional methods. Areas with visible remains are mapped with drone photography and surveyed with metal-detecting. Magnetic gradiometry provides a detailed mapping of settlement structures beneath the present tidal flats, marine reflection seismics is added to characterize the underground structures. Vibracoring and geochemical sediment analysis is used for validation of structures and reconstruction of the palaeoland-scape. An integrated GIS-database is used to bundle the results to create a comprehensive visualization of the Medieval settlement landscape. The presentation brings forward the used methodology along with exemplary prospection results from the medieval town of Rungholt, drowned in 1362.

11 NURAGIC NAVIGATION AND LANDING POINTS: THE COAST OF TERTENIA (CENTRAL EASTERN SARDINIA)

Abstract author(s): Lopez, Giuseppa (freelance archaeologist)

Abstract format: Oral

This contribution is the result of the underwater and terrestrial archaeological prospections conducted along the coast of Tertenia (central eastern Sardinia), in the locality named "San Giovanni di Sarrala".

This site is marked by a historical anthropization. Its coastal landscape has geomorphological and hydrographic characteristics that make it an area of historical and archaeological importance in connection with the sea routes and in particular due to the landing points.

The availability of landing points needs to be referred to the ancient coastal geomorphology, to the technical characteristics of the boats, and to the navigation techniques widespread in the western Mediterranean during the Nuragic time (Bronze Age). This can be achieved through a comparison with the data coming from contemporary wrecks belonging to other civilizations with which the Nuragic one had intense relationships.

This contribution therefore aims to provide new knowledge based on archaeological data resulting from targeted prospections combined with evidence coming from geomorphological and paleo-environmental studies and considering man-environment interactions, particularly how man used the environment and adapted to it.

12 THE EVER CHANGING OLÉRON (FRANCE): A CHALLENGING PUZZLE FOR COASTAL ARCHAEOLOGISTS

Abstract author(s): Save, Sabrina (Amélie SARL) - Soler, Ludovic (Service archéologique départemental de Charente-Maritime; UMR 6566 PACEA) - Gandois, Henri (UMR 8215 Trajectoires; UMR 6566 CReAAH)

Abstract format: Oral

Invaded every summer by tourists, Oléron island, on the French Atlantic coast, is the biggest French island (174 km²) after Corsica. Its physiognomy is in perpetual evolution, with today's Oléron totally different from the Prehistoric one due to rising sea levels, the infilling of its multiple coastal lagoons, the creation of big sand dunes, recent urban development and the exploitation of its salt marshes. Some Prehistoric sites are now exposed on the intertidal zone, while others are stranded in the middle of the island whereas they once had direct ocean access. Trying to understand the human implantation strategy on Oléron disconnected from the island's geographic history results in non-sense.

Intertidal excavations, pedestrian and geophysical surveys, as well as palaeo-environmental coring in the coastal salt marshes are leading to first integrated archaeological and palaeo-environmental reconstructions of the island. Coastal lagoons on the western

coast started infilling around 4900 BP, with the development of peat bogs. Around 3200 BP some erosion processes, likely caused by storms, took place and the bogs became sealed from the ocean by the creation of sand dunes. On the eastern coast, new investigations revealed the coastal lagoons were deeper and never developed peat; they remained open water until sealed from the ocean, probably following the creation of sand dunes at a yet undetermined date, transforming the lagoons into salt marshes later exploited by humans. Nevertheless, some coastal areas remain inaccessible to our investigations. While sand dunes protect the archaeology by sealing it under meters of sand, they are also an obstacle to the detection of archaeological sites, engulfing Medieval villages and Prehistoric megaliths alike. We hope in the near future that new geophysical methods will allow us to detect these sand-submerged archaeological sites allowing us to complete our comprehension of human implantation on the coasts.

13 ENVIRONMENT AND SETTLEMENT IN A LONG TERM PERSPECTIVE: VIK, ØRLAND, CENTRAL NORWAY 600 BC – AD 1250

Abstract author(s): Ystgaard, Ingrid (NTNU University Museum; Department of Historic and Classical Studies, NTNU) - Gran, Magnar (NTNU University Museum)

Abstract format: Oral

Postglacial land upheaval combined with the flat landscape profile of the Ørland peninsula, central Norway, have led to profound transformations of the landscape ever since the peninsula rose from the sea c. 600+/-100 BC. An aim of a large-scale excavation project at Vik in 2015 and 2016 was to gain a coherent understanding of the relationship between landscape development, vegetation history, climatic change and settlement at Vik, Ørland, from the Late Bronze Age to the early medieval period. A generalized interpretation of geological, archaeological and botanical data from Vik suggests periods of intensive settlement and agriculture in the Pre-Roman Iron Age and Roman Iron Age, while the Migration Period was a period of decline. Settlement and agriculture nearly disappeared in Vik during the Merovingian and Early Viking periods, coinciding with re-vegetation of the landscape after the global climatic catastrophe of AD 536. A sheltered bay formed a safe harbor during the period from c. 400 BC to c. AD 600, when the bay eventually dried out and left the settlement at Vik in a less strategic position. Vik was re-settled very late, not before c. AD 950, possibly because of the extinction of the harbor. In this paper, land upheaval, vegetation history and settlement development at Vik are combined in a chronological scheme of ten phases.

14 EUROPE'S COASTS IN HIGH-DEFINITION BY CROSS-BORDER RESIDUAL RELIEF MODELING: THE NORTH SEA AND THE BALTIC SEA AS EXAMPLES

Abstract author(s): Kristiansen, Søren (Department of Geoscience, Aarhus University; Center of Urban Network Evolution - Ur-bNet, Aarhus University) - Stott, David (Moesgaard Museum, Højbjerg) - Maring, Peter (School of Culture and Society, Aarhus University)

Abstract format: Oral

Glacio-isostatic influences on past coastline dynamics and consequences for prehistoric societies have been studied for decades. Remote sensing is increasingly an essential tool for those attempting to identify and characterize features on the surface of Earth. In particular, the rapidly growing spatial coverage of Airborne Laser Scanning (lidar) data has enabled archaeologists to find many hitherto unidentified features. This is often focused on single sites or at local scale as data are difficult to handle. However, in coastal setting lidar data are particularly useful as they all allow to examine research questions across regional and national borders.

Here, we show the first examples of the archaeological possibilities of a cross-border, newly developed GIS layer where morphologies are mapped by residual relief modelling and detected on a large scale by looking for both landscape and archaeological features. This first example covers large parts of Northern Europe, namely Belgium, Denmark, Estonia, Finland, Germany (Brandenburg), Holland, Lithuania, Poland, Norway, and Sweden.

We will exemplify the usability of a combined residual relief modelling approach by focusing on a few famous archaeological sites, to highlight what new can be learned at local scales, and will also demonstrate how it works at the borders of national datasets, where cross-border archaeological comparisons have hitherto been difficult.

15 MAPPING PALAEO-SHORELINE IN THE PREHISTORY OF THE IBERIAN PENINSULA FOR THE ANALYSIS OF SETTLEMENT PATTERNS

Abstract author(s): Mejías-García, Juan Carlos - Fraile-Jurado, Pablo (University of Seville)

Abstract format: Oral

Due to the climatic conditions of the last Quaternary ice age, it has been recorded that sea level stayed some tens below current sea level in the period between 120,000 BP and 6,000 BP, reaching its minimum value of about -130 meters approximately 18,000 years ago, during the Glacial Maximum.

This drop in sea level and its subsequent rise to recover the current levels, did not occur linearly, taking place numerous periods of changes not only in the rhythm but also in the trend.

An algorithm that allows the calculation of the time that the currently submerged lands remained, emerged during that period, was designed in order to implement it in the coasts of the Iberian Peninsula. It also provides the determination of which palaeo-shoreline would correspond to any specific date within the study period.

From our radiocarbon dating database (integrated in the SIAC project - <http://arqgeogis.us.es/dataciones/>), with more than 10,500 records, have been taken chronological data, georeferenced location and functional typology of the prehistoric sites found within of the range of distance that facilitates access to marine resources.

This approach has allowed to determine the true and precise position and distance to the marine environment from prehistoric sites linked to the sea and exploitation of marine resources, establishing a first analysis of the distribution and relationship of dating sites from peninsular prehistory with respect to its corresponding palaeo-shoreline.

16 CHANGING MINDS, CHANGING COASTS

Abstract author(s): Hutchinson, Oliver - Newman, Danielle - Northall, Lawrence (CITIZAN / MOLA)

Abstract format: Oral

Changing Minds, Changing Coast is a community led pilot study mapping 100 years of coastal change as evidenced by the memories and photographs of the residents of Mersea Island, Essex. Funded by the National Environment Research Council (NERC) and developed by CITIZAN (The Coastal and Intertidal Zone Archaeological Network), the project aims to co-create a visual and aural history of the islands changing coastline using data gathered from the community under COVID secure conditions. A network of local contacts within the Mersea community provided over 300 images and documents from their personal archives. These were supplemented by a series of eight oral history recordings recounting the presence of archaeological features, topography and structure of the foreshore sediments, and the presence and absence of plant and marine life at two locations on the island. These indicators were used to interrogate the image data and investigate, amongst others, the scale and speed of coastal erosion, habitat loss and threats to coastal heritage around the island. Using this data set, covering a century on the island, the CITIZAN team cross-referenced and mapped the myriad changes in 20-year intervals from 1920 to 2020 to create a timeline of change. The combination of oral histories and personal archives brought a unique dimension to the study, shedding light on a range of issues to help better understand the human-environment interactions on the island. The project provides a model for archaeologists to work remotely with communities to document the impacts on coastal archaeology wrought by gradual changes and abrupt shifts in coastal morphology, whilst highlighting the resilience of coastal communities to their changing environment. It was achieved within a framework that puts the community at the forefront of creating a dataset valuable to a range of disciplines including archaeologists, geographers, marine biologists, and social historians.

17 ASSESSING THE METHOD OF DATING STONE AGE SITES WITH REFERENCE TO RELATIVE SEA-LEVEL CHANGE IN SOUTH-EASTERN NORWAY

Abstract author(s): Roalkvam, Isak (University of Oslo)

Abstract format: Oral

Reconstructions of the trajectory of relative sea-level change is frequently used to ascribe an approximate date to prehistoric sites and monuments that were situated close to the shoreline during their original use and occupation. The geologist W.C. Brøgger and his son, the archaeologists A.W. Brøgger, noted the close correspondence between Norwegian Stone Age sites and prehistoric shorelines in their respective theses of 1905. Ever since, this fact has been a defining element of Stone Age research in Norway. In south-eastern Norway the isostatic rebound has been more profound than corresponding eustatic sea-level rise, leading to a continuous and relatively rapid regression of the shoreline from as much as 200 m a.s.l down to its present level. Consequently, site activities in the region can be ascribed a fairly precise date-range based on reconstructions of relative sea-level change, provided the sites were in fact located on the shoreline when they were in use. However, despite its importance, there have been surprisingly few rigorous evaluations of the applicability and precision this method. I aim to conduct such an evaluation by investigating the agreement between site dates informed by relative sea-level change and independent dates achieved through radiocarbon dating. The study is based on around 50 sites from an area where we have good knowledge of the trajectory of shoreline displacement.

An assessment of this relationship can have major implications how we approach Stone Age sites where other means of dating are unavailable, and, as a consequence, the temporal framework on which our understanding of the period is based. Furthermore, since the method is only applicable so long as the societies in question have continuously settled on or close to the contemporary shoreline, adherence or deviations from this pattern also has direct implications for the socio-economic foundations of the societies in question.

18 IMPACT OF HOLOCENE COASTAL CHANGES ON PAST HUMAN COMMUNITIES: RESULTS FROM AN INTERDISCIPLINARY APPROACH IN THE GIRONDE ESTUARY MOUTH

Abstract author(s): Culioli, Camille (Université Bordeaux Montaigne; Laboratoire AUSONIUS; Sorbonne Université Paris) - Stéphane, Pierre (Laboratoire LETG; Université de Bretagne Occidentale) - Verdin, Florence (Laboratoire Ausonius; Université Bordeaux Montaigne) - Bertrand, Frédéric - Arnaud-Fassetta, Gilles (Laboratoire PRODIG; Université de Paris) - Coutelier, Clément (Laboratoire AUSONIUS; Université Bordeaux Montaigne) - Eynaud, Frédérique (Laboratoire EPOC; Université de Bordeaux) - López-Romero, Elias (Universidad Complutense Madrid) - Suanez, Serge (Laboratoire LETG; Université de Bretagne Occidentale)

Abstract format: Oral

The current sea level rise induced by climate change may lead to challenges for coastal communities under pressure of intense coastal changes. In North-Médoc, comparable environment variations have been experienced by past human societies. The evi-

dence of human-environment interactions trapped in the Gironde estuary mouth sedimentary archives, can offer comparative systems for the current challenges. Consequently, the diachronic and long-term study of the correlation between human and environmental processes highlights the adjustment and adaptation capacities of coastal populations.

The North-Médoc Peninsula (SW France) is a triangular-shaped coastal area between the Atlantic Ocean and the Gironde estuary. During the last three decades, intense winter storms have uncovered sedimentary deposits containing numerous archaeological remains on the Amélie beach, located on the oceanic side of the North-Médoc. Coastal erosion in this area provides an opportunity to access a whole array of paleoenvironmental and archaeological data for analysis.

Since 2013, through four interdisciplinary projects: LITAQ, FAST-LITAQ, ECOREST and ESTRAN, surveys and analysis have continuously been conducted along the Amélie beach. They combine aerial photography, topography, micropaleontology, radiocarbon dating, sedimentology and archaeology. This interdisciplinary approach has resulted in a high-resolution chronostratigraphic reconstruction of the Amélie beach deposits. Human-environment interactions were analyzed for the past 8 ka years, which correspond to a Holocene sea level slowdown period. Three different scales were considered for this: from the structure to the territory to better constrain paleogeographic changes and settlement patterns. Archaeological and paleoenvironmental results have allowed the characterization of relative sea level variations in the area and the recognition of specific periods of environmental pressures and of human responses from the Neolithic to the Antiquity.

This reconstruction of long-term human-environment interactions makes it possible to sketch the evolution of adaptation strategies of human communities to coastal changes during the Holocene.

19 NATURE VS. NURTURE: THE SUBMERGED PALEO-LANDSCAPES AND LATE NEOLITHIC PILE-DWELLING IN ZAMBRATIJA BAY (CROATIA)

Abstract author(s): Jerbic, Katarina (Flinders University, Adelaide)

Abstract format: Oral

In global climate history, the period after the Last Glacial Maximum is known for a sudden increase in temperature, consequently leading to rapid rise of mean sea-levels which inundated low altitude landscapes worldwide. Sea-level rise significantly influenced the climate as well as the natural organisation of landscapes and human populations of the impacted areas. In the Northern Adriatic region, this influence was additionally amplified by the melting of the Alpine Glacier, whose melted ice was flooding the Northern Adriatic Basin slightly longer than the rest of the Mediterranean. Radiocarbon dated archaeological and paleo-environmental evidence from Zambratija Bay (Northern Adriatic) helped recreate a chronological timeline of local sea-level, environmental and social change since the time when the Alpine ice water was still flooding the landscape, until today. This evidence includes three seabed cores whose sediments heavily imply a change from freshwater, to brackish and to a marine environment in only 2500 years. A dendrochronological sequence derived from eleven wooden architectural elements found in situ revealed that around 4,200 BCE, a pile-dwelling was built there in a brackish environment and existed for at least 63 years. Furthermore, the stratigraphy of the seabed cores indicates that the site was abandoned by the time the environment fully changed to marine. These results revealed a new sociological aspect of the coastal societies in the Prehistoric Alpine Adriatic, indicating that they likely had highly developed subsistence economies and a deep understanding of seasonal activities within the environments they were inhabiting. The environments were changing so rapidly and intensely that the state of constant change must have been an incorporated part of everyday life. This paper shows the connections between the changes in natural and cultural history of Zambratija Bay by presenting evidence of resilience and sustainability of the population that occupied the prehistoric pile-dwelling.

A. INTENSIVE SYSTEMATIC SURVEYS OF PALAEOSPITS IN THE NARVA-LUGA KLINT BAY AREA: ANALYSIS OF METHODOLOGY AND RESULTS

Abstract author(s): Gerasimov, Dmitriy (Peter the Great Museum of Anthropology and Ethnography, Rus.Acad.Sci.) - Kholkina, Margarita (Saint-Petersburg State University; Russian Geological Research Institute - VSEGEI) - Muravev, Roman (Saint-Petersburg State University) - Danilov, Gleb (Peter the Great Museum of Anthropology and Ethnography, Rus.Acad.Sci.) - Kriiska, Aivar (Tartu University) - Nordqvist, Kerkko (Helsinki University)

Abstract format: Poster

In recent decades, palaeogeographical studies in the Narva-Luga Klint Bay area on the Russian-Estonian border have identified several generations of palaeospits, which formed mainly during the Litorina Sea stage (7800–2500 cal. BC).

In the beginning of the 2000s, forest fires destroyed large areas of pinewood on the Russian side of the territory. Forestry authorities cleaned the fire-damaged areas, which were then ploughed for planting new pine trees. The situation caused by the natural disaster presented a unique opportunity for archaeological surveys. During several field seasons, intensive and systematic surveys were fruitfully carried out in the territory of about 200 sq.km, and over fifty new Stone Age archaeological sites (prehistoric settlements and campsites) were discovered. The sites were associated with palaeospit formations and formed clusters.

The presence of large open areas allowed for proper transect surveys in several locations. In 2019, such a survey was conducted on the Galik palaeospit, where five Stone Age sites were already known at the time. About 300 km of transects was walked by a crew of students, investigating an area of 1 sq.km, meter by meter. Altogether 148 find spots with over 2700 artefacts were identified. The three largest concentrations were considered as remains of prehistoric settlements/campsites, but no cultural layer was associat-

ed with the rest of finds. These results, as well as those previously obtained in other palaeospits of the territory, make it possible to discuss ways of exploitation of coastal zones by prehistoric people in different phases of the Stone Age.

The study was supported by the Russian Science Foundation project № 17-77-20041 "The impact of global, regional and sub-regional natural factors on the development of coastal morphosystems of the eastern Gulf of Finland as a human living environment".

B. THE IMPACT OF SHORELINE CHANGES OVER MESOLITHIC POPULATIONS OF WESTERN IBERIA (11500 TO 7000 CAL BP)

Abstract author(s): Araújo, Ana Cristina (DGPC- Archaeosciences Laboratory, Lisboa; Research Centre in Biodiversity and Genetic Resources, CIBIO-InBIO; UNIARQ, Centre for Archaeology, University of Lisbon) - Costa, Ana Maria (DGPC- Archaeosciences Laboratory, Lisboa; Research Centre in Biodiversity and Genetic Resources, CIBIO-InBIO; IDL, Instituto Dom Luiz) - Costas, Susana (Center for Marine and Environmental Research - CIMA, Universidade do Algarve, Faro) - Naughton, Filipa (IPMA: Instituto Português do Mar e da Atmosfera, Lisboa)

Abstract format: Poster

Changes in shoreline are nowadays a major concern to populations living in coastal zones, forcing governments to act on climate change worldwide. Notwithstanding, variations in the shape and position of the coastline have occurred continually throughout our millennial history, though at different rates, with people adapting to the new environmental scenarios, creating innovative solutions, and developing new skills.

The Pleistocene-Holocene transition was concomitant to a rapid rise in mean sea-level due to global climate warming and consequent melting of ice caps. It was also a time of change in hunter-gatherer societies that become more dependent on the sea and its resources. These dynamics are well documented in the archaeological and geological records of the littoral areas of SW Iberia. From 11500 to 7000 cal BP, as sea-level rises, changes in human settlement and mobility patterns took place, although post-depositional processes may have contributed to distort traces of that distant past. These changes in the lifestyle of human societies separates the Early (11500-8400 cal BP) from the Late Mesolithic (8400-7000 cal BP). During this time span, people shift from mobile and dispersed groups occupying and exploiting the coastal environments, to more stable and clustered settlement, organised around the margins of estuarine areas formed during marine transgression.

The apparent abandonment of the coastal fringe seems to oversimplify the real distribution patterns of people during the Late Mesolithic, representing only the pattern observed along the northern coast. Indeed, the southwestern coast continues to be visited and exploited regularly during this later phase. According to our interpretations, geomorphological evidence suggests a sand depleted coast to the north that associated with its rapid retreat and inundation would have inhibit people from settling. Conversely, the southern coast was encouraged by a greater abundance of sand that would delay marine transgression, accommodating the Mesolithic groups.

C. PREHISTORIC HUMAN-ENVIRONMENT INTERACTIONS IN THE LINCOLNSHIRE FENLANDS: A GEOARCHAEOLOGICAL INVESTIGATION OF WILLOW TREE FEN

Abstract author(s): Derrett, Sally (Department of Archaeology, The University of Sheffield)

Abstract format: Poster

Researching the complex sediment sequences of the Fenlands of Eastern England reveals a dynamic environmental history of fluctuating marine and freshwater inundations throughout the Holocene. Archaeological evidence for long-term human land use and settlement is widespread on the boundaries of the Fenland basin, with the wetlands providing both challenges and opportunities for fen-edge communities.

Diachronic geoarchaeological analysis at Willow Tree Fen, in the relatively unstudied silt fens of south Lincolnshire, revealed a record of human-environment interactions in the landscape since the Late Mesolithic. The palynology and microcharcoal analyses reconstructed numerous fluctuating ecological zones which altered according to the shifting influences of marine and freshwater inputs. People's relationships with this dynamic environment were responsive and resilient, including evidence for pastoralism during dry periods and salt-making during periods of brackish marine conditions.

Despite a lack of peat sediments at the study site, the research has demonstrated the preservation capabilities of the roddon deposits in the Fenland, revealing a well preserved, long pollen sequence throughout the stratigraphy. The results demonstrate the potential for extending geoarchaeological analyses across much of the Fenland. Future research can address the bias of peat-land-focused investigations by extending palaeoenvironmental studies into areas which have been subject to extensive marine inundation and peat wastage.

149 BIOARCHAEOLOGY OF HEALTH, LIFESTYLE AND SOCIAL CHANGE IN THE LATER MIDDLE AGES

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Robb, John (University of Cambridge) - Knüsel, Christopher (Université de Bordeaux)

Format: Regular session

Skeletal and molecular analysis are providing ever more powerful tools for investigating aspects of medieval society which historical records tell us little about. This symposium displays the range of modern studies, highlighting the productive nature of bringing together different kinds of data interdisciplinarily and the gains to be made by deep social contextualisation of bioarchaeological results.

This session showcases current research at the convergence of social history and bioarchaeology, for the later Middle Ages (from around 900 AD through about 1500) in Europe. The range of topics is great. Contributions may focus upon epidemics such as the Black Death and their social consequences; genetic profiles of medieval populations and their implications for kinship and mobility; diet and its social differentiation; human-pathogen coevolution; the biological correlates of social patterns such as gender, class and religious identity; aspects of daily life such as the organisation of work, social practices of violence, and hidden aspects of religious practice; and the osteobiographical narratives of ordinary people.

ABSTRACTS:

1 MUSLIMS UNDER CHRISTIAN RULE THROUGH THE ISLAMIC POPULATION OF VALL D'UIXÓ (CASTELLÓN, SPAIN)

Abstract author(s): Olivé-Busom, Júlia (Autonomous University of Barcelona) - Márquez-Grant, Nicholas (Cranfield Forensic Institute, Cranfield University) - López-Costas, Olalla (Group EcoPast (GI-1553), Universidade de Santiago de Compostela; Archaeological Research Laboratory, Stockholm University; Laboratorio de Antropología Física, Facultad de Medicina, Universidad de Granada) - Kirchner, Helena (Autonomous University of Barcelona)

Abstract format: Oral

From 711 and until the Christian conquest, a great part of the Iberian Peninsula was under Islamic rule and became known as Al-Andalus. This generated a new political and social order, the appearance of new forms of rural settlement and agricultural practices, and the migration of Arab and North-African populations. Once the Christian kingdoms conquered these lands, they imposed a new social and economic rule, the feudal order. The Andalusí people that remained in the regions under Christian rule became known as mudéjares. Their distribution was uneven in rural areas, and in many cases, their presence was the result of relocations dictated by the feudal power. Their status within the new Christian context is widely debated as several authors propose they were subjected to fiscal depredation and populational concentration and marginalisation.

One of the areas where mudéjares remained is modern-day Vall d'Uixó (Spain). During the Andalusí period, it consisted of a series of hamlets (qurá) that were organized around a fortress (ḥiṣn), the foundational date of which is placed on the AD 9th century. Through fossilized toponomy, it is believed that these hamlets had an Arab or Berber origin. Historical sources indicate that their Islamic population remained long after the Christian conquest (AD 1238) and until the Edict of Expulsion (AD 1609), concentrating most of the Islamic population of its region. Thus, this contribution presents the anthropological data gathered from 99 human skeletal remains from two of these hamlets. Our aim is to evaluate the physiological and occupational stress in the studied sample and its biological distance towards other Al-Andalus collections. Furthermore, samples from 7 skeletons have undergone aDNA analysis currently under study to further assess their possible Arab or North African ancestry.

2 LIVING AND WORKING IN AL-ANDALUS: AN OSTEOLOGICAL COMPARISON OF RURAL AND URBAN POPULATIONS FROM ISLAMIC SPAIN (11TH -15TH C. AD)

Abstract author(s): Charisi, Drosia (Department of Legal Medicine, Toxicology and Physical Anthropology, Faculty of Medicine, University of Granada) - Laffranchi, Zita (Department of Prehistory and Archaeology, Faculty of Philosophy and Literature, University of Granada; Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Milella, Marco (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Jiménez-Brobeil, Sylvia (Department of Legal Medicine, Toxicology and Physical Anthropology, Faculty of Medicine, University of Granada)

Abstract format: Oral

The Islamic occupation of the Iberian Peninsula ("al-Andalus") from the 8th to the 15th centuries AD brought several changes in the daily life of the populations in this territory. However, it is unclear whether variability in local settings (eg. urban vs. rural contexts) triggered the adoption of different economic strategies, subdivision of gender roles and, therefore, daily activities. This study addresses this question by exploring differences in physical activity and gender subdivision of labor between urban and rural contexts in Southeastern al-Andalus. To this aim we performed an osteometric analysis of 152 adult individuals (n males: 75, n females: 77) from two cemeteries representing two social settings of Islamic Granada: La Torrecilla (rural) and Sahl ben Mālik (urban). Diaphyseal shape and product of diameters -as proxies for the directionality and intensity of bone mechanical loading respectively- were estimated from external measurements of long bones, and percentage absolute asymmetry in the humerus was calculated for both

variables. Variables were then compared between the sexes and populations by means of Independent samples t tests, Analysis of Covariance, and Mann-Whitney U tests.

Results show a) greater sexual dimorphism of shape and diameter products in the rural population, b) greater male upper limb asymmetry in both contexts, and c) rounder right humeral diaphyses for the rural males compared to their urban counterparts, pointing to differences in the types of activity and the level of gender subdivision of labor between the two populations.

This work supports the findings of previous bioarchaeological studies that highlight the difference in living conditions and gender status in rural versus urban Medieval Islamic communities, adding new insights into social heterogeneity and gender roles in Al-Andalus.

This study was undertaken under the Research Project "Health and diet in Populations of Southeastern al-Andalus" (PID2019-107654GB-I00/AEI/10.13039/501100011033), funded by the Spanish Government.

3 INFANT STRESS, MORBIDITY, AND AGE-AT-DEATH IN THREE RURAL AND SEMI-RURAL PORTUGUESE MEDIEVAL NECROPOLISES (COIMBRA, SOURE, AND LEIRIA)

Abstract author(s): de Carvalho, Liliana (Research Center of Anthropology and Health, University of Coimbra) - Wasterlain, Sofia (Research Center of Anthropology and Health, University of Coimbra; Centre for Functional Ecology, University of Coimbra)

Abstract format: Oral

Health and disease indicators may reveal important information on cultural, social, and economic aspects of a population. According to the "Developmental Origins of Health and Disease" theory, the physiological stress experienced during childhood is particularly detrimental to the individuals' health and development, causing health problems in adulthood and leading to increased morbidity, anticipation of age at death, and decreased average life expectancy.

In order to assess the impact that childhood stress may have had on the development of individuals who lived in urban or semi-urban sites, children's stress indicators will be analysed in adults from three Medieval osteological series (11th and 16th centuries), from Leiria, Coimbra, and Soure. Therefore, the present study aims to estimate the frequency of child stress in urban/semi-urban samples; to investigate if there is any relation between childhood stress and age-at-death; and to understand whether individuals who suffered childhood stress were more likely to present higher degrees of morbidity in adulthood. Non-specific stress markers, namely dental enamel hypoplasia (DEH), were observed in the individuals' anterior teeth, following the methodology suggested by Hillson (2001). The age at which each defect occurred was estimated according to Reid and Dean (2006). Other stress markers, like porotic hyperostosis (PH) and orbital cribra (OC), were also observed. Stature was assessed using Mendonça (2000) and Santos (2002) formulae.

A gradation of childhood stress levels was found, from the most urban site (Coimbra: 93.9% individuals, and 71.2% teeth with DEH; 38.1% OC; 72.0% PH; Stature ~159cm) to the smaller and more rural (Leiria: 83.9% individuals, and 56.6% teeth with DEH; 14.3% OC; 83.9% PH; Stature ~165cm; Soure: 80% individuals, and 77.6% teeth; 53.3% OC; 50.0% PH; Stature ~163cm). All obtained results suggest that the medieval urban environment was more detrimental to the children's development and growth than the rural one.

4 VIOLENCE, REPRODUCTION, AND SOCIAL MAINTENANCE IN THE LA ARRIXACA SUBURB IN THE 11TH-12TH CENTURIES

Abstract author(s): Haber, María (Dpto. Preh., Arq., H. Antigua, H. Medieval y CCyTT Historiograficas. Univ.Murcia) - Marín, Javier (Professional archaeologist)

Abstract format: Oral

The archaeological and bioanthropological analyses results of the human remains excavated in San Esteban archaeological site (12th-13th centuries) (<http://sanesteban.um.es/>) are integrated into an interdisciplinary research project that combines paleopathological, genetic, isotopic and anthropological analyses that started in 2018 to the present. In this project, the archaeological procedures necessary for the correct sampling and interpretation of data is primordial. The aim of this analysis is to approach the daily life of this population established through the study of human remains and their spatial distribution.

In total, 38 subjects have been recovered in the maqbara, but just 16 skeletons were found anatomically articulated and buried in the right lateral decubitus position following the Islamic tradition. 75% of the individuals corresponded to adult women. The study of this part of the population provides data on social life maintenance and reproduction. Gender archeology takes on great importance in the site, allowing the comparison of the domestic areas of public and private spaces with the direct data recovered from the activities carried out by women in the diachrony of the suburb. The analysis of the infant remains, all under six years of age and no possibility of sex definition makes it probable to explain the most frequent causes of death, the importance of the weaning age or nutritional deficiencies, which allows a vision of the first years of life in this population. The minority of epigenetic traits leads to a presumably small inbreeding in this population, and the study of activity markers in their upper and lower extremities indicate different activities linked to given sex and/or age. The high percentage of injuries with numerous consolidated fractures is striking, as well as some examples of violence as a direct cause of death in the subjects.

5 SKELETAL REMAINS AS TRACERS OF MEDIEVAL CHILDHOOD IN NW SPAIN

Abstract author(s): Mangas-Carrasco, Elvira (Group EcoPast - GI-1553, Area of Archaeology, Dpt of History. Universidade de Santiago de Compostela) - López-Costas, Olalla (Group EcoPast - GI-1553, Area of Archaeology, Dpt of History. Universidade de Santiago de Compostela; Archaeological Research Laboratory, Stockholm University; Laboratory of Anthropology, Department of Legal Medicine, Toxicology and Physical Anthropology, Faculty of Medicine, University of Granada)

Abstract format: Oral

The definition and characterization of childhood in different ancient societies is amongst the most stimulating subjects in archaeological academia, as well as in medieval studies. Its relevance resides on the fact that non-adult (< 20 years) studies allow to obtain a reliable knowledge of the whole medieval community, thus complementing those made on adults. Bioarchaeology provides useful tools to explore non-adult individuals' lifestyles: non-adult skeletal remains constitute direct evidence of those children who died in first years of life, as well as adult remains are those children who survive until adulthood.

We propose a methodology which combine palaeopathological, dietary and historical aspects to approach narratives of medieval childhood. The subject of our analysis is the necropolis of Pontevedra village (coastal NW Spain). Metabolic stress markers (porosities) are recorded in 51 individuals, as well as the presence of specific pathologies. Grade of severity, degree of healing and coexistence of lesions were recorded. Results were related with isotopic data ($\delta^{13}C$ and $\delta^{15}N$) and historical and archaeological information.

There is a high frequency of cribra orbitalia (60%) and femoralis (72%) in adult and non-adult remains with a clearly age-pattern in healing. No other signs of metabolic disorders or infectious diseases were observed among non-adults. Demographic profile does not show a major presence of non-adults when it is compared with other sites. Dietary reconstruction shows a high intake of marine resources and C4 plants, which is coherent with the activity of the village. Results suggest the possible existence of harsh life conditions that caused the development of porotic lesions but not death. The high frequency of porotic lesions has been also observed in other communities highly dependent on marine resources. Thus, it could have prevented against stressors agents. Present study contributes to a better understanding of the social contextualisation of children from NW Spain.

6 DIETARY PATTERNS IN THE LATE MEDIEVAL CHURCH OF SANTA MARÍA DE PONTEVEDRA (NW SPAIN) EXPLORED THROUGH ORAL PATHOLOGY

Abstract author(s): Veiga-Rilo, Clara (EcoPast - GI 1553. Universidade de Santiago de Compostela) - López-Costas, Olalla (Group EcoPast - GI-1553, Universidade de Santiago de Compostela; Archaeological Research Laboratory, Stockholm University; Laboratory of Anthropology, Department of Legal Medicine, Toxicology and Physical Anthropology, Faculty of Medicine, University of Granada)

Abstract format: Oral

Teeth are the most commonly and best-preserved human remains in archaeological contexts. Therefore, in aggressive soil environments for skeletal preservation, such as those prevailing in Galicia (NW Spain), the study of teeth allows to address additional information about past lifestyles. Oral pathology works have been mainly focused on dietary reconstruction; however, little agreement has been found with stable isotope analyses so far. We present here a necropolis whose isotopic dietary reconstruction has shown a unique consumption of marine resources and C4 plants, possibly one of the highest in Europe for medieval times. Considering this specificity, we wanted to explore if there is a connection between oral pathology and stable isotopes for highly singular diets.

Santa Maria church in Pontevedra village is a well-studied skeletal collection, including general paleopathology and stable isotopes analyses in bone collagen. The burials span a 400-years chronological window (AD 13th to 17th centuries). The present study intends to complement previous research by carrying out an oral pathology analysis on the individuals of this necropolis and compare the results with the information already available. We analysed dental caries, macrowear (attrition), alveolar abscess, antemortem tooth loss (AMTL), periodontal disease, and the presence of dental calculus. The aetiology of these features was explored in connection with historical and archaeological information. Our results showed a moderate prevalence of defects, but the attrition was particularly severe. Males tend to develop more severe lesions. High macrowear has also been observed in other populations with marine dependency related to fish consumption. This novel information will allow us to study health and modifications in the subsistence strategies, as well as to approach the possible relation with environmental changes.

7 A MULTIDISCIPLINARY APPROACH TO RECONSTRUCTING THE LIVED-EXPERIENCE OF MEDIEVAL ENGLISH SUFFERERS OF HANSEN'S DISEASE AND 'LEPROSY'

Abstract author(s): Blom, Alette (University of Cambridge) - Inskip, Sarah (University of Leicester)

Abstract format: Oral

Hansen's Disease (HD) - colloquially known as leprosy - is one of the most culturally-laden diseases of human history, largely attributable to dramatic and debilitating physical lesions. The cultural stigma surrounding the condition today can largely be ascribed to 1) the conflation or confusion of true leprosy (Hansen's disease) with 'Biblical leprosy'; and 2) 19th- and 20th-century hyperbolic interpretations and translations of medieval texts, and subsequent negative and homogenous portrayal of 'lepers' in literature, art and even medicine.

However, historic research in the last two decades - piloted by C. Rawcliffe, E. Brenner and F.O. Touati – has redefined this concept of individuals suffering from HD as one uniform, ostracized group. This revisionist approach has highlighted the amount of variation that may have existed in the lives of sufferers based on status, gender, age, location, severity of lesions, and more significantly, personal choice. This new image has received scant attention in bioarchaeological research, despite its value to reconstruct and tell individual life histories. The analysis of human skeletal remains, our most direct source of evidence on the experiences of past peoples, represents a unique opportunity to reconstruct and narrate individual lives from varying social strata and can highlight variation in how HD impacted someone's life-course in medieval England.

This paper will discuss the reconstruction of several life-courses of medieval English individuals suffering from HD and 'leprosy' by combining osteological, historic, archaeological and biomolecular data. By narrating these reconstructed lives, we can exemplify variation in experiencing the disease and life contingencies.

8 EARLY MEDIEVAL BUDEČ MASS GRAVE FROM THE BIOARCHAEOLOGICAL PERSPECTIVE

Abstract author(s): Vondrová, Hana - Štefan, Ivo (Department of Archaeology, Faculty of Arts, Charles University in Prague) - Drtikolová Kaupová, Sylva (Department of Anthropology, National Museum, Prague) - Fialová, Dana - Brzobohatá, Kristýna - Drozdová, Eva (Department of Experimental Biology, Faculty of Science, Masaryk University)

Abstract format: Oral

Budeč (Zákolany, Czech Republic) mass grave represents one of the most extensive archaeological examples of early medieval large-scale violence in Europe. This massacre dated to the 10th century may be hypothetically connected with the conflicts between members of the ruling family. The mass grave uncovered in the vicinity of Budeč hillfort had consisted of about 60 male individuals with numerous perimortem sharpforce trauma situated mainly on cranial bones. Moreover, a number of men were decapitated. Most of the individuals were robust with strong muscle attachment marks on bones. Men from the Budeč mass grave show different craniofacial values compare with individuals buried at local medieval burial sites. The characteristic patterns of healed injuries may point on the presence of trained warriors. This paper presents new bioarchaeological data that help to reveal the origin and social status of these individuals. Analyses of carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) stable isotope ratios were carried out for diet reconstruction. Individuals of non – local origin were documented by using stable strontium isotopes. The ancient DNA (aDNA) extraction was successful from all analysed human teeth. Subsequently, mitochondrial DNA was confirmed in 10 samples from 12 by PCR amplification and Sanger sequencing of the hypervariable regions I and II (HVRI and HVRII). This analysis showed wide variability in obtained polymorphisms between individuals. Next-generation sequencing (NGS) for the next step will confirm the results and extend data by the whole mitogenome. The multidisciplinary study of the Budeč mass grave offers a unique insight into the composition and lifestyle of military retinues in the early medieval societies.

This study was financial supported by a grant GAUK No. 394119, Social Structures of Early Medieval Populations from the Perspective of Archaeology and Anthropology, Faculty of Arts, Charles University in Prague.

9 WHO WERE THE FIRST COPENHAGENERS? AN INTERDISCIPLINARY INVESTIGATION OF BURIALS FROM TWO MEDIEVAL CHURCHYARDS FROM COPENHAGEN, DENMARK

Abstract author(s): Dahlström, Hanna (Museum of Copenhagen) - Jørkov, Marie-Louise (Retsmedicinskt Institut, Copenhagen University) - Newell, Elizabeth (Department of Biological and Environmental Sciences School of Sciences Elizabethtown College) - Schroeder, Hannes (Globe Institute, Copenhagen University)

Abstract format: Oral

The paper presents some of the first inhabitants in medieval Copenhagen, Denmark, from the study of their burial customs, bioarchaeological data and genetic information.

With starting point in the different burial customs registered in the period 1050-1200 at the two early churchyards in the town; the churchyard belonging to the St. Clemens church and a recently discovered churchyard at Town Hall Square, we investigate who the people were, buried here. Burial practices were clearly different in the two churchyards. The graves at the Town Hall Square are characterized by very few individual ritual traits and a low degree of variation between graves, while the material remains of burials practices at St. Clemens show a considerably larger variation. By comparing demographic and genetic information with evidence retrieved from burial customs, we investigate what social, religious, biographical or biological factors might have influenced the way the people at the two churchyards were buried, and what information this yields about the social organization of the early town.

10 ADVANCED DEGENERATIVE JOINT DISEASE AS A DISABILITY IN THE 14TH-18TH CENTURY IN ŁEKNO, POLAND

Abstract author(s): Matczak, Magdalena Domicela (University of Liverpool) - Buikstra, Jane (Arizona State University) - Pearson, Jessica (University of Liverpool) - Wyrwa, Andrzej - Krenz-Niedbała, Marta (Adam Mickiewicz University)

Abstract format: Oral

Degenerative joint disease is one of the most common bone changes identified in archaeological skeletal samples. Some of the most advanced degenerative changes developed with age may have led to socially-recognized disabilities in the past. Although the role of advanced degenerative joint disease is acknowledged as having an impact on the functioning of an individual, it is rarely

elaborated in the context of disability in bioarchaeology. The aim of the paper is a methodological discussion about which of the degenerative changes observed on skeletons can be considered leading to disabilities and their impact on individual lives. This problem is evaluated on the basis of anthropological and medical analyses. The study also aims to discuss the issue based on texts from the Middle Ages. Then, using archaeological and osteological findings, the paper shows how people with significant degenerative changes functioned in the 14th-18th century in Łekno, Poland. Deep socially contextualized analysis of lifeways of people with advanced degenerative joint disease offers the (re)construction of the osteobiographical narratives and unique insights into contemporary culture. The case study is based on the theoretical and methodological framework for disability assessment in historical populations within the social model of disability and the bioarchaeology of disability. This paper adds to the growing body of evidence documenting disability in bioarchaeology. Consideration of age-related joint degeneration thus extends bioarchaeological observations of the late medieval and early modern community.

11 ORGANIC RESIDUE ANALYSIS AND STABLE ISOTOPE PROXIES AS TOOLS FOR EXAMINING DIETARY PATTERNS AT MEDIEVAL STRONGHOLDS OF EASTERN EUROPE

Abstract author(s): Brown, Sophie (Organic Geochemistry Unit, School of Chemistry, University of Bristol) - Rusteikyte, Aukse (History Faculty, Archaeology Department, Vilnius University) - Tabaka, Arkadiusz (Ostrów Lednicki, Museum of the First Piasts, Lednica) - Klimowicz, Patrycja - Krysztofiak, Teresa - Miciak, Magda (Giecz, Branch of Museum of the First Piasts) - Antowska-Gorączniak, Olga - Danielewski, Marcin (Faculty of Archaeology, Adam Mickiewicz University, Poznań) - Wrzesiński, Jacek (Archaeological Reserve of the Grzybowo, Museum of the First Piasts, Lednica) - Evershed, Richard (Organic Geochemistry Unit, School of Chemistry, University of Bristol)

Abstract format: Oral

Owing to the inherent ability of lipids to be preserved in ceramic matrices, organic residue analysis of excavated cooking vessels provides ample opportunity to explore settlement dietary practices and broader food network trends. While this well-established biomolecular approach has been applied across various archaeological contexts, the value for such investigation within historical periods has been somewhat neglected. Here analyses have been conducted for several Medieval hillfort sites of Eastern Europe connected to emerging entities of power: from the Wielkopolska region of Poland, attributed to the early dynasty of the Piasts; and extending to Lithuanian territory, for the later ducal residency of Vilnius Palace and associated hillfort assemblages.

By performing GC-FID, GC-MS, and GC-C-IRMS analyses on sherd sub-samples, lipid biomarkers of various animal origins have been identified. With lipid extracts denoting an abundance of degraded animal fat signatures (i.e. palmitic and stearic acids), compound-specific isotope work has allowed further differentiation regarding fat source. Due to varying metabolic and biosynthetic pathways during fatty acid production, it is possible to distinguish between dairy, ruminant/non-ruminant adipose fats via determination of $\delta^{13}C$ values. This stable isotope approach has produced a deeper interpretation of results and, particularly when paired with corresponding zooarchaeological data, can effectively assess animal husbandry and hunting practices.

Results indicate a broad range of subsistence strategies, with evidence for heavy meat consumption as a shared theme, and indications of wider natural resource exploitation (e.g. fishing, beeswax use). This work establishes greater understanding of lifestyle and diet for the emerging political powers, and evaluates potential socioeconomic influences and interconnection across regions by investigating subtle trends in organic residue signatures. By cross-referencing with faunal assemblages, historical records, and other key artefacts recovered from excavations, our analytical findings help to further elucidate questions regarding dietary practices during these major socioeconomic turning points in Eastern European history.

12 SOCIAL DIETARY PRACTICES WITH BIOMOLECULAR ARCHAEOLOGY: MULTIPROXY ANALYSIS OF CONVERSION PERIOD CEMETERY AT KUKRUSE, NE-ESTONIA

Abstract author(s): Oras, Ester (University of Tartu, Department Of Archaeology; University of Tartu, Chair Of Analytical Chemistry) - Scheib, Christiana (University of Tartu, Institute of Genomics) - Hendy, Jessica (University of York, Department of Archaeology) - Tõrv, Mari - Malve, Martin (University of Tartu, Department Of Archaeology)

Abstract format: Oral

The conversion period (12th-13th century AD) cemetery at Kukruse, northeast Estonia, provides a unique dataset of well-preserved human skeletons from different sexes and ages, buried with personalised grave goods. The latter include ceramic vessels, interpreted as individualised food containers aimed at accompanying the deceased to the afterlife. This rich material allows us to target age- and sex-based social dietary habits during a person's lifetime (based on skeletal remains) and in the burial ritual contexts (based on pots as individual grave goods).

Multiproxy analysis of different dietary sources at Kukruse was conducted employing 1) mass-spectrometry based organic residue analysis from pottery (lipids with GC-MS, GC-C-IRMS, EA-IRMS, complemented with novel protein analysis with LC-MS/MS), 2) microfossil analysis from pottery-related food-crusts, and 3) dietary stable isotope analysis ($\delta^{13}C$, $\delta^{15}N$) from human remains.

The results reveal several nuances of gender- and age-specific dietary practices at the dawn of the Middle Ages in the eastern Baltic. Men and older women tend to rely on higher trophic level foods like fish and omnivorous animal meats, whilst younger females seem to eat lower trophic level terrestrial animals, most likely ruminants and dairy. Differences in dietary intake start to emerge in the early teenage years. Interestingly, similar and more detailed age- and gender-specific tendencies are also evident in the burial context pottery food residues.

The case study from Kukruse exemplifies how multiproxy dietary analysis combined with bioarchaeological data can uncover the multifaceted and socio-culturally prescribed nature of past food consumption in both daily and ritual contexts.

13 FACING THE BLACK DEATH: THE CASE OF THE PLAGUE CEMETERY AT 16, RUE DES TRENTE-SIX PONTS, IN TOULOUSE

Abstract author(s): Gourvenec, Michaël (Archeodunum; Université Toulouse Jean Jaurès UMR 5608 TRACES-TERRAE)

Abstract format: Oral

The archaeological rescue operation that took place at 16, rue des Trente-Six Ponts in Toulouse (France) during the year 2014 has uncovered part of the medieval occupation of the Saint-Michel suburb.

The excavation uncovered a funeral space used during the 14th century AD. This cemetery contains 109 graves, 29 of which are multiple graves for a total of 444 individuals, 306 of which are buried in three mass graves. These graves, whether single or multiple, have been attributed to the Black Death (1348-1352) through different methodological approaches (stratigraphic, genomic, isotopic, palaeopathological, numismatic, and ceramic). The excavation also uncovered various artisanal activities (small crafts, bell foundry workshop) that can be attributed to the same time as the crisis cemetery.

During this communication, we will explain how this plague cemetery is organized (burial area, craft area, path etc), what type of graves are there and what we learn about their arrangements for dealing with mass mortality. Then, we will characterize the buried population according to gender and age determination and their health status.

Finally, we will attempt to explain how the populations have dealt with this epidemic. We will explain how the different types of graves, whether single or multiple, tell us about the adaptations of medieval society in times of epidemics. Furthermore, we will see how the management of burial space and mortuary practices inform us about the resilience of medieval communities facing Black Plague.

14 USING SOCIALLY CONTEXTUALISED ISOTOPE ANALYSIS TO INVESTIGATE THE LIVED EXPERIENCE OF THE RESIDENTS OF MEDIEVAL CAMBRIDGE, UK

Abstract author(s): Rose, Alice (University of Cambridge) - Cessford, Craig (University of Cambridge; Cambridge Archaeological Unit) - Dittmar, Jenna (University of Aberdeen; University of Cambridge) - Hiron, Alex (University of Cambridge) - Hui, Ruoyun (The Alan Turing Institute; University of Cambridge) - Inskip, Sarah (University of Leicester; University of Cambridge) - Mitchell, Piers - O'Connell, Tamsin (University of Cambridge) - Scheib, Christiana (University of Tartu; University of Cambridge) - Robb, John (University of Cambridge)

Abstract format: Oral

This paper presents an integration of multi-tissue, multi-isotope analyses with high-resolution contextual data to allow for an exploration of the individual- and population-scale lived experience of the residents of Medieval Cambridge, UK. The methodology used allows for a greater interplay between scientific techniques and social history.

Adult individuals dating from c.10th-16th centuries excavated from six sites located either in the Medieval town of Cambridge, or its rural hinterlands were sampled for carbon, nitrogen, oxygen and strontium isotope analysis. These individuals represent a mixture of social groups, from 'ordinary' parish individuals, to Augustinian Friars, to those who may have received care in the Medieval Hospital of St John the Evangelist. In total, 223 rib samples and 156 bulk dentine samples (from 2nd premolar or 2nd molar) were analysed for $\delta^{13}C$ and $\delta^{15}N$. 169 tooth enamel samples were analysed for carbonate $\delta^{18}O$ and $\delta^{13}C$ and 113 tooth enamel samples were analysed for $^{87}Sr/^{86}Sr$. 76 individuals produced results for all isotopes. Incremental dentine samples were also analysed for $\delta^{13}C$ and $\delta^{15}N$ values in a subsample of 22 individuals from the town. Sampling multiple isotopes from tissues that represent the isotopic signature from different stages of skeletal development has allowed for an investigation of diet and mobility over individual lifecourses, but also across various social groups. When the isotopic data is considered in its wider context, using osteological and social information generated as part of the 'After the Plague: Health and History in Medieval Cambridge' project, a more nuanced understanding of the lived experience of the residents of Medieval Cambridge can be obtained. Combining the available information allows for characterisation of social groupings and creation of isotope-driven osteobiographies.

15 LIFE AFTER THE PLAGUE: EXPLORING HEALTH SURROUNDING THE TIME OF THE BLACK DEATH

Abstract author(s): Dittmar, Jenna (University of Aberdeen) - Mitchell, Piers (University of Cambridge) - Inskip, Sarah (University of Leicester) - Mulder, Bram (University of Cambridge) - Cessford, Craig (University of Cambridge; Cambridge Archaeological Unit) - Rose, Alice (University of Cambridge) - Scheib, Christiana (University of Tartu; St. John's College, University of Cambridge) - Hui, Ruoyun (The Alan Turing Institute) - Connell, Tamsin - Robb, John (University of Cambridge)

Abstract format: Oral

The 14th-century plague pandemic, also known as the Black Death, was the most devastating pandemic in the history of the world. As a result, much of the research on life during the medieval period focuses on the consequences of this catastrophic event. Taking into consideration that societies are complex and are made up of many different subgroups, this research explores the health of the inhabitants of medieval Cambridge, England surrounding the time of the Black Death. Human skeletal remains (n= 323) from three burial grounds in Cambridge, England dating to c. 950-1538 were macroscopically assessed; the Hospital of St John the Evangelist,

the urban parish of All Saints by the Castle and the Augustinian Friary. The results revealed very few differences in the prevalence rates of pathological conditions between those that lived prior to the Plague outbreak in 1348 and those that lived afterwards. No difference was observed in rates of infectious diseases, skeletal trauma, and dental disease. Particularly surprising is the lack of difference in the prevalence rates of respiratory diseases, including tuberculosis which were predicted to have decreased to coincide with the drastic reduction in the population caused by the Black Death. Equally surprising is the increase observed in dietary and vitamin deficiencies that follows after the Black Death. This paper will explore the potential factors that may have contributed to the (dis-) continuity in health status observed in the medieval population of Cambridge.

16 THE SOCIAL LANDSCAPE OF HEALTH IN MEDIEVAL CAMBRIDGE: A WHOLE-TOWN APPROACH

Abstract author(s): Inskip, Sarah (University of Leicester) - Dittmar, Jenna (University of Aberdeen) - Rose, Alice - Mulder, Bram (University of Cambridge) - Cessford, Craig (University of Cambridge; Cambridge Archaeological Unit) - Scheib, Christiana (University of Tartu; St John's College Cambridge) - Hui, Ruoyun (Turing Institute) - O'Connell, Tamsin - Mitchell, Piers - Robb, John (University of Cambridge)

Abstract format: Oral

How much did people in a medieval town differ in their health? This paper summarises bioarchaeological data from three groups from later medieval Cambridge – a group of ordinary townspeople (All Saints by the Castle), a group of Augustinian friars, and recipients of charity (The Hospital of St. John's the Evangelist). In many aspects of life the three groups shared a common lifestyle, but they differed in a number of key ways. The ordinary townspeople tended to have more traumatic injuries; the Hospital inmates had evidence for poorer childhoods, were slightly shorter and died slightly younger; and the friars were taller and appear to be better nourished than the other two groups. After contextualising these results in what we know about medieval society, this paper presents new methods for integrating data from diverse subgroups in order to create a more balanced picture of the health of the town as a whole.

17 COLLECTIVE OSTEOBIOGRAPHIES: IDENTIFYING SUBGROUPS WITHIN A MEDIEVAL CEMETERY SKELETALLY

Abstract author(s): Robb, John - Cessford, Craig (University of Cambridge) - Dittmar, Jenna (University of Aberdeen) - Inskip, Sarah (University of Leicester) - Mitchell, Piers - Mulder, Bram - O'Connell, Tamsin - Rose, Alice (University of Cambridge)

Abstract format: Oral

People have different life paths and identities. Bioarchaeologists are used to comparing skeletons grouped by grave goods or site contexts, but can we identify different kinds of people from their skeletons alone? We try to do so here using archaeological samples from the Hospital of St. John, Cambridge. The Hospital held a diverse collection of people, who wound up in the Hospital's cemetery for quite different reasons. In this paper, we combine morphological, pathological and isotopic data to separate them into subgroups which followed different life paths. The structure of variation within the group is complex and polythetic, and standard statistical methods such as correlation and regression are not much use; instead, we make much use of contextual methods of exploratory data analysis. The results identify at least five subgroups in the cemetery's population -- ordinary townspeople, the lifelong poor, the aged infirm, people dying out of place, and university scholars. The result is the first skeletal prosopography or collective osteobiography of a complex medieval site.

18 THE SOCIAL CONSEQUENCES OF THE BLACK DEATH? TRACING HISTORICAL CHANGE BIOARCHAEOLOGICALLY IN MEDIEVAL CAMBRIDGE

Abstract author(s): Robb, John - Cessford, Craig (University of Cambridge) - Dittmar, Jenna (University of Aberdeen) - Inskip, Sarah (University of Leicester) - Mitchell, Piers - Mulder, Bram - Rose, Alice (University of Cambridge) - Hui, Ruoyun (Alan Turing Institute) - Kivisild, Toomas (KU Leuven) - Scheib, Christiana Lyn (University of Tartu)

Abstract format: Oral

What were the historical consequences of the Black Death epidemic (1347-9)? Historians have discussed this at great length, noting increases in mobility, higher wages, and changes in settlement and productive systems. But there has been little skeletal research to clarify directly how the plague changed the lives of survivors and their descendants. Following this great calamity, did people live differently? Were they healthier or taller? Did they have different genes? In this paper, we first discuss models for how the plague might have affected ordinary life in bioarchaeologically visible ways. We then develop new statistical methods for studying continuous or abrupt change with skeletal data, and test these models with data from 300+ skeletons from Cambridge (England) before and after 1350. These models are tested with skeletal, isotopic and genetic data. The results show surprisingly few changes which happened in the mid-14th century and which can be directly ascribed to the plague. Many things show continuity rather than change; some ongoing, gradual changes began before the epidemic and may have resulted from more general processes in the 14th century rather than the event itself.

BAYESIAN META-ANALYSIS OF HUMAN ISOTOPIC DATA FROM LATE MEDIEVAL EUROPE REVEALS DIETARY AND HISTORICAL LINKS

Abstract author(s): Coccozza, Carlo (Ludwig-Maximilians-Universität München, Fakultät für Kulturwissenschaften.; Max Planck Institute for the Science of Human History, Department of Archaeology, Jena) - Cirelli, Enrico (Alma Mater Studiorum Università degli Studi di Bologna, Dipartimento di Storia Culture Civiltà) - Teegen, Wolf-Rüdiger (Ludwig-Maximilians-Universität München, Fakultät für Kulturwissenschaften) - Fernandes, Ricardo (Max Planck Institute for the Science of Human History, Department of Archaeology, Jena; University of Oxford, School of Archaeology; Masaryk University, Arne Faculty of Arts)

Abstract format: Oral

We investigated the interplay between historical phenomena and diachronic trends in subsistence practices during Late Medieval Europe. We employed a meta-analysis of a large collection of bioarchaeological data to determine to what extent major historical developments, such as the medieval agricultural revolution, the 14th century crisis, and the Black Death impacted subsistence for medieval society. Our main data source was the Compendium Isotoporum Medii Aevi (CIMA) that assembles human stable isotope data for Medieval Europe. CIMA is part of the IsoMemo initiative, based at Max Planck Institute for the Science of Human History, that brings together a network of isotopic databases plus access to self-developed modelling tools. We employed the modelling of human isotopic data to visualise temporal and spatial shifts in diet and to determine the relationship between these and historical processes. We adopted a transdisciplinary approach in which the modelling was combined with other archaeological sources to better characterize dietary shifts and their causes.

Our results show a significant increase in animal protein consumption across much of Europe during the late Middle Ages, albeit at varying regional rates and with an overall steep increase during the 14th-15th centuries. The latter could have been the consequence of either the rising prices of wheat, or due to the demographic decrease following waves of pandemics and wars. However, for Italy, southern France and the northern Balkans consumption of animal protein remained fairly constant during the 10th century.

Overall our results illustrate the research potential of large-scale meta-analysis of bioarchaeological data and obtained preliminary results reveal clear links between historical developments and subsistence practices in Medieval Europe.

REDUCED VIRULENCE OF LATE MEDIEVAL YERSINIA PESTIS STRAINS COULD HAVE CONTRIBUTED TO THE DISAPPEARANCE OF PLAGUE FROM EUROPE

Abstract author(s): Bonczarowska, Joanna - Susat, Julian (Institute of Clinical Molecular Biology, Kiel University) - Pētersone-Gordina, Elīna (Institute of Latvian History, University of Latvia) - Immel, Alexander - Nebel, Almut (Institute of Clinical Molecular Biology, Kiel University) - Gerhards, Guntis (Institute of Latvian History, University of Latvia) - Krause-Kyora, Ben (Institute of Clinical Molecular Biology, Kiel University)

Abstract format: Oral

Yersinia pestis (*Y. pestis*) is responsible for three major plague pandemics, including the medieval pandemic (14th-18th centuries) which began with the infamous Black Death (1347-1353). Although several *Y. pestis* genomes from that time period have been analysed, the majority of the findings come from western Europe. Therefore, the diversity and microevolution of this pathogen in the eastern part of the continent remain elusive. In the present study, skeletal remains from two graveyards located in Rīga (Latvia) were examined. Historical sources indicate that at least two plague outbreaks took place in the area while the cemeteries were in use (15th-18th centuries). It is thus possible that the sites constituted a burial ground for the victims of plague. DNA was extracted from teeth of 16 individuals and subjected to shotgun sequencing. Four samples exhibited molecular evidence of *Y. pestis* confirming the plague hypothesis. The analysis of two reconstructed bacterial genomes revealed a depletion in the *pla* region of the pPCP1 plasmid, suggesting the presence of two plasmid variants (*pla+* and *pla-*). The same phenomenon was discovered for other strains responsible for the post Black Death outbreaks of the disease. As *pla* is an important virulence factor for *Y. pestis* – essential for infection and transmission in humans – a decreased number of *pla+* plasmids could have possibly contributed to the disappearance of plague from Europe in the 18th century.

THE DUTCH Y-CHROMOSOMAL LANDSCAPE FROM THE EARLY MIDDLE AGES TO PRESENT DAY

Abstract author(s): Altena, Eveline - Smeding, Risha (Dept. of Human Genetics, Leiden University Medical Center) - van der Gaag, Kristiaan (Dept. of Human Genetics, Leiden University Medical Center; Netherlands Forensic Institute, The Hague) - de Leeuw, Rick - Vaske, Eileen - Reusink, Paul (Dept. of Human Genetics, Leiden University Medical Center) - Diekmann, Yoan - Thomas, Mark (Dept. of Genetics, Evolution and Environment, University College London) - de Knijff, Peter (Dept. of Human Genetics, Leiden University Medical Center)

Abstract format: Oral

DNA is a powerful source of information in reconstructing past population demographic processes. Here we present historical Y-chromosomal data from nearly 350 medieval and Early Modern Period (450-1850 CE) individuals from 13 locations across the Netherlands. With these data, in combination with comparable data from the present-day population of the Netherlands, we are able to test for geo-genetic patterns during different periods and population continuity. This contributes to the reconstruction of the male population history of the Netherlands over the past 1.5k years from a genetic perspective.

Using different methods we observed statistically significant differences in time and space. We could, however, not reject population continuity. The changes in geo-genetic patterns for the Y-chromosome in the Netherlands from the Early Middle Ages to present day indicate that the modern patterns formed only recently. Since we cannot reject population continuity, drift (changes of allele frequency due to chance) needs to be considered as a key factor in these changes. We should therefore be careful to assign frequency changes of genetic markers over time to specific historical events.

We also made an interesting observation on a local level. Only one of the sites from which we collected historical samples, the town of Eindhoven, contained samples attributed to Y-chromosomal haplogroup T and also in relatively high frequencies. This haplogroup, however, is very rare today in the Netherlands and Europe overall, but considered to have been brought along to Europe with the medieval Jewish diaspora. Since Eindhoven was founded around 1200 CE as a market place, and Jews were typically restricted to working in finance and trade during this period in Europe, we may have an indication for a Jewish community in Medieval Eindhoven, something that had not been observed in the archaeological record otherwise.

BIOMECHANICS OF PHYSICALLY IMPAIRED INDIVIDUALS FROM MEDIEVAL IRELAND

Abstract author(s): White, Jessica (Queen's University Belfast)

Abstract format: Poster

Disability is not defined by a set of disease conditions; individuals will have different experiences of their condition depending on the nature of their environment, culture, social status, and skills. Thus, the day-to-day quality of life of an individual, and associated limitations in activity or restriction in participation cannot be inferred from macroscopic analysis of bone alone. Bone can adapt according to the mechanical stresses placed on it; it can be strengthened by deposition when needed and reduced by resorption when not needed. In this way, bone form indicates function, therefore, analysis of bone morphology may have the potential to reveal information regarding the daily life of physically impaired individuals. By assessing the amount of cortical bone using radiographs, this study may reveal limb function after disability. Crucial to the understanding of bone morphology is the assumption that the levels and patterns of habitual biomechanical stress is reflected in the quantity and distribution of cortical bone in the diaphysis. It is based on this assumption, that allows comparison of limbs for signs of weight bearing, revealing the level of function after injury/illness. This along with macroscopic analysis will reveal if the individual used walking aids following incapacitation of their lower limbs. Additionally, by using the cortical bone analyses results and CT scans, 3D musculoskeletal models of the physically impaired individuals will be developed. This will potentially allow visualisation of their gait revealing how they may have functioned on a day-to-day basis. Using this state-of-the-art technology to assess the impact of physical impairment in an archaeological setting will not only reveal information about the past but will also show the development and outcome of diseases and injuries if left untreated medically.

TREPANNED HUMAN SKULL DISCOVERED IN THE NECROPOLIS OF 15TH-19TH CENTURIES AT THE ROMAN CATHOLIC CATHEDRAL FROM IAȘI, ROMANIA

Abstract author(s): Groza, Vasilica-Monica (Romanian Academy – Iași Branch, “Olga Necrasov” Center of Anthropological Research) - Bejenaru, Luminița - Petraru, Ozana-Maria (Romanian Academy – Iași Branch, “Olga Necrasov” Center of Anthropological Research; “Alexandru Ioan Cuza” University of Iași, Faculty of Biology) - Popovici, Mariana (Romanian Academy – Iași Branch, “Olga Necrasov” Center of Anthropological Research)

Abstract format: Poster

This study is focused on a case of trepanation, reported in a sample of skeletons discovered at the “Adormirea Maicii Domnului” Roman Catholic Cathedral from Iași (Romania). The sample of 89 skeletons (children, adolescents, adults and elders) is originated from inhumation tombs and reburials, dating from the 15th-19th centuries. Trepanation has been practiced in many ancient cultures dating as far back as the Late Paleolithic to this century, and it has been detected in locations widespread in every part of the world. Being an extremely aggressive intervention on the human body, the trepanation (craniotomy, in medical terms) is made with a purpose: medical, symbolic or magical-religious.

In this case, the trepanation was identified in a male skull of 50-55 years old, on the occipital bone, near the left temporal. The craniotomy was evaluated by macroscopic observation, followed by image analysis (i.e. radiology and computed tomography). The skull opening is roughly circular with a diameter of 25 mm, and it was probably made by the scraping method with a flat implement used in a rotary movement on the bone surface, which was eroded to the formation of a complete hole.

Regarding on the healing of trepanation studies have indicated that little osseous regeneration occurs. It is probable, that the individual survived for a fairly long period of time following the operation, since the margins of the perforation were smooth. In the skeleton with trepanation, there are not identified other pathologies.

A NEW APPROACH TO DETERMINATION OF SEX IN DEMOGRAPHIC EVALUATION OF MEDIEVAL HUMAN POPULATIONS FROM NORTH-EASTERN ROMANIA

Abstract author(s): Popovici, Mariana - Groza, Vasilica-Monica (Romanian Academy – Iasi Branch, “O. Necrasov” Center of Anthropological Research) - Petraru, Ozana-Maria - Bejenaru, Luminița (Romanian Academy – Iasi Branch, “O. Necrasov” Center of Anthropological Research; Faculty of Biology, “Alexandru Ioan Cuza” University of Iași)

Abstract format: Poster

The identification of sex is essential for the demographics of the past human populations, and not only. Traditionally, the determination of sex on the archaeological human skeletons uses linear metrical data and non-metrical. Many researchers use different skeletal elements in the estimation of the sex (e.g., long bones, pelvis, ribs, clavicle, calcaneus, etc.). But the accuracy of these sex determinations varies between different skeletal elements and between different human populations.

The present study refers to identify the most reliable variables (or indices) and to propose a discriminant function for the sex determination, as a complementary method of identifying sex on human skeletons. For this aim, we used facial metric data from 125 archaeological skeletons of 16th-19th centuries from north-eastern Romania. The analysis was focused on four facial indices: total facial index-FI, upper facial index-UFI, orbital index-OI and nasal index-ONI.

Multivariate analyses in the facial series were performed using MANOVA, regression and discriminant analysis. Results are in 95% confidence range and $p < 0.05$ was considered significant.

Univariate male/female ratios show significant sexual dimorphism in two indices (FI, ONI), indicating that the face express strong sexual dimorphism in this medieval populations. The average ONI is 84.33 in females, and 81.16 in males, while the FI is 83.51 in females, and 87.64 in males. Even if these facial indices are found to be statistically highly significant and they showed interpopulation and sex variations, we consider that the function established between the four indices is more reliable.

Discriminant analysis technique has demonstrated a high competence in the sex determination using the ONI, in specially. Correct classification rates produced by Cross-validation varied from 56% to 88%. Discriminant function equation derived from the combination of the four indices emphasize the dimorphic role of these in medieval human populations of north-eastern Romania.

152 ANCIENT WEST ASIA AND EGYPTIAN SOUNDSCAPES IN CONTACT

Theme: 4. Globalisation and archaeology

Organisers: Köpp-Junk, Heidi (Universität Trier) - Sánchez Muñoz, Daniel (University of Granada) - Rogers, John (Swansea University)

Format: Regular session

The importance of the musical traditions of Ancient Egypt (including here Kush/Meroë and Libyan areas) and West Asia (including Assyria and Babylonia, Anatolia, Iran, the Levant, Arabian Peninsula and southern Caucasus) go far beyond the ‘magnificence’ of their extant instruments (e.g. the Mesopotamian bull-lyres or Tutankhamun’s trumpets). Research demonstrates the importance of these traditions as particularly relevant for understanding cross-cultural influences in the musical traditions of surrounding regions (Franklin 2015; Sánchez Muñoz 2017).

Paradoxically, despite their geographical proximity, this previous research has only begun to explore the possible musical interactions between both areas. Moreover, the few works on the topic (Duchesne-Guillemin 1981; von Lieven 2008) still leave many questions unanswered, such as the influences of cross-cultural contact on musical aspects beyond the instruments themselves (e.g. musicians, repertoires, etc.).

This archaeomusicological session consequently emerges with the purpose of solving this situation by welcoming papers from (Ethno-)Archaeology and Material Culture Studies (besides Egyptian & Ancient West Asian Philologies or (Ethno)musicology) about any aspect of musical interactions between Egypt and West Asia during Antiquity (late-4th mill. BCE until the change of era). Emphasising multi-disciplinary approaches and methodologies, the session will develop cross-cultural archaeomusicological study as a specific contribution to wider narratives of understanding relations between both regions. These lines may guide the direction of proposed papers:

- West Asian influences on Ancient Egyptian music and vice versa.
- The role of regions connecting both continents (e.g. the East Mediterranean) in those contacts.
- Ancient West Asian and Egyptian contexts as common receptors of other Eastern and Western ancient musical traditions.

Studies regarding other Asiatic and African cultures are also welcome if pertaining to the musical interactions of both continents in Antiquity. The organisers are open to discuss such matters in advance and intend to publish the results of this session.

ABSTRACTS:

1 ANCIENT CHEIRONOMY: THE GESTURING MUSICIANS OF ANCIENT EGYPT AND ITS NEIGHBOURS. WHO INFLUENCED WHOM?

Abstract author(s): Megier, Austin (Macquarie University)

Abstract format: Oral

The surviving evidence for music in the Old Kingdom of ancient Egypt (c. 2686-2181 BC) is mostly limited to representations of musical ensembles depicted on elite tomb walls. These musical ensembles consisted of harpists, flutists, clarinetists, and the “one who sings with the hand”. This latter ensemble member is represented performing a set repertoire of hand and arm gestures. Since the early 20th century, scholars have argued these gestures are representative of a musical practice known as cheironomy. This kind of conducting is most broadly defined as a system of hand-signs used by a musician to indicate melody and rhythm.

These representations from ancient Egypt are often cited as a precursor to later cheironomic practices. For example, the cheironomy of Coptic liturgical music is often commonly argued to have arisen out of the ancient Egyptian practice, without any established link and despite the large significant gap in time.

In order to uncover the relationship between ancient Egyptian cheironomy with other cheironomic practices, we must first closely analyse what is known about the former. Though little is currently known about their musical significance, the Old Kingdom reliefs provide ample scenes from which a typology of gestures can be established. Do we have evidence of these specific gestures in elsewhere? What traces can be made between preceding and succeeding the practice of the Old Kingdom? This paper will present what is currently known about ancient Egyptian cheironomy and explore the practices in other cultures in the attempt to determine possible influences.

2 A COMPARATIVE STUDY BETWEEN BES AND THE MIDDLE ELAMITE LUTE PLAYERS IN THE SECOND MILLENNIUM B.C.

Abstract author(s): Khaksar, Sepideh (Free University Berlin)

Abstract format: Oral

Ancient Elam (southwestern Iran) developed a very rich musical culture chiefly known nowadays through seal impressions and clay figurine depictions of musicians (in particular lute players), sometimes similar to Mesopotamian figurines from the Old Babylonian Period (early 2nd millennium BCE).

The Elamite depictions of lute players may also speak, however, to connections with cultures further away than Mesopotamia, notably Egypt. The iconography of the god Bes as musician certainly shares features with a particular group of Elamite clay figurines.

How should the apparent cultural contact be contextualized? While West Asian influence on Ancient Egyptian music has been explored in the past, Elam never was considered in this, a function of the relative neglect that this culture has suffered in general. By that as it may, the case of Bes shows the validity of exploring far-range connections. In this context it may be reminded that other musical motives have long been known to inhabit a large ancient space; an example is that of monkeys playing musical instruments, which connects Egypt and West Asia.

This paper will address the matter of Bes as a musician from an archaeological and art historical perspective (Elamite written sources of direct relevance for the topic are still lacking). First, parallels between Elamite figurines with lute players and Egyptian depictions of Bes in a musical attitude will be examined. Secondly, a possible origin for such a parallel/influence will be established considering the context of West Asian influences on ancient Egyptian music.

In that way, the role of ancient Elamite music and its impact in other ancient musical traditions will be highlighted, and possible new approaches on religious contact in antiquity will be pointed out.

3 THE EARLIEST MUSIC IN ANCIENT EGYPT AND WHERE IT CAME FROM

Abstract author(s): Köpp-Junk, Heidi (University of Trier; Egyptian Archaeology at the Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences Warsaw)

Abstract format: Oral

The earliest attested instruments in Ancient Egypt are rattles, dating to the 5th millennium BCE. They are followed by clappers and flutes in the 4th millennium. Stringed instruments as well as drums are so far not documented in Predynastic and Early Dynastic times; the first harps and drums date to the beginning of the 4th Dynasty (ca. 2600 BC). Nevertheless, in this very early stage of Egyptian history, music seems to have played a major role during ceremonies and rituals.

The earliest clappers are depicted on vessels, they are slightly bend and of a simple design. In contrary, the oldest clappers attested as instruments are richly decorated with zoomorphic design or parts of the human body. The earliest rattles are made of clay, elongated and polished to a shine, others have the shape of fruits, or carvings that are interpreted as buds of a water-lily. The earliest flute looks like the later ones, but has a larger diameter.

The lecture discusses from which place of origin the earliest instruments might have come to Egypt, since a high degree of mobility and intensive long-distance trade is documented as early as the 4th millennium BCE, showing connections not only to the Sinai and Palestine, but even to Afghanistan. Previous research has not focused on this very early Asiatic evidence on Egyptian music yet.

The lecture will focus on where the instruments are attested earlier, whether there are similar parallel finds, or whether even the earliest ones attested in Egypt are modified and adapted to the Egyptian conditions and preferences. Furthermore, an attempt is made to reconstruct a possible route that the instruments might have taken, because since all these early instruments are handy, they were easy to transport when travelling. These topics have not been in focus in previous research concerning music.

4 SACRED FEMALE MUSICIANS IN ANCIENT EGYPT AND WEST ASIA: A COMPARATIVE STUDY

Abstract author(s): Guegan, Izold (Swansea University)

Abstract format: Oral

Both in Ancient Egypt and West Asia, female musicians had an important role towards the gods and the king. On the two continents, specific groups, some of them with an impressive longevity, have been identified by researchers. These sacred musicians officiated in various contexts and constituted groups apart from the society. This paper proposes a comparative study of these Egyptian and West Asian female musicians by exploring their status, activities, and identity. The focus will be on the first half of the second millennium BC which corresponds to the Paleo-Babylonian period in West Asia, and approximately to the Egyptian Middle Kingdom. This period offers a wide range of textual and iconographic sources for the two regions. This investigation will discuss different groups of female musicians in Egypt and West Asia and concentrate mainly on the Egyptian Khenerut on one hand, and the Near-Eastern palace musicians along with the Mesopotamian naditum priestesses on the other hand. The surviving documentation enables us to understand the education, status of these musicians and to ascertain their role and performance within the temple and during religious celebrations. Finally, this research aims to investigate the possible influences between these groups regarding their organization and activities.

5 MUSICAL CONTACTS BETWEEN EGYPT AND ANCIENT WEST ASIA THROUGH THE XVIIIITH DYNASTY BANQUET SCENES

Abstract author(s): Bueno Guardia, Miriam (Universidad Nacional de Educación a Distancia)

Abstract format: Oral

The Egyptian New Kingdom (1550-1070 BC) is a time of economic prosperity and artistic boom for this ancient civilization. But it is also a time when contacts with other foreign people increase. These contacts will be remarkable in different aspects of life and art. Within the art of the New Kingdom, it is worth highlighting the decoration of the private Theban tombs, which provides us with a large amount of information about the life, customs, and religious thought of ancient Egypt. One of the most important themes within this decoration during the XVIIIth dynasty (1550-1295 BC) are the banquet scenes (which also appear in the art of Ancient West Asia with some common characteristics), highlighting their great symbolic load and the presence in them of groups of musicians.

This paper aims to analyse the orchestras that appear in the Egyptian banquet scenes to extract from them the influences, sometimes reciprocal, between this Empire and the civilizations of the Ancient West Asia. The different instruments that appear in these Egyptian paintings often have origin or some kind of relationship with the Ancient West Asian cultures. But there are also other similarities related to the symbolic function that these orchestras fulfilled, the role of music on these occasions, or related to the components themselves.

Therefore, through these banquet scenes dating from the XVIIIth dynasty we can witness the growing musical contact between the Ancient West Asia and Egypt in this early part of the New Kingdom.

6 EGYPTIAN INFLUENCES IN ANCIENT MESOPOTAMIAN MUSIC? UPDATES AND NEW INSIGHTS

Abstract author(s): Sánchez Muñoz, Daniel (Independent Researcher)

Abstract format: Oral

Previous research has normally stressed the presence of Mesopotamian (and Western Asiatic in general) musicians in Ancient Egypt and their influences on Egyptian organology and musical repertoire.

When interacting, two cultures usually influence each other, even if one could exercise a larger influence over the other one. In that way, one might expect, at least, some Egyptian influences on Ancient Western Asiatic, particularly Mesopotamian, music. However, while some modern observations for Asiatic regions such as Canaan and the city-state of Ugarit already exist, nothing exists yet for Mesopotamia beyond the already outdated Hickmann ZDMG 111/1 (1960), 36.

Therefore, the present paper will begin and examination of all the possible Egyptian influences in Ancient Mesopotamian music. Three specific musical aspects will focus the attention of this study: (1) the possible presence of Egyptian musicians in Mesopotamia, (2) influences on organology and (3) playing techniques. Furthermore, a comparison with the Egyptian influences on Canaanite and Ugaritic music will be established. Textual sources (never considered by Hickmann), alongside the currently available archaeological and iconographical material, will be considered for reaching these aims.

Regarding the chronological span covered by this contribution, even if the entire lifespan of Ancient Egypt and Mesopotamian cultures will be equally considered, first millennium evidence will be the main focus of study here. That is the moment when the Egyptian presence in Mesopotamia in general is best documented, and when the largest number of Egyptian possible influences on Mesopotamian music could be sought.

After the reading of this paper, it will be clear that Egypt could, at least, have influenced (Late) Mesopotamian music in some aspects, just as Mesopotamia had done with Egypt before.

7 PLAYING AND LEARNING CYPRIOT MUSIC AT THE URE MUSEUM

Abstract author(s): Romero Mayorga, Claudina (Ure Museum of Greek Archaeology)

Abstract format: Oral

At the Ure Museum of Greek Archaeology (University of Reading) photogrammetry and 3D printing have enabled visitors to investigate the function and symbolism of a collection of 19 Cypriot terracotta figurines of the "Kamelarga" style, probably from Kition. Most of these figurines, which date to the Cypro-Archaic period (750-480 BC) exemplify a mixed technique of moulded faces and wheel-made bodies. Traditionally, these figurines have been interpreted as ex-votos, each of which represents a worshipper holding a gift for the gods – food, animal, weapon or musical instrument. Accordingly, these figurines were created by a farming society to please gods and ensure prosperity.

Although many of them have not optimally preserved their iconographic attributes, five seem to support a tympanum. By handling and playing with the 3D replicas, our staff and visitors delved into the role of music in the Archaic Cypriot society, especially when it came to its links to music performance - and iconography - in Greece, Levant, and Egypt. This paper aims to understand the function of these statuettes in their context (tombs, sanctuaries) and to offer a glimpse into Cypriot musical practices.

8 FOLLOWING THE BEAT. FRAME DRUM PATHS THROUGH EASTERN MEDITERRANEAN

Abstract author(s): Mungari, Pasquale Mirco - Kolotourou, Katerina (Independent researcher)

Abstract format: Oral

The aim of this paper is to start the development of a research course on percussive performance practice, with special focus on drumming, and in particular the performance of frame drums, which have a long tradition in ancient West Asian, Egyptian, and East Mediterranean cultures. Despite the perishable nature of the instrument itself (made of animal skin and flexible wood), there is a wealth of iconographic and literary evidence testifying to the consistent employment of frame drums in different ritual as well as secular contexts. However, we still have limited knowledge of the instrument's performance practices: the acoustic effect, the emotive affect, the music that it accompanied, its role as a solo or ensemble instrument, and the different techniques of frame-drum playing involved in these contexts, paired with typological variations of the instrument.

Information from iconographic and literary sources regarding these matters can be difficult to interpret, fragmentary, inconclusive, or altogether missing. In the absence of direct musical data for the playing of ancient percussion in general, this paper argues that the reconstruction of these unrecorded elements may be attempted through comparative analysis of current drumming practices in combination with the available archaeological data. It will demonstrate that such comparative musicological and archaeological analysis can provide unexpected clues about possible playing techniques and styles, giving an opportunity to explore potential ways of dissemination and transmission of musical knowledge between Mesopotamia, Egypt, and the Eastern Mediterranean. Notwithstanding the culture-specific character of drumming performances, through such comparative musicological analysis of the rich body of evidence it will also be possible to identify some broad overarching elements in the fundamentals of the performance of frame drums within the different cultures in question.

9 THE EGYPTIAN TBN-DRUM AND THE GRAECO-ROMAN TYMPANUM: MUSICAL ALLUSIONS TO CROSS-MEDITERRANEAN CULTURAL INFLUENCES IN THE FIRST-MILLENNIUM BC

Abstract author(s): Rogers, John (Swansea University)

Abstract format: Oral

In 1977, Christiane Ziegler wondered whether the Egyptian tbn-drum, found in texts and iconographic representation in the Graeco-Roman temples of Edfu and Denderah, was a hieroglyphic transcription of the Greek word τυμπανον (tympanon/tympandum; Tambours conserves au Musée du Louvre, *Revue d'Égyptologie*, 29, 1977: 203). Since then, there has been little sustained study of this particular membranophone beyond referencing Ziegler's remarks (see the entry in Wilson, *A Ptolemaic Lexikon*, 1997: 1133 for a brief summary of current Egyptological knowledge in a specific setting). Therefore, the purpose of this paper is, firstly, to re-examine the plausibility of Ziegler's equation and, secondly, to begin sketching the avenues of exploration that such a connection opens. To do this, the paper discusses the textual and iconographic representations and contexts of the tbn within these two temples and begins analysis of the parallels and divergences in the manifestations of the tbn in the Egyptian record and the famous tympanum of the West Asian and Graeco-Roman worlds. In doing so, the tbn may further illuminate the musical and wider socio-cultural networks between Egypt, the northern Mediterranean, and West Asia; such tangible connections speak to broader intercultural influences and networks in the experiences of ancient religion, ritual, and rulership.

10 PLACES OF MUSICAL EXCHANGE BETWEEN EGYPT AND THE LEVANT

Abstract author(s): Staubli, Thomas (Universität Fribourg)

Abstract format: Oral

Iconographic evidences from different epochs testify for an intercultural exchange between the Levant and Egypt in the field of music over centuries. The current study provides examples from the 18th dynasty in Amarna, from the 19th dynasty in Pi-Ramesse, and from the 3rd-1st c. BC in Koptos. They come from a wide range of media like reliefs, steles and bowls. In Amarna the international exchange was deliberately cultivated and documented. At Pi-Ramesse (19th dyn.), Canaanite music was probably a natural part of the cult. Much later (3rd-2nd century BC) this also applies to Koptos, where the trade routes from the north met the Nile. In addition to iconographic evidence of intercultural musical contacts in Egypt, there is also a few evidence of singers and dancers of Egyptian origin in the Levant. The evidence fits the bigger picture of the Levant and Egypt as two regions with an intensive economic and cultural exchange over centuries.

11 CHANGES AND CONTINUITY IN ANCIENT EGYPTIAN AEROPHONES

Abstract author(s): Böckler, Nadja (Egyptian Museum Munich)

Abstract format: Oral

Aerophones are one of four groups of musical instruments that are attested for the ancient Egyptian culture. The first vessel-flutes or peg instruments as well as longitudinal flutes are to be found as early as the predynastic period.

While the former do not appear in pictorial reproductions in the Old Kingdom, the flute (mA.t) enjoyed great popularity. Not only the instrument itself but the flautists as well are appreciated by inscriptions or images. In the tomb reliefs of the Old Kingdom, especially in Saqqara, the flute is accompanied by a further instrument: the clarinet.

During the New Kingdom, the group of aerophones undergo a remarkable change: The clarinet (mm.t) is gradually replaced by the oboe (wDnj), an originally foreign instrument imported from the Asiatic area. Also, the flute seems to be superseded by this new instrument which is incorporated completely into the assemblage of ancient Egyptian instruments and turns out to be the main aerophone in the New Kingdom. However, neither flute nor clarinet disappear completely from the ancient Egyptian "orchestra" – both of them rather experience a change in meaning provoked by the foreign influence and the advantages of the "new" instrument.

Also, the transverse flute and the pan flute – both without an Egyptian designation – found their way into ancient Egypt, albeit only during the Graeco-Roman period and never being as important as the oboe.

In the forthcoming lecture the two native instruments (flute and clarinet) are to be compared to the imported instrument (oboe). Based on this contrast considerations will be presented concerning questions like: Which advantages of the oboe were the reasons for its great popularity? What can we learn about music and sound traditions in ancient Egypt? What was the role of the flutist or the oboist?

12 WHO PLAYED THE SISTRUM? A MISSING INSTRUMENT IN THE HEBREW BIBLE

Abstract author(s): Friedmann, Jonathan (Academy for Jewish Religion California)

Abstract format: Oral

The sistrum, an idiophone primarily associated with the Hathor cult, appeared in Canaan in the third millennium BCE and persisted into the Roman period. Some biblical interpreters link the instrument to two ambiguous Hebrew terms, shalishim (I Sam. 18:6) and mena'anim (II Sam. 6:5). However, these translations are doubtful. Unlike other widespread instruments in the region, sistra (pl.) apparently did not outgrow associations with the cult, even as they were likely played in other contexts. Their close ties to Egyptian practice led biblical authors to censor or omit references to them. This paper proposes that three interconnected uses of sistra—cultic, apotropaic, and during women's celebrations—were especially problematic for biblical authors, who cite competing instruments serving these functions in Israelite ritual. From this perspective, the exclusion of sistra was part of a larger agenda of discrediting idolatry and distancing from surrounding cultures. Moreover, by comparing biblical passages to the available archaeological evidence, this paper confirms that what is preserved in sacred texts does not always reflect the activities of "ordinary" people, who at times engaged in musico-religious practices, such as playing sistra, that were at odds with official rulings.

153 ARCHAEOLOGY IN THE DIGITOCENE AGE: DISCUSSING CRITICAL APPROACHES, ONTO-ETHICS, AND POLICIES OF DIGITAL PRACTICES

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Hanus, Kasper Jan (TBD) - Stobiecka, Monika (University of Warsaw) - Johnson, Tyler (University of Michigan)

Format: Regular session

As archaeology experiences an ongoing radical shift from "spade-work" to "screen-work," technical advances continue to outpace the development of robust interpretive frameworks responding to the "digital ecosystems" which now characterize our field. This lack of balance risks perpetuating a trend of "techno-fetishism" whereby researchers prioritize the utilization of the latest methods to collect more and more data at the expense of keeping their interpretive frameworks abreast with new technologies. Furthermore, an outsized emphasis on the technical over the theoretical can lead researchers to "aestheticize" archaeological knowledge, fo-

causing their efforts on the production of data visualizations which enchant and impress, but do not necessarily make meaningful contributions to interpretive dialogues about the past.

Recently, a growing chorus has amplified concerns regarding these issues. Jeremy Huggett, for instance, argues that the influence of digital technologies on the very nature of archaeological practice is "under-theorised, under-represented, and under-valued," but "is increasingly fundamental to the way in which we arrive at an understanding of the past" (Huggett 2015, 86).

During this session, we seek to answer Huggett's call for a "meaningful dialogue" about digital technologies and their influence on research outcomes (Huggett 2015, 87), inviting proposals that handle the theoretical, methodological and practice-based problems of digital archaeology in research contexts. Moreover, the increasingly widespread application of digital methods in the context of heritage practice raises the need for a critical examination of these issues beyond the academic field (i.e. public archaeology, indigenous archaeology, rescue archaeology). Therefore, submissions speaking to the influence of digital on the politics of heritage, social impact and global or local values are also highly encouraged.

References:

- Huggett, J. 2015. "A Manifesto for an Introspective Digital Archaeology." *Open Archaeology* 1, 86-95.

ABSTRACTS:

1 DIGITAL SUSTAINABILITY: WHAT HAPPENS WHEN WE DIGITIZE EVERYTHING?

Abstract author(s): Stobiecka, Monika (University of Warsaw)

Abstract format: Oral

The last few years have shown that in heritage policy all over the world priority has been given to digitization. International, national, and regional authorities and academies generously support researchers and technicians working on digital heritage. Almost everything considered valuable is registered, stored in databases, or presented in museums, and finally, saved for posterity in various digital formats. However, this ubiquitous turn towards the digital that has taken over heritage studies still lacks a proper theoretical and critical framework. Many authors notice this severe theoretical lack, which often leads to techno-fetishism, particularly visible in projects where researchers, following the fast-science track, indiscriminately collect more and more data by applying the latest methods, to create more and more representations, reconstructions, simulations, or even simulacra. All too often, digital heritage is based on a simple problem-solution mechanism, dismissing the ethical implications. It is high time to think about the future of digital heritage and repeat the question posed by Harold Thwaites: what happens when we digitize everything? (Thwaites 2013). Or go further and ask: what are the ethical implications of this mass digitization – will the digital replace the material?

In my presentation I will discuss if digital heritage can be sustainable, and if the practice can be slow and thoughtful, instead of fast and managerial. My questions will embrace aspects of digital heritage related to digital materiality, energy use, and accessibility and public use. My speech will be illustrated with the preliminary results of a study on Polish digital and virtual collections.

Throughout my talk I will investigate the future of digital heritage. Assuming that we are witnessing digital heritagization, I will ask further about the implications of this preference for the digital for sustainable heritage development.

2 DIGITAL STRATEGIES FOR A MORE ACCESSIBLE ARCHAEOLOGICAL FUTURE: DISCUSSION AND EXAMPLES BETWEEN THEORY AND PRACTICE

Abstract author(s): Johnson, Tyler (University of Michigan)

Abstract format: Oral

A future that emerges as increasingly technological and virtual places immense pressure on archaeologists to produce significant results and paths forward in the realm of digital work. Currently, most significant advances in digital archaeology have emphasized excavation and laboratory workflows or practical and theoretical research outcomes. While such work is obviously to be lauded and supported, much of it has done a poor job of responding to what should be an essential demand of digital applications in archaeology: the design and creation of plans and platforms for making cultural heritage more accessible and equitable to the global public. In what follows, I will engage the concept of "accessibility" on several levels as it pertains to theory and practice in digital archaeology, with key emphasis on the potential for digital applications to make archaeology more accessible to people with disabilities. In the process, I will argue that digital archaeology has the potential to increase accessibility outcomes in both academic research and public facing contexts (museums and other cultural heritage experiences). On the other hand, digital work can only be one aspect of accessibility plans for archaeological projects and must be carefully coordinated with other efforts which strive toward a common goal (including, among other things, the training of personnel and the construction of infrastructure). As a result, this talk will draw upon a few practical examples of current work seeking to expand accessibility in archaeology using digital tools, including my own experiences with the archaeological site of Poggio del Molino (Populonia, Italy) and the University of Michigan's Gabii Project (Rome, Italy).

3 OUT OF THE FETISHISTIC FRAMEWORK: DIGITAL CRITICAL THEORY FOR DIGITAL ARCHAEOLOGY

Abstract author(s): Vaquero, Pablo (University of Glasgow; University of Granada)

Abstract format: Oral

Digital Archaeology can be conceived as the subfield which uses computational/digital tools for generating and processing data which can, then, answer archaeological enquiries. Oftentimes, these technologies seem to bring a halo of utter objectivity. This hampers discussions about the subtleties and nuances of using them, ultimately backfiring many of the expectations put upon this subfield. Such scenario plays against our interest in developing refined frameworks that can effectively deploy the full potential of Digital Archaeology. For achieving this potential, we first have to transcend a point-zero stage -i.e. explicitly address the theoretical underpinnings of these technologies and their use. Going through this stage is what would also show the subjectivity of the digital. The latter might be perceived as counterproductive, but according to Buccelatti (2017), the most appropriate way of being close to objectivity is by acknowledging our subjectivity. At the end of this process, we will realise that there is a constant need for going backwards and forward into theory for the right development of Digital Archaeology.

In this paper, I aim to discuss the importance of theory by focusing on computational ontologies. The case of The DataARC Project grounds this reflection. The presentation addresses the importance of theory for coherently developing an ontology which fits our goals and detecting implicit theoretical frameworks carried by the data (Huggett, 2015). Through this case, I moreover argue that many ontologies hitherto developed for archaeology limit this cybertool's potentialities. Finally, I reflect upon how our digital approach might affect our perception of the past. I argue that these reasonings are necessary should we develop an ethical Digital Archaeology.

- Buccellati, G. (2017). *A Critique of Archaeological Reason: Structural, Digital, and Philosophical Aspects of the Excavated Record*. Cambridge University Press.
- Huggett, J. (2015). A Manifesto for an Introspective Digital Archaeology. *Open Archaeology* 1 (1).

4 THE POTENTIAL AND LIMITATIONS OF BIBLIOMETRIC BIG DATA FOR THE ANALYSIS, VISUALISATION AND UNDERSTANDING OF ARCHAEOLOGICAL RESEARCH

Abstract author(s): Sinclair, Anthony (University of Liverpool)

Abstract format: Oral

Developments in archaeological thinking have usually been based on the close reading and criticism of published documents in the form of theoretical, methodological and analytical studies. However, the quasi-exponential growth in archaeological literature has made it almost impossible for anyone to read but a small percentage of the current literature, let alone the corpus of literature produced within any field over the last 30 years. This factor, perhaps as much as any other, has led to a progressive specialization / narrowing of focus by individuals and teams. In contrast, since the 1960s information scientists have argued that bibliometric data – the meta data of individual documents – held in abundant quantity by the major citation indexes (Web of Science, Scopus, etc.) provide an effective source for identifying the key areas of disciplinary development (the 'research fronts') their central conceptual knowledge (the 'intellectual base'), areas of potentially important research synergy between disciplines, and, of course, the most productive research areas and personnel. Network analysis linking scholars, documents and concepts, visualised by freely-available, science-mapping software provides an awesome showcase for these claims. Using palaeoanthropology as its example, this paper will examine the current effectiveness of such visualisations for understanding the development of archaeology. Specifically, it will emphasise the importance of understanding the limitations of bibliometric data in terms of (i) indexed documents versus cited; (ii) of citation-index provided subject category labels and document keywords used to generate visualisations of concepts. It will identify the work required to render this data and such visualisations useful for archaeologists. At a time when bibliometric data has become a powerful tool for institutional research managers to evaluate 'objectively' the standing and investment potential in individuals and departments, an understanding of this such is vital.

5 DIGITISATION DRIVEN BY TRADITION – AN ARCHITECTURAL VIEW UPON ARCHAEOLOGY

Abstract author(s): Lengyel, Dominik - Toulouse, Catherine (BTU Brandenburg University of Technology Cottbus-Senftenberg)

Abstract format: Oral

One of the most significant phenomena of digitalisation in archaeology is the gamification. The film industry and notably the gaming industry have been setting standards that contemporary archaeological mediation, whether in museums or in specialist journals, is reluctant to fall behind. Yet the claim is basically completely different: popular culture is primarily about entertainment if not amusement. Scientificity in these settings becomes secondary, sometimes even undesirable, as it would not only appeal directly to the little attentive, casual museum visitor or magazine reader. On the contrary – in the spirit of general participation – the presumed audience would be met where they are. Besides, it is well possible to use even the latest technology in such a way that critical and theoretical reflection is still possible, even aestheticised, whereby visualisations can certainly become meaningful contributions to interpretative dialogues. This approach even avoids the risk that this technological access would be under-theorised mainly by focusing on the two traditions of architectural modelling, i.e. the consistent use of abstract representations, and classical architectural photography, i.e. the focus on a visual perception that is as natural as possible, as if the digital model were our physical reality.

The presentation aims to demonstrate and illustrate this method by several projects developed by the authors in cooperation with archaeological research institutions:

- Cologne Cathedral and its Predecessors (by order of and exhibited in Cologne Cathedral),
- Bern Minster – its first century (by order of and published by Bern Minster Foundation)
- The Metropolis of Pergamon (within the German Research Fund Excellence Cluster TOPOI),
- The Palatine Palaces in Rome (by order of the German Archaeological Institute, both latter exhibited in the Pergamon Museum Berlin),
- The Ideal Church of Julius Echter (by order of the Martin von Wagner Museum in the Würzburg Residence).

6 INTERPRETING THE PAST – HOW ESTHETICS DESTROY THE PAST

Abstract author(s): Tomczak, Sonia (Nicolaus Copernicus University)

Abstract format: Oral

I would like to answer the question if esthetics used in creating visualisation destroy the past. Living in the Digitocene Age, we as archaeologists have new responsibilities. By examining the past and reconstrucing it based on our findings, we try to present result of our research in a way that convince the public and influence their imagination. By visualisations scientists create vision of the past in peoples' minds. At the same time, it is a great privilege and responsibility.

Nowadays, the most popular means used by archaeologists for the purpose of creating a vision of the past, are beautiful and esthetic visualisations. The use of technology changes our perception of the past. Dirty parts of a vessel dug up from mud are presented as a clean, detailed vessel. One gets the impression that it is almost possible to touch the object. The vessel is placed in a hand of a person shown in another visualisation and we move back thousand of years to see how people used vessels and how they lived. One could ask if this is real. Of course, we know that visualisation is not a real artefact, or do we? Why does it influence our senses more than a dirty pot?

7 ONE DOES NOT SIMPLY LOOK AT SATELLITE IMAGERY. INTERPRETING REMOTE SENSING DATASETS WITH ENHANCED ANALYTICAL TOOLS

Abstract author(s): Hanus, Kasper Jan (TBD)

Abstract format: Oral

The most crucial, and often overlooked, aspect of remote sensing applications in archaeology is selecting the right analytical methods to bridge datasets with theories describing past societies' complexity. With this paper, the author will attempt to highlight this issue, focusing on a particular case study of matching the social theory, interpretation methods and remote sensing data.

The presentation will focus on a new method for an assessment of past water-human interactions. The method is based on a tool developed by space syntax pioneers Bill Hillier and Julienne Hanson: a gamma graph analysis representing 'permeability' of buildings. It will be discussed how this tool was altered in order to model a water management system. Subsequently, the method's test on a case study – an ancient Silk Roads' oasis-city of Miran in north-western China, will be presented. The positive verification makes the author argue that the introduced method can provide new insight into the relations of power interlinked with water management.

8 MULTIMODAL APPROACHES TO THE PRESENTATION OF 3D AND SPATIAL DATASETS FOR SCHOLARLY AND PUBLIC INTERPRETATION

Abstract author(s): Naglak, Matthew (Boston College) - Araújo, Nina (Northeastern University) - FitzGibbon, John (Boston College) - Kim, Min Jung (Lynch School of Education & Human Development, Boston College)

Abstract format: Oral

Technical advances for archaeological documentation have led to the gathering of vast quantities of 3D and spatial data by archaeological projects, yet for the most part these data are kept siloed apart from other areas interpretive presentation, placed in repositories and left to wither. This fact requires anyone hoping to evaluate the data for themselves to jump through a multitude of hoops in order to simply gather the entire dataset into a useable format, much less actually interpret it.

In an attempt to change this mindset, the Gabii Archaeological Project out of the University of Michigan has made a dedicated effort to design a variety of multimodal, integrated user experiences of their 3D and spatial datasets for users of a variety of experience levels to engage with. Through the use of open source tools such as the Unity gaming engine, Leaflet interactive maps, and, more recently, Apple's Reality Composer Alternate Reality platform, we have attempted to bring our digital datasets out of the repository and into academic and public presentation, offering a one-stop shop for our data. Here we review these efforts (both the successes and failures) both at Michigan and more recently in collaboration with the Center for Digital Innovation and Learning at Boston College, with an eye to the future of what archaeological presentation in the classroom can be.

9 BEYOND THE VISIBLE. LANDSCAPE EXPLORATION OF THE DEWIL VALLEY (PHILIPPINES)

Abstract author(s): Kowalczyk, Zuzanna (Adam Mickiewicz University, Poznan)

Abstract format: Oral

In contemporary archeology, digital methods are commonly used at all the stages of the research – from the data collection, through analysis, interpretation, visualization, and presentation to the public. However, the overwhelming majority of these techniques are related to visual and optical cognition, such as creating graphic maps and plans, drawings, photographs, 2D and 3D models. The sensory data such as sounds, scents, textures, and tastes are considered less scientifically valuable. Even though phenomenological observations are embedded in indigenous practice and correspond with the ethnographic data.

This paper discusses the case study of specific cave sites in the Dewil Valley (northern Palawan, Philippines) which traditionally were interpreted only on the basis of visual criteria, creating an incomplete and pictorial-deterministic narrative about the past. Analyzing indigenous knowledge, ethnographic and archaeological data, I will argue that landscape cognition is inextricably linked with the physicality, features, properties of the material form, and potential for change. Tactile and smell sensations, sonorous qualities, together with visual perception are primary tools in learning landscape ontologies, therefore archaeological tools should be directed at these impressions. Furthermore, I will discuss the developing potential of scentography and sound recording as the methods on a par with the visual ones in the Digitocene Age.

10 THINKING THROUGH THE TOOL: ARCHAEOLOGICAL BODY-WORK IN IMMERSIVE VIRTUAL REALITY

Abstract author(s): Morrow, Giles - Wernke, Steven (Vanderbilt University)

Abstract format: Oral

With the recent emergence of very high-resolution three-dimensional models via photogrammetric techniques as a primary method of archaeological documentation, the construction of near perfect simulacra is imminently within reach. Such models and methods are still viewed as a vanguard practice, requiring large outlays of expertise and computational expense. The vast majority of research making use of high-fidelity 3D models of artifacts and excavation contexts tend to remain siloed under the curation and use of the research teams that produce them. In efforts to “think beyond the tool”, this paper considers how the scales at which the human body interacts with these digital environments is especially important for understanding the affordances and ergonomics of past things and places. The implications of this isometry between archaeological objects of analysis in past social contexts and emerging capabilities to interact with them through digital surrogates in the present are manifold. By enabling interaction with objects and contexts in immersive virtual space, such observational experiences create in silico engagements that are repeatable and distributable. In particular, it is the collaborative capacity of this technology that is explored in this paper through the use of immersive virtual reality (iVR) systems to reinterpret the digital records of two archaeological sites under excavation in Peru. Through iVR frameworks, the authors reconsider the colonial era reducción site of Mawchu Llacta in the Andean highlands and the pre-Columbian site of Huaca Colorada on the north coast. Synchronous scalar experiences that privilege the affordances of architectural space within digital models create opportunities for an embodied interpretational dialogue beyond academic discourse alone. The capacity to digitally inhabit these places and manipulate materials hold subtle but profound epistemological and hermeneutic implications for archaeological knowledge construction.

11 ARCHAEOLOGY REDESIGNED AS A PEER-TO-PEER PLATFORM

Abstract author(s): Wilkins, Brendon (DigVentures; University of Leicester)

Abstract format: Oral

This paper compares a traditional ‘pipeline’ with a networked ‘platform’ model of field work, assessing the impact of technology enabled participation on archaeology’s disciplinary and professional boundaries. In contrast to the collaborative potential of peer-to-peer systems, the current vogue for intra-site digital tools (such as tablet recording, GIS and 3D technologies) can be seen to augment rather than reinvent pre-digital workflows. This is where new peer-to-peer ‘platform’ technology can assist, potentially creating space for civic participation at the centre of our work. DigVentures have adopted a platform approach to archaeological resource sharing, collaborative knowledge production, and crowdsourced labour, facilitated by a suite of networked digital tools creating an accessible space for micro-volunteering initiatives and experiences. By opening up the archaeological process in this way, the central design challenge becomes how to improve research outputs whilst simultaneously enabling civic participation at every level. The underlying technology of the platform addresses this with a publishing hub, online learning courses, e-commerce crowdfunding payment system, and a read/write recoding system enabling project participants to collaboratively produce archaeological data.

A. MAPPING THE EVOLUTION OF AN ARCHAEOLOGICAL EXCAVATION IN THE DIGITAL ERA. A CASE STUDY OF SULTANA-MALU ROŞU

Abstract author(s): Frujina, Ovidiu - Covataru, Cristina - Lazar, Catalin (Universitatea din Bucuresti)

Abstract format: Poster

Until a few decades ago, aerial survey methods were used in archaeology with the sole purpose of acquiring imagistic data that could be used in identifying new areas of archaeological interest. Due to the aid of compact global and inertial navigation systems (GNSS, INS) that are incorporated in the unmanned aerial vehicles (UAV) flight planning software, the speed and accuracy at which areas

with high archaeological interest are mapped, has significantly increased. The evolution of this system facilitates the use of close-range photogrammetry to identify the micro-topographical analysis of already known archaeological sites and record the progress of the excavation and of the archaeological features within a site.

The basis for conducting this type of survey/recording consists in using UAV combined with the use of GCP’s (ground control points) that are measured with the help of a total station or a DGPS (differential global positioning system). Using a combination of these two methods, we should be able to obtain a high precision digital terrain model (DTM) and an orthophoto map with absolute geographic coordinates. Interpreting this type of information, allows us a better understanding of the excavation as well as of the archaeological landscape in the proximity of the sites.

Our study will present the results of using close-range photogrammetry as a useful tool to record an archaeological excavation over long periods of time. Interpreting this kind of analysis will allow us a better understanding of the past recorded in the archaeological contexts.

156 USERS OF HERITAGE: CRITICAL APPRAISAL OF THE ADOPTION OF CITIZEN SCIENCE IN DIGITAL PROCESSES OF ARCHAEOLOGICAL KNOWLEDGE PRODUCTION

Theme: 6. Material culture studies and societies

Organisers: Thomas, Suzie (University of Antwerp) - Oksanen, Eljas (University of Helsinki) - Wessman, Anna (University Museum of Bergen)

Format: Session with keynote presentation and discussion

We approach the growing trend of citizen science approaches in the curation and creation of archaeological knowledge. Citizen scientists are not limited to those that upload data about discoveries of archaeological material to established databases, and increasingly engagements in physical interventions with archaeological sites and artefacts are similarly being identified as citizen science activity. However, the digital realm of citizen science provides a focal point for this session.

Contributors to this session are requested to take a broad perspective to citizen science approaches, which may include developing their discussions in the context on particular case studies, or by taking a broader approach to the ethical and disciplinary questions that this form of public participation in archaeological heritage presents.

We therefore ask the following questions:

- What are the ethical parameters that need to be considered in the development and design of platforms for digital citizen science with regard to archaeological heritage? For example, whose needs are to be prioritised by these platforms, and who has and/or maintains control?
- Can we be certain (or is it desirable) that there is an interactive flow between academia and citizen scientists, or is it more important that the data is made primarily available for scientific research purposes?
- Within the European context of the Faro Convention, to what extent does digital archaeological citizen science contribute to the increase and enhancement of public participation with archaeological heritage?

Contributors should keep the above questions in mind while considering different motivations for engaging in citizen science and the roles and goals of different actors such as members of the public, heritage managers and academic researchers, the different levels of control allowed to these often diverse groups, and the questions who has responsibility for ensuring the sustainability these platforms and initiatives - WHO should manage archaeological citizen science?

ABSTRACTS:

1 TRUSTING THE PUBLIC: RECORDING ARCHAEOLOGICAL FINDS IN A GLOBAL PANDEMIC

Abstract author(s): Lewis, Michael (British Museum)

Abstract format: Oral

Throughout the recent Covid-19 pandemic, especially during March-April 2020 and December-April 2021, the recording of archaeological finds made by the public in England and Wales (through the British Museum’s Portable Antiquities Scheme) depended more on a citizen science contribution, particularly through digital technology (photography, image manipulation, providing findspot data and weights and measurements etc). This was a significant departure for the Portable Antiquities Scheme (PAS) where most finds are handed over to its team of local Finds Liaison Officers (FLOs) for recording, though interns/volunteers work alongside these professionals in the creation and curation of that dataset. As the Scheme now looks to develop its digital applications for recording finds, this paper will explore the lessons learnt from digital recording and the opportunities it brings for involving more people in the recording of archaeological finds (and archaeology more generally), but (importantly) not at the expense of the archaeological record and the value of public finds for advancing knowledge.

2 CURRENT STATE OF CITIZEN SCIENCE IN ARCHAEOLOGY OF THE CZECH REPUBLIC

Abstract author(s): Komoróczy, Balázs (Institute of Archaeology of the Academy of Sciences of the Czech Republic, Brno)

Abstract format: Oral

For the last three decades, archaeological science and archaeological heritage management in the Czech Republic have been strongly influenced by the extraordinary popularity of metal detecting by members of the public. In the 1990s and at the beginning of this century, archaeology reflected this problem mainly as an academic question of ethics, only isolated emergent calls were made during some accidentally evidenced extraordinary losses or damage to archaeological finds and contexts. Largely as a result of generational change within the archaeological community and also as a natural manifestation of the country's social transformation from post-totalitarian to still fragile but increasingly developed civic society, tools for moderating metal detecting are currently sought and applied in many major professional institutions. Both traditional and digital tools are established to enable the sharing of benefits within the archaeological community and the public. This process quite naturally and necessarily results in the emergence of citizen science circles around professional institutions. Although this is an ongoing process, yet today it is possible to clearly identify the prevailing ethical parameters and especially the practical forms in which this citizen science is constituted. Their characteristics, as well as the benefits, weaknesses and threats of this process are the main topic of the presentation.

3 CO-PRODUCTION OF ARCHAEOLOGICAL FIND DATA: ADVANTAGES AND CHALLENGES OF CITIZEN SCIENCE IN ARCHAEOLOGICAL COLLECTION MANAGEMENT

Abstract author(s): Rohiola, Ville (Finnish Heritage Agency)

Abstract format: Oral

From the perspective of archaeological collections, citizen science produces valuable and beneficial data, which has great potential to improve and enhance the efficiency of archaeological finds management. However, the challenge lies in finding ways to produce and provide archaeological knowledge that satisfies the needs and motivates different users from the general public to academia.

Recreational metal detecting has become a steady part of archaeological citizen science in the countries where metal detecting is legally permitted. In Finland, the metal-detecting finds that are considered antiquities by the Finnish Antiquities Act, need to be reported to the Finnish Heritage Agency. The digitally recorded find information by the citizen scientists is becoming increasingly interesting and valuable because of its research potential. Archaeological collections are in the key position in preserving and providing the archaeological find information and in ensuring the quality of the data and its long-term preservation.

In this paper, the interplay between citizen science and archaeological collections is studied with the example of two public services dealing with archaeological finds, managed by the Finnish Heritage Agency: the find reporting service Ilpari and FindSampo, a linked open database of archaeological finds. The main focus of the presentation is to explore the requirements and standards of object cataloguing from the perspective of citizen science. How can citizen science take part in cataloguing archaeological find data and further advance the democratization of archaeological heritage?

All the actors - public, academic researchers and heritage managers - share the interest in archaeological knowledge, but the perceptions regarding metadata quality and minimum information requirements of qualified data varies between actors. Whose needs should be prioritized in recording citizen science find data?

4 WIKIDATA AND THE WIKIMEDIA UNIVERSE AS A PLATFORM FOR CITIZEN ARCHAEOLOGISTS

Abstract author(s): Schmidt, Sophie (Free University Berlin)

Abstract format: Oral

In Germany, metal detectorists and voluntary archaeologists need to register with the federal state they want to work in and need to receive permissions to survey certain areas. As Heritage Management is federalised in Germany, different laws and regulations are enforced in each state. Data and finds by citizen scientists are recorded by Heritage Management and entered into their archives, where they „disappear“ from the public's eye. In this talk I will present the project „Zerschlagenes Geschirr - Archäologische Quellen in Wikidata“ („Smashed Dishes - Archaeological Sources in Wikidata“) funded by the Wikimedia Foundation within the Open Science Fellow Program (<http://smasheddishes.squirrel.link>). It aims to enable and empower citizen science by showing volunteer archaeologists how to use the Wikimedia universe to publish their data to the wider public as well as to archaeologists.

The Wikimedia universe provides the image storage Wikimedia Commons and the structured knowledgebase Wikidata. Especially Wikidata can be tricky to use for people which are unfamiliar with data management at all. The project therefore aims at creating easy-to-use workflows and guidance and to train volunteer archaeologists in how to use them. As a first step, a suitable data model in Wikidata needs to be designed. For this aim decisions need to be made which will be mediated between volunteer archaeologists and Heritage Management to specify what kind of data citizen archaeologists are able to and should enter, such as type of classification and precision of geographical information.

5 FACTORY SMOKESTACKS, AN INTERACTIVE ONLINE MAP, AND IDEAS ON HERITAGE

Abstract author(s): Äikäs, Tiina (Archaeology, University of Oulu) - Seitsonen, Oula (University of Oulu) - Koskinen-Koivisto, Eerika (University of Jyväskylä)

Abstract format: Oral

Factory smokestacks of abandoned industrial spaces can raise multiple feelings; they can be reminders of industrial past, arenas for urban exploring or legend tripping, or they might be considered as wasteland and unaesthetic safety-hazards. This paper is based on data collected via an online interactive map application where people can share their photos and stories related to factory smokestacks. The application gives people a chance to comment each other's postings and bring together people with different ideas of the value or disvalue of these places. Hence the interactive map not only represents factory smokestacks but through the inclusion of stories and later artwork based on these stories, has the potential to transform participants' everyday encounters with these sites. In this paper we ask, what is the role of this citizen science project in shaping people's ideas on smokestack as heritage. How can we make sure that different groups of people are equally given voice in collecting data? What is our role as researchers in the heritagization of the smokestacks?

164 CONSTRUCTIVE CONSERVATION: MAKING MONUMENTS USEFUL

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Darvill, Timothy (Bournemouth University) - Sutton, Robert (Cotswold Archaeology) - Hüglin, Sophie (University of Basel)

Format: Regular session

Following a successful first session at the 2020 Virtual Meeting we continue the debate surrounding the challenging task caring for heritage assets whether as archaeological sites, ancient landscapes, or historic buildings. It is a debate that is even more pressing in a post COVID-19 world where adjustments to a new normality will take many forms. Public authorities do not have the capacity or resources to deal with more than a very small fraction of what we now know exists, and increasingly look for public value in what they support. Private bodies and individuals are under pressure to realize financial value from the places they own during the course of development and redevelopment. Conservation as the sustainable and ethically sound management and maintenance of heritage assets needs new and innovative approaches to match these challenges. One such approach is 'constructive conservation' which encourages positive, well-informed, collaborative engagements with heritage assets; a flexible process that helps people understand their historic environment and then use that perspective to manage change. Especially important is recognizing, protecting, drawing out, and enhancing the significance of historic places. Creativity is important too, especially in finding new uses for old places in order to give them a secure future. And including elements of the intangible cultural heritage including tradition skills and beliefs can be relevant too.

This session aims to provide a forum in which to illustrate and discuss constructive conservation as an innovative paradigm in contemporary heritage management. Papers are invited on the emergence and development of the idea of constructive conservation; case studies of successful (or unsuccessful examples); and considerations of the ethical and legal implications of constructive conservation in various jurisdictions. It is hoped that the session will range widely, including contributions on buildings, monuments, and landscapes, or combinations of all three.

ABSTRACTS:

1 CONSERVATION IN PERSPECTIVE

Abstract author(s): Darvill, Timothy (Bournemouth University)

Abstract format: Oral

The idea of conservation as a means of looking after elements of the cultural heritage and protecting them from undesirable changes emerged in the late nineteenth century. Since then there have been many twists and turns in the way conservation is understood and implemented. This paper will look briefly at the philosophical roots of conservationism, and consider the dynamic relationships that have shaped its application over the last century and a half. Special attention is given to the conflicting and evolving ideas inherent to conservation within the broader field of archaeological heritage management: simple site protection; the notion of 'restoring as found'; the idea of fulsome restoration; and the emerging trend for constructive conservation in which selected elements identified through research and investigation become integrated within broader schemes of development and redevelopment. It is argued that making the past contribute to the present has been a strong theme within conservationism for many years, although what exactly those contributions might be is often contested and negotiated. In a world where emotional connections to place are seen as increasingly important, where the art of place-making is integrated with spatial planning and design, and interests in well-being, sustainability, and prosperity dominate social policy, how might constructive conservation keep up with changing demands?

2 THIS PARK IS YOUR PARK, THIS PARK IS MY PARK, ... THE STORY OF THE LVR-ARCHAEOLOGICAL PARK AT XANTEN (GERMANY)

Abstract author(s): Kienzle, Peter (LVR-Archaeological Park at Xanten)

Abstract format: Oral

The remains of the former Roman Colonia Ulpia Traiana (Roman province of Germania Inferior) are located immediately north of the medieval and modern city centre of Xanten (Germany). Until the late 1950ies, this area was agricultural land with only a few farm buildings. With the construction of a concrete factory at the site of the Roman Town Baths in 1958 prosperity seemed to come to the rural area of Xanten. The expansion of gravel pits to supply the concrete factory meant the final destruction of large parts of the Roman remains. An industrial estate was planned in other parts of the former Colonia.

With the foundation of the Archaeological Park at Xanten in 1973 the site was protected from further destruction but the archaeologists from the museum in Bonn, some 120 km to the south, were perceived as intruders by the local population. They prevented local jobs and prosperity in favour of some "strange archaeological open air museum". Slowly and gradually the public opinion changed due to various measures taken by the staff of the archaeological park, most of all by providing employment to a great number of locals.

Today, the park attracts some 350.000 visitors a year and is one of the most visited museums in Germany. Resistance prevailed with some of the elder locals and they claim their correct judgement by indicating negative effects of mass tourism. Other citizens do accept the park to be one of Xanten's highlights.

The paper explores the relationship between the local residents and "their" archaeological park to date. It shows, that a long period of mutual learning from each other results in a win-win situation.

3 CONFLICT NARRATIVES: THE POLITICS OF CULTURAL HERITAGE MANAGEMENT IN POST-WAR SYRIA

Abstract author(s): Munawar, Nour A. - Symonds, James (University of Amsterdam - UvA)

Abstract format: Oral

The physical traces of war and violence may be likened to a disfiguring scar after an accident. They can be removed or disguised using surgery, for the sake of forgetting. Conversely, such scars can be preserved for the sake of remembering and openly displayed as a badge of honour that shows evidence of the trauma that has been endured.

The Arab Spring movements, which started in 2010 in Tunisia, have been characterised by the destruction of cultural heritage sites, monuments, and facilities. Cultural heritage destruction in the Middle East and North Africa (MENA) region has infuriated and saddened local people as well as Western observers, academics and organizations.

The reconstruction of cultural heritage is a long-term process. The physical reconstruction of material heritage and monuments is just one of the first steps in this process. An ill-conceived reconstruction can be as destructive as an act of destruction, and such reconstructions can have the capacity to divide communities and prolong conflict and violence after wartime hostilities have ended. This paper explores the politics of cultural heritage in colonial and pre-war Syria and examines how Ba'athism has used the narratives and remnants of the past in the present. We argue that the ongoing reconstruction works in the Old City of Aleppo, such as the rebuilding of the Great Umayyad Mosque and its famous minaret, are freighted with cultural meaning and are primarily intended to bolster the power and authority of the ruling regime. In effort to contextualise these reconstructions we investigate how Syrian heritage management has been influenced by political developments in the MENA region since the colonial period, and how the public histories and memories of contemporary Syria have been used by Syria's government to produce and promote counter-narratives in the aftermath of Syria's unfinished conflict.

4 DE-CONSTRUCTIVE CONVERSATIONS: THE MAKING OF USEFUL MONUMENTS

Abstract author(s): Sutton, Robert (Cotswold Archaeology)

Abstract format: Oral

We can all agree that an understanding of cultural significance lies at the heart of the sustainable management of heritage assets. However, arguments on what constitutes heritage significance and how much weight this should be given, in decisions affecting its future, are commonplace. In the UK, in recent months, the subject of 'contested heritage' (specifically regarding colonial histories) is rightly being given more time in these debates. This paper will not attempt to tackle this specific matter, but will look at something far simpler, more basic. What weight should be given to widely held beliefs regarding heritage significance that are just plainly incorrect? You'd think the answer was simple, it isn't. Case studies from the UK will be used to explore whether heritage significance can be viewed as 'cold facts' or whether there is a place for the 'inauthentic monument' and misguided public perception. Have we heard enough from the experts?

5 DEAD MONUMENTS OR LIVING PLACES

Abstract author(s): Redfern, Neil (Council for British Archaeology) - Emerick, Keith (Historic England)

Abstract format: Oral

What do you see when you look at or visit a monument? Do you ask how old it is? Do you ask about what it is? Are you concerned about how authentic it is? Do you care at all or are you just visiting for a nice day out?

In understanding how we make monuments useful, first we need to understand how monuments were created – how did we come to have these pristine sites, laid out the same and presented in the same way – what do we see when we see a monument?

Drawing from our own experiences of over 30 years managing and caring for Scheduled Monuments in England we will explore the myths behind monuments and how their creation and management in the 20th Century has shaped our perceptions of them – and heritage – today.

We will argue that this formal approach has created the dead monuments we see around us. Understanding this helps us evolve our approaches to the management of monuments and enables us to transform them from dead monuments into living places that serve a multitude of uses and meanings. Our paper will show how by telling different stories we can transform our approach to these sites and places.

6 THE HIGH STREET IS DEAD; LONG LIVE THE HIGH STREET: FINDING NEW USES FOR HISTORIC RETAIL SPACES

Abstract author(s): Hunter, Sacha (Cotswold Archaeology)

Abstract format: Oral

The outbreak of covid-19 and the temporary closures of non-essential shops, and nearly all cafes, pubs and restaurants, is by no means the sole reason for the 'death of the high street in the UK'. The increase in on-line shopping is clearly an instrumental factor in its slow demise; however, it seems that covid-19 has just hastened what many commentators had predicted as inevitable. But what does this mean for the tens of thousands of historic retail and hospitality buildings that line our high streets? Clearly, some will survive, but these are likely to be a minority. With housing being in short supply, residential conversions seem to be the most likely outcome. But when heritage significance is inextricably linked to its function, can repurposing a retail space for modern day residential use really conserve an appropriate level of historic fabric and the 'essence' of the place? And how do we manage the inevitable conflict between retaining historic shop frontages, an intrinsic feature of the character of historic retail streets, but also live practically within them?

This issue will play out across the UK and in our most treasured historic locations. The management plan for the World Heritage Site of Bath explicitly cites the 'shops, coffee and ale houses: as a demonstrable quality of the Outstanding Universal Value of the place'. Surely now is the time to develop a fresh toolkit to understand and safeguard these critical components of heritage significance. As a nation of shopkeepers, its time for us to step forward with constructive, innovative ideas to manage the change occurring to historic high streets whilst also sustaining their heritage values.

7 REVIVING THE HEART OF THE CITY. ARCHAEOLOGICAL AND CONSERVATION WORKS AT THE OLD COURT PALACE IN BUCHAREST

Abstract author(s): Theodor Aurelian, Ignat - Majuru, Adrian - Clesiu, Sorin - Pirvulescu, Dan - Opris, Vasile (Bucharest Municipality Museum) - Capatana, Mircea (Polarh Design)

Abstract format: Oral

The Old Court Palace in Bucharest sits right in the center of the Romanian capital. It is the most important monument of the city and it's now under reconstruction. Its story begins in the 15th century when Vlad the Impaler (aka Dracula) issues a document from his new stone built fortress called Bucharest. Over the centuries, the fortress was reshaped by fires, earthquakes, and by the will of the following rulers of Wallachia, up until the beginning of the 18th century when it was abandoned and sold. During the 19th century the place was completely transformed as the city grew over the ancient stone and brick walls. During the 1970, by the will of the communist party, massive demolitions followed by intensive archaeological research unearthed the memory of the lost city, and a new open air museum was born. It told the story agreed by the ruling party.

Today, the Old Court Palace has the opportunity of a new beginning. As the monument is undergoing restoration works, a full-scale archaeological project uncovered new well preserved structures and features, some dating back to the 6th century AD. Conservation procedures were put into place in order to preserve these feature for in situ exposure. The initial restoration project which implies the building of a modern in-door and open-air museum had to be adapted to integrate the latest archaeological findings.

All this time marked by the Covid-19 outbreak, and shortage on funding, we have raised awareness in the community by publishing our latest archaeological discoveries on social media and newspapers, TV and radio shows, but also scientific reunions. Periodical meeting with the stakeholders also helped the progress of the project.

The new museum will unfold a new, more accurate story in an interactive fashion suited for the 21st century.

8 THE ROMAN AMPHITHEATER OF BURNUM (CROATIA): DIGITAL SURVEY AND 3D MODELING FOR THE STUDY, KNOWLEDGE AND DISSEMINATION OF CULTURAL HERITAGE

Abstract author(s): Campedelli, Alessandro (University of Bologna) - Zaninovic, Josko (National Park Krka)

Abstract format: Oral

Virtual archeology has a strong impact on the general public and is progressively gaining ground in museums all over the world, because it is able to make the user relive situations as if they were real and to experience strong emotions through immersive visualization systems given by the increased reality. In the archaeological field, most of the time ancient buildings are reduced to ruins,

and therefore thanks to the creation of a virtual model it is possible to reconstruct the volumes of the buildings, the interiors and the passable spaces. Virtual reconstructions applied to architecture constitute the most complex field of application because we will intervene on the geometries, proportions and architectural decorations that were part of the structure in antiquity. The lost architecture of the Roman amphitheater of Burnum required those who carried out the digital reconstruction operation to understand all the elements, to recognize every possible clue and to create a logical connection between the remains of the existing building, the his drawings and traces from all possible clues. The 3D modeling tools made it possible to give strength to ideas and hypotheses and were included in a workflow aimed at rediscovering the choices of architects, builders and clients of the past, following a path backwards with respect to even the slightest traces of what remained. The virtual model of the Roman amphitheater of Burnum, in addition to the dissemination purpose, was used for the restoration and reconstruction project of the ancient building and today it is one of the main tourist destinations of the Krka National Park in Croatia.

9 DEVELOPMENT OF THE ARCHAEOLOGICAL LANDSCAPE „OLDENDORFER TOTENSTATT”

Abstract author(s): Menne, Julia (University Hamburg, Institute of Pre- and Protohistoric Archaeology)

Abstract format: Oral

The present project aims at an integrative and sustainable development of the archaeological landscape "Oldendorfer Totenstatt". With this ongoing project, we intend to return the output of a university research project back to the region in order to connect regional museums, volunteers, and the local community.

The Lüneburg Heath with its "Oldendorfer Totenstatt" contains burial sites in a very small area from almost all prehistoric periods - from the Stone Age to the pre-Roman Iron Age. The ensemble, which has been under protection since the 1850s, is largely undisturbed. It thus offers the rare opportunity to observe the development of a landscape from its beginnings over thousands of years. The site is a year-round destination of numerous regional and national tourists.

The aim is to enhance existing structures, strengthen a disadvantaged region and actively involve the public in order to preserve the heritage of this landscape for future generations. This involves a combination of research concepts and various administrative departments of State Archaeological Heritage Service.

Main questions are: a) How should a monument conservation concept be structured so that state funds, state archaeological monument preservation, EU funds, University funds and other private foundations interact in a useful way? a) How can cooperation with local decision-makers, public authorities and university research look like?

The initial focus is on the development of strategies for public relations and communication. After all, participation in cultural life can only be possible where places and communication are unrestricted and barrier-free. With this example, we would like to present an idea between scientific mission, nature conservation and sustainable tourism that can stimulate a discussion about community's commitment to heritage assets.

165 PEOPLE POWER? PAST, PRESENT AND FUTURE FOR PUBLIC PARTICIPATION IN ARCHAEOLOGICAL FIELDWORK

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Lewis, Carena (University of Lincoln) - van Londen, Heleen (University of Amsterdam) - Marciniak, Arkadiusz (University of Poznan) - Vařeka, Pavel (University of West Bohemia)

Format: Session with keynote presentation and discussion

This session invites presentations about public participation in archaeological excavation. 2021 marks ten years since the Faro Convention came into force on 1 June 2011, calling for civil society to be more closely involved with heritage. In some countries 'closer involvement' has increasingly included public participation in community excavations but other countries, participation in the archaeological investigative process by people other than archaeological professionals or students remains rare, or even forbidden.

This session aims to bring together archaeologists with experience of public participative investigations and those who are interested in their potential. The session includes a keynote presentation on the aims and outcomes to date of the 'Community Archaeology in Rural Environments' (CARE) project (<https://archaeologyeurope.blogs.lincoln.ac.uk/>) (2019-23) which by the end of 2020 had involved around 350 residents of ten rural communities in the Netherlands, Czech Republic, Poland and UK in new local archaeological excavations, with the aim of advancing knowledge of the past and exploring the benefits to communities and heritage.

Complementary papers for this session are invited on public 'citizen science' participation in archaeological fieldwork, especially (but not limited to) those which have involved excavation. These may include (but are not limited to) presentations on (a) challenges and solutions for setting up and carrying out participative archaeological investigations in different countries; (b) the value of their discoveries for advancing understanding of the past, including from places with little or no previously known archaeology; (c) the impact of participative community archaeology on participants and local communities, and its risks and rewards for archaeology and archaeologists; (d) the future for this sort of archaeological practice, whether viewed idealistically or pragmatically, optimistically or pessimistically, including considerations of the impact of the Faro Convention, or more 'hyper-localised' world which may develop in the wake of Covid-19.

ABSTRACTS:

1 FROM EVIDENCE TO ACTION: TOWARDS A STRATEGY FOR INCREASING PUBLIC PARTICIPATION IN LOCAL COMMUNITY ARCHAEOLOGICAL EXCAVATION

Abstract author(s): Lewis, Carena (University of Lincoln) - van Londen, Heleen (University of Amsterdam) - Marciniak, Arkadiusz (Mickiewicz University in Poznań) - Vařeka, Pavel (University of West Bohemia)

Abstract format: Oral

This paper reviews the 'Community Archaeology in Rural Environments Meeting Societal Challenges' (CARE-MSoC) project (<https://archaeologyeurope.blogs.lincoln.ac.uk/>) in order to stimulate discussion of how opportunities for public participation in community archaeological excavation can become more widely available. The CARE project is involving hundreds of members of the public in excavations within 12 local communities in four countries and evaluating the outcomes for archaeology, people and places. Intended project outcomes include recommendations and toolkits to help European policy-makers and heritage practitioners support and facilitate public participation in local archaeological excavations. CARE's aims reflect the aspirations of the 2005 Faro Convention and, more recently, the 2020 EU 'Strategic research and innovation agenda for cultural heritage and global change' which asserts that "public and community engagement as well as participatory approaches should be at the core of [research and innovation] activities and thought should be given to... the role of communities in identifying, understanding and caring for heritage".

CARE-MSoC focusses on rural communities with few or no known archaeological remains in order to ensure beneficial access to heritage can be democratised by refocussing attention away from 'authorised' sites towards locally centred community archaeologies. The Covid-19 pandemic has made this hyperlocal focus even more relevant as people have been spending so much more time than usual within their home communities. CARE has generated a range of rigorously evaluated data from more than 350 participants in the Czech Republic, Netherlands, Poland and UK, showing that locally based community archaeological excavations can advance archaeological knowledge while also democratising participation and benefitting people, places and heritage. This paper will conclude by inviting session attendees to discuss what needs to be done to strategically encourage policy-makers across Europe to make opportunities for public participation in local community-based archaeological investigations more widely available.

2 PARTICIPATIVE ARCHAEOLOGY IN POLAND - CHALLENGES AND ATTITUDES OF ARCHAEOLOGICAL RESEARCH

Abstract author(s): Kobialka, Dawid (Institute of Archaeology and Ethnology of the Polish Academy of Sciences) - Kajda, Kornelia (Independent researcher)

Abstract format: Oral

Public archaeology in Poland has been practiced for many years. However, not many of these projects are participatory. Most of them, focuses on social outreach of archaeological excavations after conducted investigations. Organizing festivals, meetings, conferences for the public or lectures and workshops are the main popular ways in which public archaeology is brought to live in Poland.

As part of the international project "Community Archaeology in Rural Environments", we aimed at conducting archaeological project with direct and close cooperation with local communities. Our goal was to investigate rural areas together with its inhabitants to build or strengthen a relation between them and the past of the places they live in. It was the first project of this kind in Poland. But when we started our work, we did not expect to face so many challenges from the side of state institutions and the communities themselves. In our presentation we want to discuss the main obstacles that have made it difficult for us to work in participatory archeology in Poland. We also want to focus on the attitudes of local communities towards archaeological research in the areas they live in.

3 COMMUNITY ARCHAEOLOGY AND CZECH TRAMPING

Abstract author(s): Vařeka, Pavel (University of West Bohemia) - Gabriel, Frantisek (Department of Archaeology, University of West Bohemia)

Abstract format: Oral

Tramping movement based on shared interests in nature, freedom and friendship was established in Czechoslovakia in the early 20th century. During the communist regime which suppressed any ideologically uncontrolled spontaneous activities weekend camping trips allowed tramps to escape from the grey everyday reality of the totalitarian state to the woods. In many cases tramp camps were situated in places of ruined historical monuments and tramp groups started voluntarily care about these sites and endeavoured to restore architectural remains. This paper examines activities of a tramp community which camped in Helfenburg castle (14th - 16th century) in northern Bohemia and was involved in archaeological excavations lead by a local professional archaeologist. Since 1981 hundreds of tramps participated in a systematic research of the castle complex during weekends and summer holidays, learned archaeological field techniques, explored medieval material culture items and discussed interpretation possibilities of their findings. The community members were also extensively involved in restoration and their work resulted in preservation of the historical monument. These activities continued also after Velvet revolution in 1989 which opened possibilities for legalization of civic activities. Newly established Helfenburg society soon welcomed foreign young enthusiasts from many European countries and

overseas so that the community archaeology gained an international character. The paper explores types of activities carried out by community members, impact on their perception of historical heritage and memory, social impact and it also analyses structure of the tramp community.

4 THE EFFECTS OF A PARTICATORY PROJECT: THE CARE PROJECTS' SPIN-OFF IN THE NETHERLANDS

Abstract author(s): Van Londen, Helee - Verspay, Johan (University of Amsterdam)

Abstract format: Oral

After a promising start in 2019 the joint test pitting programme Community Archaeology in Rural Environments (CARE), which for the Netherlands focussed on the origins and development of historical villages in the Groene Woud region, was severely hampered due to covid-19. Nevertheless, even at this stage our efforts already sparked several spin-offs across a range of stakeholders, exceeding expectations:

Within a year, a local history club sought support to realise a reevaluation of a deselected archaeological site and eventually its excavation. Some members of the general public came to us with their own archaeological finds for identification and to have the stories associated with the finds validated. Others were keen to have their own questions researched about places in the vicinity or to participate with their specific interests and skills beyond the current scope of research. A school saw the educational potential of conducting research and presenting the results, a provincial heritage body wants to stimulate public engagement with archaeology and the Dutch National Heritage Agency commissioned the University of Amsterdam two assignments explore and facilitate citizen archaeological initiatives.

Regional presence, visibility and accessibility seem key to this spur and suddenly we face the challenge to channel this momentum. Apart from introducing people to the archaeological horizon of their environment and facilitating initiatives, the archaeologist (still) has to moderate these substantially to be successful. To further increase the level of participation, community archaeology initiatives would benefit from a more structural engagement and a learning environment for people to develop their archaeological skills and expertise. In our contribution we'll discuss how this could work in the Dutch setting.

5 ARCHEOHOTSPOTS: HOW TO CREATE CASUAL HERITAGE ENGAGEMENTS THROUGH ARCHAEOLOGY

Abstract author(s): Knoop, Riemer (Gordion Cultural Advice) - van Oorsouw, Marie-France (Weleer Heritage Communication and Advice)

Abstract format: Oral

Since 2015, a number of 22 ArcheoHotspots have come into being across the Netherlands, and two more abroad. These offer a freely accessible, no threshold (no ticket required) space in or near archaeological museums, storerooms or excavations (pop-up), where members of the public, mostly passers-by, are free to join in working with materials from museum or excavation deposits. Basic is the invitation to engage in interaction, through co-operating with elaborating finds or entering into casual conversations, with hosts ("volunteers") that are already active in a workshop / laboratory setting. The interaction is based on trust and mutual interest in each others' stories. Thus, visitors not only make hands-on acquaintance with material culture of their own living environment, but are also affirmed in their bringing complementary narratives and expertise on a par with traditional ways of knowing and speaking.

The presentation will explore the sources of the initial ideas, the trajectory of its successive development, and its present status and outlook, as well as learning points for professional archaeologists.

6 COMMUNITY ARCHAEOLOGY AS AN AIM FOR REACHING OUTSIDE THE MUSEUM WALLS

Abstract author(s): Paulsen, Charlotte (Museum Skanderborg)

Abstract format: Oral

Touch history and it touches you! During the past three years (2017-2019 as Covid-19 called 2020 out), Museum Skanderborg has invited the public to grab a trowel and participate in a community excavation. The first year, field archaeologists of the museum were nervous to hand over the gear to nonprofessionals, but they found out that with proper guidance from the professionals, there was no damage to history.

Public archaeology is new in Denmark. Museum Skanderborg is one of few museums arranging community excavations. The excavations take place for a week during the schools autumn break for people to have time off to participate. Everyone from the age of nine can participate, as you have to be old enough to understand information and work independently without constant supervision. It is not a school project for kids. When kids participate, they are with parents or grandparents that take responsibility.

The impact of the public excavations has been huge. Both the participants and the by-passers of the site have expressed amazement of the feeling of closeness to archaeological artefacts. How they were touched by history. Surveys among the participants has revealed that people find history more exciting, when they can touch things and investigate by themselves. Attending has given them an idea of where they come from. Archaeology can serve to create social memories and provide a context for the formation of relationships.

Museum Skanderborg sees the public excavation as a tool to reach out to the public and past the walls of the museum building. To take down hidden boundaries that dictates whom culture should be relevant to. One of ways of doing that is cooperation. People

meet people and interact with the past together. As an outside activity, the museum will continue to arrange public excavations in a post Covid-19 world.

7 MOLEHILLS - A NON-DESTRUCTIVE ARCHAEOLOGICAL PROSPECTION METHOD AS CITIZEN SCIENCE PROJECT

Abstract author(s): de Raad, Jesper (Laagland Archeologie; Leiden University)

Abstract format: Oral

In the Netherlands many non-destructive methods that have been prove effective before the Valletta Treaty are no longer used. These, effective non-destructive prospection method can be executed by visual inspection above ground. However, the methods are not used in Dutch commercial archaeology due to the (seasonal) presence of the to be inspected phenomena on the specific to be investigated area. Yet, the visual inspection of molehills and ditch sides are (under the VS03) still valid prospection methods under the Dutch archaeological regulation. The archaeological prospection of these phenomena are proven to still be effective.

The inspection of for instance molehills can be executed by (archaeological) volunteers under a citizen science project. Volunteers have been proven effective in the use of collecting archaeological data in the Netherlands and the non-destructive methods are particularly useful on specific protected areas, such as selected archaeological sites, archaeological monuments or castle areas. In these areas it is prohibited to execute destructive archaeological methods. The suggested non-destructive archaeological methods provide additional data on these selected archaeological site.

8 CONNECTING COMMUNITIES: 15 YEARS OF PUBLIC ARCHAEOLOGY IN KENT

Abstract author(s): Mayfield, Andrew (Kent County Council)

Abstract format: Oral

This paper will reflect on the successes and challenges of running a series of community archaeology projects in Kent. What started as a project specific role to deliver community archaeology activities for a country park has developed into a fifteen-year programme. The country park became a hub for heritage activities in the wider landscape. Though training and collaboration we now have a team of volunteers who support and instigate projects undertaken by Kent County Council's community archaeology team. These projects have included landscape partnerships, University research excavations and heritage site restoration schemes. At our home at Shorne Woods Country Park, this previously poorly understood landscape has been thoroughly researched and investigated. Activities have ranged from LiDAR groundtruthing and tree surveys, to test pitting and full-scale excavations. From 2016 to 2019 we ran the Cobham Landscape Detectives project and engaged with the wider local population. The projects were all great fun, but with the reduction of larger-scale group activities during the Covid pandemic we have had a chance to reflect on the work to date. What have we learnt and how can we move forward, post-Covid? What new ways of working are here to stay and what practices are we looking forward to reviving?

9 PARTICIPATIVE ARCHAEOLOGY, POWER DYNAMICS AND CO-PRODUCTION: A COMPARATIVE APPROACH TO DIGGING HILLFORTS IN THE UK AND GERMANY

Abstract author(s): Davis, Oliver (Cardiff University)

Abstract format: Oral

In the UK over the last two decades, 'community' archaeology has become commonplace. Indeed, it is now rare to find excavations that have no public involvement. The reasons for this are complex, but stem from a tradition of public participation in archaeological discovery which can be traced to the foundation of learned societies in the 18th and 19th centuries. In other parts of Europe, such as Germany, community archaeology is much less common and there is little room for the non-professional to engage in the practice of archaeology. Raimund Karl (2020) has recently argued that this is not due to a lack of interest with members of the public, but that the structure of archaeological discourse in the country is skewed towards the privileged expert, relegating citizens to passive consumers of knowledge. Central to these contrasting approaches in both countries are ethical considerations around power relationships and control, not only between the discipline of archaeology and contemporary socio-political agendas, but also between the archaeological professional and non-professional members of the public.

In this paper I will explore these issues by drawing from my own experiences working in the UK and Germany where I am currently co-directing projects exploring hillforts. The approaches taken contrast markedly. In the UK, I have helped develop 'CAER Heritage' which is exploring the hillfort of Caerau, Cardiff, but with a guiding principle of co-production with community members. In Germany, I have been co-directing research excavations at the hillforts of the Grotenburg and Piepenkopf, Westphalia, with colleagues from Cardiff University and the Lippisches Landesmuseum Detmold, but with no public involvement. Both approaches have their merits and drawbacks, but I will argue that the participative approach has the potential to produce more democratic power relationships between experts and citizens, and also enrich our understanding of the past.

DIRTY HERITAGE: TOWARDS AN ARCHAEOLOGY OF CONSUMPTION, WASTE AND ENVIRONMENTAL CHANGE

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Papoli Yazdi, Leila (University of Gothenburg) - Dezhankhooy, Maryam (Käte Hamburger College, University of Heidelberg)

Format: Regular session

We live in a world where the amount of consumption, more than any other traditional wealth-counting system, indicates socioeconomic status. The huge mountains of garbage outside of cities and the unwanted items stored in houses are changing the face of the globe. The rapid rate of manufacturing and consumption produces a massive amount of waste, transforming the environment.

Archaeologically speaking, consumption has added tons of wasted material to all other modern objects studied by archaeologists. Archaeology has objectified the danger of a high-speed rate of consumption by applying some advanced novel methods of archaeology developed within the last century, such as those described in Garbology by William Rathje and his team. Patterns of waste and consumption have changed rapidly since that time, while in the last century the negative consequences of modern lifestyles have become more clear. Now, manufacturing and consumption determine the political hierarchies of countries. All these processes happen while large swathes of some countries have changed into extended landfills of technological and plastic garbage.

Through our papers and discussions in this session, we aim to update our knowledge about modern consumption and garbage-making by discussing a series of questions: How do novel archaeology methods help us explore garbage-making patterns? How can garbage be used to change environmentally damaging consumption behaviors? How have consumption and garbage-making changed the criteria of social class and shaped our lifestyle and households?

Archaeologists from all over the world who have experience in working on the post-industrial revolution and modern consumption, garbage, waste, manufacturing, and environmental changes are strongly encouraged to share their insights, field work, and methodological experiences or ideas in this session.

ABSTRACTS:

1 WASTE AND THE (RE)GENERATION OF URBAN LANDSCAPES

Abstract author(s): Gardner, Jonathan (School of Art, Edinburgh College of Art, University of Edinburgh)

Abstract format: Oral

In this paper I discuss the lives and afterlives of recent and contemporary waste materials that emerged as by-products of city building, industrial processes and post-industrial demolition. Exploring the complicated trajectories of such materials and how their valuation changes throughout their creation, use, reuse and (apparent) discard, I want to think about the generative and creative qualities of waste: what has it 'allowed' or facilitated in cities in terms of social and political opportunities, in both the past and present? The transformation of such waste is often dramatic: bombed out ruins create the foundations of football pitches, the liquefied ash of coal power stations is repurposed for nature reserves and the bricks of demolished factories are pushed into the sea to 'reclaim' land. Using examples from London and Edinburgh, I will discuss my approach using historical GIS, archival research and archaeological fieldwork in a new research project ('Reimagining British waste landscapes'). Though acknowledging the often devastating social and environmental costs of creation and disposal of waste materials, I nonetheless attempt to re-excavate ideas of waste's apparent 'wastedness' and explore how it acts as a raw material for reshaping cities' and the lives of their inhabitants.

2 TELL ME WHAT YOU THROW AND I WILL TELL YOU WHAT TO DO: APPLIED CONTEMPORARY ARCHAEOLOGY TO INFORM POLICY-MAKERS

Abstract author(s): Praet, Estelle (University of York; Université Libre de Bruxelles) - Schofield, John (University of York)

Abstract format: Oral

Plastics have become the prevalent material characterising our era, sometimes also referred to as the plasticene. They are forming a stratigraphical layer representative of the garbage produced by people since bakelite's invention in 1907. This waste, so representative of the post-industrial world, contains valuable information regarding consumption habits and holds key information for investigating behavioural changes. Through three ongoing case studies, we will demonstrate the extent to which contemporary archaeology contributes to a better understanding of plastic waste.

First, plastic, and more broadly garbage, is archaeological evidence as proposed originally by Rathje. With this material culture perspective, we are studying and characterising the objects comprising the plastic-scape of Galapagos to determine patterns in weathering and deposition of plastic objects. These insights, along with citizen science data, will contribute to the establishment of strategies and policies for a Plastic Pollution Free Galapagos.

Second, humans relate to objects through emotions, and archaeologists are often unable to understand such relationships. Contemporary archaeology has the unique opportunity to investigate these relationships in real-time. By analysing stories on plastic artefacts produced by children on the East Pacific Coast through qualitative analysis (NVivo), we can determine the most commonly perceived problems arising from pollution and offer tailored alternatives for plastic use accordingly.

Third, the current pandemic is definitely marking a momentum in our archaeological horizons. We argue that statistical insights of material culture from social media can contribute to gain a better understanding of disposed face-masks and gloves and inform policy-making to limit this waste that has already entered our archaeological record. This digital archive of the pandemic holds the potential for an in-depth understanding of patterns in face mask use, disposal and perceptions.

These current projects illustrate how contemporary archaeology can provide new perspectives on policy-making.

3 WASTE, LANDFILLS, AND BURIED CULTURE: A VIEW FROM THE MIKVE ISRAEL RUBBISH PROJECT

Abstract author(s): Nativ, Assaf (University of Haifa)

Abstract format: Oral

Waste scholarship and garbology seem steeply invested in negative valuations of their research objects, often embroiling them in a highly politicised discourse. This is probably inevitable, given that their conceptual foundations consist of terms like 'waste,' 'pollution,' and 'discard' and are often associated with notions of 'danger,' 'damage,' 'inequality,' and other negatively-charged terms. Undoubtedly, this has the significant advantage of stressing garbology's relevance and timeliness; it also underscores the field's positive, constructive, and corrective agenda. However, does this not imply a strongly one-sided line of thinking? Are we not wilfully and knowingly pursuing an incomplete research programme? Drawing on the Mikve Israel Rubbish Project (MIRP) that excavated an early 20th-century landfill near Tel Aviv (Israel), I would like to indicate two areas that remain overshadowed and may complement this otherwise negative tenor of waste scholarship. The first is that, notwithstanding their adverse implications, waste production and disposal are also fundamentally creative processes that bring into existence new and distinct beings—landfills. The second area is our inability to think and discuss buried cultural formations: we know to say where they come from, but we are poorly equipped to say what has become of them.

4 RUBBISH EVERYWHERE? A RUBBISH PIT AS A CASE STUDY RELATED TO THE RUIN TRAUTSON AT MATREI AM BRENNER (TIROL/AUSTRIA)

Abstract author(s): Waldhart, Elisabeth (Universität Innsbruck, Institut für Archäologien)

Abstract format: Oral

Garbage is not only found where it belongs, in places like dustbins and landfills. Bits and pieces of modern rubbish can also be encountered "out of place", as it is at nearly every dig site, ranging from single pieces of throw-away plastic items and crown caps to dumped junk. Mostly the objects found are collected and then binned. Only rarely do they make it further and become "findings", even though they might hold information on more recent use of places.

The case study presented here is related to castle Trautson, which was destroyed by aerial bombing in 1945. Due to pending construction work, archaeological excavations took place in 2020. Besides structures and small finds from the medieval age to the time of destruction, a small pit of modern rubbish was found. As it contained many broken drinking glasses and bottles as well as burned things, an interpretation as remains of a barbecue was considered. As packaging and items necessary for consumption, the material seemed to be thrown away incidentally. On the other hand, these objects tell a story of the area that maybe would not have gotten into the scientific record otherwise. After the house had to be left in the 1980s, the premises lay partly fallow. The rubbish could point to an informal and non-commercial gathering place.

This paper reflects on how "trash" becomes an archaeological "find" and how its materiality impacts this process. This includes both the materials - from glass to plastic - and Bruno Latour's conception of objects as gatherings. With its persistence the litter has the agency to get into view the unofficial use of the place. Modern waste at archaeological excavated sites helps to understand ephemeral everyday practices that continually produce sites in the present.

5 SOCIAL DEBITAGE; AN ARCHAEOLOGICAL AND SOCIAL EXPLORATION OF THE PATTERNS OF IMPROPER CIGARETTE BUTT DISPOSAL ON A UNIVERSITY CAMPUS

Abstract author(s): Tottman, Walker (University of Victoria)

Abstract format: Oral

Around the globe, trillions of cigarettes are improperly discarded into the environment every year. As the world's most frequently littered item, and made with non-biodegradable materials and toxic chemicals, cigarette butt litter poses serious environmental concerns. Existing studies suggest both smokers and non-smokers espouse negative attitudes towards cigarette butts, and cigarette smokers are increasingly stigmatized. My research studies cigarette littering on the University of Victoria's recently designated no-smoking campus, and asks: Are there spatial distribution patterns in cigarette butt littering related to features of the built environment? Furthermore, does the seemingly innocuous activity of cigarette smoking provide deeper insight into social norms and attitudes around garbage and the environment? I collected over 7500 littered cigarette butts from the university campus, recording data on their location and condition. My findings indicate this littering occurs in non-designated smoking areas, predominantly in places that are conveniently located, provide shelter from the elements, have seating, and are well-obscured from outside view. Additionally, I suggest the taphonomic erosion of cigarette butts into the environment is conducive to enable further littering. Drawing from archaeological and social-cultural studies on waste and value, I argue social norms make the creation of trash illicit and stig-

matized, and counterintuitively reinforce the improper smoking behaviours that create litter and pollution. Fostering open dialogues about the issue of cigarette butt littering, rather than marginalizing smokers, is a needed shift in mindset.

6 WASTE AT THE 'DAWN OF EUROPEAN CIVILISATION'

Abstract author(s): Vindrola Padros, Bruno (Institute of Archaeology, University College London)

Abstract format: Oral

In the modern drive towards technological development, one of the most materially evident yet socially obscured aspects of our consumer society has been the increasing accumulation of broken objects considered as 'waste' or 'rubbish'. During the Neolithic period, south-eastern and central Europe were also to witness an unprecedented explosion of material remains, a 'thing-heavy world' (Robb, 2013:665). These material remains, mostly pottery fragments, would affect the social lives of local inhabitants. However, because of our modern tendency to write (pre)history in stages of technological development, since the time of Gordon Childe the 'Neolithic Revolution' is conventionally characterized as the moment where humans became masters over nature, which is portrayed as the 'dawn of European civilization'. Through this construct, what is emphasized about the period is the introduction of sedentism, agricultural production, and economic innovations. In contrast, the following paper debunks this concept of Neolithic mastery by looking at the unintended consequences of material accumulation and aims to show in what ways the European Neolithic was different to modern urban settings. In other words, the question "to what degree did waste create the European Neolithic?" leads us to understand a different epistemic relationship between humans and broken objects. Drawing examples from south-eastern and central Europe (i.e. Körös-Criş and Linearbandkeramik sites), it is shown that numerous social mechanisms were in place to cope with the effect of the accumulation of potsherds, which contrasts with how waste is dealt with in modern times.

169 PERIODICITY AND CYCLICITY IN PREHISTORIC PRACTICE AS SEEN IN WATERLOGGED CONTEXTS

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Ballmer, Ariane (University of Bern, Institute of Archaeological Sciences & Oeschger Centre for Climate Change Research) - Bogaard, Amy (University of Oxford, School of Archaeology) - Hafner, Albert (University of Bern, Institute of Archaeological Sciences & Oeschger Centre for Climate Change Research)

Format: Regular session

Due to preservation conditions, waterlogged sites allow an exceptional high-resolution perspective into temporal processes. The records show patterns of human practice with a regular, repetitive character, which may be seasonal, or may include longer term cycles. Specifically the relevant practices concern for instance dwelling relocation, agricultural, herding and foraging activities. While climatic circumstances may be a major driving factor for periodic and cyclical shifts, social factors are also likely to play a role.

The aim of the session is to discuss periodic and cyclical practices that are evident in the archaeological findings as a phenomenon in itself, and to provide an overview of the diversity of the practices and different rhythms. On the other hand, methodical approaches for recognising these temporalities using on- and off-site data should be in the foreground. A broader aim is to assess the significance of periodically and cyclically organized practices within prehistoric reality.

Case studies from international prehistoric wetland archeology, in particular featuring interdisciplinary interfaces with botany, zoology, geology, climatology, ecology, geography and ethnography, are welcome.

ABSTRACTS:

1 PERIODICITY AND CYCLICITY IN PREHISTORIC PRACTICE AS SEEN IN WATERLOGGED CONTEXTS. A TOPIC OUTLINE

Abstract author(s): Ballmer, Ariane (University of Bern, Institute of Archaeological Sciences & Oeschger Centre for Climate Change Research)

Abstract format: Oral

Wetland dwellings offer an outstanding quality of archaeological records of periodicity and cyclicity, in many cases in a high chronological resolution. In the sense of an overview and appreciation of the topic's significance for archaeological research, this paper will first give an overview of the different dimensions of periodicity and cyclicity, and how these are manifesting in the archaeological record of prehistoric wetland settlements. Here, the extraordinary preservation conditions allow exceptionally detailed insights, often in high temporal resolution. The focus is both on seasonal cycles, but also on longer-term periods of several years.

A theoretical-conceptual framework will consequently contribute to an understanding of the awareness of periodicity and cyclicity by the communities and individuals concerned, as well as its significance to them. Not only practical and functional perspectives related to subsistence economy, but also the factor of human biography and life cycles will be discussed, ultimately leading to a multi-layered understanding of time and temporality in prehistory. This original perception and management of time is virtually based on repetition, recurrence, transience and new beginnings.

2 SCALES OF PERIODICITY AND CYCLICITY IN PREHISTORIC LAKESIDE SETTLEMENTS

Abstract author(s): Hafner, Albert (University of Bern, Institute of Archaeological Sciences; University of Bern, Oeschger Centre for Climate Change Research - OCCR) - Heitz, Caroline (University of Oxford, School of Archaeology; University of Bern, Institute of Archaeological Sciences)

Abstract format: Oral

Two things were crucial for the understanding of prehistoric lakeshore settlements in the Alpine region: first, a robust chronology based on absolute data, achieved by the routine use of dendrochronology, and second, the excavation of complete settlements, or at least large parts of them. Both conditions were more and more fulfilled after 1980. The number of dendrochronological data increased dramatically and today we know about two dozen of well investigated settlement sites, which allow conclusions about their construction history and architectural structure. On the one hand, this knowledge allows us to record the major cycles of occupation of the lakeshores, and on the other hand it provides insights into the life cycles of settlements and periodic movements of the respective settlement communities. At both levels, regularly recurring patterns can be identified that indicate environmental influences and social dwelling practices of the individuals involved. Climatically induced changes in lake levels and resulting adaptations of settlements can be interpreted as vulnerability and resilience strategies of prehistoric settlement communities.

3 OAKS FOR THE NEXT GENERATION! HOW THE NEOLITHIC PEOPLE AT LAKE BIEL (CH) SUSTAINABLY MANAGED THEIR FOREST

Abstract author(s): Bolliger, Matthias (Archaeological Service Canton of Bern, Laboratory for Dendrochronology; University of Bern, Institute of Archaeological Sciences & Oeschger Centre for Climate Change Research)

Abstract format: Oral

The shorelines of Lake Biel (Canton of Bern, Switzerland) were popular settlement sites in the Neolithic and the Bronze Age. The favorable conditions for preservation of organic material on these waterlogged sites allowed dendrochronological investigations of the construction woods. It proved that some of these places have been repeatedly inhabited over centuries and even millennia. The duration of the settlement phases varied between a few years and several decades. Oak has been the preferred wood for buildings due to its natural resistance against decay. It was available during all periods of lakeshore settlements at Lake Biel.

The exact felling years of thousands of piles enable the reconstruction of settlement dynamics on a yearly basis. By means of a dendrotypological approach that considers the specific growth patterns of all samples, an insight into the timber supply of some settlements will be presented. It will show how the repeated human presence required or resulted in a specific management of the forests.

4 SEASONALITY, SCHEDULING AND WETLAND AGROECOLOGY AT NEOLITHIC TIANLUOSHAN, LOWER YANGTZE RIVER BASIN, CHINA

Abstract author(s): Wu, Rubi - Bogaard, Amy - Charles, Michael (University of Oxford) - Sun, Guoping (Zhejiang Provincial Institute of Cultural Relics and Archaeology)

Abstract format: Oral

The Neolithic site of Tianluoshan (Hemudu culture) is located in the Lower Yangtze River basin, China. Owing to waterlogged preservation, numerous organic archaeological remains have been excavated to provide a high-resolution view of human-environment interaction. Previous studies indicate that people here made use of a wide range of wetland plants (such as water chestnut, foxnut and rice) and animals (such as snakehead, crucian carp and common carp). The role of rice cultivation at Tianluoshan is a key question that has been debated for many years. However, recent research focuses on plants other than rice and reveals the diversity and flexibility of wetland plant utilization. Morphological analysis by the present authors shows that some of the water chestnut fruits were collected unripe while some were collected close to a biologically ripe stage. It is reasonable to infer that the harvest season of water chestnuts last for several months. Considering the huge amount of water chestnut shell remains and the storage pits discovered, people possibly use this species not only as an autumn food resource but also a winter and spring one. This revised seasonality enables us to rethink whether or not there really was a scheduling conflict in the autumn between water chestnut and rice.

5 PATTERNS OF SUBSISTENCE: AN EXAMPLE FROM LATE NEOLITHIC NORTH MACEDONIA

Abstract author(s): Holquin, Amy - Bogaard, Amy - Charles, Mike (University of Oxford)

Abstract format: Oral

Waterlogged archaeobotanical remains from the site of Ploča at Lake Ohrid in North Macedonia offer a rich record of human subsistence from the middle of the 5th millennium BCE. This site is currently under research as part of the ERC synergy EXPLO project, a collaboration of the universities of Bern, Thessaloniki and Oxford, designed to explore the chronology and ecology of early agricultural settlement on lakeshores in south-east Europe. At the site of Ploča, radiocarbon dates on cereal chaff suggest that the abundant plant material, preserved in a cultural layer in places up to 1.7 metres thick, represent a narrow time frame of at most 150 years. The remains of cultivated crops and foraged fruits and nuts thus offer an exciting opportunity to investigate patterns of human subsistence at high-resolution. Such a detailed record allows us to explore how different cultivated and wild plant foods were exploited continuously or episodically through the occupation. Located in a transitional zone between Mediterranean and continental Europe, this site also offers insights into how geographic and cultural factors shaped subsistence practices.

6 MULTISCALAR PERIODICITY IN PREHISTORIC WETLAND SETTLEMENTS: A VIEW FROM SOUTHERN ALBANIA

Abstract author(s): Allen, Susan (University of Cincinnati)

Abstract format: Oral

Archaeological, palaeoenvironmental, and palaeoethnobotanical research in the vicinity of the former Maliq wetland in southern Albania reveals a long history of wetland settlement and dynamic shifts in lake configuration from ca. 6,500 BC to the present. In this paper, I examine archaeobotanical data for the Early Neolithic site of Vashtëmi and the Neolithic to Early Iron Age lakeside settlement of Sovjan together with regional data concerning vegetation and geomorphic changes in order to consider recurring patterns of ecological variation and cultural behaviors at varied temporal and spatial scales, with a particular focus on subsistence and land-use practices. The site of Vashtëmi, excavated as part of the Southern Albania Neolithic Archaeological Project (SANAP), provides an example of an ephemeral village, while the lakeside settlement of Sovjan, excavated by the Mission Archéologique Franco-Albanais du Bassin du Korça, exemplifies a more stable, long-lived settlement. At both sites, well-preserved plant remains attest to iterative processes of mutual adaptation between the wetland and people living on its margins.

7 DENDROARCHAEOLOGY OF SOVJAN - THE FIRST EARLY BRONZE AGE DENDROCHRONOLOGICAL ANALYSIS FROM THE SOUTHWESTERN BALKANS (ALBANIA)

Abstract author(s): Maczkowski, Andrej - Bolliger, Matthias - Ballmer, Ariane (Institute of Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research OCCR) - Gori, Maja (Institute of Heritage Science, National Research Council of Italy - ISPC-CNR, Rome) - Lera, Petrika (University of Fan Noli, Korçë) - Oberweiler, Cécile (UMR 7041 ArScAn, CNRS, Université Paris I Panthéon Sorbonne, Université Paris Nanterre, Paris) - Szidat, Sönke (Department of Chemistry and Biochemistry, University of Bern; Oeschger Centre for Climate Change Research OCCR) - Touchais, Gilles (UMR 7041 ArScAn, CNRS, Université Paris I Panthéon Sorbonne, Université Paris Nanterre, Paris) - Hafner, Albert (Institute of Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research OCCR)

Abstract format: Oral

The archaeological site of Sovjan is situated on the north-western edge of the Korçë Basin, south-eastern Albania. The stratigraphy of Sovjan spans from the Neolithic till the Bronze Age. The thoroughly investigated stratigraphic sequence of the site makes it one of the most important prehistoric reference-sites in Albania and the surrounding region. During prehistory Sovjan was situated at various distances from the shores of the former Lake Maliq, which once filled the Korçë Basin, but was definitely drained after the 1940s. The waterlogged conditions on the site allowed for a high degree of preservation of wooden remains. From the two uncovered dwellings from layer 8, the Maison du Canal (House on the Canal) represents probably the best-preserved wooden structure from the Bronze Age Balkans. The predominant use of deciduous oak wood (*Quercus* spp.) is confirmed in this phase.

Through a combination of dendrochronological analysis and 14C-dates (wiggly matching), we were able to define a high-precision chronological placement of the layer with an end-date range falling between 2158 and 2142 cal BC (2 σ), the second half of the Early Bronze Age. It was confirmed that the two dwellings and the trackway were built in the same construction event, made of both worked and unworked wood. The utilized construction timber falls into various age-classes, suggesting variable exploitation of the woodland resources.

Additionally, through Bayesian modelling of the previously published 14C dates from the transitional layer 7, its chronological placement is narrowed-down to the 22nd – 20th century BC.

These new results suggest the contemporaneity of the processes in the Balkan 'hinterland' with those occurring in the wider Aegean region.

A. VIRTUAL VS. REALITY - CYCLICITY IN SIMULATED AND ARCHAEOLOGICAL DATA OF WESTERN SWISS NEOLITHIC

Abstract author(s): Laabs, Julian (Institute of Pre- and Protohistoric Archaeology, Christian-Albrechts-Universität zu Kiel; Department of Geography, Physical Geography, Christian-Albrechts-Universität zu Kiel)

Abstract format: Poster

Within the western Swiss Neolithic, lake shore settlements constitute a major archaeological site category, which is above all characterized by periodical and cyclic dynamics in space and time. These settlements offer high resolution chronological and well-preserved bioarchaeological remains, thereby constituting a promising ground for the application of simulation modelling approaches. Those can contribute to an understanding and evaluation of diverse socioecological and subsistence scenarios assumed to represent past human-environmental interactions which ultimately led to the documented archaeological record.

Already existing and extended models about the spatio-temporal behaviour and subsistence strategies of the neolithic lake shore communities, are inferred from the archaeological record and the long-lasting corpus of research. Hypotheses from those models concerning diverse processes, such as the choice of settlement locations, the land use strategies and other, are compiled and formalised to be simulated with the simulation model LUTES (Land Use and Technological Evolution Simulator). The socioecological system which is simulated, creates a data set which shows structurally similar patterns concerning settlement duration and land-use impact known from archaeological and palaeoenvironmental archives.

Within the poster contribution presented, the archaeological data and the simulated data will be compared to broaden insights into the past human-environmental relationships culminating in cyclic patterns.

171 THE EMERGENCE OF SOCIAL INEQUALITY IN EUROPE AND SOUTHWEST ASIA: FROM THE LATER UPPER PALAEOOLITHIC TO THE EARLY BRONZE AGE

Theme: 6. Material culture studies and societies

Organisers: Iversen, Rune - Haddow, Scott - Richter, Tobias (University of Copenhagen) - Kroonen, Guus (Leiden University)

Format: Regular session

The emergence of social inequality in the human past is the subject of long-running debates amongst archaeologists and anthropologists. Social evolutionary narratives that posit a unilineal increase in social inequality and complexity from the end of the Palaeolithic to the emergence of early state societies are being increasingly challenged, yet they are difficult to dispel. They are based in large part on the historical context in which archaeology and anthropology emerged as disciplines in the modern West. This legacy has come under sustained critique, leading scholars to question not just the social evolutionary underpinnings, but our definitions of social inequality as well. Recent research has not only problematized the idea that hunter-gatherers were consistently egalitarian during the Palaeolithic, but also whether social inequality was present in Neolithic and subsequent societies and how it manifested itself.

Given these critiques, archaeologists and anthropologists must rethink how social inequality should be identified and approached by considering the specific circumstances and conditions under which fluid and flexible forms of hierarchy may emerge and how they may have become more permanent and lasting. The transition to agriculture in Southwest Asia and its arrival in Europe is still seen as a key moment that may have engendered the establishment of more permanent and strict social hierarchies. There is now increasing evidence, however, that various forms of social difference may have existed well before the emergence of fully sedentary agropastoralist societies.

This session invites papers focusing on a wide spectrum of material correlates associated with social inequality in the archaeological record between the Late Upper Paleolithic and Early Bronze Age such as funerary practices, resource abundance, demography, settlement patterns etc.

ABSTRACTS:

1 THE EMERGENCE OF SOCIAL INEQUALITY IN EUROPE AND SOUTHWEST ASIA: AN INTRODUCTION

Abstract author(s): Iversen, Rune - Haddow, Scott - Richter, Tobias (University of Copenhagen) - Kroonen, Guus (Leiden University)

Abstract format: Oral

This paper will give a general introduction to the session and present some of the main issues within the field. Did the transition to agriculture in Southwest Asia and its arrival in Europe engender the establishment of more permanent and strict social hierarchies? Or did true social inequality first emerge with metal technologies that permitted the monopolization of raw materials, natural deposits and new forging technologies? An important aspect of the discussion is of course what we mean by social inequality in the past and how we recognize it – what are the material correlates of inequality that can be identified archaeologically and how reliable are they? These questions will set the scene for further theoretical, methodical and case based discussions, and they will work as a framework for the session whose participants all address different approaches to, and aspects of, social inequality from the European and Southwest Asian Upper Palaeolithic to the Early Bronze Age.

2 COERCION, STRESS OR MUTUALISM: EVALUATING DIFFERENT PATHWAYS TOWARDS SOCIAL INEQUALITY AND HIERARCHY DURING THE TRANSITION TO AGRICULTURE IN WESTERN ASIA

Abstract author(s): Richter, Tobias (University of Copenhagen)

Abstract format: Oral

In this paper I will examine three broad groups of ideas that have been put forward to explain the emergence of social inequality and hierarchy at some point during the transition from hunting and gathering to agriculture in western Asia. These three groups of ideas are coercion, stress and mutualism. Coercionist models suggest that individuals were forced into hierarchical and unequal structures when aggrandizers, big men or otherwise powerful individuals gained control over key resources and used this to leverage influence over decision making processes. Stress models propose that growing population sizes, settlement aggregation and other external factors necessitated the emergence of leaders, ultimately resulting in inequalities, in order to deal with and mitigate social stress factors (e.g. inter-personal violence, property disputes etc.). Mutualist approaches suggest that there was a voluntary acceptance of certain individuals as leaders. For example, religious specialists may have been ascribed status and elevated above other members of the group due to strong religious and ritual needs and beliefs. All of these approaches are based on a strong conception of progress and unilineal social evolution that ultimately harks back to deeply-rooted assumptions about the development of human societies. Instead, I propose here a more non-linear and anarchist reading of the archaeological evidence.

3 SHAMANS AND CHIEFS: THE PATTERNS OF SOCIAL INEQUALITY IN NEOLITHIC NEAR EAST

Abstract author(s): Türkcan, Ali Umut (Anadolu Üniversitesi)

Abstract format: Oral

The emergence of social inequality in the human past as well as in the Near East Neolithic Studies is the subject of long-running debates amongst archaeologists and anthropologists. Social complexity studies from Childe to Binford until seventies, from Cauvin to Hayden until 2000's have been identified in major decades for almost 100 years. Features of Urbanism, social complexity, complex symbolism of religion that are evidenced in Jericho, Çayönü and especially Çatalhöyük had opened discussion on social inequality with many aspects as the "mega-sites" that are evidently laid-out according to a plan, import of raw material in large quantities, exploitation of metal, lime; it is no more possible to call the sites of Neolithic culture as simple villages.

In the light of new discoveries from 1990's especially with Göbekli Tepe; the presence of monumental buildings, Displays of such a wealth expenditure in these settlements seem to have taken the form of elaborate monumental buildings. They are followed by similar sites and new excavated sites in the same area (Harran, Şanlıurfa) with similar rich array of iconography; some PPNA sites in Upper Tigris area with earlier prototypes of cult buildings as well as exotic and nonfunctional "ritual" objects that require prodigious amounts of human labor within skilled craftsmen. Combined with evidence for an unequal distribution of goods (especially exotic prestige items) within communities, the evidence seems to show that early complex societies might have engaged to some degree in the accumulation of wealth and power through trade.

At the dawn of earliest sedentary hunter gatherer communities so called as "Neolithic" societies with new subsistence strategies at the end of Younger Dryas environmental conditions, the proposal is a discussion how and why setting up these iconography and conspicuous buildings with prestige items seems to be major part of an earliest growing social hierarchy.

4 DEATH'S REFLECTION: WHAT DO MORTUARY PRACTICES ACTUALLY REVEAL ABOUT SOCIAL STRUCTURE AND INEQUALITY IN THE NEOLITHIC OF SOUTHWEST ASIA?

Abstract author(s): Haddow, Scott (University of Copenhagen)

Abstract format: Oral

Mortuary practices are one of the key archaeological indicators through which social relations and social inequalities may be identified in the deep past. However, while the manner in which a society chooses to dispose of its dead may reveal important information about the way it organizes itself, it may also serve to obscure, elide or completely invert the social structures of the living. While evidence from a variety of archaeological data sources, including architecture, material culture, food remains and mortuary practices themselves, has been used to characterize Neolithic societies as dominated by a "fierce egalitarianism", a closer examination of the variation observed within the realm of mortuary practices reveals indicators of nascent social differentiation, in which individuals received differing post-mortem treatments based on selection criteria that are, at the moment, not well understood. This variation is seen most clearly in the range of secondary burial treatments observed throughout the Neolithic of Southwest Asia, in particular the so-called "skull cult", although other skeletal elements, and even whole bodies, were manipulated in similar ways as part of extended, multi-stage funerary rites. The location of burials and the presence/absence of grave goods are also highly variable. What remains unclear is the nature of these forms of social differentiation; for example, do they reflect the existence of hierarchical (vertical) or heterarchical (horizontal) social structures? In our quest for interpretation, however, we often ignore the subtle ways in which these practices are expressed both regionally and temporally. This paper will explore the use and abuse of mortuary practices in elucidating Neolithic social structures in Southwest Asia.

5 BALANCING DIFFERENCES: PATTERNS OF SOCIAL DIFFERENTIATION AND INTEGRATION WITHIN LARGE NEOLITHIC COMMUNITIES

Abstract author(s): Mazzucato, Camilla (Stanford University)

Abstract format: Oral

It is widely believed that hierarchical societies originally developed as the inevitable outcome of large-scale, intense social interactions that first took place within the densely populated settlements of the Neolithic period. This view is rooted in the idea that social stratification and inequality developed as a way of resolving the scalar-stress and group conflict that is thought to be associated with the increase of settlement sizes in the Neolithic. This perspective has been challenged by recent archaeological research that has complicated/problematised the linear narrative of the emergence of social differentiation and inequality in prehistory. This paper explores the mechanisms of social integration and differentiation that emerge within large Neolithic settlements when no clear signs of hierarchical arrangement of society or concentrations of power have been observed. What are the processes that integrated and held these communities together? How were group identities balanced within these vast settlements? Additionally, what role do houses play in the formation of social life within these Neolithic sites? This paper focuses on the identification of these processes in the archaeological record and on tracing their changes through time and space using Çatalhöyük as a case study and network science as a methodological approach.

6 ŞEREF! THE BEGINNING OF COMMENSAL DRINKING PRACTICES IN PREHISTORIC ANATOLIA

Abstract author(s): Schoop, Ulf-Dietrich (School of History, Classics and Archaeology)

Abstract format: Oral

Commensal drinking and the use of specialised drinking equipment are known to have played an important role in elite behaviour and elite display in western and central Anatolia during the 3rd and 2nd millennia BC. This contribution will trace the history of commensal drinking practices further back into time. It will be shown here that commensal drinking was adopted, in a comparatively rapid process, as a fundamental social practice in some (but maybe not all) Anatolian regions during the final centuries of the 5th millennium BC. This contribution will argue that this phenomenon is part of a larger shift towards more competitive socio-economic practices taking place at the same time. Questions asked are how the new practice(s) relate to ideological priorities of preceding periods and, given their context in later times, whether or not they signify the first steps toward the emergence of stable social hierarchies and economic inequality in the region.

7 TRACING SOCIAL INEQUALITY IN THE NEOLITHIC THROUGH TECHNOLOGY

Abstract author(s): Vitezovic, Selena - Antonovic, Dragana - Mihailovic, Danica (Institute of Archaeology, Belgrade)

Abstract format: Oral

Although prehistoric technologies are sometimes perceived as being purely practical and ergonomic, they reflect multiple aspects of the cultural and social relations of a given community. One of the theoretical frameworks for studying technologies is the notion of practical and prestigious technologies, where practical technologies are used to solve basic needs, such as acquiring food, making of shelter, while prestigious technologies are used to solve a social problem, to negotiate and display power and prestige, etc. In this paper, we will analyse some of the aspects of the lithic and osseous technologies in the Late Neolithic Vinča culture in the central Balkan area, with particular focus on rare, exotic, luxurious raw materials: marine shells and lithic raw materials such as marble, obsidian, etc. Beside their exotic origin, their technological traits and life biographies (intensity and duration of use, instances or repair, modes of discard, etc.) suggest these were valued raw materials. The distribution, diversity and frequency of these items vary considerably from site to site, showing that only limited number of settlements and individuals had access to them. The site of Vinča-Belo Brdo particularly stands out among other Vinča culture settlements by diversity and frequency of items made from luxurious raw materials, but there are also some other sites that yielded interesting artefacts, such as the site of Pločnik, where several ornaments made from marine shells were discovered, along with some other less frequently encountered lithic raw materials. This shows that there were differences in economy between different settlements, but also in their importance and wealth, and presumably status. However, at present state it is difficult to assess whether prestigious status was held by individuals, smaller (perhaps family) group or larger groups.

8 PRISTINE EGALITARIAN CITIES? EVALUATING THE ARCHAEOLOGICAL EVIDENCE FROM TRYPILLIA 'MEGA-SITES'

Abstract author(s): Ohlrau, René (Institut fuer Ur- und Fruehgeschichte Kiel; ROOTS) - Arponen, V.P.J. (ROOTS)

Abstract format: Oral

Recently, the Chalcolithic Trypillia 'mega-sites' of the Northern Pontic forest steppe have been characterized as low-density egalitarian cities. The question whether the 'mega-sites' provide an example for the integration of larger groups without hierarchical or state organization is an essential part of the counter narrative against traditional models of social evolution.

The currently proposed seasonal, minimalist, and low-density models clearly argue against Trypillia sites as examples for large and integrated populations. In the current conceptualization it appears that only if Trypillia societies were allowed to seasonally fission, it would have been possible to integrate a modest population by egalitarian institutions for some time during the summer. Can this hold true?

This paper investigates the archaeological evidence for both egalitarian mechanisms and social inequalities from larger and smaller settlements following a diachronic perspective. Social inequalities will be evaluated within the framework of the capability approach to reach beyond wealth and towards differential opportunities and perspectives.

While previously the uniformity of the settlement and building layout was emphasized, the research of the last decade produced a variety of features, among them buildings of exceptional size, form, and position within the settlements. The taphonomy, inventory, and relations of the various building classes will be discussed. Other features such as enclosures, plazas, and the distribution of specialized crafts provide further context for the evaluation.

As a result, the framing of these settlements provides a building brick for understanding the trajectory of European social prehistory.

9 EGALITARIAN PRACTICES AMONG NEOLITHIC FARMERS IN THE SOUTH OF EASTERN EUROPE

Abstract author(s): Kiosak, Dmytro (Ca' Foscari University of Venice)

Abstract format: Oral

Neolithic societies to the east of Carpathians can be characterized with a paradox. There are many cases of collective construction efforts well known to specialists in the field. Their results sometimes are exceptional like regular layouts of Trypillian mega-sites.

However, there is an evident lack of traditional archaeological arguments for social hierarchies in these societies. Houses usually yield very standardized sets of finds; there are no outstanding burials etc. (Contra: see recent discoveries of “assembly houses” on some Trypillian sites). It seems that we often see the impressive results of collective effort of Neolithic farmers but we lack evidence for specialized managers to organize these efforts. Several solutions were proposed to solve this problem: self-organization mechanisms (J. Chapman and co-authors), particular forms of leadership (C. Renfrew), “hidden” hierarchies, which began to be revealed with enlarged archaeological research (J. Mueller, R. Hoffmann and co-authors).

Here we suggest that Neolithic societies to the east of Carpathians shared some egalitarian ethos and certain “leveling” social mechanisms, “social practices designed to assertively maintain the operation of egalitarian social systems through the strict enforcement of egalitarian ethics” (G. McCall) despite emerging social inequality. The intentional egalitarianization could be responsible for the “hidden” nature of early farmers’ hierarchies. Namely, we suggest that the deliberate burning of houses (very common in Trypillia and known in the adjacent societies) was an egalitarian practice, structurally similar to potlach of North American Indians.

10 DISTRIBUTION FITTING AND FRACTAL ANALYSIS FOR CHARACTERISING STRUCTURES OF SOCIAL INEQUALITY

Abstract author(s): Bruvoll, Hallvard (University of Oslo, Department of Archaeology, Conservation and History)

Abstract format: Oral

A discussion on the emergence of social inequality will necessitate tackling the question of what we actually mean by inequality. We can always agree that it entails some measure of difference between individuals in a group. But do all such differences qualify as signs of inequality, or can they be better understood as functional difference, or random fluctuations? Are you wealthy, if most of the people you are compared to are just as wealthy as you?

It is argued here that unequally distributed wealth and power is present where very few are highly favoured over many others. In statistical terms, such a situation can often be described as a power law distribution. In economics and finance, the connection between power law distributions and inequality has been known for a long time. Yet, this has received little attention in the archaeological debate on the origins of social inequality.

While the Gini coefficient is useful for comparing the overall level of inequality through time and space, it provides little detail on how inequality is structured. Determining the best fit distribution model of an archaeological wealth-related variable, can provide valuable insights to the underlying processes and mechanisms that generated the distribution. Power law distributions exhibit the special property of scale-free fractal behaviour, and the associated parameters – namely the scaling exponent and the fractal dimension – can work as powerful quantitative supplements to the Gini coefficient for explaining the distribution of wealth in a society.

An example of this form of analysis is given through the comparison of house-size distributions from the Linear Pottery and Trypillia cultures of the temperate European Neolithic.

11 NEOLITHIC HIERARCHY ON DIFFERENT LEVELS IN THE GREAT HUNGARIAN PLAIN THROUGH THE ANALYSIS OF DISTANT STONE RAW MATERIALS

Abstract author(s): Farago, Norbert (Eötvös Loránd University, Institute of Archaeological Sciences)

Abstract format: Oral

The late Neolithic of the Great Hungarian Plain (5000/4900-4600/4500 cal BC) is thought to be the first period in this region when unambiguous signs of inequality emerged. One of the key factors behind this statement is the growing body of so-called Trans-Carpathian raw materials (e.g. Jurassic Cracow flint, chocolate flint, Prut/Dniester flint) found on the tell sites of the Plain. Together with other spectacular phenomena appearing first during this period, like rich and diversified grave furnishing, the first occurrence of copper objects, or the development of a complex settlement hierarchy from small farmsteads to large site complexes with tell monuments, social inequality seems to be confirmed. Although such material manifestations of social differentiations can be really convincing, it might be argued that prehistoric relationships were as simple as we think. The case study of chipped stones coming from two, contemporaneous late Neolithic settlements teaches us to take into consideration the many aspects of the prehistoric worldview. Investigating either the level of individuals by their grave goods or the level of households by their waste, the observed differences suggest hierarchy in some form, but not the way we could have possibly imagined.

12 IDENTIFYING PAST SOCIAL ORGANIZATIONS THROUGH FOODWAYS – THE IMPORTANCE OF A MULTI-PROXY APPROACH

Abstract author(s): Cheung, Christina (EA – Eco-anthropologie - UMR 7206, Muséum National d’Histoire Naturelle, CNRS, Université Paris Diderot; UMR 7269, LAMPEA, Aix-Marseille Université, CNRS, Minist Culture, Aix-en-Provence) - Syrikova, Polina (Université de Bordeaux, CNRS, UMR 5199 PACEA – Bordeaux; EA – Eco-anthropologie - UMR 7206, Muséum National d’Histoire Naturelle, CNRS, Université Paris Diderot) - Le Luyer, Mona (Université de Bordeaux, CNRS, UMR 5199 PACEA – Bordeaux; School of Anthropology and Conservation, University of Kent, Canterbury) - Herrsher, Estelle (UMR 7269, LAMPEA, Aix-Marseille Université, CNRS, Minist Culture, Aix-en-Provence) - Thomas, Aline (EA – Eco-anthropologie - UMR 7206, Muséum National d’Histoire Naturelle, CNRS, Université Paris Diderot)

Abstract format: Oral

In complex societies, power and resources inequalities are often expressed in the ways people lived (i.e., dietary practices) and died (i.e., funerary practices). Thus, archaeologists have long recognized that palaeodietary and mortuary practices are powerful gateways to understand past social divisions and organisations. This study focuses on examining the social organizations of Cerny communities in the Paris Basin region through a comparison of their dietary and mortuary practices. The Cerny culture is well known for constructing some of the earliest monumental cemeteries in western Europe during the middle Neolithic period (ca. 4700 – 3500 BC). These cemeteries are highly organized and stratified, where only selected individuals were buried within/associated with the monuments, in very specific manners. Despite the highly stratified funerary arrangements, a recent stable isotopic study has revealed that there was little intra-group variability among the Cerny communities. This is in stark contrast to the neighbouring and contemporaneous non-Cerny groups, where highly homogeneous mortuary patterns and strong intra-group isotopic variations were observed. Thus, based on the isotopic results, it was initially assumed that Cerny social stratifications were more “symbolic” in nature (i.e., expressed strongly post-mortem) and that living individuals received similar sustenance across the community. However, new dental micro- and macro-wear analyses reveal that intra-group dietary variabilities indeed existed among the Cerny groups. While stable isotope analysis evaluates the total consumption of macronutrients (especially protein), dental wear analysis mostly concerns the texture of the food consumed. Our results have shown that among the Cerny communities, social stratifications were expressed not in terms of nutritional intake but in the format of the food being consumed. In addition, this multi-proxy approach has highlighted some limits to the current approach in palaeodietary reconstruction, which focused primarily on macronutrients intake and pay little attention to other factors such as food processing methods.

13 COMPARING PROXY-MEASURES OF INEQUALITY FROM GRAVES - THE CASE OF THE MORAVIAN CORDED WARE

Abstract author(s): Nørtoft, Mikkel (University of Copenhagen)

Abstract format: Oral

Measuring inequality has long been a problem in archaeology. Some studies measure by the number of object types in each grave. Other studies use the Gini coefficient which is a statistic of income distribution summarised in one number between 0 (100% equal) and 1 (100% unequal).

In the absence of a direct income unit used in Gini measures on modern societies, archaeology uses various proxies as measure units. These include house floor area, household artefacts, storage size, or an accumulation of value points defined for different grave goods.

Gini measures on grave goods often use different point systems and although naming sensible criteria to decide on the value of objects they often do not report how the individual value points are calculated. This may introduce problems when comparing Gini coefficients across time and space. This paper compares different proxy-measures of inequality in graves and attempts a more broadly applicable and flexible point system for trans-regional comparison in the European Neolithic-Bronze Age. Both the “total object types”-measure and a point system based on labour hours may also be used in tandem as holistic measures to study wealth differences across age and gender instead of focusing only on “prestige” objects. Corded Ware culture (3rd millennium BCE) graves in Moravia, Czech Republic serve as a pilot study.

14 IDENTIFYING LABOR DIFFERENTIATION THROUGH ANALYSES OF ENTHESEAL CHANGES IN BELL BEAKER EUROPE

Abstract author(s): Ryan-Despraz, Jessica - Desideri, Jocelyne (University of Geneva) - Villotte, Sébastien (University of Bordeaux) - Besse, Marie (University of Geneva)

Abstract format: Oral

The Bell Beaker period of the third millennium BCE acts as a transition between the end of the Neolithic period and the early Bronze Age in Europe. Studying this period therefore has the potential to shed light on Neolithic practices as well as some of the drivers that led to certain Bronze Age innovations. An anthropological study of 134 skeletons from individual inhumations of this culture’s Eastern complex (Central Europe) examined measurements, enthesal changes, and additional observations. The overall goal of this research was to understand how muscle development can influence bone morphology, and then apply this theory to the identification of specialized activity, mainly archery. Archery provides a unique reference point due to its links to warfare and hunting,

though for the Bell Beaker period there remains significantly more evidence for the former. The results of these analyses revealed two important findings. First, an individual perspective exhibited no link between burial context and a likely specialized archer occupation. Second, a population perspective revealed a correlation between enthesal development and burial context; less physical development corresponded to skeletons interred with archery-related grave goods, items that were also likely more socially prestigious. Specifically, these grave goods included stone wristguards, arrowheads, and bow-shaped pendants. This finding indicates a possible labor differentiation within a socially stratified Bell Beaker society. A greater implication of this study discusses a possible link between socially prominent individuals, perhaps community leaders, and a warfare ideology.

15 GROWTH WITHOUT INEQUALITY? UNDERSTANDING THE RANGE OF VARIABILITY IN BRONZE AGE ECONOMIES

Abstract author(s): Green, Adam (University of Cambridge)

Abstract format: Oral

Economic growth has been a principal feature of human economies since at least the Bronze Age, however it is rarely fully recognized in archaeological studies of inequality. While there has been a resurgence of archaeological research on inequality, many studies tend to focus on disparities within particular categories of wealth. However, Thomas Piketty highlighted the relevance of multiple parameters to the study of inequality, namely economic growth (g) and returns (r). Drawing on historical data, Piketty argued that in capitalist economies $r > g$, an arrangement that increases inequality by driving the accumulation of wealth. Because it has often been argued that economic growth, the rate at which the total amount of material goods and resources per capita within a society increases over a period of time, is restricted to capitalist economies, many archaeological analyses effectively ignore growth, hindering our understanding of how inequality emerges in deep history. However, it has become clear that growth was a key variable in Bronze Age economies. In the Mediterranean, Leppard argued that 'low-growth' settings contributed to unexpected spikes in inequality. By extension, I argue that lower levels of inequality prevailed in 'high-growth' settings, such as those that contributed to alluvial urbanism in Mesopotamia and South Asia. The growth associated with early urbanisation drives explosive upticks in wealth that can suppress the emergence of inequality. This dynamic was pronounced in the Indus civilisation, where a massive urban economy with numerous rural settlements distributed wealth to everyday people, resulting in an egalitarian urban society. Mesopotamia's Bronze Age growth was also initially marked by lower levels of social inequality, but its cities were longer-lived, fostering the consolidation of exclusive temple and palace institutions over an exceptionally long period of time. These early cities co-emerged with massive upticks in economic growth that did not inexorably produce a ruling class.

16 A QUANTITATIVE STUDY OF NEOLITHIC TO EARLY MEDIEVAL BURIAL GROUNDS IN SOUTHWEST GERMANY

Abstract author(s): Großmann, Ralph (Kiel University; Cluster of Excellence ROOTS)

Abstract format: Oral

Social inequality is a subject of contemporary concerns. Life capabilities and the access to resources vary significantly in rich and poor countries, between elites and others. Furthermore, inequalities based on bio-anthropological and non-bio-anthropological causes are almost universal. Accordingly, inequality was also inherent in past societies and archaeologists have continually examined and interpreted social inequalities in sources such as burial grounds and settlements.

This paper continues cemetery analyses with a new multi-proxy approach. It reveals social inequalities in selected past burial grounds from Southwestern Germany. The burial grounds date to the Early Neolithic (Schwetzingen), the Late Neolithic (Lauda-Königshofen), the Early Bronze Age (Singen), the Early Iron Age (Magdalenenberg), and the Early Medieval period (Horb-Altheim). The challenge was to identify hierarchical and heterarchical differences within the burial grounds based on a multitude of different proxies.

The examination encompasses variations in the distribution of grave goods, burial pit sizes, bio-anthropological and isotope data. Furthermore, spatial analyses of burial grounds and, in particular, on the distances between the graves play an essential role in this examination. The results reveal hierarchical differences but also heterarchical relationships among and within genders and age cohorts that are differently pronounced in the respective cemeteries.

A. ENAMEL HYPOPLASIA IN THE CHALCOLITHIC SITE OF LA CARADA (SE SPAIN) AS A PROXY TO CHILDHOOD LIFE CONDITIONS

Abstract author(s): Veiga-Rilo, Clara (Group EcoPast - GI-1553, Universidade de Santiago de Compostela) - Jiménez Brobeil, Sylvia (Laboratory of Anthropology, Department of Legal Medicine, Toxicology and Physical Anthropology, Faculty of Medicine, University of Granada) - López-Costas, Olalla (Group EcoPast - GI-1553, Universidade de Santiago de Compostela; Archaeological Research Laboratory, Stockholm University; Laboratory of Anthropology, Department of Legal Medicine, Toxicology and Physical Anthropology, Faculty of Medicine, University of Granada)

Abstract format: Poster

Hypoplastic dental enamel defects (HED) are non-reformable disruptions in the secretion of the enamel matrix caused by an episode of metabolic stress. In fact, HED can provide insights into stress periods that happen during development, including weaning. La Carada (Huéscar, High Andalusia, Spain) is a megalithic site (Chalcolithic), which was excavated by A. Molina in 1980. The recovered archaeological assemblage comprises a minimum of 164 skeletons and grave goods. The relative high number of non-adults recov-

ered (n=68; 41%) enables to explore the presence of stress markers in childhood. Remains were comingled and fragmented, but teeth were well preserved; although most teeth were recovered in avulsion, hampering to obtain information at population-level.

A descriptive analysis was carried out on a sample of 382 canines (81 deciduous, 301 permanent) from La Carada. We focused our study on the prevalence, susceptibility and severity of the lesions according to dentition (deciduous/permanent), tooth type, affected surface, probable sex, age-at-death and age of formation of the defect.

HED was present in 54% of the pieces, being linear hypoplasia the most common. HED was more prevalent in the permanent dentition. Probable females displayed significant higher number and severity of defects than probable males. Deciduous teeth showed metabolic disruptions, preferentially between 3.5-4 months postnatal age, while permanent teeth showed them at the 4-4.5 years. These lesions do not seem to fit with the usual age of weaning, which might have occurred at later age. The high prevalence of HED in permanent teeth, in contrast to deciduous ones, is interpreted as a consequence of several metabolic disruptions in childhood, but not in the pre- and perinatal stage. Finally, the highest HED rate in females could be related with higher fragility, perhaps due to the differential use of resources in parenting.

172 SACRIFICE & VALUE: SEEKING AN ANTHROPOLOGICAL ARCHAEOLOGY OF SACRIFICE

Theme: 6. Material culture studies and societies

Organisers: Walsh, Matthew (Museum of Cultural History, UiO; National Museum of Denmark) - Moen, Marianne (Museum of Cultural History, UiO)

Format: Regular session

Archaeologists are often in a unique position to encounter evidence of ritual and sacrificial offerings in the past. However, such evidence varies wildly, both materially and contextually, and how we interpret such findings when they are encountered may also vary considerably. Indeed, sacrifices in some form or another are ubiquitous across societies around the world, and sacrificial practices and traditions have emerged, persisted and evolved in diverse contexts for millennia. Yet, archaeological interpretations of sacrifice, especially of the human variety, are often met with not just a healthy skepticism (as they should be), but they also often lead to controversy and even outright denial of the possibilities.

This session will explore archaeological interpretations of evidence of sacrificial offerings, whether they be of animals, objects or people, in whatever regions around the world they are encountered. Research that seeks to understand the archaeological evidence of such phenomena from cosmological, socio-cultural, ecological, economic and judicial perspectives are all welcome. We especially seek papers which attempt to engage with and untangle the myriad values possibly at play in sacrificial logics in the past and which explore the vicissitudes, vagaries and paradoxes of sacrificial practices in both relative and comparative contexts. A concern with perceived values furthermore means we seek to contextualize divides between objects/persons and thereby encourage papers which explore questions of personhood, identity and value in relation to sacrifice. We hope to investigate this fascinating subject with an eye towards better understanding the why behind acts of ritualized violence as offering, beyond the what and how so often necessarily the focus on the material record.

ABSTRACTS:

1 FROM OBLIGATION AND OBLATION TO SUBLIMATED VIOLENCE? TRANSFORMATION OF HUMAN SACRIFICE IN THE PREHISTORY OF NORTHERNMOST EUROPE

Abstract author(s): Walsh, Matthew (National Museum of Denmark; Museum of Cultural History, UiO)

Abstract format: Oral

This research investigates evidence for human sacrifice in Northern Europe from the Late Neolithic period through to the Early Iron Age, with a special focus on cases involving wet site archaeology. Firstly, a brief review of key forensic cases of possibly sacrificial executions of varying degrees of violence (concerning bog bodies) is provided. Secondly, an attempt to compare and contrast known cases through time is made, with preparation for new quantitative approaches -- presenting an original database which synthesizes comparative characteristics for many known cases. Thirdly and finally, a phylogenetic neighbor-joining network analysis is brought to bear on this data to explore whether it is possible to apprehend new emerging patterns of cultural transmission related to ritual violence across time in this region. Findings suggest that not only is it possible to trace hitherto unknown networks of cultural contact in pre-historic Northern Europe, but they can also inform new hypotheses for explaining a long temporal gap in the continuity of human sacrificial practices, suggesting major shifts in human values along the way.

2 BODY PARTS IN THE BOG: PERCEPTIONS OF PERSONHOOD, VALUE AND SACRIFICE

Abstract author(s): Moen, Marianne (Museum of Cultural History University of Oslo)

Abstract format: Oral

This paper positions a relatively small and hitherto not very well known corpus of human remains from wetlands from Iron Age Norway into a wider theoretical framework of sacrifice and personhood. By juxtaposing these remains with the better-known bog body

tradition evidenced from Northern Europe, I activate the similarities and differences between these to query constructions and perceptions of personhood.

Situating the discussion into contextual constructions and relational underpinnings of ways of being, I here seek to demonstrate how the material at hand, in the main comprised of fragmentary skeletal remains in votive contexts, offer a novel base from which to consider social relations. Furthermore, these perspectives are used to query the efficacy of the implicit tendency to draw interpretative lines between human remains and predefined personhood. Overall, the paper seeks to ask whether or not the assumption that personhood rests in a human body can be implicitly inferred when confronted with ancient human remains, and in turn what this may imply for interpretations of human bodies in votive settings. This brings the perspective round to a discussion of sacrifice and value, wherein the universality of an assigned value based on status as human is brought into question on the strength of relative constructions of personhood.

3 BANDS BETWEEN THE LIVING AND THE DEAD: THOR'S HAMMER RINGS IN RELATIONAL AND RECIPROCAL PERSPECTIVE

Abstract author(s): McGinnis, Meghan (Stockholm University)

Abstract format: Oral

Within the field of Viking Age archaeology, 'Thor's hammer rings' are by now well-known as a class of finds especially characteristic of cremation grave contexts in certain parts of eastern Scandinavia, such as the Mälär valley in Sweden and the Baltic Åland islands. Yet although these objects are highly recognizable elements of mortuary practice, attempting to explain their overall distribution, and also their presence in particular burials, in terms of gender, age groups, social strata, or other facets of identity often associated with 'grave goods' has proved largely unsuccessful. Why is this? Perhaps because Thor's hammer rings in the main had no link to individual identity, and rather everything to do with establishing and managing connections between different persons, not all of whom were human in nature.

Analyzing examples of assemblages that include Thor's hammer rings from grave field RAÄ 28 Söderby in Sweden, and building on my own and other scholars' recent work that ties the broader category of 'amulet rings' to the swearing of oaths and making of votive offerings at cult sites, this paper explores how rather than passively reflecting already existing personal attributes and affiliations, Thor's hammer rings used in mortuary contexts instead functioned as active agents facilitating transformations of states of being, and the production and maintenance of relationships between both living and deceased participants in ritual acts. And did so both in rites that were part of the drama of burials themselves, and those that comprised continued interactions with gravesites during various post-funerary moments. By investigating practices involving these objects from this more relational perspective, we open another window onto the lived experience of a reciprocal logic of sacralized exchange which underpinned the whole religious world of the late Iron Age of Fenno-Scandinavia.

4 RITUALS AND SACRIFICES IN ANCIENT ARCADIAN CULTS

Abstract author(s): Dimopoulou, Sotiria (University of Münster, Classical Archaeology)

Abstract format: Oral

Ancient Arcadia is a region in Peloponnese, whose various cults have been accompanied by sacrifice rituals and religious regulations. Some of them had a purifying character e.g., for those who participated on ritual ceremonies or were connected to the cult of a specific god or goddess.

Despite the fact that literary and archaeological sources about sacrifices are meager, our knowledge about them allows us to study and evaluate these phenomena also as a part of the human behavior with social background. Foremost sacrifices can be seen as a medium of a direct communication with the divine element or as an expression of a deep religiosity of a community. Diverse kind of sacrifices before or during cult practices, such as animals, fruits, pomegranates, animal skins, terracotta statuettes on animal masks, clothes, textiles, even human sacrifices etc., indicate that the type of sacrifice depended on the art and purpose of the cult.

This paper re-examines the significance of sacrifices, trying to give new aspects about beliefs and thoughts connected to specific regulations, mystery cults or matters of social prestige. The study evaluates also a possible relationship between sacrifices and offerings, as well as between sacrifices and initiations, pilgrims, women or important persons. In what way the art of sacrifice was related to specific category of people and how can we interpret it? As a human need, as a deep religiosity or as a long religious tradition? In any way, sacrifices belong to the material culture of an ancient society, a very important factor to understand ideologies and aspects about this custom.

5 MIMETIC RITUALS AND THE SOCIAL

Abstract author(s): Hohle, Isabel (RGK - Romano-Germanic Commission DAI)

Abstract format: Oral

Studies from Social Anthropology indicate that non-hierarchical or less hierarchical societies practice certain rituals which are intended to strengthen or restore cohesion in the community and, could act as coping practices, e.g. in exceptional environmental conditions or to reduce tensions within or between communities in order to avoid conflicts. In addition, there are certain practices and rituals that are only carried out in "crisis situations" and are characterized by violence and destruction (both in a direct and fig-

urative sense). The concept of "désir mimétique" developed by René Girard - the desire for violence compensated for by imitation (GIRARD 1992) could be extended to any form of mimetic violence: the destruction, smashing, overkilling of objects or animals as well as ritual slaughtering, butchering and smashing the remains of the dead. These mechanisms serve to avert violence against one's own group (be it from outside or inside) in order to protect the community. There seems to be a connection between the performance of complex, painful (also figuratively) and violent rituals and times of crisis.

Girard's theory has been widely discussed and criticized and should not be presented here without reflection. Basically, it should rather be about the underlying idea of imitation and representation - concepts that could help to understand practices of sacrifice in prehistoric societies.

6 THE QUESTION OF A POTLATCH IN ARCHAEOLOGY

Abstract author(s): Gralak, Tomasz (University of Wrocław)

Abstract format: Oral

In case of many archaeologically discovered remains of sacrifices, it is clearly visible that various types of goods were withdrawn from circulation. In the most spectacular way it is possible to observe through the discoveries of hoard finds. This phenomenon is particularly distinctive for Central and Northern Europe during the Bronze Age and the Early Iron Age. It seems to be directly connected with the autarkic and non-commercial type of the economy at the time. It was possible to generate a surplus, but it was almost impossible to invest. So there was a capital within a very shallow market. Moreover, among traditional societies the dignity and honor of groups and individuals are the highest and most precious values. It was the relationships with other members of the community that determined the quality of life, and were necessary for survival in difficult conditions. Hence, the accumulated goods were invested in interpersonal relations (status) - by sacrifices and probably through gift giving also. Therefore, such actions resemble the nature of a potlatch. It is not a waste of goods, but ritually conditioned building of social bonds. In this context, trade in metals is also important, because bronze, silver or gold mostly could not be obtained by the autarkic economy of central and northern Europe. Not everyone could participate in the import of these materials, which resulted in a progressive differentiation of status. Hence the need to show it - also through the potlatch.

7 FIBULAE LEFT BEHIND: SACRIFICES AT FIRST SIGHT? A PRELIMINARY REPORT OF THE SACRIFICIAL SITE AT OBERLEIBNIG (TIROL/AUSTRIA)

Abstract author(s): Waldhart, Elisabeth (Universität Innsbruck, Institut für Archäologien) - Schmölzer, Astrid (Otto-Friedrich-Universität Bamberg, Institut für Archäologische Wissenschaften, Denkmalwissenschaften und Kunstgeschichte - IADK)

Abstract format: Oral

Located at a hillside at the Alpine Isel valley 180 objects dating from Iron Age to Roman Times were found. The topographic setting and the object selection includes coins and fibulae as well as artefacts related to feasting and craft. Usually, depositions like these are summarised as "Brandopferplätze". There are a lot of sites known in this region with identical findings, ranging from larger sacred sites to small locations in the high mountain environment, all together forming a religious landscape.

Within these assemblages of offerings, differences and parallels are raising questions on different social roles and status of the people visiting. The various rituals and composition of objects - especially the occurrence of provincial Roman fibulae - contrast with the continuous use of places known. This allows us to investigate processes of Romanisation in the region. The sacrifices can be seen as constitutive for group and subjective identity as well as the sacrificial site as a place where identity is negotiated.

Especially fibulae are a common object at sites within this sacrificial tradition. Alongside coins and small votive figurines, they can be discussed as individual offerings. Furthermore, fibulae can be seen as commodities, sacrifices of small value as well as an expression of identity. They could be laid down as single votives or were part of a bigger sacrifice - a fibula could also hint to a whole costume (pars pro toto). As a part of the sacrificial site, they can be seen within a network of objects where value is changed or remade through the act of offering. Some objects change from commodities to sacred objects, others from personal things to sacrifices.

The term "Brandopferplatz" is regionally well established. Thus, it is important to re-evaluate and consider theoretical approaches on object agency, applied to our fibulae case study.

8 SACRIFICE, VALUES AND MONETARY SYMBOLS

Abstract author(s): Gullbekk, Svein H (Museum of Cultural History, University of Oslo)

Abstract format: Oral

In this paper I will argue that there exists a close relationship between sacrifice and money from the introduction of coinage in the late 7th century BCE onwards. The sacralization of monetary symbols and values was vital for its success. Monetary expressions of value became symbols of importance in sacrificial rituals, taking on a plethora of meanings and significances in Greek and Roman mythology as well as in Christian theology.

In Christianity, the concept of 'Economy of salvation' where the activity of the creator God in the world to redeem a fallen and sinful humanity was expressed by economic means, especially from the 11th century CE onwards. The sacralization of value expressed in monetary terms and through monetary symbols was viewed as a direct designator of faith as well as authority through the force of various traditions in the hands of the elites, profane as well as religious. In many forms, money was sacred.

The value of sacrifice was transformed and sublimated through performative rituals and narratives, and has often been expressed in the universal language of monetary standards. The relations between money and sacrifice will be discussed through the cases of sacrifice at the temple of Asclepius on Kos (Classical Greece), the rituals of the Eucharist as undertaken in medieval churches, and from foundation offerings in late medieval Siena (Italy).

9 EARLY MEDIEVAL WEAPON DEPOSITIONS IN WATERY CONTEXTS: CONTINENTAL EUROPEAN PERSPECTIVE

Abstract author(s): Maczek, Dušan (Department of Archaeology and Museology, Masaryk University, Brno; Faculty of Archaeology, Leiden University)

Abstract format: Oral

In continental Western Europe, the practice of weapon burials is slowly abandoned throughout the 8th century AD. This shift is, among others, attributed to the Christian doctrine that gradually seems to obstruct the custom of burying grave goods with the deceased. In the archaeological record, what is striking is that depositions of weaponry in watery contexts take over at this point and continue well into the high medieval period. The medieval arms found in mainland Europe's rivers and wetlands have traditionally been interpreted as traces of violent conflict. These interpretations have nevertheless rarely considered the chronological and distributional patterns of this evidence, mainly due to the pagan nature of this phenomenon in the previous periods, which has always been put in contrast with the Christian nature of the Carolingian kingdom and its successors. It seems that the people of historical periods of Western Europe have been considered too 'rational' and too 'Christian' to be depositing valuable personal arms such as swords or lances in such an intangible context as water. This, however, seems to be our construct of the past since the evidence tends to point the other direction. Contextual reconsideration of continental European water-finds of weaponry from the medieval period questions the interpretation of mere battle remains. Whether this archaeological evidence is a result of a convergent value-systems in the light of Scandinavian incursions of the time, conversion of and boundary making in the landscape, coping with the abandonment of weapon burial, conflict resolution or needs to be understood from a perspective of Christian appropriation of past beliefs, the evidence at hand allows us to look at this material from a new perspective.

178 BETWEEN AUTOCHTHONISM, MARXISM AND TURBOSLAVISM: CONCEPTS OF SLAVS AND SLAVIC ORIGINS THROUGH SPACE AND TIME

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Reichenbach, Karin (Leibniz-Institute for the History and Culture of Eastern Europe - GWZO) - Milosavljević, Monika (Department of Archaeology, University of Belgrade) - Broka-Lāce, Zenta (Institute of Latvian History at the University of Latvia)

Format: Regular session

"The Slavs" of the past are associated with a national idea that may relate to ethnicity, an individual state or Pan-Slavism. Academic conceptualizations of the Slavic people(s) and their origins spanned into a wide range of disciplines from early on, including archaeology, linguistics, historiography and physical anthropology. Even now a whole variety of approaches and results are negotiated in academic discourse, while neo-romantic concepts of Slavic identity and ancestry undergo a growing revival in different public fields, be it populist propaganda or popular culture. Often they seek to ground national identity in ancient ethnic origins, like turboslavist creations of a Slavic past that interlocks scholarly knowledge production with identity and memory politics, old and new nationalisms, neo-pagan spiritualization as well as references to DNA data in order to locate ethnic origins. Where there is a growing idea to "make Slavs great again", it seems largely based on outdated academic concepts and often lapses into pseudoscience.

Approaching and reflecting different understandings of "the Slavs" as well as the changing ideas tracing their origins and continuity, can disclose similarities and differences in scientific conceptualizations and constructions as well as public narrations and visualizations of Slavic identity. The organizers would like to form a dialogue with scholars within scientific and public discourse to explore the representation of Slavs and Slavic origins in academia and beyond approaching complex questions of collective identity. The session aims to enable a reflexive discussion on the entanglements of scholarly perspectives, public representations and political use of the Slavic issue, from autochthonist-allochthonist dichotomies, Nazi counter narratives, to communist rule and Marxist interpretations up to current megalomaniac phantasmas built on pseudoscientific and nationalistic notions. All contributions related to the topic are welcome, referring to diverse regions, historical periods and the present, to different political systems and social contexts.

ABSTRACTS:

1 SLAVIC FACTOR IN THE HISTORY OF LATVIAN ARCHAEOLOGICAL THOUGHT

Abstract author(s): Broka-Lāce, Zenta (Institute of Latvian History, University of Latvia)

Abstract format: Oral

Latvian archaeology from the theoretical standpoint until this day is strongly influenced by culture-historical tradition. Thus, the study of Latvian ethnogenesis occupies an important place in a large part of research. Due to lack of written sources the synthesis of archaeological, bioarchaeological, ethnographical and linguistic data plays an important role in the search for origins of the various

ethnolinguistic groups that inhabited the territory. Most of the hypotheses so far are based on the retrospective method, the significant disadvantages of which are the problems of interpretation and data synchronization.

The relationship between Latvian predecessors - Balts and their neighbouring ethnolinguistic entity - Slavs and the nature of their influences to one-another during prehistory are still debatable from both a linguistic and archaeological point of view. The question of Balto-Slavic linguistic and ethnic unity in prehistory remains debatable whereas there are several conflicting hypotheses, which inevitably have a political context as well.

Through the history there have been different attitudes towards the meaning of Slavic factor in development of Latvian culture, but during the Soviet occupation the Slavic question became predominant. Soviet science considered Slavic people to have special virtues and a historical role in the development of their neighbouring groups. The theory of cultural superiority of the Slavs was mandatory in Soviet archaeology as a political tool to legitimize the ongoing process of Russification and assimilation of non-Russian peoples in The Soviet Union. In archaeological thought it was manifested as an unsubstantiated exaggerating of the Slavic factor in the development of local culture. The desire to unite Slavic world with the help of archaeology and history emerges over and over again. This report tries to search for the roots of different ideas about Slavs in Latvian archaeology, comparing the scientific consensus before, during and after the Soviet occupation.

2 RESEARCH ON THE PERIPHERY OF THE SLAVIC WORLD. ABOUT THE SO-CALLED SLAVIC ARCHAEOLOGY AFTER WORLD WAR II IN GERMANY

Abstract author(s): Grunwald, Susanne (RGK/JGUniversity Mainz)

Abstract format: Oral

The northwest border of Slavic settlements in the Middle Ages lies in today Germany, but so-called Slavic Archaeology was a peripheral topic on the periphery of the Slavic world for a long time. The growing interest on that topic in East Germany was understood as an effect of the political twist in Eastern Germany after the war. Slavic archaeology seemed as one kind of political supported and willed research and an example for the internationalization of archaeology in the socialist states. Archive sources like letters and unpublished research programs allow another interpretation of the development in the 1950s and 1960s in Germany: Especially investigations on so-called Slavic hillforts in the north of both parts of Germany can see as resumption of elder studies about the ethnogenesis in the southern Baltikum in the middle ages and the search to proof the unbroken dominance of German cultures in that region. Before 1945 German archaeologists and historians tried to describe Slavic cultures just as episodes in a German-dominated region. After 1945 a network of archaeologists and regional historians (Landeshistoriker) just switched officially the protagonists of their research from Germans to Slavs but asked the same questions. That helped to continue research traditions and generate new contacts and cooperation with colleagues in the eastern socialist states.

3 WHY THE 'SLAVS'? - LEGITIMATIONS OF SLAVIC ARCHAEOLOGY IN COMMUNIST EAST GERMANY. A CASE STUDY

Abstract author(s): Kluger, Anne (Leibniz-Institute for the History and Culture of Eastern Europe - GWZO; University of Münster)

Abstract format: Oral

In communist East Germany, research on the early 'Slavs' from prehistoric and medieval times was one of the main branches of archaeology and prehistory. Unlike in other states of the Eastern Bloc, this may not be obvious at first - not least regarding the traditions of German research before 1945. Based on this observation, I will analyze how the focus on the early 'Slavs' was explained and justified in East German archaeology and prehistory and how the 'Slavs' were defined in this context. Therefore, Joachim Herrmann, director of the archaeological and prehistorical institute at the East German Academy of Sciences and one of the protagonists of Slavic archaeology in the GDR, will serve as a case study, as his interpretations of the 'Slavs' and their connection with the past and present of the GDR represented the dominant narratives in East German Slavic archaeology. In his publications and talks, Herrmann did not only emphasize the GDR's obligation to compensate for the pejorative evaluation of the 'Slavs' in the German 'Ostforschung' before 1945 but also assumed an outstanding importance of the 'Slavs' for the exploitation and development of the territories that meanwhile belonged to the GDR. Furthermore, Herrmann included ethnic interpretations, for example when he referred to the Sorbs as a living proof of 'Slavic' continuities in East Germany since prehistory. I will discuss Herrmann's arguments for Slavic archaeology concerning their connections with identity politics and the legitimization of the GDR's membership in the Eastern Bloc. Besides, the impact of Soviet guidelines and interactions within the communist scientific community will be addressed as part of the analysis. Therefore, the case study enables further insights into the interpenetration of scholarship, political goals, and ideological premises in communist East Germany and the role of conceptualizations of the 'Slavs' in this context.

4 THE LONG SHADOW OF AUTOCHTHONISM IN CONCEPTS OF SLAVIC ORIGINS IN 20TH AND 21ST CENTURY POLAND

Abstract author(s): Reichenbach, Karin (Leibniz-Institute for the History and Culture of Eastern Europe - GWZO)

Abstract format: Oral

The paper addresses autochthonism as a concept localizing the origins of the historic Slavs on the territory of central Europe and especially of modern Poland and tracing them back far into prehistoric times. Fully developed by the end of the 19th century it gained recognition first among Czech prehistorians, while later spreading widely into Polish archaeology where it was mainly advo-

cated by Józef Kostrzewski and the Poznań school of archaeology. It remained the basis for reconstructions of Slavic-Polish history during the post-war decades, losing its significance only from the late 1960s onward. Though thoroughly criticized since then, the concept still has supporters in Polish Slavic studies and archaeology. Its most successful revival, however, it receives as a key element in the pseudoscientific “turboslavic” theory of “Wielka Lechia” claiming the existence of a glorious ancient “Lechitic” empire.

Tracing its progress through changing paradigms within Polish archaeology from positivist national history to Marxist approaches and beyond, the concept of autochthonism has apart from academic discussions always seemed to fulfill a specific function in memory politics, too. It provided arguments in inter-war German-Polish geopolitical disputes, but also played a significant role in the legitimation of the territories shifted from Germany to Poland after 1945 and therefore was inextricably linked to the establishment of communist rule. Even now, the alternative history theory of “Wielka Lechia” is regarded as a pretext for clear political ambitions. Since the political exploitation of a Slavic history based on autochthonist presumptions derived from ethnic interpretations of the archaeological record, the presented insight from the history of archaeology can contribute to a central issue in the methodological discussion, illuminating controversial approaches to material culture as a foundation for far-reaching historical narratives.

5 A LONG, LONG TIME AGO IN A GALAXY FAR AWAY ... - SLAVS AND HIDDEN POLISH HISTORY

Abstract author(s): Blaszczyk, Dariusz (Faculty of Archaeology, University of Warsaw)

Abstract format: Oral

“The beginnings of Great Lechia date back to around 1800 BCE, when the migration of Elamites from the lands of today’s Iran to Central Europe gradually began. The chronicles state that Sarmata was elected the first Lech, i.e. king at the Slavic rally...”

Around the year 2014 on the Polish internet appeared a new trend. A group of people started to write about the Great Lechia, a mythical empire inhabited by “Aryo-Slavs”, allegedly stretching from the Rhine to Novgorod. A year later, a well-known and respected publishing house in Poland, Bellona, published a book with an intriguing title The Slavic Kings of Lechia by Janusz Bieszk. The following years brought more books by various authors and more websites. This is how the idea of the Great Lechia was initiated. Its followers, called Turboslavs (that is, people striving to show an improved past), proclaimed the existence of an alternative version of history, in which Poland before its baptism was a superpower state, whose story has been falsified. Over time, this pseudoscientific approach has gained some popularity and its representatives began to claim that it was they who discovered the true history of the Slavs and their origin, long hidden by official, academic science.

In my presentation, I will discuss the main ideas of the supporters of the Great Lechia, present selected profiles of its main representatives, and above all, I will consider the reasons for the emergence, spread and popularity of this type of ideas.

6 THE “GREAT LECHIA” HISTORICAL NARRATIVES AS A REFLECTION OF A PRESENT-DAY POLISH SOCIETY

Abstract author(s): Pawleta, Michał (Adam Mickiewicz University)

Abstract format: Oral

This presentation seeks to analyse the popularity and significance of the so called “Great Lechia” or “TurboSlavs” phenomenon. It is a spread-out of the academia historical narrative of an alleged ancient empire of Slavs that used to occupy the area of almost whole Europe. Its greatness was supposed to manifest itself in the territorial conquests and successful wars against such dangerous enemies as the Roman Empire, as well as superior standard of living and level of cultural and social progress.

The Great Lechia narratives are widespread not only in the Internet, but also in books than can be found in the leading bookstores in Poland. The most influential author is Janusz Bieszk, who wrote four extensive monographs in order to prove the Lechites empire existence. What is characteristic of Bieszk’s and his followers’ narratives is that they stand against findings of academic research.

In my presentation I will characterise main motives and pivotal elements of contemporary socio-cultural context that are present in ‘pseudoslavic’ narratives. I will base my observations on two kinds of sources. On the one hand, it will be an analysis of the leading “Great Lechia” authors and their publication as well as the internet sources (webpages, blogs, etc.). On the other side, I will be referring to critical publications and discussions related to this phenomenon. As I argue, motives that lay behind the The Great Lechia popularity refer not only to a growing distrust of science and academic research conclusions but are also a reflection of broader issues connected with condition of contemporary Polish society.

7 ARCHAEOLOGY OF SLAVS OR THE DEVELOPMENT OF MEDIEVAL ARCHAEOLOGY? MEDIEVAL ARCHAEOLOGY IN THE WORK OF THE ARCHAEOLOGICAL SOCIETY OF YUGOSLAVIA

Abstract author(s): Lorber, Crtomir (University of Ljubljana)

Abstract format: Oral

Yugoslavia partially built its legitimacy on an idea of being the “natural” state of southern Slavs. To construct this idea it relied on archaeology and history. One of the most important archaeological “institutions” in Yugoslavia was the Archaeological Society of Yugoslavia (1953–1991), formed after the 1st Meeting of Yugoslav Archaeologists in Niška Banja (1950), where the study of the ethno-genesis of Yugoslav nations was defined as one of the primary goals of Yugoslav archaeology after WW2. This had an impact on the development of the society, primarily on its’ Medieval Section, its’ publishing activity and its’ international work.

The paper discusses the development of the archaeology of the “Slavs” in the Yugoslav archaeological society by highlighting three key topics.

- The definition of the archaeology of the “Slavs”, formed during the meeting in Niška Banja, and the work of the Medieval Section of the Archaeological Society of Yugoslavia, emphasizing that the society conceptualized medieval archaeology in the context of post WW2 nation building and as a tool of international cooperation.
- Looking at the international work of the society we highlight the formation and cooperation with the UIAS (Union Internationale Archeologique Slave), modelled after UISPP, and cooperation of Yugoslavia with the countries of Eastern Europe. In the field of publishing the paper focuses on the journal *Balcanoslavica*, a journal of the Medieval Section.
- In conclusion we define the relationship between the society and other relevant Yugoslav institutions (such as Centar za balkanološka ispitivanja ANUBiH) and its’ view of ideas such as Ilirism and autochthonism, which were popular in certain professional and political circles in Yugoslavia.

8 THE DANGEROUS ENTANGLEMENT OF SERBIAN ARCHAEOLOGY - ARCHAEOLOGICAL EVIDENCE AND INTERDISCIPLINARITY UNDER THE SHADOW OF POLITICAL PRESSURE

Abstract author(s): Milosavljevic, Monika (University of Belgrade)

Abstract format: Oral

The medieval past has been appropriated and misused in support of or to fuel collective identity and answer questions of national origin. In this dangerous entanglement, it is interesting to examine what mechanisms have led to the use of archaeological evidence for such nefarious purposes. Questioning the process of change in archaeological interpretations of the early-medieval Slavic past in Serbian archaeology may act as a prism through which light may be cast on such practices used to prove autochthonous continuity.

Once part of former Yugoslavia, Serbian archaeology shares its general trajectory with its close neighbours’. Serbia’s history of medieval archaeology has not yet been the focus of any critical research. Among other phenomena, relations between archaeological excavations and extremist right-wing interpretations of ethnic origins in 1990’s ethnic wars within the former Yugoslavia fall under a shadow of trauma and silence in Serbian contemporary society. The conceptual foundations of early-medieval archaeology in Serbia were formulated as a cultural-historical paradigm in the shadow of political pressure for constructing identity. The aim of this presentation is therefore to demonstrate the development of a conceptual approach framing of the same evidence that had once been interpreted for a unitary mixed South-Slavic past but then applied to a fragmentary, pure-ethnic past of the Serbs. The backbone for this research is to analyze the scaffolding of archaeological interpretation as it changed through physical anthropology and ethnology to support political misappropriation of evidence to flame ethno-nationalism.

The data samples analysed for this presentation are the main archaeological publications on Slavic and early-medieval Serbian archaeology through discourse and content analysis. The timeframe for this contextualisation of the history of Serbia’s early medieval archaeology focuses from 1945 to 2000, a politically dynamic time (from communist rule, nationalistic uprising, the wars in the former Yugoslavia and its transition).

9 WHERE DID ALL THE SLAVS GO? FROM COLLECTIVE SOUTH SLAVS TO FOREFATHERS OF THE SERBIAN STATE

Abstract author(s): Cvjeticanin, Tatjana (National Museum in Belgrade; Faculty of Philosophy, University of Belgrade)

Abstract format: Oral

The past is always modeled and invented in the present; certain perceptions are accentuated, other neglected. As in other countries, current Serbian memory politics is partly a response to the tensions of the modern world, but mainly it is the answer to the novel political reality emerging after the 1990s. In the aftermath of the end of the Yugoslavia and the dissolution of its symbolic capital of supra-nation the establishment of a new cultural identity and new collective memory was necessary. Chosen was a narrative of the ‘(heavenly) people with (glorious) past’, living on a territory with a special spiritual axis. The nation became the only true community.

Museums played an important role (again) in the creation of this new identity. While pasts and legacies of the Yugoslav federal state were explained “to the people” using unifying elements, such was the idea of the exhibition “Ethnogenesis of South Slavs” (1950), several decades later only traits that distinguish are important in the representations. “Legacies and echoes. Stefan Nemanja – nine centuries” (2013), showing the beginnings of the Serbian state as well as religious and cultural ambient of the medieval Serbia, presented the victorious past, full of splendor and heroes, ‘our’ unique past.

Alongside the glorification of the medieval national history, exhibitions offer celebration of linear connections with great ‘civilizations’, such as Roman, and the plain appropriation of particular prehistoric cultures, such as Vinča. The continuity that is constructed is territorial – singularities of ‘our’ space – and, especially, spiritual – the distinctive Geist (spirit) of this region. The past that defines us is now measured in millennia, and even though the new narrative occasionally distinguishes indigenous ancestors and Slavic fore-brothers from the North, the notion of the long-lasting homeland, i.e. eternal hearth, politically useful, gains momentum.

THE ROLE OF ARCHAEOBOTANICAL RESEARCH IN SLAVIC DISCOURSE

Abstract author(s): Smuk, Ana (Department of Archaeology, University of Belgrade)

Abstract format: Oral

Slavs as an ethnic category are being investigated for decades, having culture-historical paradigm rooted in many of the archaeological interpretations across the Balkans and the Pannonian Basin. One way to develop the research on this topic is by including a set of disciplines dealing with the questions of human economy – among others archaeobotany. It shall be discussed if the archaeobotanical results are showing Slavs as a specific group of people with certain habits and diet preferences, or they, no matter how much we try to single them out from the wide set of ‘others’, are representing ordinary life of those who were interacting with each other without making the differences in the way as we do today. Could the agricultural practices, procession and plant consumption of the Slavs have differed from the other ethnic groups? Shall we look at the Slavs as one phenomenon existing independently of others, or we should look at the broader picture taking into consideration their cohabitation with ‘others’? Published set of archaeobotanical material coming from the medieval Slavic sites and some of the authors work on the sites in the Pannonian Basin/Balkan region will be taken into consideration and compared with the neighbouring countries in order to see to what extent the habits and ideas were fluctuating through the continent, regardless of nation, considering that geography sometimes had more important role than ethnicity. We will try to see if the archaeobotanical interpretations were determined by certain paradigms, or archaeobotanists, dealing with the relatively ‘young’ kind of discipline in the Slavic discourse are rather staying away from the interpretations related to the ethnicity. Therefore, a question if archaeobotanists should deal with the topic of ethnicity at all is something to be considered and debated about.

COLLECTIVE ACTION THEORY: THE NEW APPROACH TO EXPLORE THE SLAVIC ORIGINS AND IDENTITY IN CENTRAL EUROPE

Abstract author(s): Machacek, Jiri (Masaryk University, Brno) - Hofmanova, Zuzana (Masaryk University, Brno; Max Planck Institute for Evolutionary Anthropology, Leipzig)

Abstract format: Oral

Previous research into early medieval society in Central Europe was based on a traditional approach to archaeology focusing on the historical explanation of archaeological and anthropological evidence. Within this paradigm most of the social changes were explained either by migration or with the help of top-down models positing hierarchical control by elites. The Slav predecessors of the Central European nations were thought to have migrated en masse to Central Europe from the east in the 6th century (from the Slavs’ homeland in the central and upper Dnieper region). The multi-ethnic character of the society was rarely taken into consideration, because the traditional and national “ethnic paradigm” had dominated “Slavic archaeology” for decades as stressed by e.g. Sebastian Brather.

To pursue this line of thought, we are introducing a new project. The main objective of the project is to investigate the formation and dynamics of the early medieval Moravian polity and population over an extended period (from the 6th to 10th centuries). Our research is focused on social and ethnic group building, variation in the nature of leadership and on the collective-autocratic variability of governance. Collective action theory seems to be a very effective approach for investigating the past of complex and multiethnic societies. As a key study we will present the new discovery, which is the rune-inscribed bone found in the Early Slavic context (see Journal of Archaeological Science, March 2021, Vol. 127). It should be the first archaeological find indisputably attesting to direct interaction between the people of Germanic a Slavic habitus and perhaps origins in Central Europe.

THE GEOARCHAEOLOGY AND SUSTAINABILITY OF CULTIVATION TERRACES AND LYNCHETS IN EUROPE

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Fallu, Daniel (Arctic University Museum of Norway) - Walsh, Kevin (University of York) - Klinkenberg, Victor (Leiden University)

Format: Regular session

Cultivation, or agricultural terraces (and lynchets), are seen as characteristic land-forming elements in many parts of Europe and worthy of protection under both Global and European Heritage Protection schemes (e.g. UN Sustainability Goals and FAO-GIAHS). This is partly because they are under threat from the refashioning of agriculture on slopes, forestry and rural depopulation. There is a real danger that many will disappear before they have been recorded let alone investigated. Even where they are protected, and being maintained or rebuilt, we rarely know their full use-history, origins and relationship to settlements. This is largely because cultivation terraces have rarely been the focus of archaeological excavation per se – due to problems of dating, a typical lack of finds, and problems of deciphering their past cultivation history from aerobic and biologically active soils. However, there is a suite of new techniques which can overcome some of these problems ranging from Lidar to optically stimulated luminescence (OSL) dating. This session will examine a range of aspects of terrace archaeology from the identification and mapping of terraces, through excavation and geochemical methods, to soil micromorphology and direct-sediment dating techniques (such as OSL). Progress has also been made in the use of phytoliths and, most recently, biomolecular methods, including sedaDNA have been attempted. Knowing the

original crops or vegetation on terraces as well as their date of construction can both inform landscape archaeology and the range of possible land uses that they could be restored to.

This session will present papers using these techniques on terrace systems in Europe and also the Heritage and sustainability aspects of terraces in the light of the refocussing of agricultural incentive schemes and support from both the EU and European governments.

ABSTRACTS:

1 AGRICULTURAL TERRACES: INTENSIFICATION, DIVERSIFICATION AND NUTRITION

Abstract author(s): Brown, Antony (University of Southampton; Arctic University of Norway, Tromsø) - Walsh, Kevin (University of York) - Fallu, Dan (Arctic University of Norway, Tromsø)

Abstract format: Oral

Theoretical debates around the adoption and development of agricultural terracing have generally privileged intensification as the dominant explanatory model. However, terraces, although undoubtedly representing an intensification of pre-existing land use, also represent a process of diversification. This may take the form of multiple crops, inter-cropping and rotational cropping. It can also include multiple crop life-forms, so in addition to graminoids (e.g. grain crops) and forbs (pulses, beans etc.) terraces can also support tree crops (olives, hazelnuts, apples..) and epiphytes (vines, hops, figs) which can maximize not only the created fertilized tread-space but also other niches offered by the walls, water channels and structures. The principal result of this diversification is an increase in multi-nutritional yield (i.e. over the range of nutrients required to maintain a healthy population) including some limiting nutrients (e.g. vitamin C). An additional component is the production of prestige goods, secondary products (e.g. honey) and even craft production. This also implies a close connection with population growth and urbanism. Diversification, not intensification, is also the principal way in which terraces confer sustainability in the face of drought reducing the likelihood of population reduction through famine. This paper argues that we need to reframe the terrace debate in terms of the origins and cultural drivers of diversification and localization which inevitably brings in questions of migration, domestication and the organization of society.

2

EXTENSIVE MEDIEVAL FIELD PATTERNS PRESERVED UNDER WOODLAND CANOPIES IN BOHEMIA: DETECTION, PRESERVATION, VERIFICATION, AND DATING

Abstract author(s): Holata, Lukáš (University of South Bohemia) - Malina, Ondřej (NPÚ and Heritage Conservation) - Plzák, Jindřich - Budilová, Kistýna (University of South Bohemia)

Abstract format: Oral

Considerable afforestation of Bohemian landscape has allowed preserving various remains of past human activities in relief. However, agricultural terraces and lynchets were documented only sporadically and fragmentarily for a long time as they are very hardly discernible by the surface survey in the forest environment. ALS data, used in recent years, has completely changed state of the art – extensive field patterns are indicated under woodland canopies, even the total extent of original ploughlands of some deserted medieval settlements. The paper will discuss the four aspects crucial for the valid interpretation of these types of earthworks: detection, preservation, verification, and dating.

Thanks to a long tradition of research into medieval rural settlements, we focus exclusively on previously discovered sites. For them, a specific method of ALS data elaboration and visualization has been adopted, which ensures the recognition and correct morphological classification of all earthworks indicating medieval land-use, including terraces, lynchets, and even ridge and furrow. Areas of deserted medieval villages are not significantly overlaid by later human activity. Recent disturbances and forest management are thus the greatest threat – they cause significant erasure or destruction of large areas. Therefore, the preservation of field systems is very unbalanced – somewhere we see uniquely preserved field patterns, elsewhere only their fragments. An extensive ground-truthing campaign consisting of surface survey and historical maps analysis is implemented to eliminate a significant number of recent or false objects depicted in ALS outputs. Additionally, the presence of very indistinct/doubtful terraces has been tested using close-range photogrammetry (SfM), which allowed the creation of ‘enhanced 3D models’ of selected transects. Pollen, phytolith, and geochemical analyses confirm the previous cereal cultivation of these areas. Dating represents the most serious issue, but for most cases, the correlation of field patterns with medieval settlements is proven.

3

CHARACTERISING TERRACE SYSTEMS: USING REMOTE SENSING DATA TO HELP UNDERSTAND THE ROLE OF TERRACES IN LANDSCAPE DEVELOPMENT

Abstract author(s): Sevara, Christopher (Newcastle University) - Salazar Ortiz, Natalia (University of Lleida)

Abstract format: Oral

Terrace systems are striking manifestations of the choices people have made in the past as they confronted social and environmental issues and sought short- and long-term agricultural solutions to improve their own lives and/or those of their communities. However, due to a lack of sufficient understanding about the origins, construction, maintenance, and use of terrace systems the reasons for their development largely remain presumptive. A better understanding of terrace development and use is a key to understanding their role within the framework of wider landscape development, and the goal of the project Terraces as Sustainable Agri-

cultural Environments (TerraSAGE). TerraSAGE focuses on improving knowledge about terraced landscapes through a combination of luminescence analysis, integrated geoarchaeological investigation, and landscape analysis and modelling. This paper concentrates on the contributions that over 80 years of remote sensing data, including historic aerial and spaceborne imagery, LiDAR and Synthetic Aperture Radar (SAR) data provide for understanding such events. This information forms the basis of TerraSAGE's Historic Landscape Characterisation (HLC), a geospatial dataset created from a variety of historic and modern information to document the historical transformation of the landscape. We present ongoing research in Catalonia, Spain, discussing how HLC approaches, geospatial analysis and modelling can be used to produce broad-scale narratives of terrace development, document and analyse the impact of modern mechanization on terraced environments, assess the impact of terracing on soil loss, and understand how terraces may contribute to ecosystem sustainability on local and regional levels. Together with data from detailed geoarchaeological and environmental analyses being carried out in other components of the project, this information will be used to better understand the origins and development of terraced landscapes as well as to inform development of sustainable strategies for management, monitoring and their future use.

4 CHARACTERIZING AGRICULTURAL TERRACES - NEW QUANTITATIVE GEOMORPHOMETRIC APPROACHES TO ESTIMATE SOIL VOLUMES STORED

Abstract author(s): Cucchiari, Sara (Department of Agricultural, Food, Environmental and Animal Sciences, University of Udine; Department of Land, Environment, Agriculture and Forestry, University of Padova) - Paliaga, Guido (Research Institute for Geo-Hydrological Protection, National Research Council) - Pears, Ben (Department of Geography and Environmental Science, University of Southampton) - Walsh, Kevin (Department of Archaeology, University of York) - Zhao, Pengzhi - Van Oost, Kristof (Georges Lemaître Centre for Earth and Climate Research, Earth and Life Institute, UCLouvain) - Snape, Lisa - Lang, Andreas (Department of Geography and Geology, University of Salzburg) - Brown, Antony (Tromso University Museum, UiT The Arctic University of Norway; Department of Geography and Environmental Science, University of Southampton) - Tarolli, Paolo (Department of Land, Environment, Agriculture and Forestry, University of Padova)

Abstract format: Oral

Agricultural terraces are the most extensive and common landforms that humans have ever produced. Geomorphometric information can be exploited to study and ultimately assist in the future preservation of such landforms in a world increasingly affected by anthropogenic activities. High-resolution topographic (HRT) techniques allow the mapping and characterization of geomorphological features with wide-ranging perspectives at multiple scales through high-resolution Digital Terrain Models (DTMs). By using riser bases as well as terrace edges (riser tops) and through the computation of geomorphometric parameters as the minimum curvature, it is possible to obtain environmentally useful information on these agricultural systems such as terrace soil thickness and volumes. This work aims to realize and test an innovative and rapid methodological workflow to estimate the minimum anthropogenic reworked and moved soil of terrace systems in three different terrace sites in central Europe (Italy and Belgium). We start with remote terrace mapping at a large scale and then utilize more detailed HRT surveys to extract geomorphological features, from which the original theoretical slope-surface of terrace systems were derived. The utilization of ground-truthing through field excavation and sampling has confirmed the reliability of the methodology used. Differences between actual and theoretical terraces from DTM and excavation evidence have been used to estimate the minimum soil volumes and masses used to remould slopes. Moreover, geomorphometric analysis through indices such as sediment connectivity permitted also to quantify the volume of sediment transported downstream, with the associated and mobilized C, after a collapsed terrace. The quantification of terrace volumes can provide extremely useful standards for further multi-disciplinary analysis on the terrace sediments themselves, new benchmarks for soil erosion models, new perspectives for land and stakeholders for terrace management in terms of natural hazard and offer a measure of the effect of these agricultural systems on soil organic carbon (SOC) sequestration.

5 NEW INSIGHTS INTO AGRICULTURAL TERRACE SYSTEMS. THE USE OF BIOLOGICAL MICRO-REMAINS FOR TERRACE USE

Abstract author(s): Alonso-Eguiluz, Mónica (ERAAUB Equip de Recerca Arqueològica i Arqueomètrica de la Universitat de Barcelona) - Albert, Rosa María (ICREA; ERAAUB Equip de Recerca Arqueològica i Arqueomètrica de la Universitat de Barcelona) - Brown, Antony (Tromso University Museum, UiT The Arctic University of Norway; Geography and Environmental Science, University of Southampton)

Abstract format: Oral

Agricultural terraces are a significant modification of the landscape that provide sediments and nutrients on slopes. On the other hand, and in an archaeological context, they have a social and demographic impact. Biological micro-remains such as phytoliths have proven to be an excellent source of information for understanding agricultural processes, particularly when analyzed in combination with other biological micro-remains such as calcium oxalates (transformed into ash pseudomorphs after combustion), fecal spherulites, starches, diatoms, and sponge spicules. However, and despite the fact that these studies have been applied in a generalized way in urban contexts, and that terraces are a generalized phenomenon throughout the world, there are still few studies that have applied a microbiological multiproxy approach that allows us to understand the formation and uses of agricultural terraces. Here we present the first results of a combined study of phytoliths, ash pseudomorphs, and fecal spherulites applied to three agricultural terrace deposits from various locations in Europe (Italy, Belgium, and the United Kingdom). All of them correspond to different chronological periods ranging from Prehistory to the Middle Ages. The objective of this study is twofold, on the one hand, to evaluate

the potential of the methodology for the understanding formation and post-depositional processes that may have affected the conservation of these remains, and, on the other hand, to shed new light on the crops used on the terraces under study. The results have shown differences for each one of the terraces, both in terms of preservation of the different micro-remains and plant identification. We will analyze these results to further understand the observed differences and their relationship with the formation of the deposits and the possible post-depositional processes that may have affected the preservation of the different micro-remains, and evaluate their feasibility from an archaeological perspective for the identification of crops.

6 TEMPERATURE SENSITIVITY OF SOIL ORGANIC CARBON IN TERRACE SOILS

Abstract author(s): Zhao, Pengzhi (Georges Lemaître Centre for Earth and Climate Research, Earth and Life Institute, Université catholique de Louvain) - Fallu, Daniel (Tromso University Museum, UiT The Arctic University of Norway) - Cucchiari, Sara (Department of Agricultural, Food, Environmental and Animal Sciences, University of Udine; Department of Land, Environment, Agriculture and Forestry, University of Padova) - Tarolli, Paolo (Department of Land, Environment, Agriculture and Forestry, University of Padova) - Snape, Lisa - Lang, Andreas (Department of Geography and Geology, University of Salzburg) - Brown, Antony (Tromso University Museum, UiT The Arctic University of Norway; Geography and Environmental Science, University of Southampton) - Van Oost, Kristof (Georges Lemaître Centre for Earth and Climate Research, Earth and Life Institute, Université catholique de Louvain)

Abstract format: Oral

Being the most widespread man-made landform, terrace construction has resulted in an extensive perturbation of the land surface. This perturbation has induced changes in soil organic carbon (SOC) stocks, as well as the temperature sensitivity of SOC to decomposers (Q10) in terraced soils, but both are poorly constrained. Understanding the fundamental drivers and basic patterns of Q10 in terraced soils, however, is critical for predicting the future status of SOC stocks in the context of climate change. Here we explored the factors controlling Q10 of heterotrophic soil respiration of abandoned agricultural terrace soils, using soil fractionation and temperature sensitive incubation experiments in combination with measurements of terrace soil burial age and soil pedogenic oxides. Our preliminary results indicate that Q10 was closely related to the terrace soil age. In the relatively younger terraced soils, a decrease of Q10 with soil burial age was observed. This pattern is related to the fact that stronger SOC protection mechanisms, such as soil aggregation and organo-mineral interaction, limit the substrate availability, leading to a decrease in Q10 with soil burial age. However, in the relatively older terraced soils, an increase in Q10 was observed in the oldest soil horizons. On one hand, SOC becomes more chemically recalcitrant due to the preferential decomposition of more labile fractions (i.e., coarse particulate SOC), and this result in a low quality but high-temperature sensitivity of SOC stock in old buried soil horizons; but on the other hand, constraints of SOC protection mechanisms (through mineral associations) gradually weakens with soil aging. This may allow the previously chemically recalcitrant SOC to become accessible again to decomposers and increases sensitivity to warming. These results suggest that the buried SOC stock in the old terrace landscape could be more sensitive to climate change under the scenario of global warming.

7 INVESTIGATING RURAL CHANGES: TERRACES AS ARCHAEOLOGICAL EVIDENCES AND HERITAGE MONUMENTS. CASE STUDIES FROM LIGURIAN APENNINES

Abstract author(s): Stagno, Anna Maria - Panetta, Alessandro (University of Genova - Laboratory of Environmental Archaeology and History - DAFIST-DISTAV)

Abstract format: Oral

Starting on the results of a series of systematic archaeological surveys and excavation carried out in Western Ligurian Apennines by the Laboratory of Environmental Archaeology and History at the University of Genova, this paper proposes a reflection on the multiple dimensions of environmental resource management practices, interpreting them as actions (facts) characterized by the stratification of social, juridical and technical practices. The research made it possible to analyse a high number of historical terraces dated at least since the 16th c.

From a methodological point of view, the aim of the paper is to discuss if it is possible to build chrono-typologies of terraces, detecting their chronologies from the different typologies of their dry-stones walls. From a theoretical point of view, the idea is that to keep together the different dimensions of the actions permits the implementation of new perspectives on the processes that bind social change with landscape transformation, focusing on the process of marginalisation of the European rural societies as a parallel process of the one of the heritagisation of their historical rural landscapes.

8 THE TERRACES OF KYTHERA: INTERDISCIPLINARY BIOGRAPHIES OF A 4000 YEAR-OLD MEDITERRANEAN LANDSCAPE

Abstract author(s): Trimmis, Konstantinos (University of Bristol) - Tzortzopoulou-Gregory, Lita - Paspalas, Stavros (Australian Archaeological Institute at Athens)

Abstract format: Oral

Terraced landscapes across the Mediterranean are well studied in their historical and geographical context and their functional role for agriculture and water management is well documented. In the context of the Greek islands, studies on the terraces have taken place, among other places, on the islands of Crete, Andros, Kephallonia, and Kythera. Most of these studies have focused on the geoarchaeology of the terraced landscapes and their role in local communities. In the context of the Australian Paliochora-Kythera

Archaeological Survey (APKAS), a project that aims to record the prehistoric and historical landscapes of the northern part of the island of Kythera, a small study was undertaken with the aim to preliminarily record the date using OSL dating, architecture, and the geoarchaeological development of the terraces in this part of the island. The results of this study point to a landscape almost 4000 years-old with the first terraces emerging at some point in the early centuries of the 3rd millennium. The terraces have been constructed with similar complex architectural elements and have been cultivated and maintained diachronically following similar patterns. This paper will present the research conducted on the terraces in northern Kythera and how they relate to terracing techniques across the Aegean, while putting forward some ideas for further research in the area.

9 MANAGING A MARGINAL LANDSCAPE IN BRONZE AGE CRETE: THE AGRICULTURAL TERRACES AND DAMS AT CHOIROMANDRES, ZAKROS

Abstract author(s): Vokotopoulos, Leonidas (“Minoan Roads” Research Project)

Abstract format: Oral

Recent investigations on the island of Crete, Greece, have documented the presence of agricultural terraces and dams dating from the first half of the second millennium BC – the heyday of Minoan civilisation. Most of these structures represent isolated finds, yet in a few exceptionally well-preserved cases a better understanding of their arrangement and extent has been possible, the whole picture substantiating an intensive exploitation of the hinterland and a pressing need to ensure the productivity of the marginal parts of the landscape.

One such site is Choiromandres, situated at the east end of the island. Surface survey and excavation have resulted in the detection of terraces, enclosures, dams and check-dams that cover a significant part of this small valley. Most of these structures were apparently constructed all at once – they represent, that is, a single large undertaking. Interestingly, this dates to the aftermath of the Bronze Age eruption of the volcano on the island of Thera – an event that had a profound impact on the palatial polities of Crete.

This paper will provide an overview of the land and water management project at Choiromandres, discussing its planning, function, and dating in respect to erosional and depositional events, with the aim of placing this undertaking in its wider historical context.

10 SITE TAPHONOMY IN MEDITERRANEAN TERRACED LANDSCAPES: THE CASE OF SITE RB228 (CERCHIARA DI CALABRIA, IT)

Abstract author(s): van Leusen, Martijn (Groningen Institute of Archaeology)

Abstract format: Oral

Human tillage has long been among the most powerful geomorphological forces affecting archaeological landscapes. As is demonstrated by the results of the intensive and systematic fieldwalking surveys conducted between 2000 and 2013 by the Groningen Institute of Archaeology in the Raganello watershed basin in northern Calabria (Italy), cultivation terraces and lynchets play an important role in preserving/obscuring archaeological remains in situ, but the concomitant plough erosion plays an equally significant role in destroying/uncovering such remains. The current paper focuses on archaeological sites that appear to be partially preserved beneath a terrace or lynchet, and partially damaged or destroyed in the field immediately downslope of it; in recent years we examined four such sites with test trenches and excavated one in order to understand how taphonomic processes result in the pottery scatters observed at the surface. We review the results of these investigations and discuss the implications for site preservation and the interpretation of geophysical survey data.

11 THE TERRACES OF CASTRONOVO AND THE CONSTRUCTION OF LANDSCAPE IN ISLAMIC SICILY

Abstract author(s): Molinari, Alessandra - Ciccone, Gabriele - Giovannini, Fabio (University of Rome Tor Vergata) - Fiorentino, Girolamo (University of Salento)

Abstract format: Oral

The research carried out in the town of Castronovo di Sicilia as part of the ERC SicTransit project (directed by M.O.H. Carver and Alessandra Molinari) has allowed us to study the system of irrigated terraces within the town through different types of sources. On the basis of various clues it is possible to hypothesize that the original design of the system, which up to the present day has guaranteed prosperity to this Sicilian community, was born in the Islamic age. In 2019 it was possible to carry out a stratigraphic excavation in a specific terrace and collect various information on its construction history. The overall study of the irrigated system through the drone made it also possible to hypothesize the main phases of its topographical development. The contribution will place this particular study in the more general transformations of the territory of Castronovo between the seventh and fourteenth centuries AD.

12 SOME THOUGHTS ON THE AGE AND ORIGIN OF AGRICULTURAL VALLEY TERRACES IN ETHIOPIA AND TUNISIA

Abstract author(s): Blond, Ninon (Université Lumière Lyon 2, Archéorient - UMR 5133; École Normale Supérieure de Lyon - ENSL, EVS - UMR 5600) - Benoist, Anne (CNRS, Archéorient - UMR 5133) - Callot, Yann (Université Lumière Lyon 2, Archéorient - UMR 5133) - Gajda, Iwona (CNRS, Orient & Méditerranée - UMR 8167) - Jacob-Rousseau, Nicolas (Université Lumière Lyon 2, Archéorient - UMR 5133) - Schiettecatte, Jérémie (CNRS, Orient & Méditerranée - UMR 8167)

Abstract format: Oral

Nowadays, many parts of the world are cultivated on terraces. These include Eastern Tigray (Ethiopia) and Southern Tunisia, where such terraces allow rain-fed agriculture without irrigation. The terraces of these two regions, however, have the particularity of being erected not on the slopes but in the valleys, which they cross perpendicularly to form flat cultivation areas and conserve water and soil on the plots.

In Eastern Tigray, pre-Aksumite, Aksumite and post-Aksumite archaeological remains have been unearthed on the high points overlooking the terraced valleys. The cultural exchanges between these populations and the Sabeen populations of South Arabia, renowned for their hydro-agricultural works, are well documented today and lead to the hypothesis that terraces were ancient. Similarly, in Tunisia, the attested existence of hydro-agricultural developments from the Roman period in the region raises questions about the age and origin of the actually visible structures.

A methodology combining geoarchaeology, geohistory and ethnogeomorphology allows apprehending these issues and estimating the period of installation of water and soil protection structures in the two studied areas, in a comparative perspective.

Moreover, the contemporary evolution of these structures raises the question of their sustainability. In Eastern Tigray, agricultural terraces represent the main, if not the only means of subsistence for the populations. They are now subject to erosion. In Southern Tunisia, the recent rural exodus has exposed the structures to rapid evolution: destruction of low walls, loss of agricultural land by suffosion. Southern Tunisia thus allows a prospective reflection on the future of Tigray in the light of the ongoing rural exodus and questions the factors of regressive erosion in these two areas. More broadly, these two case studies can serve as analogues for reflection on other terraced areas, at different periods and in different regions.

13 ON THE TIMING OF AGRICULTURAL TERRACES: OPTICALLY STIMULATED LUMINESCENCE DATING APPLIED TO TERRACED LANDSCAPES IN THE UK, BELGIUM AND ITALY

Abstract author(s): Snape, Lisa - Lang, Andreas (Department of Geography and Geology, University of Salzburg) - Brown, Tony (Tromsø Museum, UiT; Palaeoenvironmental Laboratory, University of Southampton) - Fallu, Daniel (Tromsø Museum, UiT) - Pears, Ben (Palaeoenvironmental Laboratory, University of Southampton) - Walsh, Kevin (Department of Archaeology, University of York) - Cucchiari, Sarah (Department of Agricultural, Food, Environmental and Animal Sciences, University of Udine; Department of Land, Environment, Agriculture and Forestry, University of Padova) - Zhao, Pengzhi (Georges Lemaître Centre for Earth and Climate Research, Earth and Life Institute, UCLouvain)

Abstract format: Oral

Ancient terrace and lynchets are abundant across various environmental settings; commonly within mountainous, hilly zones, and other undulating landforms. Our understanding of their origins, timing of use and abandonment has been hampered by the lack of reliable dating evidence. This has made it difficult to draw comparisons across different time periods and understand landscape transformation in response to cultural transitions, climate and other environmental changes. The ERC project ‘TerrACE’ offers the opportunity to study terraces and lynchets systematically from different locations across Europe and to understand how different factors - topography, geology, soil types and agricultural practices - influence the mineralogical characteristics that are important for applying optically stimulated luminescence (OSL). Here we present the OSL dating results from three distinctly different terrace and lynchet systems in Italy, Belgium and the UK. OSL ages show that some lynchets were established in Prehistory and were utilised over millennia into the Medieval period, whilst some terraces were used only over a very short period of time (a few hundred years or less). We suggest that OSL dating techniques can routinely be employed in the study of terrace landscapes in conjunction with other geoarchaeological techniques. This paper will also discuss some of the remaining problems of OSL dating terraces and some possible solutions.

14 ORIGINS AND HISTORIES OF (AGRICULTURAL) TERRACING AT PETRA, JORDAN

Abstract author(s): Plekhov, Daniel - Rojas, Felipe (Brown University) - Newman, Sarah (University of Chicago) - Nicosia, Cristiano (Università di Padova)

Abstract format: Oral

Studies of agricultural terraces have long recognized their recurrent use or re-use through time, in some cases after centuries of abandonment and disuse. The capacity for these structures to be repaired, modified, and transformed underscores their enduring function as landesque capital, continuing to influence land-use practices well after their initial construction. Less acknowledged are the various kinds of landscape modifications that precede terrace construction, which nevertheless also have enduring effects on the landscape and may in fact influence where terraces are built. This paper presents the preliminary results of the Petra Terraces Archaeological Project, which in 2019 investigated a dense concentration of terraces in the hinterlands immediately north of Petra,

Jordan. Although most of these walls were initially thought to have been built in the first centuries CE, the results of our radiocarbon and optically stimulated dating indicate that some may in fact date several thousand years earlier. Their use as terrace walls by local communities today, and perhaps at various points in the recent past, is thus only one of their functions of through time. PTAP's findings caution us to be explicit about the time scales over which we evaluate the sustainability of terrace systems and also underscore the need for even greater time depth in studying their development and long-term history of use.

15 ON NOT OVERLOOKING LOOKING CLOSELY: THE BENEFITS OF MACROSCOPIC ANALYSIS AND ATTRIBUTE-BASED TERRACE DOCUMENTATION

Abstract author(s): Kvapil, Lynne (Butler University)

Abstract format: Oral

For many years, the study of agricultural terraces was hampered by doubts about dating dry stone architecture – doubts that were aggravated by archaeological approaches privileging the search for sites over elucidating the longue durée of the landscape. Off- and non-site approaches to archaeological exploration along with a bevy of technologies able to establish secure chronologies for terrace use and constructions have ushered in a renaissance of scholarship on agricultural terraces and a renewed focus on land use and farming. This paper, while acknowledging these advances, outlines the benefits of incorporating macroscopic analysis for the localized study and architectural documentation of terrace construction as a complement to the range of new techniques.

The methodology described here was developed and implemented for the study of agricultural terraces in the Korpos region in the Corinthia of southern Greece as part of the Saronic Harbors Archaeological Research Project (SHARP). Documentation consisted of multiple phases of macroscopic analysis and hand mapping that led to the assemblage of a suite of terrace attributes distinct to this region. Attributes were used to establish a relative sequence of terrace construction; but, perhaps more importantly, micro-histories of long-term land use centered on terraced farming were able to be determined on a slope-by-slope basis. The approach revealed that the relationship between successive terracing phases and the preservation of terrace walls in the landscape was often surprisingly complex. Past attempts at terrace removal, indications of reuse and rebuilding, and complicated architectural positioning – discovered through systematic documentation and repeated close observation – illustrate cycles of change and continuity in local approaches to the landscape, including the types of farming technologies used and the possible range of crops cultivated from the Bronze Age to the Modern period.

16 OSL AND PROXY DATING OF LATER PREHISTORIC CULTIVATION TERRACES ON ARTHUR'S SEAT, CENTRAL EDINBURGH, SCOTLAND

Abstract author(s): Srivastava, Aayush - Kinnaird, Tim (School of Earth & Environmental Sciences, University of St. Andrews) - Johnson, Melanie (CFA Archaeology Ltd) - Tipping, Richard - Wilson, Clare - Ferreira, Carla - Tisdall, Eileen - McCulloch, Robert (School of Biological & Environmental Sciences, University of Stirling) - Pickering, Rachel (Historic Environment Scotland, Edinburgh)

Abstract format: Oral

Arthur's Seat, a prominent volcanic plug in central Edinburgh, supports the most extensive cultivation terraces in northern Britain. At least 20 terraces extend some 9.6ha, broadening downslope to widths of around 370m. Excavation of a few terraces in 2019 is the only modern-standard analysis. In support of this, OSL profiling, OSL dating, and portable XRF analyses were used to decipher the stratigraphy. Three OSL assays from basal sediment give pre-Holocene ages. The oldest dated Holocene sediment, in Trench 4 has an age of 1640 ± 490 BC, within the Bronze Age. These contexts appear to drape the remains of a stone bank. Other OSL assays, in Trench 4 and others, are much younger, of early to mid-Iron Age (650 ± 380 BC; 150 ± 250 BC), and broadly Medieval. It is difficult without further analysis to understand fully the chronology of soil/sediment formation from excavation, but this can be compared with securely ^{14}C dated pollen and sedimentological analyses from Dunsapie Loch, at the base of the slope. At 1833-1242 BC there was the first major increase in eroded sediment, in a treeless, fully agrarian landscape. After 1111-928 BC, lithogenic elements, from bedrock, became far more abundant than more mobile, pedogenic elements, until 377-93 BC. One explanation for this imbalance is the preferential loss after c. 1000 BC of pedogenic elements in soils stored in cultivation terraces. Thus, two lines of evidence make us suggest the Arthur's Seat cultivation terraces began to be constructed in the Bronze Age. The social and organisational implications of such activity is exceptional in this period in this region.

17 CONSTRUCTION OF MEDITERRANEAN TERRACES INTENSIFIED IN THE LATER MIDDLE AGES: EVIDENCE FROM LANDSCAPE ANALYSIS USING OSL-PD

Abstract author(s): Turner, Sam (Newcastle University) - Kinnaird, Tim (University of St Andrews)

Abstract format: Oral

Dating the construction and use of earth features including terraces has been a long-standing problem for archaeologists. The history of agricultural terraces consequently remains poorly understood and this has impacted research on their significance more widely, limiting knowledge of past agricultural practices and the long-term landscape management strategies used by rural communities. In a series of five widely-separated case-studies from Turkey, Greece and Spain, optically-stimulated luminescence profiling and dating (OSL-PD) was applied to to date the construction and use sediments associated with agricultural terraces. Through GIS-based landscape characterisation the results were linked into the wider context in order to shed light on the evolution of these

terraced landscapes more broadly. Results from across the Mediterranean show that the most intensive episodes of terrace construction took place during the later Middle Ages (c. AD 1100-1600); these major episodes of landscape reorganisation were rarely evident in other archaeological or historical sources. The five pilot studies have informed the methodology used in ongoing multi-proxy analyses for the TerraSAgE project.

18 TERRACES AND LYNCHETS IN PYRENEAN PASTURES: METHODOLOGICAL APPROACHES AND SOCIAL CONTEXTS (BRONZE AGE TO THE PRESENT)

Abstract author(s): Rendu, Christine (CNRS UMR 5136 Framespa) - Bal, Marie-Claude (CNRS UMR 5602 Géode) - Calastrenc, Carine (CNRS UMR 5136 Framespa) - Passarrius, Olivier (Pôle archéologique des Pyrénées-Orientales) - Bousquet, Delphine (UMR 5608 Traces) - Guerre, Josselyne (Inrap) - Lallemand, Véronique (Ministère de la Culture - SRA Occitanie) - Bille, Elisabeth (UMR 5136 Framespa) - Conesa, Marc (Université Montpellier 3 Laboratoire Crises) - Campmajo, Pierre (UMR 5608 Traces)

Abstract format: Oral

Ten years ago, the archaeological exploration of terraced systems on the Pyrenean slope of Enveig, between 1650 and 1950 m asl, gave rise to a debate on the cross-use of pedoanthracology, archaeological stratigraphy and radiocarbon dating of coals to understand the chronology and succession of the terraces. In the light of the results, a Bronze Age chronology was proposed for the first generation of terraces observed, and finally admitted. As charcoals in the soils can always be discussed in a chronostratigraphic point of view, we will first return to the main arguments that supported our reading of the profiles.

Other archaeological experiments were subsequently carried out in the same micro-region, using different methods. These fieldwork focused on: 1. the creation and transformation processes of the terraced landscape of a medieval village (Vilalta, 1700 m asl), which we sought to study before, during and after the existence of the settlement; 2. the spatial organisation of terraced plots built around medieval and modern seasonal barns (1800 - 2000 m asl), scattered in the communal heathland; 3. a set of small lynchets created by regular practices of land redistribution in a communal pasture at a lower altitude (1600 m asl).

The aim of this communication is, first, to compare these fieldworks from a methodological point of view (contributions of GPS mapping and mechanical trenches to the spatial understanding of the phenomena, use of radiocarbon measurements and sedimentary approaches). The social and environmental contexts and dynamics of these terraced systems, which oscillate between common land and private plots, will then be discussed, using, together with archaeological sources, written and ethnographic documentation. The final questions will focus on the different trajectories illustrated by these case studies, on what they say about the sustainability of these socio-environmental configurations, and on ways to improve this research.

19 THE PLUZINA FIELD SYSTEMS – THE NEGLECTED MEDIEVAL LANDSCAPE PHENOMENON IN THE CZECH REPUBLIC

Abstract author(s): Šitnerová, Ivana - Beneš, Jaromír - Majerovičová, Tereza - Bumerl, Jiří (Laboratory of Archaeobotany and Palaeoecology, Faculty of Science, University of South Bohemia, České Budějovice; Institute of Archaeology, Faculty of Arts, University of South Bohemia, České Budějovice) - Janečková, Kristina (Department of Land Use and Improvement, Faculty of Environmental Sciences, Czech University of Life Sciences, Praha)

Abstract format: Oral

The pluzina landscape in the Czech Republic is a very significant feature of former arable agriculture. These field systems were neglected by archaeologists for a long time despite their important role in making of landscape character. Today more attention is afforded them in connection with study of agrarian villages background due to new methods of remote sensing and environmental archaeology. The research project „Identification and protection of preserved remnants of the historical pluzina system“ supported by the Ministry of Culture Foundation of the Czech Republic is taking place from 2018 with duration to 2022. Aim of this project is to provide knowledge about important role of these past agrarian field remains and to provide a basis for qualified protection of the pluzina itself, which is missing in the Czech Republic. The specific goal of this project is to date particular chosen systems of pluzina field remains and to collect other data for detailed description and reconstruction of the past vegetation. With this data, researchers can describe the development of these field systems and their original function as arable fields and later as pastures. We compare archaeological data (technological elements of agricultural terraces; ceramics in the past and present arable soils), environmental data (pollen, botanical macroremains, AMS ^{14}C , isotopes of ^{210}Pb and ^{137}Cs) and historical dating (written sources) of pluzina archaeological remains. Five sites with the different pluzina field systems were chosen across the Czech Republic. This contribution is more focused on one of them to demonstrate the first completed result of this project.

20 LIVING ON THE EDGE PATTERNS OF SETTLEMENT AND CULTIVATION IN THE INNER FJORDS OF SUNNMØRE, NW-NORWAY

Abstract author(s): Dahle, Kristoffer (Møre & Romsdal County Council) - Fallu, Daniel (UiT The Arctic University of Norway)

Abstract format: Oral

In 2005 the Geiranger fjord entered the UNESCO World Heritage List, as a central part of the Western Norwegian Fjord landscape. It represents a marginal agrarian landscape, with small iconic farms situated on ledges and steep mountainsides along the fjord, and a contrast both to central agricultural areas along the coast and the hunting grounds further inland. Yet, our knowledge on the origin

and development of these small agrarian farms is still quite limited, as modern development-led archaeology has not yet encroached into these sparsely populated areas.

In 2018 Møre & Romsdal County Council initiated a project to enhance our knowledge on the settlement and land-use in this area, based on archaeological and palynological investigations of lynchets and field tillage at the fjord farms. These investigations were viewed in relation to more central farm settlements, on the basis of written sources, grave-finds and development-led excavations and surveys, as well as to the numerous traces of hunting and trapping in the mountains beyond. This project was followed up by new investigations along the fjords in 2020, as part of the TerrACE-project. By widening the toolkit (e.g. pOSL, XRF, aDNA), what can these investigations tell us about former land use and management, continuity and change, and how this affected the soil properties in a long term perspective.

21 ANTHROPOGENIC SOILS ON JÆREN - RESULTS FROM MICROMORPHOLOGY, XRF-ANALYSIS, AND RADIOCARBON DATING

Abstract author(s): Lechterbeck, Jutta - Gebremariam, Kidane Fanta (Arkeologisk Museum, Universitetet i Stavanger)

Abstract format: Oral

In the course of development led excavations the Museum of Archaeology in Stavanger often encounters so called "cultivation layers" – most of them turned out to be actually anthropogenic soils or even fulfil the criteria for plaggen soils. Most of these soils are found on Jæren, which is an ancient cultural landscape, settled since the Mesolithic. Though many soil profiles have been sampled for pollen, botanical macroremains, micromorphology and radiocarbon dates very little research has been done on the soils themselves.

In the last years we were able to analyse profiles from the ancient farms Tjora and Hogstad, who shared a common infield. The anthropogenic soils of the infield are built up on the remnants of the original podzol. Micromorphological analyses revealed the actual anthropogenic character of the soils featuring microcharcoal, wood charcoal, fuel debris and heated or burnt mineral grains. Furthermore, all profiles featured a very high organic content. XRF analyses showed also very high values for phosphorous and carbon.

A survey of the excavation reports from the last 20 years showed that these soils are very widespread in Rogaland. These excavation reports provided a large dataset of radiocarbon dates (over one hundred) which were group calibrated. The large number of the dates outlevels to some extent the fact that older material is mixed into younger soils. The radiocarbon dates revealed that the practise leading to plaggen soils started in Rogaland at least in the pre-roman Iron Age, maybe as early as in the Bronze Age.

Additional analyses are currently under way such as analysis of organic components. Further research questions include quantitative element analysis, quantification of soils and climatic relevance as carbon sinks as well as the archaeological implications of this major land use shift which still coins the appearance of the landscape today.

22 ANALYSIS OF LOESSIC ORIGINATED TERRACE AND LYNCHET SEDIMENT SYSTEMS IN CHALKLAND LANDSCAPES OF THE UK AND CENTRAL EUROPE

Abstract author(s): Pears, Ben (University of Southampton) - Brown, Antony (Tromsø Museum, UiT; University of Southampton) - Roberts, Mark (University College London) - Lang, Andreas - Snape, Lisa (University of Salzburg) - Fallu, Dan (Tromsø Museum, UiT) - Walsh, Kevin (University of York)

Abstract format: Oral

Loess deposits cover large areas of central mainland Europe but are far rarer in the UK. In many cases windblown sediments have been mapped across chalkland landscapes and due to their particular textural characteristics have been intensively cultivated which has led to major colluviation and sediment storage within terrace and lynchet features. This paper presents geoarchaeological results from a substantial chalkland terrace system on the South Downs at Charlton Forest, Sussex identified by Lidar and archaeological excavation and compares it to a large lynchet and terrace system from Belgium.

Both sites demonstrate distinctive horizonated sediment stratigraphies dominated by loessic reworking alongside distinctive anthropogenic input and processional alteration through the cultivation practice over time.

Optically Stimulated Luminescence (OSL) dating of the Charlton Forest site has demonstrated in-situ loess dating to the Late Pleistocene and preserved beneath a Mesolithic burnt mound at the top of the hill, whereas in the terrace system itself repeated cycles of reworked loess and stony sediments have been accreted since the Early Bronze Age and the agricultural system appears to have been extensively exploited from the Romano-British to mid-7th century AD and probably until the development of beech (fagus) woodland in the medieval period.

Comparisons between Charlton and the Belgian site show similar thicknesses of in-situ loess at the hilltop location (30-50cm) with clear downslope variation within lynchets and terrace structures. Additional analysis of the valley bottom at Belgium also demonstrates the extent of colluviation over an extended period as a result of extensive, prolonged cultivation throughout the Holocene.

180 PROTECTING ARCHAEOLOGICAL HERITAGE IN THE GLOBALISATION ERA: TRENDS, CHALLENGES, SOLUTIONS ILLICIT TRADE

Theme: 4. Globalisation and archaeology

Organisers: Mödlinger, Marianne (University of Genoa) - Kairiss, Andris (Riga Technical University) - Bernard, Elisa (IMT School for Advanced Studies Lucca) - Olevska, Irina (ArtLaw.club)

Format: Regular session

The increase of trafficking in cultural goods through globalisation constitutes a fast-growing threat to the protection of cultural heritage and its role as an important resource of socio-economic development. Online trade and social media significantly ease the organisation of looting and selling of artifacts from conflict areas, Europe and other regions.

This raises questions concerning the effectiveness and accountability of the UNESCO 1970 and UNIDROIT 1995 Conventions and other international legal instruments. Bilateral accords (e.g. Met-Italy 2006 "Euphronios" Accord), Codes of Ethics and Conduct (e.g. AIAD/IADAA/CINOA/AIC/ICOM), best practices and guidelines underline a global, but toothless will of protection.

Nowadays, especially during the Covid-19 pandemic, museums are increasing Open Access policies: virtual tours, online databases and catalogues ease international fruition of cultural heritage. On the contrary, there are numerous private collections that remain unavailable to research and public.

IT sets out both opportunities for, and challenges to countering of looting and illicit trade. Searchable databases allow users to check the objects' provenance and register lost/stolen properties (e.g. Carabinieri T.P.C.'s Leonardo, Art Loss Register), whilst projects that create repositories of artefacts currently in circulation aim at counteracting looting and illicit trade (e.g. Circulating Artefacts, Palmyra Portrait Project).

The (continuing) entry of artefacts with doubtful provenance in museums calls for a discussion about whether and how such artefacts should be published. Several institutions (e.g. AIA/DAI/IAA) provide indications. We aim to develop basic principles/guidelines for EAA members concerning the publication of illicit artefacts.

Papers for this session may include but are not limited to:

- Impact of globalization on, and strategies against illicit trafficking in cultural material;
- Changes and challenges in looting and illicit trafficking during Covid-19;
- How to increase public accessibility to private collections;
- (Inter)national (online) activities against looting and trafficking;
- Ethics of publishing illicit antiquities;
- Scientific value and narrative of looted objects.

ABSTRACTS:

1 THE REPATRIATION OF ARCHAEOLOGICAL PROPERTY AND ITS DILEMMAS

Abstract author(s): Bernard, Elisa (IMT School for Advanced Studies Lucca)

Abstract format: Oral

Since the late nineteenth century, the protection of Italy's archaeological property has raised a number of dilemmas, including the tensions between cultural property nationalism and internationalism and the degree of museums' decentralisation on the Italian territory (polycentrism versus "oligo-centrism"). In recent years, another dilemma has emerged that reflects the friction between the function that public powers should deliver in this field: protection and valorisation. This paper explores these dilemmas with a twofold aim. The first section reconstructs the main points of the debate that raged in Parliament and academia after the Unification of Italy over how to control the loss of archaeological objects: both State retention and context-based conservation were believed to foster universal culture. The second section uses the case of Morgantina's Hellenistic Silver to investigate whether and how the pillage and later repatriation of Italian archaeological objects from foreign "universal museums" compromise the Italian narrative surrounding them and where and how they best serve the interests of protection and valorisation. It argues that museums can play a significant role and become reception contexts (also) for looted and repatriated archaeological objects when they leverage both those objects' lost origin context and (illicit) provenance as well as the museum's own meta-history.

2 THE ICOM RED LIST FOR SOUTHEAST EUROPE EXPERIENCE

Abstract author(s): Cosic, Natalija (Department of Archaeology, Faculty of Philosophy, University of Belgrade)

Abstract format: Oral

The aim of this paper is to present working experience on the development of the Red List of Cultural Objects at Risk in South-Eastern Europe (SEE) that occurred during 2020 and 2021. The ICOM Red Lists of Cultural Objects at Risk became a worldwide initiative in order to illustrate the most vulnerable cultural assets and objects that are subjected to looting and trafficking. During its twenty years of existence, the Red List has covered the territory of different countries in Asia, Latin America, West Africa, as well as North Africa, and the Middle East. The initiative to create the ICOM Red List SEE is the first publication of its kind for the European countries.

The ICOM initiative for the Red List for SEE included the following countries: Albania, Bosnia and Herzegovina, Bulgaria, Montenegro, Croatia, Romania, Moldova, Northern Macedonia, Slovenia, and Serbia. The drafting phases were defined by the ICOM Red list general guidelines, but the decision on a methodology for determining and collecting information was left to each working group of the ICOM National Committees. Based on the participatory model and open consultations with professionals from museums, institutions of protection, and culture, the working group of the NC ICOM Serbia worked on developing a list of objects at risk of theft and illicit trade. During this process, the working group faced a number of challenges in researching and compiling the list of endangered cultural assets.

Although the Red List SEE will be finalized during 2021, the overall experience has brought many questions, but also some fruitful solutions and insights in this topic.

3 COMMUNAL AND NON-PUBLIC ARCHAEOLOGICAL COLLECTIONS OF LOWER AUSTRIA

Abstract author(s): Kerbler, Lukas (ARMET Archäologie & Archäometallurgie e.U.) - Pieler, Franz (State Collections of Lower Austria) - Maurer, Jakob (Danube University Krems)

Abstract format: Oral

Archaeology aims at understanding life of the past. As the material culture is the main source, it is vitally important to Archaeological heritage management, scientific research and for the engagement of the public with local history, to know as many sites and finds in a region as possible in order to get an idea of the context and the greater picture.

In Lower Austria, much of our archaeological heritage is not in the hands of state institutions, but in small communal or private collections. These rarely have their collections registered or published in any form, so we have no information on them.

To improve the situation, in 2013 the State Collections of Lower Austria and the Federal Monuments Authority of Austria started a cooperation project with the aim of establishing a systematic record of small communal and private collections.

Since private archaeological collections are as diverse as their individual owners are, the creation of comparable general metadata, using a standardised questionnaire, is vital. This includes basic information about the collection (e.g. contact data, owner/s, focus ...) and its archaeological quality (site allocation/documentation; inventory and storage situation). An important question is about plans for the collection's long-term preservation. Of collections with uncertain prospects and those in private ownership, a standardised catalogue and photo documentary of the most relevant finds is being established.

The paper will present

- a) The general background of the historical development of the role of small and non-public-collections in Lower Austria and of challenges one is confronted with when needing data from them e.g. for research projects.
- b) The project started in 2013 upon this background.

c) An appraisal of how this project connects to the sessions keywords, esp. "accessibility", "provenance", "scientific value" and trade/trafficking.

4 OWNERSHIP OF ARCHAEOLOGICAL HERITAGE OBJECTS: ADVANTAGE OR ENCUMBRANCE?

Abstract author(s): Kairiss, Andris (Riga Technical University) - Olevska, Irina (ArtLaw.club)

Abstract format: Oral

Cultural-historical and, inter alia, archaeological sites provide opportunities to meet different needs and interests, such as aesthetic, symbolic, educational, research and others. No less important are the economic opportunities offered by the development of the potential of cultural heritage sites. Socio-economic interests and thus the opportunities provided by heritage sites, depending on the quality and significance thereof, affect many stakeholders - their owners (individuals, companies and other organizations, municipalities, state), local community, researchers, tourists, businesses, mass media, heritage institutions, etc., as well as society as a whole.

However, it is widely acknowledged that investment in cultural heritage sites (including conservation, restoration, maintenance, marketing, etc.) tends to outweigh their direct economic benefits (direct revenue). The financial and informational aspect of state aid is important, as ownership of an object with the status of a cultural monument not only increases socio-economic opportunities, but also imposes certain obligations and business activity restrictions. Thus, questions arise: does the immovable cultural object represent opportunities or burden to its owner? What does the effective use of the cultural object owner's opportunities depend on?

The presentation, analyzing the situation in Latvia and making international comparisons, uses the integration of socio-economic and legal approaches to the researched issue. It provides both theoretical and practical insight into the problems of cultural-historical (especially - archaeological) heritage objects development potential and possible solutions thereto. The presentation is based on the authors' research made in 2020 -2021.

5 FROM BONE ROOMS TO INSTAGRAM FEED. TRAFFICKING AND RETURNING HUMAN REMAINS FROM THE 19TH CENTURY TO DATE

Abstract author(s): Crescenzi, Nicole (IMT School for Advanced Studies Lucca)

Abstract format: Oral

In 1862 the finding of a young Dakota man, maybe belonging to the Sioux tribe, was the kickoff that started the gathering of human skeletal remains with social, cultural, and intellectual purposes.

Museums began a real competition, in order to achieve the largest and best-stocked "bone room", in which human remains were kept and exhibited in an effort to understand races' hierarchy, to show comparative anatomy, and also to safeguard a culture that was going to disappear (Native Americans). As an answer to the strong request of museums for human remains a looting process started, with collectors, professionals and amateurs, and scholars digging cemeteries to send the collected bones to museums or to exhibit them in their collections. At the same time exchanges of bones were undertaken with foreign museums, in Europe (where something similar was taking place with colonized countries) and in Asia (Redman 2016).

As a consequence of the looting and exhibiting their ancestor remains, in 1970s indigenous people began to make requests for the restitution of their sacred objects and of human remains, thus opening a debate that has not yet ended. The outcome of these requests was a long process of restitution, of new laws (NAGPRA 1990), and of what is known as "collaborative museology" (Pinna 2011).

But the story of trafficking human remains is not yet over. Nowadays it is even possible to purchase human remains online, through Instagram, Facebook, Etsy, and other very much used platforms. "The 'fetishization' of the 'exotic' dead that underpins this trade by its very nature transforms pieces of the body into material culture: curios, commodities or objets d'art" (The Bonetrade Project).

The present study will give an overview of this long process and of its main key-points, showing how the discussion is still very far from its conclusion.

6 TO BUY, OR NOT TO BUY... AN EXPERIMENTAL SURVEY ON SOCIAL MEDIA TO BETTER UNDERSTAND THE MARKET FOR CONFLICT ANTIQUITIES

Abstract author(s): De Bernardin, Michela (Ca' Foscari University of Venice; The Journal of Cultural Heritage Crime) - Giovanelli, Riccardo (Ca' Foscari University of Venice)

Abstract format: Oral

In the last few years, we have witnessed terrible losses concerning cultural heritage in the Middle East. Many archaeological sites in Iraq, Syria, and North Africa were heavily affected by extensive looting and destruction. So far, most of the research on cultural heritage "in conflict" has focused on the international legislation related to war damaging, import/export and restitution policies, and art market regulations. These are relevant issues, as well as customs enforcement and investigations on art dealers or auction houses. However, besides such law-concerned measures, in-depth knowledge of the market - from both the sellers' and the buyers' point of view - is necessary to decrease the flow of illegal goods drastically. Apart from ICOM's and UNESCO's efforts to raise awareness of heritage in danger, accurate analysis of general buyers has not yet been undertaken. People buy antiquities for several reasons, but mostly as a symbol of power and prestige. So, what about conflict antiquities? How is this kind of artefacts generally perceived? Are they recognized as illicit trade? Our research aims to answer these questions by looking at the psychology underlying the collecting of antiquities. We plan to develop a focused anonymous survey to be launched online on a range of social media accounts, notably those of the specialized journal "The Journal of Cultural Heritage Crime" (www.journalchc.com). We thus envisage being able to identify different buyers' "profiles" and offering the EAA Conference attendants an experimental study on this pivotal matter. Our ultimate purpose is to allow academics and institutions to strategically disseminate knowledge about looting and heritage in danger by addressing specific target-audiences as potential buyers.

188 BEAST AND HUMAN: NORTHERN EUROPE, FROM THE BRONZE AGE TO MODERN TIMES

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Grimm, Oliver (Centre for Baltic and Scandinavian Archaeology - ZBSA) - Kashina, Ekaterina (State Historical Museum, Moscow) - Kirkinen, Tuija (University of Helsinki) - Piličiauskienė, Giedrė (University of Vilnius) - O'Regan, Hannah (University of Nottingham)

Format: Regular session

Human relations to wild animals have gone through multiple transformations in Northern Europe (understood in wide geographic terms). From the Bronze Age onwards, wild animals played only a minor, if any, role for human subsistence. How did this influence the perception of wild animals? And if not for food, for what reasons were they hunted? Are there any patterns in the bones of wild animals found in settlements, burials or offering sites? Did farmers (peasants) hunt differently to the upper classes, and were there other populations to whom the hunt remained important in a mixed economy? Is there a meaning in the low representation or absence of significant species? What kinds of wild animals had a prominent place in human life and religion?

The session is open to different kinds of contributions: diachronic or related to certain periods, in a regional or wider sense, archaeological or interdisciplinary (including modern insights into practical hunting). Recent challenges may be worth considering, too, such as the return of wolves or the co-existence of, for example, bears and humans.

ABSTRACTS:

- 1 ON THE SCARCITY OF WOLF REMAINS IN THE ROMAN AND MIGRATION PERIODS NORTHERN GERMANY. INSIGHTS FROM BIOMETRICS**
Abstract author(s): Patalan, Krzysztof (LVR-Archaeological Park Xanten)
Abstract format: Oral
According to common conception it is assumed that wolves kept their distance from human settlements. Premises for that claim are grounded in the ethology of the wolf who sees humans as a potential danger and in the active persecution of wolves documented since the early historic period. The active persecution of wolves led also to the rise of dog breeds specialized in protection against and for the hunting of wolves, such as the Irish Wolfhound. Taking into consideration the similar size of such dog breeds and wolves as well as the close genetic relationship of both subspecies, the question arises: is it possible that some wolves were overlooked in the previously studied osteological material?
In the presentation I will provide an overview of the common cranial morphometric techniques that have been proposed to distinguish between wolves and dogs. I will discuss them in the context of a case study of the settlement Feddersen Wierde in order to evaluate the possibility of hybridization between wolves and dogs. The potential implications of this phenomenon on the trifold relation human – wolf – dog will be elucidated. In conclusion I will provide a brief overview of possible future avenues for study of this topic such as the incorporation of geometric morphometrics with genetic and isotope analyses.
- 2 HUNTING DOGS AND HUNTING WITH DOGS IN THE GRAND DUCHY OF LITHUANIA DURING THE 13TH TO 17TH CENTURIES**
Abstract author(s): Piliciauskiene, Giedre - Blaževičius, Povilas - Skipitytė, Raminta - Micelicaite, Viktorija - Zrankaitė Margienė, Toma (Vilnius University, Department of Archaeology)
Abstract format: Oral
According to historical records and iconography, hunting dogs were animals of extraordinary importance in the life of the elite in the Grand Duchy of Lithuania. Written sources report that in the 14th c. Grand Dukes of Lithuania were still cremated together with birds of prey, horses and dozens of dogs. Hundreds of dogs were kept in the kennels of the Grand Dukes' in the Late Middle Ages. Statutes of Lithuania in the 16th c. mention 15 dog "breeds", their functions and also prices of these animals: the main purpose of the elite dogs was hunting.
An impressive collection of dog remains was collected during the intense archaeological excavation of the Vilnius Lower Castle complex, Lithuania. During the 13th-17th centuries, it was the royal residency of the Grand Duchy of Lithuania. Among 100 000 animal bones, remains of a minimum of 63 dogs (NISP 654) were collected and analysed. At least five gracile individuals of 70-80 cm height were morphologically very close to the modern greyhound type dogs. A few robust individuals were very similar to Molossian-type dogs that are found in iconographical sources depicting medieval and Early Modern Period hunting. Carbon and nitrogen stable isotopic analysis of 40 individuals were performed in order to determine the diet of different types of dogs. The aim of this presentation is to discuss elite hunting practices, morphology, types, the health status and diet of the 13th-17th c. dogs from Vilnius Lower Castle according to the zooarchaeological, historical and stable isotopic data.
- 3 RARE BUT IMPORTANT: WILD BIRDS IN LITHUANIA DURING THE 13TH-17TH C. ACCORDING TO ZOOARCHAEOLOGICAL AND HISTORICAL DATA**
Abstract author(s): Zagurskyte, Aurelija (Vilnius University Department of Archaeology) - Rumbutis, Saulius (Kaunas Tadas Ivanauskas Museum of Zoology) - Blaževičius, Povilas (National Museum of Lithuania) - Piličiauskienė, Giedrė (Vilnius University Department of Archaeology)
Abstract format: Oral
In general, bird bones contain a small part of Medieval – Early Modern period zooarchaeological material in Lithuania, usually up to 1-3 % of all faunal bones. Moreover, these are mostly domesticated bird remains while wild birds are exceptionally rare. Exclusive archaeological sites where wild birds are more abundant are castles and palaces, i.e. residences of elite. Kernavė (East Lithuania) medieval trade and political center is represented by 14 bird species. Furthermore, at least 27 species of birds were identified at Vilnius Lower castle (East Lithuania) - residency of the Grand Dukes of Lithuania. At least five species of the birds of prey were found in both royal sites and some of these birds were directly linked to falconry. Falconry in general was an important part of elite life and birds of prey were a luxury item and a gift. Also, birds were frequent companions to the afterlife until the Christianisation of Lithuania in the late 14th c. Written sources report that in the 14th c. Grand Dukes of Lithuania were cremated together with dozens of birds of prey, horses and also dogs.

4 OF BEARS AND HUMANS. THE VISIBILITY OF ANIMAL AGENCY IN ARCHAEOLOGY

Abstract author(s): Kipke, Natascha (Kiel University; Institute of Pre- and Protohistoric Archaeology)

Abstract format: Oral

The Human-Animal Studies emerged as an interdisciplinary research discipline to investigate the relationships and interactions between humans and animals. The basis is to see the animal as an influential player within human worlds with its own agency. Currently the role of archaeology within this new research field is barely noted. In order to examine the value of archaeology for the Human-Animal Studies and to get a closer look into the nature of the human-bear relationship from different points of view, a change of perspective shall be attempted. The bear as one of the greatest mammals in Northern Europe acted in manifold ways and affected human cultural and social worlds. Depictions and illustrations of bears are spread over the Scandinavian countries and show in combination with other bear-related archaeological finds a picture of a relation that is still in progress and embedded in multispecies systems. While using ethnological and archaeological theories and methods complementary to investigate the human-bear relation from Mesolithic times until the Viking Age with an emphasis on the younger periods, it is important to keep in mind that Animal Agency can only be detected where the lives of humans and animals have intersected and were visibly manifested.

5 BEARS, BEARSKINS, BEAR-WARMTH AND BEAR-NESS IN THE VIKING AGE: INTERSECTIONS BETWEEN ARCHAEOLOGY, SAGAS AND FOLKLORE

Abstract author(s): Evans Tang, Harriet - Milek, Karen (Durham University)

Abstract format: Oral

Relationships between humans and bears are well attested in the archaeological record of Viking-age northern Europe. Viewed as a whole, the physical evidence for the hunting of brown bear, long-distance trade in bear pelts, the use of bearskins (sometimes with claws attached) in burials, and bear sacrifice – including bear graves in the Saami lands of northern Scandinavia – are testaments to the importance of this species to pre-Viking-age and Viking-age economies and beliefs. But our understanding of the complex roles of bears in Viking-age mentalities is vastly expanded by the poetry and prose written down in a country that has never actually been inhabited by bears: Iceland. Although penned in the thirteenth and fourteenth centuries CE by an agro-pastoral society that hunted only modest numbers of Arctic fox, birds, marine mammals and fish, the Icelandic sagas carry a cultural memory of bears and human-bear relations that is likely to stretch back centuries. In these stories, bears appear as adversaries against which heroes test themselves, polar bears are prestigious gifts for foreign kings, and both kinds of bear appear in dream sequences in which they are the supernatural double, or 'fetch' (ON fylgja), of living people. Alongside the dominant association of bears with warriors and hunters is another cultural memory that has so far been overlooked: the warmth imparted by bearskins, and the so-called bear-warmth (ON bjarnylr) attributed to people who do not feel the cold. This paper pulls together both archaeological and textual sources to explore the multi-faceted relationship between bears, their skins, and humans in Viking-age and Medieval societies in Scandinavia and the North Atlantic region, and considers the wide range of bear-like qualities that might have been valued and deliberately appropriated through contact with bearskin.

6 DIACHRONIC AND MULTIDISCIPLINARY APPROACH TO UNDERSTAND TRANSFORMATIONS OF HUMAN-BEAR-RELATION IN NORTHERN GERMANY –AN EXAMPLE FOR HUMAN-ANIMAL STUDIES AT THE ZBSA

Abstract author(s): Schmölcke, Ulrich (Zentrum für Baltische und Skandinavische Archäologie - ZBSA)

Abstract format: Oral

One species group is particularly suitable for studies of relationships between humans and wild animals that go beyond the profane and trivial: large carnivores. Due to their versatile behavioural repertoire and their potential danger, they naturally attracted the attention and interest of humans. In northern Europe this is particularly true for brown bear. By combining ecology, distribution history, settlement and burial archaeology, written sources etc., it is possible to create a continuous scenario covering the entire Holocene, which uncovers several transformations of the reception of the species.

In northern Germany, model region for this presentation, brown bears were distributed from 15,000 years ago and disappeared from west to east over a period spanning several thousand years; the last individuals were killed in the 18th century. It is evident that the meaning and relevance of this animal changed several times in this region. In the Stone Age, bone assemblages indicate no human interest in bear hunting-reasons for this could be spiritual or profane. But during Iron Age and medieval times (the main chronological focus of the presentation), bears for a start began to play a role in human funeral practices, and in the first centuries AD, bear claws were quite regularly used in burial contexts. The new role had not only a cultural, spiritual or religious level, but also an ecological dimension: the demand for bear products must have caused an increased pressure on hunting. In medieval times at the latest, bears occurred only east of the Elbe. There bears were still a constant hunting prey, but a spiritual connotation is not archaeologically visible. Later, the growing human population density, large-scale habitat loss, massive direct persecution (after Christianization bears became deuced) and finally, the capture of bears for public entertainment, led to an extirpation of the last populations.

7 WHO GETS BURIED WITH A BEAR? AN EXAMINATION OF WILD ANIMALS IN THE EARLY MEDIEVAL CREMATION CEMETERIES OF EASTERN ENGLAND

Abstract author(s): O'Regan, Hannah (University of Nottingham) - Squires, Kirsty (Staffordshire University)

Abstract format: Oral

In early medieval England (5th – 7th centuries AD), cremation was one of the dominant mortuary rites. Cremation cemeteries span a large region in eastern England from the East Riding of Yorkshire through to East Anglia. One of the most distinctive practices amongst cremation practicing groups was the provision of both domesticated and wild animal offerings at the funeral. Bear phalanges are found in a number of cremation burials in early medieval cemeteries in England. To date, of the cremation assemblages analysed, bear remains have been found at four sites; namely, Sancton, Elsham, Cleatham and Spong Hill. In this talk we examine the role of bear remains in the cremation rite. The association between the bear bones and the age and sex of the deceased, as well as relationships with pyre- and grave-goods will be explored on a site and inter-site level. We also examine the other wild animals that have been identified from cremation burials, such as fox and osprey, and discuss why these species were selected. Finally, we consider the origin of this burial rite, and the sources of the animals. Bears were probably extinct in England at this time, so this raises the question as to where the bones and/or pelts were being obtained from, and what this can tell us about identity and affiliation. This presentation aims to further our understanding of the provision of wild animals, particularly bears, in early medieval cremation burials.

8 BEAR CLAW FINDS IN 6TH CENTURY SAMBIAN WEAPON GRAVES AS INDICATION OF THE GERMANIC WARRIOR CULTS

Abstract author(s): Prassolow, Jaroslav Aleksei (Centre for Baltic and Scandinavian Archaeology - ZBSA; Institute of Archaeology of Russian Academy of Sciences - IA RAN) - Skvortsov, Konstantin - Dobrovol'skaja, Maria - Kleshchenko, Ekaterina (Institute of Archaeology of Russian Academy of Sciences - IA RAN)

Abstract format: Oral

This report is devoted to the study of interregional cultural relations of the Sambian-Natangian culture on the Kaliningrad (formerly Sambian) peninsula in the south of the Baltic Sea basin. The end of the 5th century was marked by a disappearance of weapons from the male burials of the inhabitants of Sambia, Aestii, in spite of their presence in the majority of the earlier male graves. At the beginning of the late phase of the Great Migration period (early 6th century), a transition from military democracy to stratified society took place in the societies of Western Balts, and armed retinue and unarmed farming classes emerge. In the light of this hypothesis, analysis of male (warrior) burials with weapons, which reflect the higher social status of the buried person, is of special importance. The results demonstrate the influence of the European warrior culture, which was characterized by the presence of cultural elements of both nomadic and Germanic origin. In this context, two recently discovered 6th century burials with weapons and horses are of particular interest: burial X22 of the Aleyka-7 burial ground and burial 25 at the Mitino burial ground. In spite of the differences in the richness of their grave inventories, which allow them to be interpreted as a so-called "chief" burial and that of a retinue warrior; both graves contain objects typical of the Germanic cultural circle. Especially interesting are the first documented finds in Sambia of burned bear claws in the cremations, which are interpreted as elements of clothing (fur cloaks), which probably had a cult character. Use of bearskins was practiced by the elite of Germanic warriors throughout the Early Middle Ages, as is recorded in a number of sources. These finds most probably demonstrate the influence of Germanic traditions on the upper strata of the Aestii society.

9 THE SNAKE AND THE DUCK OF THE BELARUSIAN LAKELAND

Abstract author(s): Charnianski, Maxim (Department of the prehistory archaeology, Institute of history, NAS of Belarus)

Abstract format: Oral

The settlements of the Kryvina peat bog (Northern Belarus) from the Late Neolithic and Early Bronze Age provide us with a large amount of material evidence that is connected with the beliefs of the population of the region. Among them, special attention is drawn to sculptural images of ducks (bone and clay) and snakes (bone), found in the Northernbelarusian culture (mid-3rd – mid-2nd millennium BC). In the previous, genetically related, Usviaty culture of the Middle Neolithic (end of 4th – 1st half of the 3rd millennium BC), these creatures were also present, but only as ceramic vessel decoration. Interestingly, images of ducks and snakes in this area continue to occur later on, for example, pendant-ducks (8–11 centuries AD) and bronze bracelets with zoomorphic ends in the form of stylized snake heads (10–13 centuries AD) from the territory of the Kryvichy population, ceramic whistles in the shape of a duck dated 12–13 centuries AD from Polack city. Legends about the King Snake (Grass snake), as well as the custom of feeding grass snakes near the houses were recorded in ethnographic materials in the 19th and beginning of the 20th centuries. All this may indicate the birth in the Late Neolithic/ Early Bronze Age of a powerful ideological impulse associated with these two creatures, the echoes of which reached even modern times.

10 FROM A DRAGON TO A HARE – SELECTION OF ANIMALS FOR SYMBOLIC PURPOSES DURING THE LATE IRON AGE IN ESTONIA

Abstract author(s): Jonuks, Tõnno (Estonian Literary Museum; Tallinn University)

Abstract format: Oral

The Late Iron Age (ca 800-1250 AD) witnessed a situation, where a large variety of animals, or references to animals were used for symbolic purposes. This corpus of material includes animal teeth and bones, as well as animal figurines used for pendants and decorations. Animal images were also combined with other objects, enlarging the subject of animal representation. In this lecture I will give an overview of animal representation in Estonia, discussing the animal species that are portrayed, their semantic details and contextual distribution. Among the animal species we can identify a variety of predatory animals and birds, mythological beasts, but also more "peaceful" examples like the hare and chicken. At the same time major economic species, like sheep, cattle, or horse, are used less for symbolic purposes, or not at all. This study will analyse the ideology, religion and moral values of the human culture expressed by animal symbolism in the Late Iron Age Estonia.

192 LANDSCAPES AND THE AUGUSTAN REVOLUTION: EXPLORING THE TRANSFORMATION OF THE WESTERN PROVINCES BETWEEN THE REPUBLIC AND THE EARLY EMPIRE

Theme: 4. Globalisation and archaeology

Organisers: Espana-Chamorro, Sergio (Institut Ausonius - UMR 5607, Bordeaux) - Moreno Escobar, María del Carmen (Durham University)

Format: Regular session

The Western provinces of the Roman Empire experienced different processes and temporalities of Roman conquest that created diverging ways of understanding these provincial landscapes. In particular, the hodological vision of the republican period has generated perceptions of provincial spaces from the Romano-centric point of view which have defined how the provinces of Sardinia, Sicilia, Gallia, Hispania and Africa are understood. During the Imperialism development, the emergence of new requirements and aims motivated a complete renovation of Roman domains at the end of the Republic started (but not completed) by Caesar. These transformations have been analysed from the perspective of epigraphy, literature, history, and material culture, but has left out the agency of local communities and their impact on the provincial landscapes they inhabited and lived in. In this sense, the potential contributions of landscape archaeology are clear, due to its capacity to identify, analyse and understand changes and continuities on these provincial landscapes, which were intimately linked to the processes of social and political change occurring in the Empire.

This session will focus on the contributions that both landscape studies and landscape archaeology have on the understanding of wider processes developing in the western provinces of the Roman Empire, aiming at generating new insights into how these developed (e.g. their differences and similarities). As such, we welcome submissions exploring the transitions to the Empire in the provincial landscapes of the western Roman Empire (Hispania, Italia, Gallia, North Africa) from both theoretical (e.g. the transformation from hodological point of view to the cartographical vision) and practical perspectives (e.g. settlement patterns, mobility and communication, spatial analysis, remote sensing and GIS).

ABSTRACTS:

1 EUROPA ASIA AFRICA IN LATIN LITERATURE FROM THE REPUBLICAN TO THE AUGUSTAN AGE

Abstract author(s): Paladini, Mariantonietta (Università di Napoli)

Abstract format: Oral

'Europe', 'Asia' and 'Africa' are words very common and frequent in our languages, due to the general knowledge that Earth is divided into (five) continents. In ancient times, and especially in the Roman and Latin world, the situation was very different. Even if the Oikoumene's division in three parts is a concept that emerged very early in Western culture within Greek scientific works, the Roman world did not react to it in the way we could expect: Roman geography became an independent discipline with Pomponius Mela, who wrote a book entirely devoted to this subject, which he divided into three parts describing each of these geographical regions. However, how this situation was before him remains unclear, since there aren't many sources that could help us define it. An important question in this regard is: What was the attitude of Roman poets, orators, and historians in the Republican times and even in the Augustan Age? This contribution will address this topic by discussing the recognition of the words 'Europe', 'Asia' and 'Africa', their presence in texts (e.g. in sequence or not), and the existence of the variation 'Libya', as terms that were used by non-geographer writers during the Republican and Augustan times.

2 AUGUSTUS AND THE TRANSFORMATION OF THE ROMAN ROAD NETWORK IN THE WESTERN PROVINCES (GAUL, HISPANIA AND AFRICA). AN EPIGRAPHICAL PERSPECTIVE

Abstract author(s): Espana-Chamorro, Sergio (Universidad Complutense de Madrid; Institut Ausonius - UMR 5607, Bordeaux)

Abstract format: Oral

Roman road policy has been considered as one of the best strategies for opening and developing conquered territories. Roman transport was a fundamental tool for the consolidation of the newly annexed spaces and for the dissemination of the territorial administration and the Roman lifestyle. It was also one of the best ways to incorporate these spaces into the economic coherence of the Roman Empire. Another aspect to consider in terms of the Roman road policy is the crucial role that the development of infrastructures had for extending the real political aegis of Rome to regional and local levels through the introduction of the Roman provincial administration.

A specific aspect of Roman roads was the use of milestones. During the Republic, milestones were erected mainly in Italy and only few evidence have been found in the provinces (Eastern Hispania, Southern Gaul and Greece). Augustus was the first ruler who promoted an expansion of this landmark in the new reorganised Empire. From the Augustan age the use of milestones started in some regions as North Lusitania, Baetica or Africa. This paper will provide the transformations of Roman roads in the age of Augustus by analysing mainly epigraphic evidence. A comparison between Gaul, Hispania and Africa will provide a new vision in the panorama of Roman roads.

3 ROADS AND LANDSCAPE TRANSFORMATION IN SOUTH-EASTERN HISPANIA: A CASE STUDY

Abstract author(s): Lopez Garcia, Antonio (University of Helsinki)

Abstract format: Oral

Between the end of the Roman Republic and the beginnings of the imperial era, the administrative boundaries of the Hispanic provinces changed significantly. The re-adjustment of the blurred liminal area between Hispania Baetica and Hispania Tarraconensis in the south-eastern sector left some inconclusive footprints on the archaeological record. Decades of investigation have revealed the prominence of the trade routes that linked the resources of the Baetica with the eastern Mediterranean coast. Acci, a minor Iberian settlement at the foothills of the Mons Solorius—the current Sierra Nevada—became in Augustan times the dominant node that interconnected the mines of Castulo and the Baetis basin in the western with the seaport of Carthago Nova in the southern Tarraconensis. Other significant roads converged in Acci, connecting the colony with the southern coast and with the municipium of Florentia Illiberritana. The landscape transformation caused by the Romans in this area is visible through the lens of archaeology. In this presentation, I analyze the historical development and the environmental adaptation of the area.

4 THE IBAÑETA/RONCESVALLES PASS AND ITS TERRITORY: AN EXAMPLE OF LANDSCAPE ORGANISATION IN THE EARLY EMPIRE PERIOD IN THE WESTERN PYRENEES

Abstract author(s): Mendizabal Sardonís, Oihane (UPV/EHU, Department of Classic Studies; Aranzadi Science Society)

Abstract format: Oral

The territory of the Ibañeta-Roncesvalles pass (nowadays in Navarre, on the border between Spain and France) was one of the last regions starting the Romanisation in the all Pyrenean mountain range. According to the data currently available, these processes should be dated to the Augustan period, linked to the development of the Imperialism. It was quickly integrated into the dynamics and the administrative and economic organisation of the empire, due to its privileged strategic position and the abundance of raw materials in the area.

All this territory was articulated around the iter XXXVIII, which linked the northwest province of Hispania Citerior with Aquitania in Gaul. Stable urban settlements were created around the route of the road, in the north side of the Pyrenees. There, we know the settlement of Donazarre/ Saint Jean Le Vieux (Donazarre/ Saint Jean Le Vieux, Pyrénées-Atlantiques Department), and, in the south, the newly discovered settlements of Zaldua (Auritz/Burguete and Aurizberri/Espinal, Navarre), and Artzi (Artzibar/Arce Valley, Navarre). The two of them are located in an area traditionally considered as a sparsely Romanised place. Since 2012, the discoveries of those new sites in the foothills of the Pyrenees have shown that they could be considered as mirrors of their counterparts on the north side. Besides, their function was directly linked to the services required by road users, the military control of the Ibañeta pass and the mining operations in the surroundings.

5 PARAMETRISING THE ROMAN ARMY'S BEHAVIOUR IN NORTHERN IBERIA: THE EXPEDITIO PROJECT

Abstract author(s): Costa-García, José (Universidade de Santiago de Compostela)

Abstract format: Oral

Over the centuries, the Roman Empire expanded across Europe, spurring dramatic political, social, economic and cultural changes and forever transforming the diverse landscapes it encountered. In the last decade, the appearance of new conceptual and technical tools (GIS, remote sensing, UAVs) has led to gathering an enormous amount of archaeological data that can be related to the Roman army's activities in Iberia. The situation in the northernmost territories -the last to be conquered between 138 BC and 19 BC- has been particularly thriving.

Within the Expeditio project (funded by The Galician Autonomous Government, Spain), a considerable effort has been made to systematise and catalogue the archaeological information related to the Roman army in northern Iberia. This action aims to make it easier to parametrise variables and behaviours reflecting different military actions and operations by using morphological, locational and mobility analyses.

So far, archaeological data points to diversity. It is possible to document scenarios of fossilised violence (sieges, assaults, battles), while the primary concern in other areas seems to have been to keep logistical supply routes active. Similarly, some activity clusters appear to respond to warfare episodes that involved the deployment of large armies. The distribution of several posts occupying key geographic positions across the territory could be better understood in terms of occupation and control logic. By reconstructing these lost scenarios, aspire to recreate the sequence of events that will support innovative perspectives and archaeological narratives on the asymmetric interaction between the Late Iron age indigenous peoples and external imperial power in this area.

6 TIMES OF CHANGE: THE TRANSFORMATION OF SETTLEMENT LANDSCAPES IN EASTERN GAUL DURING THE AUGUSTAN PERIOD

Abstract author(s): Fernández-Götz, Manuel (University of Edinburgh, School of History, Classics and Archaeology)

Abstract format: Oral

In many parts of eastern Gaul, the main changes in settlement patterns and lifestyles did not take place during or immediately after the Caesarian conquest, but rather in the Augustan period. This paper will focus particularly on the civitas of the Treveri. In this area, a fundamental change occurred towards the end of the 1st century BC and the beginning of the 1st century AD. Most Late Iron Age oppida were abandoned or suffered a drastic decline, whereas new centres of power such as the Roman capital of the civitas, Augusta Treverorum, were founded. However, some of the old centres retained a role as religious centres, despite the decline in population and economic activities. The transformations can also be observed in the funerary record associated with settlement centres. The paper will explore the possible reasons and main drivers behind the changes, while at the same time exemplifying the complexity and diversity of existing situations in relation to factors such as geography and social status.

7 AGGREGATION AND LOCAL AGENCY IN THE LANDSCAPE OF EASTERN LANGUEDOC (1ST C. BCE - 1ST C. CE)

Abstract author(s): Borowski, Pawel (University of St Andrews; University of Tuebingen)

Abstract format: Oral

One of the key features of the provincial landscape in the early Roman empire was the phenomenon of aggregation, which created relations of dependence between conquered communities. Typically, scholars discuss subordinated communities in terms of the administrative categories *adtributio* and *contributio* which emphasise Roman conceptual perspectives and marginalise local agency. To recover the role played by communities themselves in transforming the provincial landscape, this paper examines the relations of dependence between Nemausus and 24 subordinated communities in eastern Languedoc in the 1st c. BCE – 1st c. CE. The case of Nemausus is attested primarily by literary sources (Pliny the Elder, *Historia Naturalis* 3.4.37 and Strabo, *Geographica* 4.1.12) which are usually interpreted as evidence for Nemausus functioning as a passive regional centre organised by Rome. By reconstructing the complexity of the socio-political landscape in eastern Languedoc on the basis of archaeological, numismatic and epigraphic (CIL 12.3362) records, I argue that Nemausus was not just a subject of Rome's actions but an active agent: it fostered its communal interests and changed the regional landscape at the expense of the subordinated communities. To support my claim, I will complement the literary sources with the results of rescue archaeology in Nemausus and its peripheries, and archaeological work at various eastern Languedocian sites which have been identified with the subordinated oppida.

By examining the case study of Nemausus in light of the present archaeological knowledge of eastern Languedoc, this paper will illustrate the role played by local agency within the phenomenon of aggregation. Ultimately, I will offer a new understanding of the processes which transformed provincial landscapes.

8 LANDSCAPE TRANSITIONS IN TARRACO: EXTENDING THE UNDERSTANDING OF PROVINCIAL COMMUNITIES AND THEIR INTEGRATION INTO THE ROMAN EMPIRE

Abstract author(s): Moreno Escobar, Maria del Carmen (Durham University; University of Lund)

Abstract format: Oral

The Iberian Peninsula has been repeatedly characterised by its wide diversity of landscapes and of communities inhabiting them in Antiquity. This circumstance has hindered the possibility of developing holistic interpretations of cultural change experienced by these communities. However, recent research (e.g. Moreno Escobar, Ojeda Rivera and García Sanjuán 2020) has highlighted how the analysis of landscapes can not only unveil dynamics of transformation but (most interestingly) can also generate a holistic interpretative model that integrates both archaeological analysis and historical contextualisation. This particular model successfully explored and interpreted the changes in local communities from very different regions in Baetica in connexion with their inclusion and integration within the political, economic and social structures of the Roman Empire. However, despite its success for these particular -Baetican regions, its suitability to interpret the integration of other regions of the Roman Empire remains unexplored.

This contribution will focus on testing this model's application to other areas of Hispania, taking the Roman city of Tarraco and its hinterland as case study. This region has been subject to a long tradition of research in the area, mainly on its rural occupation, territorial organisation, and more recently on its Roman port system. This previous work has resulted in the generation of a vast amount of archaeological data susceptible of re-analysis, which makes this region an optimal case study. By applying techniques of spatial analysis and statistical analysis, this work seeks to contribute towards the definition of a holistic interpretation of Tarraco's development between Republican and early Imperial times and of this community's integration into the Roman Empire.

Reference:

- Moreno Escobar, M. C., Ojeda Rivera, J. F. and García Sanjuán, L. (2020) 'Effects of Roman rule on the Settlement Geography of Southern Iberia: A GIS-approach', *Oxford Journal of Archaeology*, 39(2).

9 TRANSFORMATION OF THE PRODUCTIVE LANDSCAPE IN SW IBERIAN PENINSULA: ECONOMIC ORIENTATION AND INFRASTRUCTURE BEFORE AND AFTER THE "AUGUSTAN REVOLUTION"

Abstract author(s): Moreno Megias, Violeta (Instituto del Patrimonio Cultural de España; Universidad de Sevilla)

Abstract format: Oral

The distribution of the elements that shape the productive landscape in the SW Iberian Peninsula contributes to the understanding of the provincial landscape of Hispania. The moment of change represented by the beginning of the Augustan period coincides with the provincial reorganisation. It marked a change in the economic orientation of the region - it began to organise itself as an area of exploitation for large parts of the Empire, while at the same time hosting increasingly powerful markets. The location and characteristics of agricultural and fish farming structures, pottery workshops, storage buildings and port infrastructures began to follow very different guidelines to the previous phase. During the republican period, the spaces of persistence of pre-Roman traditions had merged with new imposed realities for a heterogeneous population, impregnated with a multitude of cross-influences. This contribution focuses on the transformations of the productive space and the infrastructures related to the commercial organisation before and after the provincial reorganisation promoted by Augustus. It will be done from a diachronic approach and a local perspective, with special regard to the western area of the Guadalquivir valley.

10 HYDRAULIC TECHNOLOGIES, THE PRODUCTIVE LANDSCAPE OF WESTERN PROVINCES AND THE DEVELOPMENT OF ROMAN LAW

Abstract author(s): Ronin, Marguerite (CNRS)

Abstract format: Oral

The proposed contribution builds upon a reconstruction of the agricultural landscape of Roman Central Italy where, from the 2nd c. and increasingly in the course of the 1st c. BC, 1) peri-urban areas are developed into small, intensively cultivated and irrigated plots devoted to market gardening and to the supply of urban markets; 2) hill slopes, naturally exposed to waterlogging and erosion, are relatively newly terraced lands, adapted to winegrowing and tree crops. Based on archaeological and literary evidence, this reconstruction emphasizes the role of hydraulic technologies for increasing the food production. It is also consistent with the legal texts and, arguably, it helps contextualize two legal mechanisms notably developed at the same period: the servitude to draw water (*servitus aquae ducendae*) and the action to ward off rainwater (*actio aquae pluviae arcendae*).

Jurisconsults and public authorities controlling legal changes were responsive to the needs of those engaged in the farming business. Exploring the legal documentation is consequently key to understanding how these activities developed, what were the opportunities and risks faced by the landowners and the farmers in regard to water resources and hydraulic risks. However, while this reconstruction of the productive landscape, with its economic and legal implications, is credible enough for Central Italy, where the legal solutions were enforced in the first place, we may wonder if it is sensible to extrapolate from these results to reconstruct the productive landscape of the provinces. This paper will take some case studies in Gaul, Africa and the Iberian Peninsula to test and explore this question, crucial for both our understanding of the agricultural production and of the diffusion of the Roman law.

202 ANCIENT CULTURAL ROUTES: PAST TRANSPORTATION AS A TWO-WAY INTERACTION BETWEEN SOCIETY AND ENVIRONMENT

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Mazzilli, Francesca - Glomb, Tomáš (University of Bergen) - Fulminante, Francesca (University of Bristol; University Roma Tre) - Faupel, Franziska (University of Kiel)

Format: Session with keynote presentation and discussion

Ancient regional routes were vital for interactions between settlements and deeply influenced the development of past societies and their "complexification" (e.g. "urbanization", Roman expansion). For example, terrestrial routes required resources and inter-settlement cooperation to be established and maintained, and can be regarded as an epiphenomenon of social interactions. Similarly, navigable rivers provided a complementary inter-settlement connectivity, which conditioned the development of roads and pathways. In this sense, fluvial and terrestrial connections can be seen as the two layers of an integrated regional transportation system, which was the product of social relations and of the interplay between past societies and environment. Sea transportation is also relevant as it expands the scale of these relations and interplays.

When we consider past societies, we implicitly or explicitly take into account interlinked aspects, such as their culture, traditions, politics, economy and religion. Under the umbrella of environment, we include topography, terrain, visibility, water management and sustainability,

In view of numerous conference sessions and publications on transport networks in past societies, this session specifically focuses on how the transportation networks and their modes, from terrestrial to riverine, sea routes or a combination of them, were a crucial part of the dialogue between past societies and the environment and how the dynamic processes related to human culture were developed by this dialogue. Following this rationale, we welcome methodological papers and case studies that focus on:

- How the constraints of the physical environment impacted on dynamic processes of human societies in the past, such as cultural transmission, trade, migration, and war, or in the opposite direction;
- How the activities and motivations of human agents shaped and structured the environment with respect to mobility.

ABSTRACTS:

1 TRANSPORT, INTERACTION, AND CONNECTIVITY

Abstract author(s): Nakoinz, Oliver (Johanna Mestorf Academy)

Abstract format: Oral

Transport is an aspect of greatest relevance for the development of culture, society, and economy because it was the only means of spatial interaction in pre- and protohistory. Transport is the actual movement of people and commodities towards a spatial target. The routes form the spatial outlay and are part of the infrastructure for these movements. These routes are mainly determined by interaction which refers to the interaction between environment and society on the one hand and inter-human interactions. The transportation network adapts to the actual interaction canalises the interactions. Interaction allows the balance of interests, the exchange of ideas, and the development of complex social organisations. Furthermore, it enables the collaborative work on innovations, the division of labour, and urban and centralised settlements. But interaction also can be a root of conflicts. The analysis of interaction mainly focuses on one of the three dimensions of interaction research: Groups and cultures, networks, and interaction-intensities. Transport and interaction research already are able to reveal a substantial amount of knowledge but these research topics are still rather concrete. For more general results we need to turn to a more abstract keyword: Connectivity. Connectivity can have two meanings, both important. Connectivity can refer to the actual degree of interaction or to the potential degree of interaction. Which interactions do we actually have and which interactions are possible? Both parameters are connected in different ways to general developments of culture, society and economy enable us to contribute to general questions and macro-history.

2 REGIONAL RELIGIOUS NETWORKS AND THE ROAD NETWORK IN THE ROMAN EMPIRE

Abstract author(s): Mazzilli, Francesca (University of Bergen)

Abstract format: Oral

Cult sites were meeting public places for village communities and worshippers coming from neighbouring and farther afield areas. They were monumental displays of elite's wealth and of local communities' religious beliefs visible by anyone passing by. Cult sites were not isolated centres, but they were part of the wider social network affected by neighbouring and farther afield communities and cultures. For these reasons, it is even more important to contextualize a cult site in its landscape and in relation to other sites. Anna Collar undertook proximal point analysis (PPA) to calculate and discuss the spread of cults based on the proximity of sites. However, people and religious ideas were facilitated to move from one site to another by infrastructure into place (roads, riverine and maritime routes).

This paper will consider regional case studies at the edge of the Roman Empire (Lusitania, roughly Portugal, and the Hauran in the southern Syria):

- to discuss methods to understand the relationship between cult sites and the road network (through spatial distribution of cult sites in relation to roads, location of a site within a 5 km radius from the road, identification of differences between PPA and PPA based on road networks);
- to understand the role of Roman roads in the spread of cults which might have varied depending on the gods worshipped in cult sites, their benefactors, worshippers, and possibly subject to the complexity of cult sites.

3 THE WORSHIP OF ROMAN DEITIES ALONG THE ROADS: A GIS NETWORK APPROACH

Abstract author(s): Glomb, Tomas (University of Bergen)

Abstract format: Oral

In recent years, the amount of available data for exploring quantitatively the Roman culture and mobility has increased significantly. With respect to mobility in the Roman period, researchers can now work with the Stanford geospatial network model of the Roman world (ORBIS) that allows calculating the fastest, shortest, or cheapest connections between selected cities based on the distance, mode of transport used, and seasonality. Another suitable option is a dense network of geocoded Roman roads based on Richard Talbert's *Barrington Atlas of the Greek and Roman World*. Considering the evidence on Roman culture, online databases of geocoded inscriptions, Roman coinage, and corpora of ancient texts in Greek or Latin represent a suitable data pool for approximat-

ing quantitatively many cultural aspects. The paper follows this development in the historiography of the ancient Mediterranean and discusses how can epigraphic databases and geocoded ancient roads help examine the relationships between the worship of Roman deities and mobility in the Roman Empire. Specifically, the paper presents a case study focusing on the spatial patterns of worship of Apollo, Minerva, and Asclepius and their ties to the transportation network and Roman military infrastructure in the border provinces between Britannia and Moesia Inferior. Besides presenting the preliminary results of the intra-regional and extra-regional dynamics with respect to the spread of these cults across the transportation network, the paper discusses both the advantages and the pitfalls of the available geocoded data for spatial network analysis.

4 DATA AND HYPOTHESIS ABOUT ROAD SYSTEM IN WESTERN SICILY FROM THE ROMAN PERIOD TO THE NORMAN AGE

Abstract author(s): Canale, Alessandra - Burgio, Aurelio (Dipartimento Culture e Società, Università di Palermo)

Abstract format: Oral

The paper aims some hypotheses about the system of ancient path routes in Western Sicily. The focal point is continuity and discontinuity of use from the Roman period to the early Middle Ages, when the main streets become pilgrimage roads and, along these, borns resting places such as xenodochia and hospitalia or small rural churches usually located near the most important crossroads.

This historic fase of the landscape is evidenced by the dissemination of place names, often associated with byzantine cults, as well as by the persistence of rural cults in the modern sanctuaries linked with the ancient road system, some of which are living a modern revival of longstanding votive practices of pilgrimage.

The historical-topographical analysis is focused on the areas around Castronovo di Sicilia and Vicari, along the basin of the North Imera river and in the Madonie mountains. Moreover, these places are connected with the historical events Teutonic Knights of the Magione di Palermo and with their politics of control territory to defence Christianity, thanks to which they had accumulated huge wealth and many estates in the Palermo province and in other areas of Sicily.

5 SALT PRODUCTION IN CENTRAL ITALY AND SOCIAL NETWORK ANALYSIS CENTRALITY MEASURES: AN EXPLORATORY APPROACH

Abstract author(s): Alessandri, Luca (University of Groningen) - Fulminante, Francesca (University of Bristol)

Abstract format: Oral

Since the first pioneering application of network principles to identify and analyse the 'centrality' of a place and the dynamics of settlement and/or trade patterns such as for example the dynamic of hunters-gatherers populations in the Fjorland Archipelago (Mackie 2001), or the brick trade in the Tiber valley during the Roman time (Graham 2006) many advances have been made especially thanks to the application of different cost-allocation spatial models, gravity models, stochastic models and more recently models that combine spatial and cultural variables.

In this exploratory paper we partially go back one step and apply traditional Social Network Centrality measures to fluvial and terrestrial transportation networks in central Italy with a focus on a particular type of site: the Bronze Age and Iron Age coastal sea-salt production centres, about which many questions remain still unanswered. We experiment normalized degree centrality, betweenness centrality and closeness centrality and obtain varied results that partially bring to interesting new hypotheses, which deserve further investigation with more sophisticated models.

In particular, the closeness centrality is probably the less interesting: all sites have more or less equal values, as it is probably foreseeable in a relatively small and compact region such as Latium and Etruria. The normalized degree centrality indicates some centres with a higher number of neighbours, which often seems to coincide to important centres also according archaeological or historical evidence. However, the more interesting results comes from the betweenness centrality.

The routes indicated by the centres with highest betweenness centrality are the potentially most used routes both fluvial and terrestrial. This analysis shows some patterns that shed new light on the potential dating of both the briquetage and the more efficient saltpan salt-production techniques and the more frequent use of the famous salt roads, later identified with the Salaria.

6 TRANSPORT COSTS AND ECONOMIC DEVELOPMENT IN ROMAN BRITAIN

Abstract author(s): Ortman, Scott (University of Colorado) - Wiseman, Rob (University of Cambridge) - Lodwick, Lisa (University of Oxford) - Lobo, Jose (Arizona State University)

Abstract format: Oral

Archaeological studies of relationships between settlement population and material output have uncovered consistent increasing returns, whereby output increases proportionally faster than population, at rates that are mirrored in contemporary urban systems. This suggest a common underlying process is responsible for extensive (agglomeration-driven) growth in all societies. However, an important difference between ancient and contemporary societies pertains to the baseline productivity of workers, which was relatively static prior to the industrial revolution but has increased steadily since then. A possible exception to this pattern may be the Roman Empire, and especially Roman Britain, where analyses of data compiled by the Rural Settlement of Roman Britain project and the Portable Antiquities Scheme suggest an increase in baseline productivity over time, and relative to the pre- and post-Roman periods. Settlement scaling theory proposes that this type of intensive (i.e., individual productivity) growth is driven in part by

improvements in transport technology. In this paper we ask whether intensive growth in Roman Britain coincides with reductions in transport costs over time. We adapt ideas of spatial equilibrium from urban economics to interpret the fall-off curves of pottery wares, distinguishing water vs. land transport, to infer any changes in basic transport costs that may have occurred due to technological changes in shipping, vehicles, and roads. Previous studies suggest that the slopes of these curves capture differences in transport costs related to product weight and mode of transport. We extend this work here by comparing slopes for coarse ware pottery made during different time periods. Our results suggest the Roman economy exhibited growth dynamics common to economies throughout history, not so much in the magnitude of growth or level of output, but in the generative mechanisms behind it.

7 TERRESTRIAL TRANSPORTATION INFRASTRUCTURE BETWEEN SOCIETY AND ENVIRONMENT: A CASE STUDY FROM BRONZE AND IRON AGE TUSCANY

Abstract author(s): Stamerra, Laura (Roma Tre University, Italy) - Fulminante, Francesca (Bristol University; Roma Tre University)

Abstract format: Oral

Routes are a vital feature of the ancient anthropic landscape. Through their analysis, scholars can get a better understanding of settlement patterns, landscape exploitation strategies, social interactions, and cultural exchanges. Sometimes, it can also help to clarify the organization of a society, its development and eventual 'complexification'. In the last decades, thanks to the introduction of GIS (Geographic Information Systems) and spatial analysis tools, new perspectives of research are available. Scholars can more easily attempt to reconstruct and evaluate pathways networks.

In this paper, we present the case study of Central-north Tuscany during the Bronze and Iron Age. Although sparsely populated, the medium and lower Arno basin represents a coherent and complex system. The area was populated by local communities, which were deeply attached to the land but at the same time fully integrated into regional and interregional cultural trends. Interactions and cultural exchanges with the more densely populated surrounding areas – especially the Romagna – continued even during demographic declines. This suggests the presence of highly important communication pathways, connecting north Italy with the Etruscan territories. It also leads us to question the label of "marginal area" that weighs on the region.

Using cost surface and least cost path analysis, regional terrestrial pathways are reconstructed in their diachronic evolution, investigating their influence on settlement development. To test the model validity and recognize main cultural routes, correlation is sought between the paths network, identified topographical routes, and defining materials distribution. Furthermore, we compare sites typology and site function (domestic, funerary, productive) with Social Network Analysis Centrality measure to verify whether specific types of sites are more 'central' than others according to different degrees of centrality, and to better understand the role of transportation routes in the shaping of the landscape, as well as its socio-political, economic, and symbolic use.

8 MODELLING SPATIAL INTERACTION DURING THE EARLY IRON AGE IN SOUTHWEST GERMANY AND THE ALSACE

Abstract author(s): Faupel, Franziska (CRC 1266)

Abstract format: Oral

This study aims at the investigation of river systems as interaction corridors and infrastructure elements, the reconstruction of terrestrial path systems, research desiderate for the Early Iron Age, and the evaluation of interaction relationships of princely seats in dependency of geographical distance.

The Rhine and Danube serve here as reference areas, as they allow to investigate communicational corridors, different environmental settings and different primary orientations. The Rhine cultural distance diagram profile curves show high deviations in the interaction relation with the north and south located type spectra of the central axis at three places. Therefore, these points are interpreted as points with a high exchange rate. The interaction references on the Danube do not represent such concise structures. Exchange nodes or zones do not establish themselves in the entire material's curves, but rather as latent structures concerning vessels, ring jewellery or garb and often only related to one river bank. Such an exchange zone is recorded in the vicinity of the Heuneburg.

Although the significance of transportation for the Iron Age is well-known, the reconstruction remains an open issue. So far, mainly theoretical models based on partial data (import goods) and an emphasis on river systems outline possible connections while neglecting alternative routes, cultural effects, or the path's exact location. The entire working area's local path system is reconstructed from barrows' location. Princely seats are being built in places with good infrastructure. Rural settlements are based on other parameters and are usually further away from the paths. To be able to carry out exchanges, the location was therefore not ideal for agriculture. Exchange nodes at rivers functioning as communication corridors, channels and bundle exchange from far-reaching contacts over 50 km away characterise the image of the EIA distribution system.

9 ON THE ROADS AND RIVERS OF LATE IRON AGE GAUL : CHALLENGES IN CALIBRATING LEAST COST PATH MODELS

Abstract author(s): Filet, Clara (UMR 7041 Université Paris 1) - Rossi, Fabrice (Université Paris Dauphine)

Abstract format: Oral

The end of the second Iron Age saw the explosion of trade leading to an extension of medium and long-distance traffic. However, the understanding of these traffic flows is hampered by the lack of knowledge of the road network in use during the last decades of Gallic independence. The objective of this communication is to propose a method for estimating realistic transport costs between settlements, in a context where the road network is unknown.

The classic solution for reconstructing a transport network from the sole location of archaeological sites consists in approximating the transport network by the set of least cost paths (LCP) between sites based on the constraints of geographical space (relief, wetlands, etc.).

Our work extends the state-of-the-art in three directions:

1. Our method is based on the articulation of partial historical data with multiple simulations to estimate unknown values (transshipment costs, river crossing costs, etc.). These simulations are compared using systematic sensitivity analyses, including the use of novel aggregated metrics that characterise a LCP collection and emphasize global effects of some parameters.
2. Few studies have attempted to take into account the multimodal nature of old transport (land and river), and the many scientific and technical problems posed by modelling changes in means of transport. In this context, this work proposes a new explicit implementation of the bimodal (terrestrial and fluvial) nature of these old transports.
3. The last challenge is the application of these methods to extremely voluminous data, using a high-resolution numerical terrain model at the scale of central-eastern Gaul (260 000 km²). The numerous simulations needed to assess the sensitivity of LCP calculations to the cost parameters are associated with a large consumption of computational resources. A dedicated implementation is needed to complement the classic tools, such as R packages traditionally used for LCP.

10 AN EXAMPLE OF GEOGRAPHIC NETWORK ANALYSIS: THE CASE STUDY OF THE FORTORE VALLEY (MOLISE AND PUGLIA, ITALY)

Abstract author(s): De Simone, Claudio (University of Naples Federico II-Specialization School of Archaeology)

Abstract format: Oral

Today, the Fortore river is the geographic and administrative limit between the regions of Molise and Puglia but was it the same in the past? In the last decade, scholars have debated about the Fortore's role during pre-Roman and Roman periods, specifically focusing on how this physical boundary may have influenced the interaction and connectivity between the Samnium (modern-day Molise) and Daunia (modern-day northern Puglia).

Both ancient literary sources and archaeological finds demonstrate that the situation is more complex than it may seem and that it is not easy to locate the geographical and cultural borders, especially in the pre-Roman period. In this poster is suggested a model that can help to understand the interaction between the two modern-day settlements that are opposite only in appearance, i.e. Macchia Valfortore (Molise) and Carlintino (Puglia). These sites were in the proximity of the Fortore river, and, in both centres, a specific investigation of material culture brought to light a complex and diversified society, between the Iron age and Samnitic period (respectively, 9th-8th cent. BC and 6th-3rd cent. BC). The small-scale geographic network (constructed) helps to explain the interchange dynamics between the two sites and, furthermore, the interaction with transhumance routes, i.e. tratturi. These are associated with the collective seasonal migration of animals and shepherds between the highlands of Central Apennine and the pastures's South Italy, but not only that. Since the Iron Age, the transhumance, in the study area, has had a strong impact on many economic activities and on different aspects of society.

So, the proposed case study points out the successful choice of using an innovative model to identify interaction areas through a historic interpretation; and moreover, it demonstrates the key-rule of the fluvial connections in the area to the development of human society.

11 WATER, COMMUNICATION, SIGHT AND THE LOCATION OF FORTIFICATIONS ON THE STRATA DIOCLETIANA (SYRIA) IN LATE ANTIQUITY

Abstract author(s): Seland, Eivind - Meyer, Jørgen Christian (University of Bergen)

Abstract format: Oral

Strata Diocletiana was a military road constructed along the Syrian Desert-frontier of the Roman Empire in the late third century AD. New military outposts were established at regular intervals after the Roman sack of Palmyra, probably reflecting a situation when Roman soldiers had to directly control a route that had earlier been the responsibility of their former Palmyrene allies.

The new road seems not to have been constructed along the easiest and fastest route through the desert. What considerations came into play when reorganizing communication along the Syrian Desert-frontier? Using GIS approaches we compare the situation of archaeologically attested Roman forts and outposts with the distribution of (modern era) water sources, the distance between

military installations, the least-cost path between permanent settlements and the viewshed from the military outposts. We argue that access to water and considerations of viewshed and defense were more important than speed and ease of travel.

12 MARGINS. REFRAMING THE POTENTIAL OF MOUNTAINOUS AND INSULAR AREAS FOR MOBILITY AND INTERACTION IN NEOLITHIC SICILY

Abstract author(s): Dawson, Helen (Dipartimento di Storia Culture Civiltà, Università di Bologna; Institut für Prähistorische Archäologie, Freie Universität Berlin) - Speciale, Claudia (Istituto Nazionale di Geofisica e Vulcanologia - Osservatorio Vesuviano) - Forgia, Vincenza (Dipartimento Culture e Società, Università di Palermo)

Abstract format: Oral

This paper discusses the role of two "marginal" areas of Sicily, the Madonie mountains and the island of Ustica, in the ancient organisation of a mobility system evidenced by the spread of obsidian during the middle Neolithic (end of 6th-middle 5th millennium BC). The Madonie mountain range is located in the northern part of Sicily some 40 Km from the coast, ranging in altitude from approximately 200 m a.s.l. at the bottom of the Imera River Valley, to 1,979 m a.s.l. at Pizzo Carbonara. Ustica is a small volcanic island (ca. 9 sq Km) located some 70 Km north of the coast from Palermo and 110 Km west of the Aeolian islands. Both areas had access to obsidian, despite their distance from the two main sources on the islands of Pantelleria and Lipari.

Taking as case studies these two very different areas, we evaluate key aspects linked to insularity and marginality, such as geographic accessibility, resource availability, evidence for networks and their role in the development of prehistoric cultural routes. Our work highlights potential reasons that attracted Neolithic communities to occupy such extreme environments, in particular communication and exchange routes. We interpret the occupation of small islands such as Ustica and of mountainous landscapes within Sicily to represent choices by early communities. The evidence for lithic raw material networks highlights the role of such marginal or "in-between" areas in the exchange of obsidian resources within and throughout Sicily.

13 THE ROLE OF THE ROAD IN SETTLING A MOUNTAINOUS REGION

Abstract author(s): Mino, Martin (Monument Board of Slovak Republic)

Abstract format: Oral

In the heart of Europe in the area of traditional threshold between cultural areas lies a mountainous area in Northern Carpathians in today's Central Slovakia. Though this area isn't abundant of fertile soils it has been a repository of raw material resources since the Palaeolithic. In spite high demand on the resources the current state of research indicates an incapability of prehistoric and early historic populations to maintain a self-sustaining continuous settlement area. Even up to modern days the local communities exploiting the raw materials depended on long distance trade for subsistence. To maintain the trade a reliable network of safe routes across the mountainous landscape had to be established. Many fragments of old roads connecting this mining area with locations in all directions are still preserved. Especially the south - north route connecting these resources with the Carpathian Basin in the south and the Vistula River Basin in the North seems to come to the most importance as a possible bypass to the well known Amber Road. In combination of the walkthrough survey and high resolution LIDAR data course of single roads can be reconstructed. Analysing them in smaller scale plans the main routes can be defined. By applying GIS and adding settlements, fortifications, farmable land, exploitation sites, environmental features such as geo-relief, hydrology or seasonal heavy snow cover and cultural features such as hostility of cultures analyses could be performed on whether the route passing through a certain area is a cause of establishing settlements or in contrary the route is built as a consequence to connect an established site with the rest of the surrounding world and ancient route planning strategies could be defined. Attempt to answer the question how the main routes facilitate the settlement pattern and cultural evolution could be made too.

14 COUNTRY ROADS TAKE ME HOME TO THE PLACE I BELONG. REGIONAL ROUTES ON NORTHERN APENNINE AS RESOURCES FOR IDENTITY NEGOTIATIONS

Abstract author(s): Da Vela, Raffaella (SFB1070 RessourcenKulturen University of Tübingen)

Abstract format: Oral

Between the 7th century BCE and the 4th century BCE, the Northern Apennines can be considered as a complex system of natural and cultural resources, rich of water, quarries and forests and populated by people whose cultural references and religious identities were expressed in hybrid languages. Quickly mentioned in the ancient literary sources as a barrier to overcome, aiming to reach reach the fertile fluvial plains, the Apennines has been longer considered as a geographic and cultural boundary also in the archaeological research. Recent surveys and excavations demonstrate indeed, as the connections across the mountains has been always an opportunity for commercial contacts and cultural exchange. The mobility of persons and supplies across the Apennine, attested by several archaeological finds and epigraphic data, constituted a channel for these cultural contacts and for the exchange of knowledge and ideas. Focussing on the roads in the mountain and in the foothills and on the relationships with the material culture attested in settlements and cult places, the present contribution points out as environmental and cultural factors shaped not only the mountainous landscape, but also the identities of local communities. These regional routes, rather than commercial and colonial infrastructures, are thus approached as resources for the negotiation of the social identities of the ancient inhabitants of the region.

204 ARE WE REALLY STRATEGIC? DEVISING AND IMPLEMENTING ARCHAEOLOGICAL STRATEGIES

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Doyle, Ian (The Heritage Council of Ireland) - Robinson, Rhonda (Historic Environment Division, Northern Ireland Department for Communities) - Grant, Kevin (Historic Environment Scotland)

Format: Regular session

Archaeologists are no strangers to devising strategies. Research frameworks, historic environment plans, organisational documents and planning for heritage areas all include elements of strategy. Yet, as a discipline we rarely discuss what has worked.

In devising sectoral plans there are a number of common approaches including stakeholder mapping and consultation, a reflection of the benefits of greater participation and access to heritage, the economic opportunities provided by archaeology, as well as emphases on skills and learning. Research Frameworks ensure that important questions are addressed and that we look to the bigger picture. Such approaches are underpinned by surveys demonstrating how the public relates to archaeology as well as by forecasting exercises and horizon scanning practices. Yet are there other equally valid approaches to devising strategy for the archaeological heritage sector?

An additional key ingredient of strategy is how do we deliver it successfully and sustainably. What has worked to ensure that the efforts that have gone into strategy formation are matched by successful implementation? Traditional approaches to delivering on strategy include leadership, lobbying, quick wins, and the continued involvement of stakeholders through suitable structures. Equally how good are we as a profession in monitoring and evaluating progress or otherwise in a plan of strategy?

This session builds upon ongoing collaboration on the island of Ireland and Scotland in the devising and delivery of strategies for archaeology. We would like to broaden the frame of reference to other countries and organisations at various stages in the strategy cycle. These issues are of growing importance as typically the historic environment sector faces low levels of resources, regular fluctuations in economic conditions and, even more so, the challenges of climate change and a global pandemic mean we need to share learning on strategic practice.

ABSTRACTS:

1 ARCHAEOLOGICAL STRATEGIES FOR THE DANUBE REGION – THE IRON-AGE-DANUBE EXPERIENCE

Abstract author(s): Mele, Marko (Universalmuseum Joanneum)

Abstract format: Oral

We love EU-projects! They are a great opportunity for transnational co-operations in research, monument protection and tourism. For at least three to five years they provide us funds for nice products (outputs), which sometimes even survive and continue to thrive beyond the project duration. One of the most loved outputs of the Interreg projects are Strategies and Action and Implementation plans. They are even so greatly needed, that they are a mandatory part of many international EU-programmes. But, they often are not among the most sustainable outputs, which create a major impact in the targeted stakeholder group.

Twenty partner from four countries, Austria, Croatia, Hungary and Slovenia, concluded in 2019 the Interreg Danube Transnational project called Iron-Age-Danube. In the project working groups were established, which developed joint strategies for the research, protection, promotion and touristic use of archaeological landscapes in the Danube region. The focus was mostly on the regions with well known and preserved Iron Age heritage, mostly represented by hilltop settlements and tumulus cemeteries. The international strategies were flanked by national action and regional revitalisation plans, with concrete steps for their implementation.

In my paper I would like to discuss the process of the development of strategies and the challenges which the partners have to overcome, once the strategies are developed. In addition, in 2020 a new Interreg project called Danube's Archaeological eLandscapes was launched, which also aims to add new strategic approaches to the digitisation of the archaeological heritage. Therefore, I would also like to present, what lessons were or were not learned and transmitted to the new project with over 20 partners from 10 countries of the Danube region.

2 'PLAN OR BE PLANNED FOR': REFLECTIONS ON ARCHAEOLOGICAL HERITAGE STRATEGY IN IRELAND

Abstract author(s): Doyle, Ian (The Heritage Council of Ireland)

Abstract format: Oral

Recent years have seen a number of over arching documents on archaeology and heritage policy for the Republic of Ireland. These cover areas such as the development of the wider profession, the implementation of standards, involving communities, better communication and advocacy, maximising the knowledge dividend from field practice, and winning support from decision makers. Organisational strategies and location specific conservation and management plans are also important elements of ongoing practice. Research frameworks, policy documents on issues like climate change and sectoral plans have been the key outputs from all of this activity – yet have they delivered beyond their launches or is the drafting of a plan enough in its own right? This paper will outline some of the key strategy documents set out in Ireland in recent years and examine how they were compiled, where is the ownership, how has their delivery been structured, and have they been evaluated so as to determine success or otherwise. This, it is argued, will suggest that we have a lot of plans with a mix of achievements and that this in turn provides lessons for future practice.

3 IMPLEMENTING THE HISTORIC ENVIRONMENT RESEARCH AND DELIVERY STRATEGY: HIGH SPEED RAIL 2-UK

Abstract author(s): Halsted, John (Atkins; HS2 Ltd) - Court, Michael (HS2 Ltd) - Hopla, Emma (HS2 Ltd; Atkins)

Abstract format: Oral

The large scale of the HS2 rail project in the UK, extending 200km from London to north of Birmingham gave rise to the development of a strategy which aimed to focus investigations and approaches in key areas. The strategy was developed around key headline objectives and specific objectives relating to knowledge creation, community and skills. For archaeological and historic environment investigations the strategy focussed on knowledge creation objectives, drawn from existing research frameworks and agreed through a process of consultation with stakeholders. The implementation and delivery of those methods was underpinned by a series of technical standards, echoing industry standard best practices in, for example, fieldwork survey and excavation practice, GIS standards and data delivery. The strategy as a whole was designed to support over-arching commitments for the historic environment through a published Heritage Memorandum, ultimately supporting an Act of Parliament.

Key themes have arisen during the course of works including how to address less visible archaeological remains, selection for further investigation, the potential for bias and the consideration of scales of analysis. This paper will discuss how the strategy has been implemented, the decision-making processes involved, and the methodologies used to date in addressing the specific research objectives.

4 MAKING ARCHAEOLOGY MATTER: FIVE YEARS OF SCOTLAND'S ARCHAEOLOGY STRATEGY

Abstract author(s): Grant, Kevin (HES Historic Environment Scotland)

Abstract format: Oral

Scotland's Archaeology Strategy was launched at the EAA in Glasgow in 2015 with a vision to make Archaeology Matter – imagining a Scotland where archaeology is for everyone. It articulated an ambitious agenda for archaeology, meeting the challenges of the future, enhancing the value archaeology brings to wider society, and fitting into a wider strategic landscape within Scotland.

IN 2021, a five year review of Scotland's Archaeology Strategy was published, and is therefore a good time to take stock of what has been achieved and what issues remain to be addressed. This presentation will review the experience of delivering the strategy so far, focusing on key areas where there is ongoing work and discussion. It will also share examples of best practice and an honest assessment of the challenges we face working across the Historic Environment Sector to deliver an ambitious strategy to make archaeology central to Scottish life, whilst sited in a global context.

5 ARCHAEOLOGY 2030: CREATING A STRATEGIC APPROACH FOR NORTHERN IRELAND

Abstract author(s): Robinson, Rhonda (DfC Historic Environment Division)

Abstract format: Oral

The past twenty years has seen considerable changes in Northern Ireland. With land use change, increased development and the introduction of new planning policies, has come a significant increase in the number of archaeological excavations being conducted. With archaeological legislation which was introduced in 1995, related planning policies in 1999, and more public interest in archaeology than ever before, it seems timely now in 2021 to stand back and consider where we are at as a sector, and where we want to go within the next ten years.

There are some substantial questions which those who participate in the whole range of archaeological activities have identified that we need to answer. Key issues include reviewing our legislation, policies, systems and procedures to ensure that they facilitate and enable us to deliver archaeology and maintain and protect our heritage assets in today's working environment. How do we implement best practice standards, and could a research framework help us to collaborate, and synthesise data to produce knowledge, which can be shared and made accessible? How do we look after our records, archives and artefacts? What are the skills and new technologies that are essential for the future? Perhaps most crucially in a time a limited finances, how do we mainstream archaeology and encourage to public to engage with it, and to understand the wide range of benefits it can produce?

These are big questions for a small sector! If all archaeological work aims to broaden and deepen our understanding of the past – what is our strategy to achieve this by 2030 in Northern Ireland?

6 CREATING A SUSTAINABLE ARCHAEOLOGICAL RESEARCH STRATEGY FOR THE ENGLISH EAST MIDLANDS

Abstract author(s): Knight, David (York Archaeological Trust) - Miles, Dan (Historic England) - Owen, Vicky (York Archaeological Trust)

Abstract format: Oral

The East Midlands Historic Environment Research Framework is one of a suite of English regional frameworks developed from the mid 1990s to provide a more strategic and research-led culture, primarily for development-led investigations. Recent work to transform the original document-based framework into an interactive digital resource is a significant step towards developing a sustainable research strategy for the East Midlands. The focus has been on three areas: creation of an online wiki framework that can be

kept up to date, maintained and developed; an implementation plan that will embed it into practice and deliver impact; and the establishment of a research community that is responsible for managing, implementing and sustaining the framework. The development of the online framework has in many ways been the easy part, as both websites and wikis are now mainstream in terms of innovation. The most daunting task has been to drive the framework forward and to encourage implementation of the recommended strategies. Extensive consultations with community groups, contracting units, planning offices, universities, museums and other organisations have succeeded in engaging stakeholders from across the East Midlands. In addition, we have developed a sustainable management structure, underpinned by a steering group comprising members from across the historic environment spectrum with shared interests and agendas and a common strategic vision of the future. We will reflect upon the methods used to encourage stakeholder engagement during compilation of the framework; the strategies for involving stakeholders in maintaining and updating the new wiki; the contribution of this process to the delivery of public benefit and impact; and the potential of the framework to serve as a template for national and international research strategies.

A. URBAN ARCHAEOLOGY IN PANDEMIC TIMES

Abstract author(s): Luciano, Vanda Bela (UAL)

Abstract format: Poster

Preventive archaeology in Portugal continues to surprise us, even in pandemic times. We have had to adapt to promote the protection for our heritage but to protect us too. Yet despite these disturbing times, archaeology never stopped in Portugal. Due to the pandemic construction on urban sites has been challenging because we had to work more safely and also we had the challenge of working in the uncertainty caused by the pandemic.

The recording and analysis of walls uncovered in urban archaeology in Portugal is sometimes forgotten. This poster argues that as we focus on stratigraphy and the excavation of deposits we are in danger of overlooking important evidence for the materials used and re-used in the actual wall fabric. In order to change this situation, this poster will suggest the need to raise awareness of the vulnerability of this resource. If we lose this information, we have lost it for ever. The poster will argue that if surveys and excavation are important in a urban project, why is the survey of walls not given more attention?

205 LITHIC RAW MATERIALS IN PREHISTORY: METHODS, PRACTICE AND THEORY. PART 1

Theme: 6. Material culture studies and societies

Organisers: Brandl, Michael (Austrian Academy of Sciences, OREA-Institute) - Martinez, Maria (Smithsonian Institution, National Museum of the American Indian) - Gurova, Maria (National Institute of Archaeology and Museum, Bulgarian Academy of Sciences)

Format: Regular session

Lithic materials are the oldest provable culture bearing resources in human history, demonstrated by the wide array of their use in the profane and sacred spheres of life. Due to their abundance, versatility and longevity, lithic artefacts are ideally suited for approaching and interpreting past human behaviour through the reconstruction of resource management, i.e. the procurement either directly or through distribution networks, the processing, use and eventual discarding, which represents the complete chaîne opératoire of lithic production and artefact biographies. From a diachronic perspective, such studies can reveal dynamic processes relating to the development of economic behaviour, production strategies and traditions, landscape use, contact spheres, routes of migration, and distribution networks. Successfully reconstructing these processes however crucially depends on the ability to trace these materials back to their original sources. Despite the obvious importance of provenance studies in archaeology, attempts to generate characteristic “fingerprints” of particular raw materials are still not widely available and remain challenging endeavours. Consequently, this session focuses on analytical techniques applied to various lithic raw materials from all geographical regions, and their potential for tracing lithic resource management. This topical issue can be tackled from a multitude of perspectives, which hold the promise for significantly enhancing our insights into past economic behaviours on a large international and multidisciplinary scale.

We cordially invite researchers from diverse backgrounds to contribute to this undertaking.

ABSTRACTS:

1 LITHIC RAW MATERIAL PROVENANCE STUDIES IN THE SIWALIK HILLS OF NORTH-WESTERN INDIA: A REASSESSMENT AND FUTURE SCOPE

Abstract author(s): Kaur, Anubhav (Indian Institute of Science Education and Research, Mohali)

Abstract format: Oral

Palaeolithic evidences have been known from the Siwalik Hills of north-western India since the early 20th century. These assemblages are characterised by the exploitation of fluvially rolled quartzite clasts using simple core-and-flake technology. The entire Siwalik Frontal Range is abundant in good quality quartzite clasts with an uneven spatial distribution. However, the problems of raw material provenance, acquisition, transport and site-selection are poorly understood. Previous geoarchaeological studies in north-western India, have identified potential raw material sources in the Boulder Conglomerate Formation (Middle Pleistocene) and

the post-Siwalik deposits (Late Pleistocene), due to the abundant presence of knappable quartzite clasts and spatial overlap with identified Palaeolithic sites and findspots. Geological data points towards a presence of probable raw material sources in the Early Pleistocene Siwalik deposits as well. However, no targeted, site-specific, scientific inquiry has yet been undertaken to ascertain any of these sources and their relationship with the Palaeolithic sites with conviction. Chauhan (2007) is the only study that initiates a site-specific, theoretical inquiry into the problem. The main issue that remains here is that to date no surveys have yet, been undertaken to ascertain local raw material sources and their macroscopic and microscopic relationship with the lithic assemblages. Such studies in the region are necessary to understand the hominin land-use pattern, site-selection, raw material exploitation and transport. This study particularly highlights the lack of provenance studies in the Siwalik Hills of north-western India, thereby, focusing on the need, analytical methodologies to be used and the future scope of the same in the region.

2 KNAPPED RAW MATERIALS OF THE SOUTH INDIAN NEOLITHIC: A COMPARISON OF TECHNOLOGY AND USE FROM THREE INDIAN ASHMOUND SITES

Abstract author(s): Rajala, Ulla (Stockholm University) - Madella, Marco (ICREA - CaSEs, Department of Humanities, Universitat Pompeu Fabra) - Korisettar, Ravi (Karnatak University, Dharwad)

Abstract format: Oral

The lithic assemblages of Neolithic South India have normally been described according to typological divisions without entering the topic of raw material exploitation and stone technology. Indeed, flint and chert were only a part of a more complex array of raw materials utilised by the Southern Neolithic people. Even if this situation has improved (cf. Rajala et al. 2009; Shipton et al. 2012), the wider questions related to different Neolithic chaîne opératoire –sequences still require further work.

This study is based on the lithic materials from The Herders' Monuments: Ashmounds of Southern Deccan Neolithic project. The summary outline of the surface survey and its lithic material (Rajala et al. 2009) established that the assemblage reflects Late Neolithic-type chaîne opératoire and the quartz assemblage from Palavoy is relatable to the quartz industries in northern Europe. The further study of surface assemblages from three different ashmound sites, in the collections of Karnatak University, has revealed differing patterns of raw material use depending on local natural and social environment. The analysis will concentrate on presenting different modes of quartz exploitation in comparison with other raw materials exploring different technological diagnostic features and typological makeup in the assemblage. Furthermore, the procurement and use strategies are compared to those from other quartz using areas in Eurasia and beyond.

References

- Rajala, U., Madella, M., and Korisettar, R., 2009. Quartz and other knapped raw materials of the South Indian Neolithic. In F. Sternke, L. J. Costa and L. Eigeland (eds.), Non-flint Raw Material Use in Prehistory, BAR International Series 1939, 225-232.
- Shipton, C., Petraglia, M., Koshy, J., Bora, J., Brumm, A., Boivin, N., Korisettar, R., Risch, R. and Fuller, D. 2012. Lithic technology and social transformations in the South Indian Neolithic: The evidence from Sanganakallu-Kupgal. *Journal of Anthropological Archaeology* 31(2), 156-173.

3 A STUDY OF RAW MATERIAL ACQUISITION IN THE MIDDLE AND INITIAL UPPER PALEOLITHIC OF MONGOLIA

Abstract author(s): Khatsenovich, Arina - Rybin, Evgeny (Institute of Archaeology and Ethnography SB RAS) - Shelepaev, Roman (Institute of Geology and Mineralogy SB RAS) - Popov, Alexei (Trofimuk Institute of Petroleum Geology and Geophysics SB RAS) - Olsen, John (School of Anthropology, University of Arizona, Tucson; Institute of Archaeology and Ethnography SB RAS)

Abstract format: Oral

Pleistocene lithic industries in Mongolia reveal various knapping strategies, usually associated with the Middle or Initial Upper Paleolithic. MP industries are known from central Mongolia and the Gobi Altai region, while most IUP occurrences with laminar technology are located in northern Mongolia. These industries fall with the range of ca. 45-40 cal. ka. Studies of MP and IUP raw material indicate technological dependence on the size of initial clasts rather than raw material quality per se. The Tolbor cluster of sites in the middle Selenga Basin is located near primary raw material outcrops. Rock samples selected for analysis exhibit variable features of structure and color divisible into three primary categories: (1) cherts (defined as silica-rich sedimentary rocks) with a cryptocrystalline structure of chalcedony-quartz composition; (2) tuffaceous siltstone; and (3) three varieties of coarse tuff and tuffites with siliceous cement. Cherts predominate the Tolbor IUP industries. This raw material was accessible as large blocks with an average length up to 30 cm, suitable for decortification and core preparation. MP industries in the Orkhon Valley in central Mongolia are dominated by Levallois production and simple parallel unidirectional methods of core flaking based on local alluvial pebbles including smaller, rounded, internally fractured argillite, siltstone and aleurolite sandstone pebbles less than 15 cm in length. These pebbles were suitable for the production of medium-size blades. Clustering by K-means indicates the lack of difference in size between blades and Levallois end-products and the constraints placed on both technologies by the size of available primary nodules. Levallois convergent point technology was used here instead of subprismatic large blade production to compensate for shortcomings of elongated pointed blanks.

This study was supported by the Russian Science Foundation grant No. 19-18-00198.

4 SERPENTINE PROCUREMENT AND PERSONAL ORNAMENT PRODUCTION IN THE EARLY UPPER PALAEOLITHIC ASSEMBLAGES OF ALTAI

Abstract author(s): Fedorchenko, Alexander - Belousova, Natalia - Kulik, Natalia (Institute of Archaeology and Ethnography SB RAS)

Abstract format: Oral

A comprehensive study of utilitarian and symbolic artefacts made of exotic stone raw material contributes to obtaining unique information about mobility, cultural and technological innovations of their makers. While the main aspects of the transportation and processing of jade or obsidian in Siberian prehistoric cultures are well known, other specific lithic material's role is still poorly studied. Here we present new data from detailed analyses of the serpentine personal ornaments (n = 15) from Early Upper Palaeolithic assemblages of Ust-Karakol, Anuy-2 and Denisova cave sites (Russian Altai). Our research focused on the production sequences and functions of artefacts following technological, use-wear and experimental, petrographic, refitting and raw material unit analysis.

The petrographic study of magmatic rocks of the Bashchelak and Anuy mountain ranges showed that serpentine for ornaments could have been local. We consider gabbroid deposits related to Devonian and Permian magmatism of the region as potential sources. For blanks, Palaeolithic inhabitants of Anuy river valley used small angular laminar fragments. Items' perforation preceded the abrasive treatment of their surfaces owing to the serpentine's fragility in use. Such a sequence reduced the risk of breaking an ornament. The experimental and functional analyses show that most serpentine ornaments have evidence from contact with threads, straps, clothes or human skin. Reconstructed manufacturing techniques belong to the technological repertoire of the Ust-Karakolian tradition in the Altai. Lithic assemblages of this tradition demonstrate perfect knowledge of the local raw material resource base and early humans' high mobility. Thus, they could afford to select lithic materials for manufacturing tools and personal ornaments of various types.

This research was funded by the Russian Science Foundation project No 20-78-10125 «The dynamics of cultural development and human colonization of Altai at the onset of the Upper Paleolithic: life support strategies, paleotechnologies, mobility».

5 PREHISTORIC STONE AXES IN THE SAHARA – SOME THOUGHTS ON RAW MATERIAL

Abstract author(s): Jesse, Friederike (University of Cologne, Institute for Prehistoric Archaeology, African Archaeology)

Abstract format: Oral

Prehistoric stone axes in the Sahara can be considered a neglected find category. They are numerous and various in shape but not much attention has been paid to them in recent research. Since 2019 a research project focuses on a special form of stone axes, the so-called "necked axes", "hache à gorge", "Darfurbeile". This rather peculiar type is widely spread throughout the Sahara and can there be linked with the different pastoral groups of the 5th to 3rd millennium BCE. Seen the wide distribution between the Nile Valley and Mali questions of trade and transport of these axes are an important research question. The raw material used for the manufacture of the axes is of great interest in this regard. Especially, since already in first descriptions a peculiar greenish rock is mentioned, especially for pieces found in the eastern part of the Sahara. To get a better understanding of the raw materials used pXRF analysis were made on a sample of about 60 axes from the eastern Sahara, mainly the Wadi Howar and Laqiya region in northern Sudan. The results will be presented and discussed.

6 PREHISTORIC FLINT PROVENANCE AND DISTRIBUTION IN BULGARIA: PETROGRAPHIC AND GEOCHEMICAL ANALYSES OF RAW MATERIALS AND PREHISTORIC ARTEFACTS

Abstract author(s): Gurova, Maria (National Institute of Archaeology with Museum, Bulgarian Academy of Sciences) - Stefanova, Elitsa - Andreeva, Polina (Geological Institute, Bulgarian Academy of Sciences)

Abstract format: Oral

Bulgaria is a country with many primary and secondary outcrops of flint raw materials that were or could be sources for flint toolmaking in prehistory. A provenance study, as well as long distance raw material transfers across Bulgaria and other forms of prehistoric cultural messaging and interactions have previously and mostly been inferred by visual and/or petrographic observations of flints.

Our innovative (for 2011 – the year of starting) and efficient analytical approach, combining micropetrography and LA-ICP-MS analyses of raw material samples and prehistoric artefacts has proven its reliability and potential. So far, a significant number of flint raw material outcrops (more than 40) and archaeological sites (more than 10) have been identified and documented and more than 100 raw materials and artefacts were characterized in detail by microscopic petrography and LA-ICP-MS analyses.

Petrographic microscopy can contribute to a better understanding of the origin of the flint and help to identify source areas. Therefore, identification of possible sources requires additional methods to be employed. The LA-ICP-MS technique is a highly appropriate method for studying archaeological artefacts because it is virtually non-destructive and does not require any specific sample preparation. Our results suggest that geochemical data are very efficient for better characterization of individual flint types and allow us to differentiate different subtypes.

Our results show that both methods have advantages and can yield valuable information about flint raw materials and prehistoric artefacts.

This paper summarizes the results of our work in order to evaluate the potential of both methods to answer different archaeological questions concerning raw material sourcing and mobility patterns during prehistory. The paper illustrates the advantages (and limitations) of both methods for the study of flint materials.

7 VIRTUAL LITHIC REDUCTION WITH NEURAL NETWORKS: A PROOF OF CONCEPT FOR A NOVEL RAW MATERIAL RESEARCH TOOL

Abstract author(s): Orellana Figueroa, Jordy (Department of Early Prehistory and Quaternary Ecology, University of Tübingen) - Reeves, Jonathan (Technological Primates Research Group, Max Planck Institute for Evolutionary Anthropology) - McPherron, Shannon (Department of Human Evolution, Max Planck Institute of Evolutionary Anthropology) - Tennie, Claudio (Department of Early Prehistory and Quaternary Ecology, University of Tübingen)

Abstract format: Oral

The experimental replication of prehistoric stone tools is an important tool for raw material studies. Methods such as the calculation of core reduction intensity and cortical index are commonly based on studies performed on experimental lithic replication (e.g. Clarkson and Hiscock, 2011; Shipton and Clarkson, 2015; Braun et al., 2008). However, such experiments can require large amounts of time and raw materials, limiting the amount of research that can be carried out, as well as the size of the resulting experimental datasets.

A program for virtual stone knapping that uses a fraction of the time and resources required for actual knapping—and whose results were validated with archaeological and experimental data—could be an important tool for raw material research. Such a tool would allow for simpler data sharing, easier replication of lithic studies, and more robust insights into the effects of raw material in core reduction.

With a fully digital dataset, the creation of the desired core shapes and sizes could be done easily in a computer. In addition, the virtual knapper program would allow for extensive digital core and flake assemblages that could be used to compare with experimental and archaeological data.

We present here the initial results of a proof of concept for a virtual knapping framework based on a conditional generative neural network (CGAN). For this proof of concept, we generated a dataset (n = 2010) of 3D cores and flakes based on core shapes from an experimental study (Dibble and Režek, 2009), and used them to train and test the neural network model. The model obtained highly accurate results in predicting flake width, volume, length, and overall shape.

These results from our proof of concept suggest that our framework, when trained and validated with an experimental dataset, could be a powerful tool in lithic research.

8 VOLHYNIAN LONG BLADES' DISTRIBUTION IN 4TH MILLENNIUM BCE

Abstract author(s): Sliesariev, Yevhenii (Institut fuer Ur- und Fruehgeschichte Kiel)

Abstract format: Oral

Volhynian" flint raw material is well known for its high quality throughout history. Exploitation of this resource started during the occupation of the Pre-Carpathian region of nowadays Ukraine by LBK communities in 6th millennium BCE. In 4th millennium BCE the intensification of large-scale contacts took place in Central – Eastern Europe. This phenomenon occurred not least because of Trypillian communities' movement toward North-West to Volhynia which is rich with high-quality siliceous raw material. One of the clearest markers of long-distance contacts during the 4th millennium BCE is long blade hoards which were discovered in different areas of Trypillian oikumene and beyond. Tracing the distribution of long blades over the long distance together with use of other markers of material culture could help us to understand the exchange system, inequality rise, and to reconstruct prehistoric routes of exchange in Central – Eastern Europe. It is also clear that Volhynian flint served as a raw material for specific needs. Among Trypillian communities it was used for elaborate tools and weaponry crafting, at the same time using "local" lower quality raw materials for crafting more simple tools. Understanding what is "Volhynian flint" and tracing its distribution could give us necessary information about raw material management, trade relations and local economies' organization in Chalcolithic Central – Eastern Europe.

9 CHARACTERIZATION AND IDENTIFICATION OF SILICEOUS ROCKS AS POTENTIAL RAW MATERIALS

Abstract author(s): Kochman, Alicja (AGH University of Science and Technology; Faculty of Geology, Geophysics and Environmental Protection)

Abstract format: Oral

The Upper Jurassic sediments from the southern part of the Kraków-Częstochowa Upland (KCU) are developed as carbonates and host a variety of siliceous rocks (chert concretions, bedded cherts and epigenetic siliceous rocks). In the Middle Palaeolithic, this region was settled by humans. Among the reasons were: availability and high quality of local siliceous raw materials. In archaeological research, the siliceous raw materials used in this production are categorized mostly according to the macroscopic features. Moreover, such raw materials are linked with particular regions or even with particular outcrops. The mineralogical and petrographic characterization of siliceous rocks is closely related to the development of primary depositional structures of their limestone hosts.

The identification of different types of siliceous rocks used for tools manufacturing should base upon the microscopic observations of thin sections, which reveal primary microfacies of limestones subjected to silicification, and the X-ray diffraction analyses

including the determination of crystallinity index of SiO₂. This research enabled to relate the distinguished types of siliceous rocks to particular stratigraphic intervals of Upper Jurassic succession from the southern KCU. Moreover, it was possible to evaluate the credibility of provenance determination of siliceous raw materials from which tools were manufactured, based upon the macroscopic feature. Unfortunately, the available research methods do not allow to identify the varieties of chert concretions, which might have been even roughly connected with particular outcrops or, at least, with particular regions of the occurrence of siliceous raw-materials, also on Pan-European scale. Macroscopic criteria recently used in archaeological classifications, aimed to evaluation of the origin of stone tools together with resultant conclusions indicating the source outcrops or regions are, regretfully, groundless from the geological point of view.

This researches was supported by The National Science Centre, Poland, contract no. UMO-2017/27/B/ST10/00594.

10

CHOCOLATE FLINT. WHAT DO WE KNOW AND WHAT DO WE WANT TO KNOW? HISTORY OF RESEARCH AND RESEARCH PERSPECTIVES

Abstract author(s): Sudol-Procyk, Magdalena (Institute of Archaeology, Nicolaus Copernicus University, Torun) - Werra, Dagmara (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Warsaw) - Brandl, Michael (Austrian Academy of Sciences, OREA-Institute, Vienna) - Krajcarz, Maciej (Institute of Geological Sciences, Polish Academy of Sciences, Research Centre in Warsaw) - Siuda, Rafał (Faculty of Geology, University of Warsaw) - Malak, Magdalena (Institute of Archaeology, Nicolaus Copernicus University, Torun)

Abstract format: Oral

Chocolate flint is one of the most renowned types of silicite raw materials used in prehistory, which occur in the territory of Poland, as well as in Central-East Europe. The materials were known and utilized since the Middle Paleolithic to the Late Bronze Age/ the beginning of the Iron Age. Research on chocolate flint has been going on for 100 years. The best known and studied zone of its deposits is the north-eastern edge of the Holy Cross Mountains and for many years this area was considered the only region where this raw material occurs. The current state of knowledge has been changed by the recent discovery of deposits of this raw material located about 200 km to the west, in the Kraków-Częstochowa Upland area. The discovery of chocolate flint outcrops in the central part of the Upland and – in the context thereof – mines along the open-air and cave sites with workshops, sheds new light on the current state of knowledge in the field of extraction, production, and, above all, distribution of this raw material.

All that puts our knowledge, especially about the uses and distribution of this raw material by prehistoric communities, in a new perspective and creates new questions. Such as those about the occurrence of chocolate flint outcrops in other parts of the Kraków-Częstochowa Upland; petrological features that can be used to distinguish the chocolate flint from the Kraków-Częstochowa Upland from the chocolate flint from the Holy Cross Mountains; or the importance of the Kraków-Częstochowa Upland raw material for the prehistoric economy.

Looking for answers, we would like to present the state of knowledge about chocolate flint, mostly based on the results of various instrumental methods.

Research on chocolate flint is carried out thanks to funding from the National Science Center, Poland, grant No 2018/30/E/HS3/00567.

11

FLINT TECHNOLOGY AND SOCIAL BEHAVIOUR AT THE TBK POGANICE SITE

Abstract author(s): Pyzewicz, Katarzyna (Faculty of Archaeology, University of Warsaw) - Gruzdz, Witold - Migal, Witold (State Archaeological Museum in Warsaw)

Abstract format: Oral

The site in Poganice is located in the part of Pomerania (Poland) that lacks good quality raw material outcrops. The societies TBK of culture that inhabited this region applied methods of flint production in quite a different manner than their counterparts in the inland territory. Our presentation focused on the analyses of chaîne opératoire of different tool type that were made from two kinds of erratic flint at the Poganice site. The most common raw material in the assemblage is the so-called Pomeranian flint that occurs in small pebbles. The dimensions and shape of this nodules influenced the reduction method. The second group of flint consist of cretaceous flint of different varieties that are assigned in polish literature to so-called Baltic flint. In our studies, we applied experimental and use-wear methods to investigate how the products from both kinds of raw material were made and used. We wanted to investigate if these two groups of tools were used in the same manner or different and if it is possible to state any connotations between them and inland production and usage of flint tools.

12

ALFÖLD LINEAR POTTERY CULTURE COMMUNITIES IN EASTERN SLOVAKIA (THE NORTH-EASTERN CARPATHIAN BASIN) IN THE LIGHT OF OBSIDIAN SOURCE USE

Abstract author(s): Werra, Dagmara H. (The Institute of Archaeology and Ethnology Polish Academy of Sciences, Warsaw) - Hughes, Richard E. (Geochemical Research Laboratory, Portola Valley) - Nowak, Marek (Institute of Archaeology, Jagiellonian University, Cracow) - Vizdal, Marián (Institute of History, Prešov University, Prešov) - Gačková, Lýdia (Zemplínske múzeum, Michalovce)

Abstract format: Oral

Obsidian due to its particular physical properties, as well as its aesthetic qualities, was widely used by prehistoric communities, and still attracted attention in modern times. This natural volcanic glass is present on archaeological sites in Eastern Slovakia dated from the Middle Palaeolithic, through the Upper Palaeolithic, Mesolithic, up to the Neolithic, up to the Early Bronze Age. The incidence of obsidian use increased with the appearance of the Early Neolithic communities. Archaeologically they are reflected by the Alföld Linear Pottery Culture (ALPC) dated to c. 5600–4900 calBC. The ALPC chipped lithic inventories are almost entirely composed of obsidian items. Over the last few decades since the first description of Carpathian obsidians, numerous modern analytical methods have been applied to determine the provenance of obsidian artefacts. However very little instrumental analysis has been undertaken on obsidian from ALPC sites in Eastern Slovakia.

In the presentation, we will demonstrate the results of the non-destructive energy dispersive x-ray fluorescence (EDXRF) analysis of obsidian artifacts from eight archaeological sites attributable to the Eastern Slovak ALPC. This is the largest instrument-based study yet conducted and reported for obsidian artifacts connected with the activity of the ALPC communities in this territory.

Obsidian artefacts, next to the pottery finds, are used to delineate prehistoric conveyance networks in the Carpathian Basin, but also outside of it (e.g. in the Vistula river basin). The obtained results make it possible to have a look for signs of actual, cultural and territorial differentiations. They also enable to evaluate the role of far-reaching communication networks in the functioning of the 'Eastern Linear' communities.

Acknowledgements: Investigations were financed by the National Science Centre, Poland (OPUS 15 2018/29/B/HS3/01540).

A.

RAW MATERIAL UNIT ANALYSIS IN THE THEORY AND PRACTICE OF ARCHAEOLOGICAL RESEARCH: AN EXAMPLE FROM PALAEO-LITHIC SITES OF RUSSIAN ALTAI

Abstract author(s): Belousova, Natalia E. - Fedorchenko, Alexander (Institute of Archaeology and Ethnography SB RAS)

Abstract format: Poster

In this paper, we discuss the methodological and practical aspects of applying the raw material unit analysis (RMU) to study the Initial and Early Upper Palaeolithic assemblages from the Russian Altai (45,0–30,0 kyr uncal BP). This method is also called transformation analysis (TA) or minimum analytical nodule analysis (MANA) in the archaeological literature. This approach aims to identify from a broad technological context of assemblage groups of lithics produced from the same raw material blocks. As the main criteria, we used colour, texture and another macro- and microscopically seen petrographic attributes of artefacts.

Based on the collections of the Ust-Karakol-1 multilayered site we integrate data from the raw material unit analysis and refitting studies of lithic assemblages, experimental modelling of operational sequences, the results of the use-wear investigations to reconstruct the structure of stone processing production activities, its spatial and temporal aspects, as well as the raw materials strategies of Upper Palaeolithic human. The implementation of complex geological-mineralogical and exploratory studies, the integration of natural science and archaeological data allow us to establish the nature and localization of the primary sources of stone raw materials of different cultural complexes, to assess the influence of stone raw material on the life-support processes and mobility structure of the first Upper Palaeolithic inhabitants of Altai, the functional specificity of the sites and cultural appearance of assemblages.

The research was supported by the Russian Science Foundation project No 20-78-10125 «The dynamics of cultural development and human colonization of Altai at the onset of the Upper Palaeolithic: life support strategies, paleotechnologies, mobility».

206

LITHIC RAW MATERIALS IN PREHISTORY: METHODS, PRACTICE AND THEORY. PART 2

Theme: 6. Material culture studies and societies

Organisers: Brandl, Michael (Austrian Academy of Sciences, OREA-Institute) - Martinez, Maria (Smithsonian Institution, National Museum of the American Indian) - Gurova, Maria (National Institute of Archaeology and Museum, Bulgarian Academy of Sciences)

Format: Regular session

Lithic materials are the oldest provable culture bearing resources in human history, demonstrated by the wide array of their use in the profane and sacred spheres of life. Due to their abundance, versatility and longevity, lithic artefacts are ideally suited for approaching and interpreting past human behaviour through the reconstruction of resource management, i.e. the procurement either directly or through distribution networks, the processing, use and eventual discarding, which represents the complete chaîne opératoire of lithic production and artefact biographies. From a diachronic perspective, such studies can reveal dynamic processes relating to the development of economic behaviour, production strategies and traditions, landscape use, contact spheres, routes of migration, and distribution networks. Successfully reconstructing these processes however crucially depends on the ability to trace

these materials back to their original sources. Despite the obvious importance of provenance studies in archaeology, attempts to generate characteristic “fingerprints” of particular raw materials are still not widely available and remain challenging endeavours. Consequently, this session focuses on analytical techniques applied to various lithic raw materials from all geographical regions, and their potential for tracing lithic resource management. This topical issue can be tackled from a multitude of perspectives, which hold the promise for significantly enhancing our insights into past economic behaviours on a large international and multidisciplinary scale.

We cordially invite researchers from diverse backgrounds to contribute to this undertaking.

ABSTRACTS:

1 MINING AND USE OF VIENNA RADIOLARITE – AN INTEGRATED STUDY OF LITHIC RESOURCE MANAGEMENT

Abstract author(s): Brandl, Michael - Schmitsberger, Oliver (Austrian Academy of Sciences, Austrian Archaeological Institute) - Penz, Martin (Museen der Stadt Wien – Stadtarchäologie) - Trnka, Gerhard (University of Vienna, Dept. of Prehistoric and Historical Archaeology)

Abstract format: Oral

In the course of the ongoing project “BergbauLandschaftWien” (Mining Landscape Vienna, MLV) previously unknown radiolarite mining and processing sites have been recovered and documented in the context of the radiolarite bearing St. Veit Klippen Belt southwest of present day Vienna, Austria.

The MLV-project combines geo-archaeological surveys, archival research, techno-morphological studies of old collections and newly discovered lithic assemblages, and raw material analyses according to the Multi Layered Chert Sourcing Approach (MLA).

Until recently, the only known radiolarite mine in this area was located at the Antonshöhe in Vienna-Mauer, dating to the Lengyel Culture. Since 2016, almost 30 new radiolarite quarrying- and workshop areas have been identified based on extensive remains of prehistoric quarrying, including debris from extraction activities, decortification flakes, discarded precores, and hammer stones. First results of raw material analyses aiming at the characterisation of the quarried material, which we term “Vienna radiolarite”, offer promising future perspectives for a differentiation from North Alpine and Carpathian radiolarites, and also on a more local scale between various types found within the St. Veit Klippen Belt.

Currently, the project is concerned with incorporating the mining landscape into the surrounding prehistoric settlement infrastructure to understand the socio-economic dimensions of these mining activities. Our study of selected lithic assemblages from throughout eastern Austria and adjacent areas demonstrate that Vienna radiolarite was used from the Palaeolithic to the Bronze Age, however, the peak of mining seems to have occurred during the Neolithic period. The preliminary results of this research program show that the dimensions of Neolithic radiolarite mining in Vienna were dramatically underestimated, and revealed a prehistoric mining landscape of international rank and significant extent providing unprecedented research potential.

2 CHERT OF CHOICE. RAW MATERIAL PROCUREMENT STRATEGIES IN NORTH-EASTERN VORARLBERG (AUSTRIA) DURING THE BOREAL AND ATLANTIC – A CASE STUDY

Abstract author(s): Posch, Caroline (Department of Archaeologies, University of Innsbruck)

Abstract format: Oral

Northern Alpine radiolarite and chert constitute two of the standard raw material varieties within various archaeological sites of Western Austria from at least the Late Palaeolithic onwards. Although the presence of these raw materials has been recorded time and again in the archaeological record, only few studies have looked into the respective procurement strategies and the decision-making processes behind the utilisation of these ubiquitous lithic resources. Therefore, it is the aim of this paper to explore their usage more in depth, using the area of north-eastern Vorarlberg as case study. Here, in the regions of Großes Walsertal and Kleinwalsertal, several outcrops of the Ruhpolding Formation and thus primary deposits of high-quality radiolarian rocks and chert are present. Concerning the archaeological record, numerous – mainly Early Holocene – sites have been recorded in the area since the 1980s. The Kleinwalsertal in particular features more than 90 archaeological sites, dating from the middle of the Boreal and to the end of the Atlantic period and containing large numbers of lithic artefacts predominately made from locally available chert varieties. Thus, the research area provides an opportune possibility to examine the different procurement modes of local varieties as a resource for the production of blanks and tools. To understand these strategies, the lithic artefacts were studied in more detail via an analysis of their morpho-technological and taxonomic characteristics as well as their respective position within the chaîne opératoire. This revealed striking differences and similarities between sites from various chronological and topographic contexts, including the choice of raw material sources (primary vs. secondary deposit), colour and the extent of preliminary core curation strategies.

3 ZÜRICH ALWAYS “INTERNATIONAL”? NEW PROVENIENCE ANALYSES BY OF THE PILE DWELLING SETTLEMENT ZÜRICH-INSURANCE

Abstract author(s): Wehren, Helena (ArchGeo Biel/Bienne) - Affolter, Jehanne (Ar-Geo-Lab Neuchâtel; University of Berne)

Abstract format: Oral

In prehistory, human contacts can be sketched by tracing the geographical origin of the raw material of silica artefacts. Knowledge about the distribution of artefacts and about their source of raw materials makes it possible to gain insights into prehistoric contacts and the area of movement.

We present in this presentation the results of a provenience study of silicite raw materials of/from artefacts found in a multiphase pile dwelling settlement excavated in 2018 in the agglomeration of Zurich (Switzerland). We use the sedimentary microfacies analysis which corresponds to the analysis of the fossils, sedimentary features, and their relation to each other. This enables investigation of the depositional conditions of the parent rock and thus its geological affiliation and its geographical origin.

The raw materials show typical contact networks observed in the Zurich area. The local and regional materials lie on possible routes for the few long-distance contacts correspond to possible routes seen in the nearer material. However, there are some new types in the raw materials record in the Zurich area.

4 ACHEULEAN INDUSTRIES AND ITS RELATION WITH AVAILABLE RAW MATERIAL IN T4 TERRACE: THE MALHADINHAS CASE STUDY (TEJO RIVER, CENTRAL PORTUGAL)

Abstract author(s): Pirata, Vânia (Universidade Autónoma de Lisboa; Novarqueologia, Lda.) - Pereira, Telmo (Universidade Autónoma de Lisboa; Instituto Politécnico de Tomar; UNIARQ, Centro de Arqueologia da Universidade de Lisboa) - Cunha, Pedro (University of Coimbra, MARE – Marine and Environmental Sciences Centre, Department of Earth Sciences) - Martins, António (Universidade de Évora, Departamento de Geociências; ICT – Instituto de Ciências da Terra) - Pereira, José (Novarqueologia, Lda.)

Abstract format: Oral

The basal sequence of the T4 terrace of the Tejo River is characterized by the presence of Acheulean and can be divided in two units: the Lower Gravels below and the Upper Sands above. In the Lower Gravels (ca. 340 to 325 ka), the debitage is mostly on chopper-like cores, flakes have informal retouched and the LCTs are rude and little elaborated. In the Upper Sands (ca. 325 and 220 ka), there is high number of discoidal-like cores, flakes have formal retouched and the LCTs are more elaborated. Above the basal sequence, the middle and upper sequences of the T4 already have Mousterian, that also occur through the younger T5 and T6 terraces. In the older T3 terrace there were never been found lithic artefacts.

Malhadinhas is an Acheulean site located in the T4 terrace at the right bank of the Lower Tejo. The site is known for almost one century but was only briefly surveyed and sampled. In 2019, the construction of a Solar Photovoltaic Plant allowed producing the first extensive surface collection, combined with mechanical test pits and manual excavations that allowed a detailed description of the context and to collect more than 1300 stone tools. Geomorphologically, this Acheulean occupation is at 45 m a.s.l., on the top of the Lower Gravels, which doesn't have artefacts in the 3 m below the occupation. Archaeologically, the assemblage is very well delimited in space at the elevation of 45 m a.s.l. and it is composed by almost only large artefacts, which is congruent with other assemblages found in the Lower Gravels across the Lower Tejo. Together, this data suggests that the presence of this dense gravel of quartzite boulders was determinat for the Acheulean occupation in order to produce LCTs.

5 RAW MATERIAL USE AND SETTLEMENT PATTERNS DURING THE END OF PLEISTOCENE AT CENTRAL PORTUGAL

Abstract author(s): Gameiro, Cristina (UNIARQ - Lisbon University) - Aubry, Thierry (Fundação Côa Parque) - Manzano, Carmen (Arqueologia&Património) - Gomes, Sérgio (CEAACP - Coimbra University) - Matias, Henrique (UNIARQ - Lisbon University)

Abstract format: Oral

In Portugal, the chrono-cultural sequence of the Upper Palaeolithic was tardily defined, when compared to the rest of Southwestern Europe. Until 1995, when the Côa Valley engravings and occupation sites were discovered, most of the known sites were in Estremadura.

The recent identification of two Upper Palaeolithic occupation sites in the Vouga River valley (central Portugal) is yet another valuable contribution to this knowledge. This paper will present a synthetic analysis of raw material procurement modalities, blank production, transformation and use of the lithic tools recovered at the Rôdo and Vau. The results will be compared with data from analogous sites of Estremadura and the Côa Valley, in order to understand the exploitation modalities of the territory located between these regions. Apart from Vau's Middle Gravettian occupations (SU005) and Olga Grande 14 (SU3) the remaining Upper Palaeolithic assemblages are mostly composed of various types of quartz, both in the Côa Valley and the Vouga Valley. The available data seem to indicate a decrease in the percentage of flint, silcrete and hydrothermal silicifications from Final Magdalenian/Azilian onwards, in both regions.

In the Côa Valley, the use of the same types of flint, silcrete and hydrothermal silicifications available in the Spanish Meseta and Portuguese Estremadura is documented between Gravettian and Tardiglacial. Most of these raw materials have also been identified at the Palaeolithic sites of the Vouga Valley, a region situated halfway between the Côa Valley and the flint sources of Estremadura. By interpreting the Palaeolithic rock art sites of the Côa Valley as a place of aggregation, one can envisage the mobility of human

groups between these two regions, more than 150km apart, enabling the exchange of lithic raw materials from various sources and the diffusion of know-how concerning the production of lithic artefacts.

In addition, the study of the site location, spatial organization of the structures and artefacts enables a functional interpretation of these hunter-gatherer camp sites.

6 IT'S JUST LOCAL! FOLLOWING THE SOCIAL NETWORKS OF A LOCAL FLINT IN PREHISTORY

Abstract author(s): Monforte-Barberan, Andreu (Grup de recerca Arqueològica al Mediterrani i al Pròxim Orient, Universitat Autònoma de Barcelona) - Pardo-Gordó, Salvador (Departament de Prehistòria, Arqueologia i Història Antiga, Universitat de València) - Molist, Miquel (Grup de recerca Arqueològica al Mediterrani i al Pròxim Orient, Universitat Autònoma de Barcelona)

Abstract format: Oral

The circulation of lithic resources, either as raw materials or as manufactured products, constitutes a key factor for the analysis of the production, reproduction and consumption of prehistoric societies. Due to the difficulty of identifying and differentiating siliceous rocks in archaeological contexts, the implication of most of these materials in the change and exchange networks had been excluded. Although, there are some siliceous varieties with specific geochemical identifiable remarks such as the Montjuïc's jasper. This flint has been detected in different sites in the northeastern Iberian Peninsula as a significant raw material used by prehistoric societies between the 6th and 3rd millennium cal. a.n.e.

Circulation patterns of this raw material, a priori with a local scale distribution, could be explained by dynamics networks, especially by structural (measured as the betweenness centrality) and geographical position of some nodes. Using graph models and a statistical approach, the aims of this communication is to present the reconstitution of the circulation networks of a local flint to reconstruct the connectivity degree of these prehistoric societies.

7 NON-INVASIVE GEOCHEMICAL DISCRIMINATION OF CORDED WARE CULTURE BATTLE-AXES FROM THE NE BALTIC SEA COASTS – TESTING PXRF PROTOCOLS

Abstract author(s): Holmqvist-Sipilä, Elisabeth - Nordqvist, Kerkko (University of Helsinki)

Abstract format: Oral

The Battle Axe / Corded Ware Culture (CWC) spread around the Baltic Sea c. 2900–2200 BCE, its northern-most adaptation emerging in the modern-day Finland. An astonishingly rich collection of ground stone battle-axes that lend the name to the cultural phase, c. 1400 specimens, has been found in the country. The abundance of battle-axe discoveries is explained by a century-old, yet never thoroughly scientifically proven postulate of the existence of a domestic battle-axe production centre in SW Finland, which exploited the olivine-diabase deposits of the Satakunta County and distributed battle-axes across southern Finland and beyond. We aimed to challenge the prevailing Satakunta-provenance paradigm by analysing stylistically related CWC battle-axes from Finland and comparative material from Estonia and Latvia via portable X-ray fluorescence spectrometry (pXRF). We also acquired a substantial comparative data set by analysing lithic samples from Satakunta and other diabase deposits in Finland. The majority of the battle-axes in the museum collections are intact, which challenged us to seek analytical protocols for non-invasive surface-analysis of lithic artefacts. Our aim was to establish protocols that generate adequate analytical power for geochemical discrimination and source determination of the axes. The identification of regional battle-axe economies and distribution patterns of the axes can inform us about the organisation of prehistoric labour and resources, and the formulation and maintenance of inter-regional contact networks by prehistoric communities – these questions are of particular interest when interpreting material evidence of a migration or expansion associated with the CWC phase.

8 SOURCING OBSIDIAN FROM THE EARLY BRONZE AGE MARITIME SANCTUARY OF KEROS (CYCLADES, GREECE): AN INTEGRATED APPROACH

Abstract author(s): Carter, Tristan - Moir, Rose (McMaster University)

Abstract format: Oral

Until 2019 there had never been a sourcing study undertaken on an obsidian assemblage from the prehistoric Cyclades, the received wisdom being that it would all be from the 'local' source of Melos. Ultimately this may well be the case, however this is to ignore the fact that there are two spatially and geo-chemically distinct sources on Melos – Sta Nychia (Adhamas) and Dhemenegaki – whose exploitation through time and space we cannot assume to have been the same. This paper details the elemental characterization of 198 obsidian artefacts from the well-known Early Bronze Age [EBA] (3rd millennium cal. BC) site of Keros, of which 99 came from the maritime sanctuary at Kavos, while 99 derived from the neighboring settlement of Dhaskalio, representing c. 13% of the total assemblage from the 2006–08 excavations. Portable x-ray fluorescence spectroscopy [pXRF] was the best-suited technique for the study as it (a) can discriminate the products of the main obsidian sources of the Aegean and surrounding region, (b) is non-destructive, and (c) can be undertaken where the material is stored. The artefacts selected for analysis included all of those illustrated in the original publication, i.e. our study was underpinned by a detailed techno-typological analysis of the assemblages, and also represented the different phases of occupation at Dhaskalio to gain a diachronic perspective on traditions of obsidian consumption. The results of this work suggest a striking preference for one of the Melian sources over the other, plus handfuls of other source products, a assemblage variability not usually associated with EBA assemblages in the southern Aegean, but very much in keeping with the well-connected character of the site.

9 LONG-DISTANCE OBSIDIAN TRADE TO NORTHERN ITALY DURING THE NEOLITHIC

Abstract author(s): Tykot, Robert - Vianello, Andrea (University of South Florida)

Abstract format: Oral

Obsidian from four islands in the central Mediterranean was acquired starting in the Early Neolithic (ca. 6000 BCE) and distributed long-distance to sites in northern Italy. The nearest is the islet of Palmarola, several hundred km to the south, while Lipari, Monte Arci (Sardinia), and Pantelleria are even further away. Previous studies demonstrated that obsidian from all four reached this far north, raising questions about quantity and frequency from each and how they may have changed over three millennia. Our study used a non-destructive portable X-ray fluorescence spectrometer to analyze >1000 artifacts from several sites in northern Italy. This research significantly increased the number of archaeological sites and artifacts tested in this region, allowing statistical comparisons between time periods and sites and provides some interpretations for the socioeconomic factors involved in this variation.

The sites tested in this study include Pescale, southwest of Modena, excavated by an early archaeologist and dating to the Middle-Late Neolithic. The majority of the 926 artifacts tested are small blades. The sites of Case Catena (56 artifacts), Pontetaro (66), and Guidorossi (47) are all near Parma, and date to the Early-to-Middle Neolithic. Along with mostly small blades, obsidian cores have been found at the first two of these sites, confirming the local production of the final tools used. About 35 obsidian artifacts from several sites in northeastern-most Italy were also analyzed.

The results obtained in this study show striking differences between the sites in the distribution patterns of obsidian from each source, as well as changes over time which may be related to increasingly complex socioeconomic patterns over the course of the Neolithic. The obsidian distribution patterns are used to propose potential transportation routes while assessment of the techno-technology of the artifacts addresses the involvement of lithic specialists in various stages of the chaîne opératoire.

10 VARIATIONS IN USE OF LANDSCAPE RESOURCES THROUGH TIME AT A MIDDLE PALAEO-LITHIC SITE, THE BAU DE L'AUBESIER, VAUCLUSE, FRANCE

Abstract author(s): Wilson, Lucy (University of New Brunswick In Saint John)

Abstract format: Oral

The Bau de l'Aubesier is a multi-level rock shelter site with Middle Palaeolithic layers dating from the later Middle Pleistocene into the Late Pleistocene. A long-term project aimed at identifying raw material sources for the lithic assemblages has made it possible to delineate the territories exploited for each assemblage, and to evaluate the extent of use of different parts of those territories. This presentation combines the lithic data from several layers with information on the season of death of fauna, and environmental data from micromorphological analyses, sediments, and fauna, to look for potential relationships between season of use and climate on the lithic territories of each layer. The older layers formed during spring to fall times of year, in cold periods. They contain a predominance of faunal remains from large mammals, and have lithic assemblages where ease of access to sources of raw materials seems to have been emphasised, more than the raw material characteristics such as nodule size or quality for knapping. In the middle part of the site stratigraphy, a layer deposited mainly during winter in a warm period has a lithic territory that is concentrated in an area with easier terrain, and the proportion of faunal types that could have been obtained nearby, in the gorge where the site is located, increases. In the upper layers, climate was again cold, and fauna and lithics are both diverse, but the choice of sources of raw material was more influenced by raw material characteristics, and less by terrain considerations. The youngest layer provides evidence of the passage of highly mobile hominins with a toolkit made of flint from a variety of sources, some relatively distant, but also reflects a period of intense use of local resources, both lithic and faunal.

11 REFLECTANCE SPECTROSCOPY AS A CHERT PROVENANCE METHOD IN ASSESSING LATE PLEISTOCENE HUNTER-GATHERER MOBILITY

Abstract author(s): Parish, Ryan (University of Memphis)

Abstract format: Oral

The application of reflectance spectroscopy in chert provenance studies is in its developmental stage though is proving to be a method with high potential. The reflectance spectroscopy technique is not a geochemical method but instead uses the reaction of outer valence electrons and dipole bonded molecules in the visible, near-, and middle-infrared regions of the electromagnetic spectrum to characterize spectral variation. The spectral data, when analyzed with multivariate statistical methods, has differentiated both chert formation types and individual deposits. Other benefits include its accuracy, speed, low cost, portability, and non-destructiveness. Regardless of the benefits of reflectance spectroscopy, a continued emphasis on survey, source identification, sampling, lithic database construction, and statistical methods should be maintained in conjunction with technique development. The limitations and areas needing further testing are also crucial components when evaluating reflectance spectroscopy or for that matter any technique applied to chert source research. Therefore, a portion of a large private collection, the Sim's collection, was non-destructively analyzed using reflectance spectroscopy to study mobility patterns of Late Pleistocene hunter-gatherers in the Southeastern United States. The results of the chert source study highlight both the reflectance spectroscopy technique and its application in understanding past human behavior.

12 UTILIZATION AND PROVENANCE OF STONE ARTEFACTS AND RAW MATERIALS FROM I GALIKU (Ø47) AND TATSIP ATAA KILLEQ (Ø172) IN SOUTHWEST GREENLAND

Abstract author(s): Beck, Sólveig (University of Iceland)

Abstract format: Oral

The aim of this paper is to share preliminary findings of an on-going classification study of stone assemblages from two Norse midden formations uncovered at the episcopal manor in Igaliku (Garðar Ø47) and farm site Tatsip Ataa Killeq (Ø172) in Vatnahverfi in the Eastern Settlement in South Greenland. Combined, the two sites yielded over 1700 stone finds, artefacts, debitage and raw materials, the majority of which are comprised of steatite, red sandstone and chert. The ultimate objectives are to pinpoint commonalities and differences between the assemblages of the two farm economies, and map raw material variabilities and their potential sources with the aid of typological, petrological and chemical analyses (XRF and LA-ICP-MS), whether they be from within or beyond the shores of Greenland. This study is part of a larger research project, Sticks and stones: Raw material use in Norse Greenland, a collaborative effort between the National Museums of Greenland and Denmark, the University of Iceland, and the Geological Survey of Norway (NGU), Denmark and Greenland (GEUS). The project aim is to shape a more detailed view of the nature of raw material utilization and material procurement strategies for wood and stone between the 11th and 15th centuries and add important insight into the structure and extent of Norse socio-economic networks in Greenland, at the very margin of Northwestern Europe.

13 PROCUREMENT, PRODUCTION, AND DISTRIBUTION IN THE UCAREO/TULA OBSIDIAN EXPLOITATION SYSTEM IN POSTCLASSIC HIGHLAND MEXICO

Abstract author(s): Healan, Dan (Tulane University)

Abstract format: Oral

Over the past four decades, geochemical studies have identified Ucareo, Michoacan as a major source of obsidian for artifacts found at prehispanic sites in many parts of Mesoamerica, beginning in the Early Formative period. During the Epiclassic and Early Postclassic periods, Ucareo obsidian appears to have been a particularly important commodity associated specifically with prismatic core/blade technology, and comprised the principal source of prismatic blades at a number of major centers, including Xochicalco, Tula, and Chichén Itzá. Over the past several decades, archaeological investigations of prismatic core/blade workshops at Tula and obsidian quarries and related sites at the Ucareo source itself have examined the principal nodes of a network of exploitation encompassing extraction and initial processing of raw obsidian at one extreme and prismatic core/blade production and consumption at the other. Collectively, these investigations provide critical insights into quarry and core/blade production technology, and shed light upon the sociocultural milieu in which production took place.

14 BEYOND THE MIRROR: REFLECTIONS OF INDIGENOUS CONTINUITY IN OBSIDIAN LAPIDARY IN CENTRAL MEXICO

Abstract author(s): Martinez, Maria (Smithsonian Institution, National Museum of the American Indian) - Brandl, Michael (Austrian Academy of Sciences, Austrian Archaeological Institute) - Vicenzi, Edward (Smithsonian Institution, Museum Conservation Institute) - Sharps, Meredith (Rochester Institute for Technology, Image Permanence Institute) - Lam, Thomas (Smithsonian Institution, Museum Conservation Institute)

Abstract format: Oral

Over the last couple of decades researchers have increasingly used museum collections as primary sources for gaining a deeper understanding of socio-economic processes of the past, both independently and in comparison, to newly excavated archaeological material. For this study, we apply collections-based research with an ethno-historical approach that interweaves museum collections with obsidian sourcing and historical as well as archaeological evidence to explore the potential function, chronology and cultural assignment of six rectangular obsidian tablets typically identified as pre-Columbian "mirrors" housed at the Smithsonian Institution (SI)-National Museum of the American Indian (NMAI).

We employed a novel analytical procedure for non-destructive obsidian sourcing combining pXRF with SEM based micro-XRF. The latter achieved more refined chemical signatures not observable through pXRF and revealed a previously unknown local of obsidian procurement in the Los Azufres volcanic complex used for the manufacture of one of the investigated items.

The results of combined techno-morphological analysis, provenance studies and the study of historical sources enable us to show that these items are of Colonial origin, discuss the role and autonomy of obsidian lapidarians from Central Mexico after the European invasion of 1521, and the impact of the conquest on craft production. The outcomes of this study highlight the importance of integrated collections-based research utilizing non-destructive analytical techniques and the full breadth of historical sciences to answer complex socio-economic questions, which resulted in the definition of an analytical protocol for collections-based research involving rectangular polished obsidian tablets from Mesoamerica on a larger scale.

15 THE LONG JOURNEY: CHEMICAL SOURCING AND DISTRIBUTIONAL ANALYSIS OF JADE IN MESOAMERICA

Abstract author(s): Kovacevich, Brigitte (University of Central Florida)

Abstract format: Oral

Chemical compositional analysis and sourcing of jadeite and greenstones in Mesoamerica has been a process fraught with difficulties due to the heterogeneity of the material. Numerous techniques have been implemented, including X-Ray Fluorescence (XRF), Instrumental Neutron Activation Analysis (INAA) Inductively-Coupled Plasma Mass Spectrometry with Laser Ablation Introduction System (LA-ICP-MS), stable isotope analysis and others. Headway has been made, but there are still more questions than answers. Despite the challenges presented by compositional analysis, if complemented by the study of production techniques and distribution patterns, these processes can together be used to infer mechanisms of movement and organization of production of Mesoamerican greenstones. Jadeite and other greenstones can no longer be considered to be the exclusive property of the elite and they may have been produced and exchanged in a variety of contexts. Archaeological, chemical sourcing, iconographic, and ethnohistoric evidence will be reviewed in order to investigate the use and meaning of jade for the Maya.

207 COMBUSTION FEATURES IN MEDITERRANEAN LATE PREHISTORY: MULTIDISCIPLINARY APPROACHES TO THEIR USES AND FUNCTIONS

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Belarte, Maria Carme (ICREA - Catalan Institution for Research and Advanced Studies; ICAC - Catalan Institute of Classical Archaeology) - Beylier, Alexandre (UMR5140, CNRS - Centre National de la Recherche Scientifique; Université Montpellier 3; Service archéologie Sète agglomération méditerranée) - Mateu, Marta (Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México) - Molist, Miquel (Departament de Prehistòria, Universitat Autònoma de Barcelona) - Portillo, Marta (Institució Milà i Fontanals, CSIC - Spanish National Research Council)

Format: Regular session

Firing installations, such as hearths and ovens, are among the most frequent structures documented in settlements of any period. They are mainly associated with cooking but also had other functions such as heating, lighting or transforming raw materials. Their location determines the circulation and use of space, as well as the organisation of daily activities, both individual and collective, and, ultimately, the organisation of the households. Their study can be approached from very different perspectives in order to obtain information on aspects such as fuels, technological level of the societies that built and used them, food, management of natural resources, craft activities or certain ritual practices, among others.

The aim of this session is to share the results of studies carried out or underway on combustion structures from different methodological approaches, such as geo-archaeology, bio-archaeology, experimental archaeology or ethno-archaeology, including interdisciplinary analyses. It includes the presentation of both case studies and regional syntheses of the different areas of the Mediterranean arc in recent prehistory (from the Neolithic to the Iron Age).

ABSTRACTS:

1 PYROTECHNOLOGICAL PROCESSES BEHIND FIRE TRACES: EXPERIMENTAL ARCHAEOLOGY FOR THE INTERPRETATION OF ARCHAEOLOGICAL RECORD

Abstract author(s): Costa, Annalisa (LaBAAF, Laboratorio Bagolini Archeologia Archeometria Fotografia, Università degli Studi di Trento) - Cavulli, Fabio (Università degli Studi di Napoli Federico II, Dipartimento di Studi Umanistici) - Pedrotti, Annalisa (LaBAAF, Laboratorio Bagolini Archeologia Archeometria Fotografia, Università degli Studi di Trento)

Abstract format: Oral

In the early Neolithic site of Lugo di Grezzana (VR), dated between 5500 to 4900 cal BC, several pits have been dug: morphometrically similar, circular or squared in plan, with dimensions of the opening that vary from a minimum diameter of m 0,85 to a maximum one of m 2,10, they are all clearly characterized by charcoal and ash remains, strong rubefaction of the walls, oxidized sediments, artefacts and ecofacts modified by fire such as burnt clay, and burnt beams at the bottom. Rubefaction is always more pronounced on the pit walls than on the base surface, and traces of a cover are not recorded at all. It is difficult to define which processes led to the formation of such traces in the archaeological record and to relate them to a specific function. Dimensions and rubefaction of the walls could reflect several and/or long lasting firings as can be the case for pottery firing. The smallest ones could be used for other purposes. However, we cannot exclude similar structures might have been used in a multifunctional way.

The methodological approach applies an experimental archaeology to test different hypotheses for better understanding of the firing process that led to the formation of the archaeological traces. The several actions involved in the process have been enucleated, slightly changing them many times to see the effects to the records. Experiments aimed to observe the effect of a single or many firings, of reducing conditions and which processes allow the preservation of wooden burnt beams at the base of the pit and to understand.

The experimental work not only allows the comparison with the archaeological features but it gives unexpected information about pyrotechnology.

Using SEM-EDXS and FT-IR analyses on both archaeological and experimental samples of fired sediments allowed to make interesting considerations.

2 COMBUSTION STRUCTURES AND USE OF SPACE. A MULTIDISCIPLINARY APPROACH TO THE NEOLITHIC OCCUPATION AT COVA DE LES PIXARELLES (TAVERTET, BARCELONA)

Abstract author(s): Sisa-López de Pablo, Joaquim (Universitat Autònoma de Barcelona, Departament de Prehistòria, Grup de Recerca en Arqueologia prehistòrica de la Mediterrània i Pròxim Orient - GRAMPO) - Watzetz, Julia (Inrap, Umr 5140 Archéologie des Sociétés Méditerranéennes; Equipe Sol-DMOS, AgroParisTech) - Álvarez, Ramón - Rauret, Anna Maria (Universitat de Barcelona, Departament d'Història i Arqueologia) - Gómez, Anna - Molist, Miquel (Universitat Autònoma de Barcelona, Departament de Prehistòria, Grup de Recerca en Arqueologia prehistòrica de la Mediterrània i Pròxim Orient - GRAMPO)

Abstract format: Oral

As is well known, combustion structures are a key element in archaeology for understanding the articulation of the social spaces of past societies since they allow us to approach to domestic activities, given the role they play in daily life production and consumption practices. In the last years, the study of hearths and other combustion features as well have been enriched by the application of a set of new methodologies, which has made it possible to delve deeper into its study and know both the activities involved in its use and the management.

In this communication, we present the results of an interdisciplinary study carried out at the Cova de les Pixarelles site (Tavertet, Barcelona) which aims to contribute to the knowledge of the use of space and rhythms of occupation of the Middle Neolithic societies in the Northeast of the Iberian Peninsula through the study of combustion structures and their management. The exceptional conservation of the remains in strata of highly organic composition due to the formation of travertine layers in the periods when it is not occupied, constitutes this cave as a benchmark for occupations in karst cavities during recent prehistory in the region. More specifically, we will focus on Level XXII, made up of a large accumulation of ashes and faunal remains among other utilitarian elements. Therefore, the ethnographic vision of the use of the cavity in the economic and social cycle is deepened by the first results of the micromorphological analysis along with the rest of the archaeological record.

3 A MULTIDISCIPLINARY TOOLSET TO STUDY A NEOLITHIC COMBUSTION STRUCTURE FROM THE NORTHEASTERN COAST OF THE IBERIAN PENINSULA

Abstract author(s): Monforte-Barberan, Andreu - Sisa-López de Pablo, Joaquim - Breu, Adrià (GRAMPO, Universitat Autònoma de Barcelona) - Beamud, Elisabet - Maestre, Estefanía (Unitat de PALEOMAGNETISME - CCiTUB-CSIC / Geosciences Barcelona - Geo3Bcn) - Gallego, Jose (Global Geomática SL) - Martínez, Pablo (SERP, Universitat de Barcelona / CIPAG) - Molist, Miquel (GRAMPO, Universitat Autònoma de Barcelona)

Abstract format: Oral

The study of combustion structures through multidisciplinary tools inform us about the means of production, reproduction and consumption of prehistoric societies. This communication aims to study the use of space, subsistence behaviours and management of a combustion structure localized in the Carrer Aurora (Barcelona), dated from the 5th millennium cal. This archaeological site was excavated in the framework of a rescue archaeology activity in the Raval quarter. To this end, we apply a multidisciplinary toolset including geological, archaeomagnetic, microspatial, micromorphological and biochemical analyses which will be capable to assess the social life of the structure. This is the first time this type of approach has been applied to hearths from the northeastern coast of the Iberian Peninsula. We expect to combine the study of the original source of the hearth stones with archaeomagnetism, analyses of any surviving organic residues and a comprehensive description of the micromorphological features of the structure.

4 AN APPROACH TO THE STUDY OF PREHISTORIC FIRE-PITS BASED ON NEOLITHIC EVIDENCE FROM THE BARCELONA PLAIN (SPAIN)

Abstract author(s): Ruiz, Joaquim (Universitat Autònoma de Barcelona. Prehistoria. GRAPPO)

Abstract format: Oral

The general aim of this study is to contribute to the analysis of prehistoric hearths in the settlements of the northeastern Iberian Peninsula, specifically in the Neolithic period (5000-3500 BCE). We present the results of a multidisciplinary research project on a specific type of fire installation, the "Fire-Pits", defined by an excavated structure and a filling consisting essentially of stone blocks and combustion evidence. This type of hearth is abundantly documented and, for our study, we will analyse in detail those discovered in the archaeological sites of the Barcelona Plain (Raval district). The large combustion structure from "Reina Amalia 38 bis" site, dating from the post-Cardial Neolithic period (5310 ±30 BP), has been studied using a methodology based on the analysis of the lithic filling, the spatial distribution of the remains, their reassemblage and the combination with thermal alterations. The study allows addressing hypotheses about the functioning of the structure (open/closed combustion), as well as identifying the post-depositional processes and the variability of the rubefacted elements. The analysis carried out allows proposing a methodology and analysing a series of variables, which will contribute to the study of similar structures and thermal processes in the recent prehistory of the Western Mediterranean.

5 KILNS AND BUILDERS: AN EXPERIMENTAL STUDY ON HUMAN FACTOR IN THE CONSTRUCTION AND USE OF POTTERY FIRING INSTALLATIONS IN CHALCOLITHIC

Abstract author(s): Manea, Bogdan (ArchaeoSciences Division, ICUB, University of Bucharest) - Opreș, Vasile - Ignat, Theodor (Bucharest Municipality Museum) - Popescu, Gabriel - Lazăr, Cătălin (ArchaeoSciences Division, ICUB, University of Bucharest)

Abstract format: Oral

Experiments on prehistoric pottery firing structures generally focused on testing multiple techniques in order to achieve different combustion atmospheres, analyzing thermal data (maximum temperatures/heating rate/soaking time/cooling rate), recording temporal information about the firing and fueling process as well as the type/quantity of the fuel used. Alongside identifying the potential construction methods, the above-mentioned approaches are very important. However, for a better understanding of the complexity that the building process and use of such structures entailed for the prehistoric communities we need a broader perspective analysis.

The current paper will provide the results of an experimental archaeology program carried out at Sultana-Malu Roșu (Romania), regarding the study of prehistoric pottery firing structures.

We will discuss the whole range of operations performed when building and using some pottery firing structures archaeologically certified for the Chalcolithic period from Southeastern Europe. Information will be included, relative to all the materials used (type/preparation/quantity), the building process (construction/drying process/repairs) and use of the reconstructed structures. Likewise, information relative to the operational sequences will be provided, concerning labor (number of individuals/sex/age) and the physical effort entailed.

The results offered by the experimental study will be correlated with the archaeological record, to help us reveal some of the unknowns concerning people's interaction with both tasks and the environment, as well as the knowledge and skills required for making and using such structures. Ultimately, our results may lead to a better understanding of the decision making process relative to the overall process of ceramic production, during Chalcolithic.

This work was supported by a grant of the Romanian Ministry of Education and Research, CNCS - UEFISCDI, project number PN-III-P4-ID-PCE-2020-2369, within PNCDI III.

6 FROM THE NORTH TO THE SOUTH. BRONZE AGE COMBUSTION FEATURES OF VIA ORDIERE-SOLAROLO AND MURSIA(ITALY): ARCHAEOLOGY, GEOARCHAEOLOGY, EXPERIMENTAL DATA

Abstract author(s): Peinetti, Alessandro (Laboratoire Archéologie des Sociétés Méditerranéennes, UMR 5140, CNRS, Univ. Paul Valéry Montpellier 3, MCC; LabEx ARCHIMEDE, programme IA- ANR-11-LABX-0032-01; Università di Bologna) - Debandi, Florencia - Cattani, Maurizio (Università di Bologna)

Abstract format: Oral

The aim of this paper is to compare the combustion features of two Bronze Age sites of the Italian peninsula from a typological, technological and functional point of view. The two sites are the Middle Bronze age village of Via Ordieri-Solarolo, located in the alluvial plains of Emilia-Romagna, and the Early-Middle Bronze Age village of Mursia-Pantelleria, settled up on the volcanic island of Pantelleria. The analysis is based on archaeological and geoarchaeological data and completed by experimental observations about technological and functional markers or taphonomy.

At Via Ordieri-Solarolo the combustion residues from dumps furnish relevant data about domestic fire management and practices in the first occupation phase, when the site is built up with pile dwellings. On the contrary, an earth oven and several structured fireplaces are preserved in the later occupation phases. Two other fire installations, with a peculiar and elongated morphology, are also attested and probably refer to artisanal activities.

On the other hand, the documentation about fire installations in Mursia is particularly abundant. Each domestic building of the village presents several structures related to the use of fire, with different morphologies: hearth delimited with four stone slabs; fireplaces realized with a horizontal slab or with earthen materials; ovens built with stones; etc. This variability attests of different way to manage the fire and transform consumption goods. The diachronically change of the morphology and of building techniques of some of these installations suggest a change of behaviors through time as well. They show also particular choices and a selection of raw materials for their construction.

The comparison of the two sites, highlight the different behaviors concerning the use of fire and the way to manage it by two different Bronze Age communities, taking into account the different environmental, economical and cultural variables which characterize the two contexts.

7 DEFINING RECURRENT HUMAN ACTIVITIES AT A 3RD MILLENNIUM SETTLEMENT THROUGH CONCENTRATIONS OF ARCHAEOBOTANICAL REMAINS: THE CASE OF DHASKALIO, KEROS, GREECE

Abstract author(s): Mavromati, Antigoni (Independent researcher) - Ntinou, Maria (School of History and Archaeology, Department of Archaeology, Aristotle University of Thessaloniki) - Tsartsidou, Georgia (Ephorate of Palaeoanthropology-Speleology, Ministry of Culture, Athens; M. H. Wiener Laboratory for Archaeological Science, ASCSA, Athens) - Margaritis, Evi (The Cyprus Institute, Science and Technology in Archaeology and Culture Research Center - STARC, Nicosia) - Boyd, Michael - Renfrew, Andrew (McDonald Institute for Archaeological Research, University of Cambridge)

Abstract format: Oral

The Early Bronze Age settlement of Dhaskalio, Keros, Cyclades, Greece, was systematically excavated between 2007-2008 and 2016-2018. Dhaskalio, at present an islet separated from the main island of Keros by 90 m of water, in the EBA was a rocky promontory covered in constructions. Excavations on Dhaskalio have revealed extensive architectural remains where surfaces and fills can be potentially associated with a broad range of activities, including craftworking (primarily metallurgical), as well as perhaps domestic activities. Systematic recovery of archaeobotanical remains has been conducted at the site and the analysis of charred wood, plant macroremains, and phytolith samples is underway. In this study, we examine the deposition and distribution of all categories of archaeobotanical remains in areas L and H of the settlement that have provided evidence for metallurgical activities and in parts of areas A, C, F of a possible domestic character. The study focuses on single contexts in these areas such as surfaces with ash concentrations and deposits with evidence for metalworking as identified through metallurgical remains and soil chemistry analyses. We set out to explore 1. the preservation of plant remains and how it can help clarify taphonomy issues site-wide and in individual contexts, 2. the type of fuels potentially present in each context, i.e. wood, the remains of crop cleaning for kindling, etc., 3. the taxonomic composition of the charred wood, plant and phytolith assemblages of each context and 4. the possible association of different types of fuel and or taxa with different activities. We suggest that at Dhaskalio the study of plant remains associated with fire installations and their contemporary surfaces may help characterize the use of space and the organization of related activities as well as reveal aspects of fuel management and procurement.

8 A MULTIDISCIPLINARY APPROACH TO FUEL CONSUMPTION: ANALYSIS OF LATE PREHISTORIC COMBUSTION FEATURES IN NE IBERIA AND THE BALEARIC ISLANDS

Abstract author(s): Allué, Ethel (Institut de Paleoeologia Humana i Evolució Social - IPHES-CERCA) - Burguet-Coca, Aitor (Institut Català de Paleoeologia Humana i Evolució Social - IPHES-CERCA) - Mas, Bàrbara (Seminari d'Estudis i Recerques Prehistòriques - SERP, Departament d'Història i Arqueologia, Universitat de Barcelona) - Picornell-Gelabert, Llorenç (ArqueoJIB Research Team, Department of Historical Sciences and Theory of Arts, Universitat de les Illes Balears)

Abstract format: Oral

Combustion features have been approached from different perspectives, among which fuel residues analysis plays a key role. Fuel remains constitute one of the main components of these features, allowing fire activity identification of and the understanding of combustion features functionality in the archaeological record. Besides, fuel procurement and consumption constitute one of the most enduring social practices since the domestication of fire. Accordingly, the aim of this presentation is: 1) to analyze theoretical and methodological issues related to the study of fuel from combustion features, paying special attention to the ethnoarchaeological approach to fuel consumption; and 2) to discuss fuel remains in different type of combustion features. The comprehensive approaches to combustion features require multi-proxy analyses, combining spatial distribution and archaeobotany, mainly charcoal, phytoliths, dendro-anthracology, with ethnoarchaeology and experimental archaeology providing prospective venues of inquiry to discuss methodological and theoretical approaches to fuel. By combining different approaches to fire structures and fuels we will discuss the role of fuel residue analysis in these kind of archaeological features. The examples considered show different contexts, including domestic and funerary hearths located in NE Iberia and the Balearic Islands (e.g., Cova Gran, Son Ferrer, Cova des Pas, Cova de la Font Major). The results provide a dataset on plant evidence including taxa and plant parts used as fuel and evidences of the combustion conditions. The results indicate that the formation process of each type of context and the specific uses have an effect on taxonomic diversity that can be related to the functionality of each structure. Moreover, these analyses allow to address multiple methodological questions, such as the representativeness of dispersed vs. concentrated charcoal assemblages in terms of taxonomy and plant types diversity; or the archaeological analysis of social choices taking part in fuel procurement and consumption (e.g., selection, avoidance, preference, etc.).

9 IRON AGE COMBUSTION STRUCTURES IN THE EASTERN IBERIAN PENINSULA AND SOUTH OF FRANCE: A TRANSDISCIPLINARY STUDY

Abstract author(s): Belarte, Maria Carme (ICREA - Catalan Institution for Research and Advanced Studies; ICAC - Catalan Institute of Classical Archaeology) - Portillo, Marta (Institució Milà i Fontanals, CSIC - Spanish National Research Council) - Mateu, Marta (Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México) - Pecci, Alessandra - Saorin, Carme (Universitat de Barcelona) - Camañes, Pilar - Cuscó, Oriol - Pastor, María - Canela, Joan (ICAC - Catalan Institute of Classical Archaeology)

Abstract format: Oral

Throughout the first millennium BC (and following a tradition that dates back at least to the Neolithic), combustion structures with similar characteristics are widespread across the Mediterranean, from North Africa and the Iberian Peninsula to the Aegean. This is particularly true when it comes to hearths. These commonly display an earth layer as a firing surface, even though there are different formal possibilities and techniques. Beyond these similarities, a certain diversity has been described according to the construction techniques, and have led to typological classifications applicable to different geographical areas over long periods of time.

As for the combustion structures in the eastern Iberian Peninsula and south of France, they have traditionally been analysed through the study of formal aspects as well as the association of these fire installations with archaeological findings. Approaches including microarchaeology as well as the combination of different disciplines are still rare. In this respect, the TRANSCOMB project (Transdisciplinary and experimental study of combustion structures in the western Mediterranean during Protohistory) aims to implement an interdisciplinary methodology that integrates specialities such as thin section micromorphology, archaeobotany (anthracology, phytoliths and other calcitic microfossils), organic residue analysis, as well as experimental archaeology. In this paper, we present the first results of the project.

10 GEOCHEMICAL TECHNIQUES APPLIED TO THE STUDY OF COMBUSTION STRUCTURES

Abstract author(s): Saorin, Carme (GRAP - Universitat de Barcelona)

Abstract format: Oral

In this presentation we will show some results of the techniques of X-ray diffraction (XRD) and Fourier transform infrared spectroscopy (FTIR) applied to the study of combustion structures.

These techniques will be applied to the study of combustion structures from the protohistoric period in the north-eastern part of the Iberian Peninsula and southern France, both in the framework of the TRANSCOMB (Transdisciplinary and experimental study of combustion structures in the western Mediterranean during Protohistory) project and in my doctoral thesis project.

The techniques of XRD and FTIR applied to the study of combustion structures are very useful. These allow us to know the mineral composition of the sediment used to build them and also the cooking temperature reached, which can be inferred from the thermal alteration of these minerals and the presence or absence of other minerals that vary according to the temperature. Knowing this variable will enable us to confirm or discard the use of these structures for cooking food and also to determine the function of the space where they are located.

The application of these techniques, together with micromorphology, archaeobotany, and organic residue analysis, will allow us to have complete knowledge of the use or uses that these structures had in the contexts studied.

11 FUEL USE IN NORTHEASTERN IBERIA THROUGH MICROMORPHOLOGY AND PLANT MICROFOSSIL EVIDENCE FROM IRON AGE COMBUSTION INSTALLATIONS

Abstract author(s): Mateu, Marta (Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México) - Portillo, Marta (Department of Archaeology and Anthropology, Archaeology of Social Dynamics - 2017SGR 995, Institució Milà i Fontanals - IMF, Spanish National Research Council - CSIC, Barcelona)

Abstract format: Oral

In this presentation we focus on micromorphological and microfossil evidence from fuel remains from varied types of combustion structures (e.g. flat, semi-excavated and elevated hearths, hearths with and without a preparation layer, ovens) from Iron Age north-eastern Iberia.

The identification and interpretation of fuel remains through microcontextual thin section micromorphology leads to solid interpretations on key archaeological issues on energy use. Despite in our research area hearth combustion surfaces are found commonly 'clean' and macroscopic remains are scarce or even absent, whereas other fire structures appear filled with dumped remains, micromorphological evidence may provide insights into whether or not these remains were burned in situ. In addition to detect depositional pathways, firing episodes and postdepositional processes, microcontextual approaches are critical to assess the integrity of fuel remains, including phytoliths and other calcitic microfossils such wood ash pseudomorphs and dung spherulites, as installation types (e.g. hearths, ovens or walled structures), location (indoor, outdoor), and burial conditions (fast, slow) may determine microfossil preservation.

Further, independently of the type of combustion installations and location, the plant microfossil records suggest a varied range of fuel sources, such as wood and a mix of vegetal matter including the leaves and culms of grasses and palm leaves, likely native Mediterranean dwarf palm (*Chamaerops humilis*) which is common in coastal sites in the research area.

Through this integrated micromorphological and microfossil approach depositional pathways and fuel use are identified and understood more accurately, showing the value of microcontextual studies to traditional macroscopic archaeological studies.

12 EVIDENCE FOR FIRE USE -OR NOT- AT THE TALAYOTIC SITE OF TORRE D'EN GALMÉS

Abstract author(s): Perez-Juez, Amalia (Boston University; Institut Menorquí D'estudis) - Goldberg, Paul (University of Tübingen; Boston University)

Abstract format: Oral

The archaeological site of Torre d'en Galmés spans from the beginning of 1st millennium BCE to the 13th century CE, encompassing Talayotic, Roman, and Muslim periods. It covers two thousand years of occupation in which different peoples used the space according to their needs and cultural patterns. They also made fire, which is evident throughout the site and during the different time periods just mentioned.

We have documented fires for cooking, keeping warm, lighting a room, cleaning, in addition to industrial uses. Some were produced in situ and others were made somewhere and the remains transported and dumped somewhere else. We have also identified different fuels such as wood or dung. The traces of combustion in the archaeological record are multiple and depend on numerous factors. These traces are not always clear at the site, and using only field observation can lead to misinterpretation of remains and possible activities.

This paper will present the evidence of fire found at Torre d'en Galmés, Menorca, applying micromorphological analysis as a way of identifying and evaluating fire, combustion features, their traces or deposits that turned out not to be associated with fire. We will present examples from the interior and exterior of domestic structures and open spaces that show how micromorphology can contribute to a better understanding of site activities as a whole.

13 INTEGRATING MICROFOSSIL RECORDS FROM LIVESTOCK DUNG BURNED AS FUEL IN MENORCA, BALEARIC ISLANDS: AN EXPERIMENTAL APPROACH

Abstract author(s): Portillo, Marta (Department of Archaeology and Anthropology, Archaeology of Social Dynamics - 2017SGR 995, Institució Milà i Fontanals - IMF, Spanish National Research Council - CSIC) - Dudgeon, Kate (Department of Archaeology, University of Reading) - Llergo, Yolanda (Department of Prehistory, Autonomous University of Barcelona) - Anglada, Montserrat - Ramis, Damià (Museu de Menorca, Menorca, Balearic Islands) - Ferrer, Antoni (Institut Menorquí d'Estudis, Menorca, Balearic Islands)

Abstract format: Oral

Interdisciplinary microarchaeological approaches including integrated studies of plant and faecal microfossils are fundamental to identify and interpret fuel remains within combustion installations such as hearths and ovens, which are common across the Near East and the Mediterranean. This is particularly critical in cases when other sources of archaeobotanical evidence such as charred macroremains are partially uninformative or absent, in order to assess the nature of burnt fuel, as similar plant records may derive from plant-based fuels and other fuel types including animal dung.

The current research illustrates the contribution of integrated analytical methods in archaeobotany to interdisciplinary approaches on the identification, seasonality, and the impact of fuelling on modern livestock dung. The focus is on phytoliths, pollen, non-pollen palynomorphs and calcitic dung spherulites embedded within cattle, sheep and pig faeces collected in different seasons of the year and farms from UNESCO Biosphere Reserve Menorca, Balearic Islands. Experimental firing reference records provide modern comparative datasets on factors affecting the microfossil content and preservation of animal faeces used as a fuel source, as well as on the range of natural and anthropogenic pathways influencing these which are critical to identify and accurately interpret fuel remains. The results reported here are also compared to laboratory-controlled experimental datasets as well as ethnoarchaeological records including firing measurements (time and temperature) from cooking installations that have followed a similar integrated methodological approach.

Experimental and ethnoarchaeological records provide fundamental information on taphonomic issues that are understudied, such as the variation in the ingestion and digestibility among different animals, as well on seasonality of plant and faecal microfossils that are embedded within the dung, and the impact of fire on these as a result of fuel use, as an important combustion material which is still commonly overlooked.

14 INVESTIGATING COMBUSTION STRUCTURES THROUGH EXPERIMENTAL APPROACHES AT IRON AGE CALAFELL ARCHAEOLOGICAL SITE (TARRAGONA, SPAIN)

Abstract author(s): Belarte, Maria Carme (ICREA - Catalan Institution for Research and Advanced Studies; ICAC - Catalan Institute of Classical Archaeology) - Pou, Josep (Ajuntament de Calafell) - Morer, Jordi (Món Iber ROCS SL; Universitat de Barcelona) - Pastor, María (ICAC - Catalan Institute of Classical Archaeology) - Portillo, Marta (Institució Milà i Fontanals, CSIC - Spanish National Research Council) - Mateu, Marta (Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México) - Pecci, Alessandra - Saorin, Carme (Universitat de Barcelona) - Fernández, Joaquim (Universitat Autònoma de Barcelona)

Abstract format: Oral

The goal of this paper is to present the first phase of experimentation on Iron Age combustion structures in the framework of the TRANSCOMB (Transdisciplinary and experimental study of combustion structures in the western Mediterranean during Protohistory) project. Experimental work is carried out in the "Iberian Citadel of Calafell" (Calafell, Tarragona, Spain), a reconstructed Iron Age site, open to the public since 1995, and also a field of experimental archaeology.

The experiment is performed on present-day replicas of archaeological hearths and ovens, located both indoors and outdoors. The structures correspond to a varied typology, based on archaeological documentation from the excavation of Iron Age sites in the western Mediterranean (flat, semi-excavated and elevated hearths, hearths with and without a preparation layer, ovens). Experimental works include the use of various fuel-types (wood, grasses and animal dung), according to the available archaeobotanical records. Variables such as increased heating and time are measured, in order to determine whether variations occur, depending on the fuels used, the type of structure or its location. Liquid boiling and meat cooking tests are also being performed.

In this paper, the first results obtained will be discussed. In the medium to long term, these will contribute to a better understanding of the functioning of the combustion structures in the analysed area and period. Information on daily activities such as food or natural resource management is expected to increase, which will ultimately help to improve the knowledge of the household organisation.

15 MODULAR OVENS OF THE CAPUT ADRIAE IRON AGE: USE AND FUNCTION

Abstract author(s): Tasca, Giovanni (Museo Civico di San Vito al Tagliamento) - Vinazza, Manca (University of Ljubljana) - Groppo, Veronica (University of Venice)

Abstract format: Oral

The authors have recently recognized and defined, through a classical typological ceramic analysis and reassembly of large quantities of fired clay fragments, a class of household ovens with mobile modular elements. They are widely distributed in settlements in northeastern Italy and western Slovenia between Final Bronze and the Early Iron Age (XII -V century BC). In the proposed paper, the authors intend to present the results of a research based on different approaches. Due to status of preservation of this kind of archaeological material it is not easy to understand its function and use. The main focus is construction techniques, use and function of household ovens. The research is based on experimental archaeology, ceramic petrography and residual traces of organic matter. We would like to understand whether the function of these ovens is related to the daily cooking of food or to cooking for preservation purposes (e.g. roasting of cereals).

16 CONSTRUCTION OF SOCIAL HISTORY OF CONTROL AND APPLICATION OF THERMAL ENERGY PROCESS AND ITS TECHNICAL, SOCIAL, SYMBOLIC AND PALAEOENVIRONMENTAL CONSEQUENCES

Abstract author(s): March, Ramiro (CNRS)

Abstract format: Oral

Reconstruction of fire history since its discovery, control and application to the transformation of matter within the different human societies has followed a theoretical - methodological rather complex history, result of the different theoretical frameworks that given rise to the emergence of the study of fire structures in archaeology. This session focus on methodological approach's and the use of experimental and analytical methods concerning the study of societies that evolved in the Mediterranean region in late prehistory with having different degrees of complexity. In previous works we trying to explain that, "rebuilding to understand", is a necessary step for the reconstruction of this process. But this approach is also essential for the reconstruction of the history of every fire structure and for each site studied and must be adapted in relation to the complexity of uses of thermal energy in the different kind of societies under study. In this article we will try to unravel, analyzing examples from these periods, how the fire structure analysis continues to be problematic due to: the complexity of the phenomenon; the incomplete interactions between different analytical methods applied and the consequent hyper-specialization and fragmentation of our object and subject, the lack of a systematic study in a well-established theory framework among specialists and generalists and finally how the practical inherent problems of our disciplinary approach are reinforcing this inductive tradition that frequently neglected a broader theoretical perspective necessary to solving the problem. In our sense this approach needs to incorporate a reflection about different human modes of appropriation, production and uses of thermal energy and the strategies implemented by these different societies to reproduce themselves. Therefore we need to give to these question the necessary relevance of their significance at the different aspects of each society and culture structuration, from infrastructural to ideological levels.

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Mele, Marko (Universalmuseum Joanneum) - Fábián, Szilvia (Hungarian National Museum) - Mihelić, Sanjin (Archaeological Museum in Zagreb)

Format: Regular session

Archaeological routes and paths, information boards and monument interpretation tools are considered a great way to present and promote the archaeological heritage. They encourage individual visitors or groups to explore the landscapes and experience the original sites of discovery of the objects displayed in the vitrines of museums. The approaches and challenges may differ widely, depending on the type of heritage, accessibility, possibilities for presentation, touristic potential of regions and so on. Many of these challenges were discussed in the Session "Routed Archaeology – Archaeological Routes and Their Impact on Perception of Archaeological Heritage in the Landscape" at the annual EAA meeting in the year 2020.

The year 2020 and COVID-19 pandemic have created new challenges, but also new opportunities for the archaeological routes. On the one hand, it is becoming increasingly difficult to transmit information on heritage to visitors in a direct manner, but on the other hand the promotion for regional/local/national tourism has raised the interest in the European archaeological heritage. In the recent years new technologies are steadily gaining in importance as indispensable tools in the visualisation and interpretation of archaeological heritage. Digital guides, augmented reality, digital visualisations of monuments are becoming major tools for reaching new younger audiences. They offer new ways to transmit information to the outdoor visitors of archaeological sites.

In our session we are looking for contributions presenting new digital tools for the interpretation of archaeological monuments along trails, routes, sites or open-air facilities. A special focus will be given to new fresh approaches in the digital or virtual archaeology and the combination of digital and analogue interpretation tools.

The session is associated with the EU-Project "Danube's Archaeological eLandscapes".

ABSTRACTS:

1 FROM ARCHAEOLOGICAL DATA TO TOURISTIC PRODUCTS – A CASE STUDY FROM THE IRON AGE SITE SCHWARZENBACH, AUSTRIA

Abstract author(s): Fera, Martin - Doneus, Michael - Lobisser, Wolfgang (University of Vienna) - Neubauer, Wolfgang (Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology)

Abstract format: Oral

Developments in archaeological research in the last centuries have brought new methods and new technologies to investigate various sites in their broader environment and revealed data for the reconstruction of entire landscapes for various prehistoric and historic periods. Established remote sensing approaches of aerial archaeology on the landscape scale got enriched by Airborne Laser scanning, that allowed us to investigate remnant archaeological traces that survived in the relief. Effective geophysical systems allow additionally to investigate large areas for archaeological prospection of entire sites in their surroundings. But also classical archaeological approaches, as excavations, benefited from the integration of various sensors and bio- and geoarchaeological practices in the research process.

This paper presents results from research projects from eastern Austria with a focus on Iron Age research on multiple scales. It uses selected examples to demonstrate how long-term multidisciplinary collaboration allowed the collection of data sets from the landscape scale down to Iron Age habitation and production areas. Using the example of the Iron Age site of Schwarzenbach it shows how the data and its interpretation were used in the construction of sustainable forms of presentation for the benefit of various stakeholders, for knowledge generation, educational purposes and regional development.

2 ARCHAEOLOGICAL ROUTES AS A GAMING EXPERIENCE? THE ROLE OF AR AND VIDEO GAMES IN THE ACTIVE CONSUMPTION OF ARCHAEOLOGICAL HERITAGE

Abstract author(s): Frankovic, Filip - Balen, Jacqueline (Archaeological Museum in Zagreb)

Abstract format: Oral

In the recent years, one of the most remarkable outbreaks in the mobile gaming industry was the release of Pokémon Go by Niantic, Inc. The game was released in 2016 and soon became a global phenomenon, reaching 150 million active users by 2018, one billion downloads by 2019 and the profit of 6 billion dollars by 2020. The game became the best known video game for mobile phones which combined both location-based and augmented reality (AR) technologies, at the same time promoting video games as an outdoor activity. While Niantic, Inc. has released or plans to release similar games in the future, it is often forgotten that the company's first successful title was Ingress. The success in the game strongly relied on the players' ability to visit as many real life locations designated as portals as possible. Various monuments, statues and historical buildings functioned as portals in the game, motivating visits to historical sites.

This paper examines the potential of similar location-based and AR games in the popularization, promotion and presentation of archaeological heritage. It explores the potential of similar platforms in the presentation of individual sites and the creation of archae-

ological routes (i.e. micro and macro level). The introduction of similar tools in the presentation of sites and routes might increase the possibilities for a more active consumption of archaeological contents, as well as satisfy the demands of the newly emerging audiences.

3 VILLA ROMANA BALÁCA – FURTHER STEPS IN HERITAGE PRESENTATION AND PROMOTION

Abstract author(s): Kovacs, Lorand (Hungarian National Museum - Magyar Nemzeti Múzeum) - Látos, Tamás - Fábián, Szilvia - Pálkás, Adrienn - Czifra, Szabolcs (Hungarian National Museum)

Abstract format: Oral

Roman exploitation of the countryside is symbolized by Villa Romana Baláca (in Hungary), the centre of a large estate upon which the rural economy of the Western Empire was based. The villa of total ca. 56 hectares is one of the largest and most luxurious of its kind in Pannonia province. Archaeological excavations uncovered the central building of 2400 m², to which a number of smaller constructions were attached: e.g. a bath, private granary, wine press-house, other farming buildings and a monumental burial place that originally must have been 12 m high. Based on the results of interdisciplinary works, central buildings of the villa were partly reconstructed and have been open to the public since 1984. A new EU funded project called Danube's Archaeological eLandscapes open new dimensions in heritage visualization and enables to coin a vivid answer on the question: „What have the Romans ever done for us?”.

Virtual reality and the connecting vectorized archaeological data play an essential role in this process. Favouring VR methods to visualize archaeological heritage, the project's main output and will virtually connect archaeological artefacts stored in museums and the reconstructed sites.

The project put great emphasis on connectivity and foster the creation of new cultural routes at the border territory of the western and eastern Roman Empire. The ancestor of our idea was, the itinerary called Pannonia Hungarica Antiqua was a real and good endeavour in 1995 to connect Roman sites in Transdanubia, Hungary but unfortunately, it remained just a “play for fanatics”. Concerning the Roman period, authentic tracks of roads can be used to re-connect known remains, such as cities, villas, forts, etc. and hopefully revitalize these sites as cultural and touristic sights.

4 ROUTED IRON AGE - APPROACHES TO THE DIGITISATION OF THE IRON AGE HERITAGE IN GROSSKLEIN (STYRIA, AUSTRIA)

Abstract author(s): Mele, Marko (Universalmuseum Joanneum)

Abstract format: Oral

Archaeologists developing apps, databases and digital content is often like kids playing with fire. It is a lot of fun, but they often get burned. Almost 10 years we are playing with such fire and as soon as something, like a database, an app or an elearning tool, gets lit, there is a danger that the fire can't be maintained and we burned another pile of public finances. The reasons for struggling are many and very diverse, e.g. from creating a highly complex content to being always behind the newest technologies and trends.

In my paper I would like to discuss four major digital products from our past projects, two databases, an interactive tool and a visitors app, which were developed for the archaeological heritage in Großklein (Styria, Austria). All of them have been developed by archaeologists, with the intention of boosting the interest on local heritage and by this to support its protection, research and usability for tourism. The questions which arise are: what impact did each single tool have on the overall comprehension of the Großklein's heritage on local, regional and international level? Are the tools actually compatible? What do locals think of the work?

In 2020 we started the EU-project Danube's Archaeological eLandscapes, yet another project dealing with digital technologies, mostly 3D, VR and AR. In the paper I would like to address the question: what did we learn from the past projects? How can we change our approach in developing such tools to achieve a higher impact and sustainability? The archaeological heritage of Großklein is presented in three museums, in a reconstructed village and as an archaeological path. The last will be mostly in the focus of my presentation.

5 IN THE FOOTSTEPS OF THE WARRIORS: IRON AGE IN THE GOLDEN VALLEY

Abstract author(s): Rakvin, Marta - Balen, Jacqueline (Archaeological Museum in Zagreb) - Potrebica, Hrvoje (University of Zagreb, Faculty of Humanities and Social Sciences) - Lukačević, Marijana (Papuk Nature Park)

Abstract format: Oral

Cultural route "In the Footsteps of the Warriors: Iron Age in the Golden Valley" was created based on the notion that cultural routes are one of the best forms in which the cultural heritage sites can be introduced to the public. A walk through the past, while immersed in the landscape and surrounded with cultural heritage sites, allows the visitors to experience the heritage presented.

Furthermore, presenting the sites using new digital tools further engages the visitors and provides a better context for the finds usually accessible only in museums.

In this paper we wish to present the case study of the aforementioned local cultural route where a combination of digital and analogue interpretation tools was used in order to bring the EIA closer to the public. Created on the EIA archaeological site Kaptol in Požega Valley (Eastern Croatia), one of the most prominent Early Iron Age sites in continental Croatia, 11 different topics are presented on the thematic boards posted along the route.

The first idea for visualization and reconstruction of the site was created in the scope of the project "Monumental landscapes of the Early Iron Age and the Danube region" (Iron-Age-Danube), which was implemented from 2017 to 2019 and is being enhanced through the implementation of the project "Virtual Archaeological Landscapes of the Danube Region" (Danube's Archaeological eLandscapes). In 2020 the route became a part of a larger international network the Iron Age Danube Route.

Along with the benefits of cultural route establishment, specific sets of issues will be addressed ranging from preservation and protection of the heritage presented to the responsible sustainable management of the route and the role of the local community.

6 INTEGRATING IRON AGE ROUTES IN THE SOPRON-FERTŐ REGION (NW-HUNGARY) INTO MODERN TOURISM-RELATED INVESTMENTS

Abstract author(s): Jerem, Elizabeth - Wollák, Katalin (Archaeolingua Foundation)

Abstract format: Oral

In the past few years, international projects and programmes (IAD, IADR) provided an opportunity to conduct research into Iron Age sites and landscapes in the Sopron-Fertő micro-region, during which a special emphasis was placed on the main routes and the general character of the road network, surveyed by digital and non-invasive methods. The Hallstatt period settlement network became even more dense in the Late Iron Age and a system of connections that has impacted cultural history until today was formed at the foot of the Eastern Alps, around the Leitha Mountains and Lake Fertő.

Tourism-related investments that have been implemented recently and are planned in the future certainly interfere with the one-time road network and settlement hubs. The Amber Road in the Roman period crossed the area of present-day Sopron, and from here it led towards Vindobona and Carnuntum, as well as towards Braunsberg and Bratislava. The main road along Lake Fertő also joined this network of west-east oriented communication and trade routes that ran parallel to the Danube.

Several Hungarian and international programmes target regional developments in north-west Transdanubia which facilitate recreational, sport-related, or educational investments. In this presentation those projects will be discussed that placed a special emphasis on digital applications and have had a considerable outreach. The modernisation project of the Sopron museum quarter, the development of touristic and heritage trails around the town and connected to archaeological sites, the forest schools and camps, the Centre of Eco-Tourism and Culture to be built in Fertőrákos, and the issues concerning world heritage areas will be addressed, as well as the potentials of cooperation with representatives of municipal and forest management authorities and touristic associations.

7 THE DEVELOPMENT OF CULTURAL ROUTES IN GREECE AND THE USE OF NEW TECHNOLOGIES

Abstract author(s): Kosta, Elissavet (Ionian University)

Abstract format: Oral

The cultural routes are generally a big challenge and chance for culture, tourism, the economy and the local growth. They include a wide range of possibilities like the evolution of the new touristic strategies as well as the local development of these areas. At the same time, they constitute a unique kind of cultural tourism as they combine culture with tourism as they have the potential to offer the visitors a host of activities.

The aim of the current research is the creation of cultural routes in Greece. The cultural route is defined as a brand name touristic product, that is a product of cultural tourism, which is shaped according to a specific connecting element. We attempt a diachronic approach as we will include places and monuments from the ancient times until the transition in the industrial and post-industrial societies. In order to design the cultural routes, we will put emphasis on the co-existence of the cultural route with the wealth of each peripheral section.

Modern tourists have created a new profile of a traveler who aims at living some new experiences. For this reason, the new technologies will play an important role in this effort so as to facilitate the visitors and to enhance their experience.

8 XPLORE-SH. LANDSCAPE ARCHAEOLOGY AND LOCATION-BASED EDUCATION

Abstract author(s): Hölscher, David (Institut fuer Ur- und Fruehgeschichte Kiel)

Abstract format: Oral

Past societies have shaped European landscapes from the Neolithic onwards at the latest and left traces within our everyday environment. Some of these are still visible today. While this is rather obvious to experts, public awareness of "ordinary" archaeological heritage in middle and northern Europe, such as gravemounds and earthen fortifications is low. In Germany communication related to them is often absent or limited to interpretive signage for selected sites. With his PhD-project the author tackled the task of engaging "the" public with this kind of heritage and raising awareness for the long-lasting history of landscapes – and thus human-environment relations. To this end a cycling tour was set up, guided by a mobile application providing information about archaeological sites and landscape development on site. In contrast to the rather intuitive use of (esp. digital) communication tools that seems to be widespread within public outreach in archaeology, this project was set within a framework of educational research. Besides founding on educational theory, it also included an empirical study on learning outcomes connected to the use of the app. Hopefully sharing some of the results will shed light upon possibilities and limitations of digital heritage communication outdoors.

9 DESIGNING COMMON GROUND AS A BASIS FOR ARCHAEOLOGICAL ROUTES

Abstract author(s): Toulouse, Catherine - Lengyel, Dominik (BTU Brandenburg University of Technology Cottbus-Senftenberg)

Abstract format: Oral

During the Counterreformation, in the early seventeenth century, the archbishop of Würzburg, Julius Echter von Mespelbrunn, built several hundred village churches, that follow a common principle, that by itself has never been realized due to the varying preconditions. Prof. Dr. Barbara Schock-Werner, the former master builder of Cologne Cathedral, verbally described this hypothetical ideal church in her habilitation treatise. The project demonstrated in this paper describes not only how the ideal church has been translated from the verbal into a virtually modeled state, but also its mediation to the public by an interactive Virtual Reality experience introduced by a narrative film and a physical model. The objects are represented in the common model scale 1:100 at first. When the operator successfully composes a church's volumes, he is forwarded to an original scale model. It is one of the specific strengths of Virtual Reality to switch between scales.

The ideal church project demonstrates how the combination of digital and analogue interpretation tools can succeed in conveying an identity whose origins are scattered over larger regions. Individual finds in the museum combined with a recontextualisation in virtual reality does not only reach the new younger generation. This form of presenting cultural heritage encourages people to visit original sites. The virtual experience serves as a promotion for an archaeological route connecting the realised churches, which are then put into relation with the ideal church and interpreted accordingly, which also serves the identification of the locals.

Particularly abstraction, if carefully designed, allows to demonstrate, explain, illustrate and understand concepts that otherwise can only be perceived subtly. The project has been realised for the exhibition „Julius Echter. Patron der Künste. Konturen eines Fürsten und Bischofs der Renaissance“, exhibited in the University of Würzburg's Martin von Wagner Museum in the Würzburg Residence in 2017.

214 KINGSHIP IN EARLY MEDIEVAL EUROPE: PLACES OF ROYAL POWER AND RITUAL

Theme: 7. From global to local: Baltic-Pontic studies

Organisers: Sanmark, Alexandra (University of the Highlands and Islands) - Ljungkvist, John (Uppsala University) - Hall, Mark (Perth Museum & Art Gallery)

Format: Regular session

Following on from a series of workshops held in Scotland over 2020/21 exploring early medieval kingship and its attendant ritual, this session will seek to explore the diverse range of evidence for early medieval kingship and ritual across Europe and the Pontus region from Late Antiquity to circa 1000 AD. We welcome contributions from a range of disciplines, including but not limited to, archaeology, art history, history, onomastics and folklore. We hope to further promote the excellent research of recent years in to the dynamics of kingship across Europe and we would welcome contributions that dealt with, for example, the types of royal site that can be identified (including their topographical settings and archaeological signatures), any regional differences (including any detectable influence from Pontus, Roman Byzantium and the Sassanian world); any toponymic identifiers; the nature of ritual and other activities associated with such sites; religious links (notably but not limited to Christianity) and any legacy and folkloric memory the places gave rise to. We are keen to gather as wide a geographic assemblage as possible, not only the Baltic-Pontic axis but from Francia, Spain and the Western Mediterranean.

ABSTRACTS:

1 A PRE-CHRISTIAN CULT AREA IN FREY'S SHIRE – A PRESENTATION OF TWO SITES NEAR HARREBY, SOUTHERN DENMARK

Abstract author(s): Grundvad, Lars (Museet Sønderkov)

Abstract format: Oral

The increasing use of metal detectors in Denmark over the last decade has led to the discovery of several new metal-rich sites from the pre-Christian era. A few of these show indications of belonging to the highest social strata and demonstrate intriguing signs of ritual practice.

Two of these sites are situated adjacent to each other in the hinterland of emporium Ribe in southwestern Jutland. Both have been partly excavated and the combined surveys have revealed several hall buildings and metal depositions of varying character dating to the first millennium AD. The earliest of the two sites included the deposition of more than 200 weapons, a ceremonial wagon and a sacrificed gold neck ring, all from the Roman and Early Germanic Iron Ages. This site was eventually abandoned around AD 550 and no later than around AD 600 a new sacred site emerged near Harreby – a historical placename that strongly suggests the presence of a "hørg"; a feature interpreted as a pre-Christian "alter". Preliminary surveys have revealed a sacred area enclosed by fences, partly hidden behind a 575 meter linear earthwork. Within the fenced area were traces of a large Viking Age hall building and a hørg. Besides these features, the site is known for two Viking Age hoards; one consisting of multiple gold artefacts that are stylistically related to the workshops of King Gorm the Old, and the other, a silver hoard consisting of mostly coins. Both hoards were deposited in pits near the entranceway to the sacred area.

This paper presents these new discoveries and the interpretation that these sites were a part of a sacred complex named after the god Frey. Furthermore, they seem to have been either under kingly control or maybe even owned by the Jelling Dynasty.

2 MEMORIES OF PICTISH ROYAL POWER IN PLACES OF CHRISTIAN RITUAL

Abstract author(s): Plumb, Oisín (University of the Highlands and Islands)

Abstract format: Oral

The memory of Pictish secular authority remained strong in local church foundation accounts long after the end of the Pictish kingdom. It is notable that in the origin accounts of several churches, the original bestowal of land to the Church comes from an unambiguously Pictish king or noble. This is despite the long-recognised process of ‘depictification’ in medieval hagiography, which led to Pictish men and women in the church coming to be portrayed as Gaels. This discussion will focus on surviving church foundation accounts of establishments in formerly Pictish locations, such as those of St Andrews, Deer, Loch Leven and Abernethy. It will consider why Pictish secular authority is given such a prominent role in these texts and ask if these accounts can tell us anything of the legacy of royal authority in Pictland and its relationship with places of Christian ritual, both in the Pictish period and as perceived in later ages.

3 CARVED STONES AND KINGSHIP IN EARLY MEDIEVAL NORTH-WESTERN EUROPE

Abstract author(s): Busset, Anouk (University of Glasgow; University of Lausanne)

Abstract format: Oral

During the first centuries of Christianisation, the role of kingship gradually transformed. The modification and manipulation of places of rituals linked to kingship for the purpose of negotiating social relationships were likely inextricably intertwined with the conscious agency involved in erecting, shaping, and utilising stone monuments within their boundaries. Focusing on case studies across north-western Europe, this paper will explore how carved stones participated in the transformation of places linked to royal rituals. The comparative analysis undertaken here allows a novel approach into the twinned processes of Christianisation and institutionalisation of the Church and how these processes drove a shift of power from the secular elites to the Church. Research on this topic has been constrained by analysis often conducted at a local or national level, leading to a strong understanding of local environments, but often forgetting transnational social, religious and political trends. By moving beyond the localised approaches within a framework centred on the creation of spaces, this paper discusses convergence in how stone monuments were employed in the negotiations of power between kings, local elites and the Church.

4 KING-SEATS OR ROYAL RESIDENCES, THAT’S THE QUESTION

Abstract author(s): Fallgren, Jan-Henrik (Uppsala Universitet)

Abstract format: Oral

In this paper I will discuss so called King-seats and royal residences in connection to Scandinavian Central-places. The paper will discuss the differences between King-seats and royal residences and how these concepts fit in, or not, to these special Scandinavian places. Scandinavian Central-places are usually regarded as either royal residences or some form of estate owned by some king or dynasties. I will instead argue that these so called Central-places neither can be characterized as royal residences nor have constituted any kind of estates. This will be done by comparing a large number of different Scandinavian larger farms and their agrarian economy with the type of economy and find material that characterize the uniqueness of the Central-places. By comparing these Nordic settings with Anglo-Saxon so called “great hall complexes”, Irish “royal places” and Pictish “power centers”, I hope that the argumentation and discussion that will take place will become more interesting and convincing.

5 LOCAL COMMUNITIES AND THE RISE OF POLITIES IN THE TYNE-FORTH REGION

Abstract author(s): Orsini, Celia (Durham University)

Abstract format: Oral

Early medieval cemeteries have been described as central places where identities are developed, reassessed, and reaffirmed. They have been the focal point of early medieval researchers for the past two decades, notably the large cremation cemeteries thought to have a large site-catchment and to serve multiple communities. However, in areas where the size of cemeteries is much smaller, the existence of small communities is not as easily inferred; Instead, the excavation and analysis methods are questioned. This paper aims to challenge the current framework and revisits the social organization of the communities of the Tyne-Forth region between the 5th-8th centuries. Working with 90 site locations and 2434 burials, this research explores how people signaled their identity and their connection to places through their funerary practices and through the use of their surrounding landscapes. A comparative analysis of the funerary practices calls attention to the existence of highly varied practices, showing no sign of homogeneity throughout the selected timeframe despite the spread of Christianity, and it is here interpreted as a localized expression of identity. Proximity and viewshed analysis complement the landscape study to stress the use of varied features (natural and built) and their visibility in localized area. Finally, the apparition of larger cemeteries around the 7th century is discussed, underlining the high variability in the funerary practices within each site. This paper argues for a social organization in small to very small social

groups through the 5th and the end of the 6th century and highlights a change in the social organization during the 7th century, correlated to the spread of larger political entities in the region.

6 VISIBILITY, MOVEMENT, AND THE ROYAL DYNAMICS OF CONTROL AT YEAVINGER, NORTHUMBERLAND, ENGLAND

Abstract author(s): Buchanan, Brian (Eastern Washington University) - Semple, Sarah - Skinner, Tudor (Durham University)

Abstract format: Oral

The iconic early medieval royal palace of Yeavinger is located on a small, elevated terrace at the base of the Cheviot Hills in the fertile Milfield Basin. The excavations of the site, led by Brian Hope-Taylor, revealed a multi-faceted complex containing timber halls, cemeteries, and evidence of reuse and reinterpretation of prehistoric features. Hope-Taylor identified the site as the royal vill noted by Bede as an assembly site used by King Edwin of Northumbria. Although long considered a type-site of early medieval royal centres in Britain, questions remain on the site’s extent, development, chronology, and landscape context. Since the publication of the Yeavinger monograph in 1977, numerous early medieval settlement sites have been identified in the region, placing Yeavinger in a landscape of activity, ritual, and power. This presentation examines the topographic position of the palace complex as a function of the subtleties of kingship, control, and ritual. Using GIS-based analyses focused on visual exposure and movement, this presentation demonstrates that the spatial location of Yeavinger affords specific types of control over the landscape. Yeavinger’s location is vital in understanding both the ritual importance of place and being a strategically important nodal point overseeing social movement in the landscape. This further demonstrates the importance of visibility and movement for the development of early medieval royal centres in Britain.

7 FEEDING KING AND COURT: FOOD RENDERS, HUNTING AND FEASTING AT LLANGORSE CRANNOG, WALES

Abstract author(s): Best, Julia (Cardiff University)

Abstract format: Oral

Llangorse Crannog is a gem in crown of Welsh archaeology. This royal site, associated with the kings of Brycheiniog, was in use between 890 and 916 AD before being burnt to the ground. Excavation revealed a rich array of artefacts including the largest analysed bone assemblage in Wales of this date. The animal bone assemblage contains a unusually high frequency of wild animals alongside the domestic ones, with some species having distinct sections of the body represented. The animal bone has given an incredible insight into both hunting, and the wider provisioning of the site. When analysed alongside the Welsh lawbooks such as Cyfraith Hywel (the Law of Hywel) this site provides a unique window into hunting, herding, feasting, kingship and social hierarchy. This allows investigation of status, display and sustenance in Early medieval Wales, and can also reveal how different groups used the resources to negotiate power and identity.

8 THE VOCABULARY OF POWER AND BECOMING (NEARLY) ROYAL: THE EARLS OF FLANDERS BETWEEN THE LATE 9TH AND EARLY 11TH CENTURY

Abstract author(s): Tys, Dries (Vrije Universiteit Brussel)

Abstract format: Oral

The dynasty of the Graven van Vlaanderen, the Earls of Flanders, rose rapidly to power between 880 and 890 in order to reach a nearly royal position. In particular Baldwin the second, who was the grandson of Charles the Bald and the son in law of Alfred The Great, had the ambition of creating a royal position and future for his family and the principedom of Flanders. A combination of historical information, architecture and monuments and landscape archaeology shows how he and his son, Arnulf the Rich, used a diverse set of media and means to create a royal vocabulary of power. In this paper we will present this vocabulary and how it was used to consolidate power, in an attempt to form a new Middle Kingdom. The means that were used included of course Palaces and burghs, burials and collegiate churches, but also genealogies, and even the environment. Most of all an innovative concept of governance, which marked the end of the Early Medieval Period.

9 FROM SITE ON TRADE ROUTE TO KEY ROYAL CITY

Abstract author(s): Videiko, Mariia (Kyiv Borys Grinchenko University)

Abstract format: Oral

The second half of the Xth century was a time when the “trading cities” moved under the royal power. Profits from trade that went along the Dnieper gradually became a source of power for the rulers of Kyiv. As in the North of Europe in the East, uncontrollable trade factors here become the mainstay of royal power. The city of Tropol, which is located on the Dnieper, was first mentioned in written sources at Xth century as belonging to the Kyivan prince. However, there is reason to believe that it was founded earlier and is known from the runic inscription as Ustaholm. Archaeological research here shows the existence of the city on an area of about 30 hectares. This is the third largest settlement at this time on this section of the Dnieper. It had three lines of fortifications and a special channel with the “Water Gates” around, possibly used as a harbor for ships. There are three types of sites on the Dnieper, which functioned to provide a way across the Dnieper. These are open settlements, fortresses, fortified harbors. The time of their

appearance can be attributed to the Xth century. Some of them were clearly outside the jurisdiction of the princes of Kyiv. However, from the end of the Xth and during the first half of the XIth century, all these points were conquered by them. It was then that cities grew around some fortresses, and in between new fortresses were built, which marked the new borders of Kiev's royal power, which moved to the South. These boundaries were defined in more detail by a large-scale defense system known as "serpent's ramparts" - an analogue of Danevirke.

10 THE ORIGINS OF COPENHAGEN AND THE CONSOLIDATION OF ROYAL POWER

Abstract author(s): Stafseth, Terje (Copenhagen Museum)

Abstract format: Oral

According to the standard version of Danish history, the origins of Copenhagen, and the consolidation of royal power, started with the archbishop and warlord Absalon (1128-1201). Absalon is seen as the first town lord, transforming a fishing village into a town in the mid-12th century. Following new archaeological results, we have good reasons to argue that the town originated earlier, in the 11th century, and royal consolidation of the town took place shortly after.

Based on the new evidence, we believe that Copenhagen grew from a local chieftain's farm into a regional trading port during the 11th century. This growing town, with an associated church and churchyard, attracted the king's attention. To counteract the power of the local lord, the king established his presence with a new fortified area / royal court in the center of this developing town, accompanied by his own church of St. Clements.

Around 50 years later, as a gift from the king, Absalon took over lordship of the town as a whole and by the beginning of the 13th century all traces of the older settlement, church and earlier local lords had vanished.

The paper will present the most important archaeological results from the last decade, contributing to our new knowledge concerning the origin of the town. Focus will be on The Metro Cityring excavations 2010-2014 and a later excavation in Rådhuspladsen (Town Hall Square) in 2018, which revealed evidence of urban settlement dating back to the early 11th century. This suggests the presence of an urban settlement larger than a mere fishing village at the start of the 12th century.

11 THE GEOGRAPHY OF POWER IN MEDIEVAL SCOTLAND

Abstract author(s): Sanmark, Alexandra (University of the Highlands and Islands)

Abstract format: Oral

This paper will examine some key places of power in late medieval Scotland, such as Edinburgh Castle, Dunfermline Abbey and Stirling Castle. These sites played important roles in different types of event, from royal ceremonies, such as coronations, marriages and key assembly meetings over several hundred years. These sites also seem to have been important strongholds in many of the medieval wars that took place in the course of the Middle Ages.

These sites, and other key sites, will be examined in terms of their archaeological remains as well as their location in the landscape. The earliest evidence of fortifications will be traced. Other important issues include identifying any key features that these places share. Emphasis will also be placed on any particular differences between the sites that can be discerned. Through this applying this interdisciplinary approach the underlying patterns of the geography of power in late medieval Scotland will be investigated.

216 HORIZON EUROPE: ADDRESSING THE PRIORITIES

Theme: 2. Pandemics and climate change: responses to global challenges

Organisers: Carver, Martin (University of York; British Academy) - Bánffy, Eszter (DAI Römisch-Germanische Kommission, Frankfurt am Main; German Archaeological Institute, Budapest Research Unit)

Format: Round table

Horizon Europe, which follows Horizon 2020 as the principle vehicle of EU research funding in January 2021, urges us to focus on the urgent matters of the day:

1. Health
2. Culture, creativity and an inclusive society
3. Civil security
4. Digital industry and space
5. Climate, energy and mobility
6. Food, bioeconomy, natural resources, agriculture and environment

These objectives align with the Sustainable Development Goals drawn up by the UN in its 75th anniversary year, so can be justly called global. How will archaeology organise to address these topics? As a subject that professes disciplines of both STEM and SHAPE we are well placed to make effective contributions. While science is seen as the primary instrument for achieving the objectives, there is a good case for the humanities, and archaeology in particular, to illuminate the case and win new support through the advocacy of the past. But some adjustment will be required to the traditional agenda and to the interdisciplinary groupings that will be needed. This round table intends to launch the conversation.

AGENDA

1. Introduction: Are we ready to go global? Addressing the UN SDGs: pathways for archaeological research
2. Personal, National and Global: at what level should research agendas be prescriptive?
3. Archaeology is both a STEM and a SHAPE subject with strong benefits to both communities; can we make the case, to governments for a two-horse category for archaeology?
4. If STEM deduces, and SHAPE advocates, how can we strengthen both to strengthen the impact of the whole?
5. Interdisciplinarity is necessary to address the SDG's. How can project design accommodate it in the new goals?
6. If its principal agenda is to serve the SDGs, how would project designs be assessed?
7. Archaeology has a strong commercial presence and is a million-euro player in the economy; how are its commercial and intellectual contributions to be assessed?
8. If any of these ideas attracts support, how would their adoption affect the teaching of archaeology?
9. How would these ideas be of benefit to the public?

217 PREHISTORIC LANDSCAPES UNDER THE BOG: TRACING CULTURAL RESPONSES TO ENVIRONMENTAL CHANGE

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Behrens, Anja (Lower Saxony Institute for Historical Coastal Research; German Archaeological Institute) - Smyth, Jessica (School of Archaeology, University College Dublin) - Mennenga, Moritz (Lower Saxony Institute for Historical Coastal Research)

Format: Regular session

The reaction of prehistoric societies to the consequences of environmental change is mostly hard to trace for archaeologists. However, when we combine different scientific analyses, field methods and the local palaeogeography, in some regions good insights are possible – and allow wider questions on this theme. In this session we want to focus on bog areas in Northern Europe that developed in the Holocene. Both coastal and inland terrain in several regions changed during this period, affecting how people used the landscape. In some places this change was very rapid, and in others more gradual, as wide areas became covered by bog and/or flooded by the sea.

Investigations on these preserved regions show that a combined evaluation of the changes in landscape and cultural responses are possible. We want to know more about ongoing or already completed research on this topic with a focus on prehistory. How do you trace archaeological features and changes in landscape use within the bog, what are your methods and what are the results? We are interested in all kinds of research approaches; from coring, botanical analysis and remote sensing to the usage of archaeological biomarkers, such as pottery lipids or bog butter analysis. The focus of papers should be your conclusions about the environmental-cultural interaction of prehistoric societies. What role did the developing bog have on choice of settlement areas, ritual practices, economic life, communication structure and networks. We welcome papers from all bog regions of Northern Europe and throughout prehistory to explore these questions.

ABSTRACTS:

1 LIVING IN A DROWNING LANDSCAPE. INTERDISCIPLINARY RECONSTRUCTIONS OF LONG-TERM HUMAN-PEATLAND INTERACTIONS IN THE NORTHERN NETHERLANDS

Abstract author(s): Beek, Roy - Quik, Cindy (Wageningen University & Research)

Abstract format: Oral

In historical literature and folkloristic sources bogs are frequently described as remote, hostile and dangerous. However, the contrary is true. Archaeological evidence demonstrates that they were exploited, modified, accessed and structured by humans. Furthermore, they influenced patterns of habitation and movement. Gaining insights into long-term landscape developments requires intimate knowledge of the interrelations between habitation trends and environmental change, as well as the pace of these processes. With regard to Dutch peatlands this type of research is rare, due to a lack of high-resolution environmental data. This is mainly caused by the fact that the large majority of these environments have disappeared long ago due to turf-cutting and agricultural reclamation. In this lecture we present the results of ongoing interdisciplinary work in one of the largest remaining bog remnants in the Netherlands: the Fochteloërveen. The results of new coring data on peat stratigraphy are integrated with palaeoecological evidence and a detailed archaeological inventory comprising over 400 sites ranging from the Late Palaeolithic to the High Middle Ages. This allows us to study the lateral expansion of this formerly vast peatland over time, and to reconstruct how humans interacted with this drowning landscape over long time scales and on various spatial levels.

2 WET FEET OR DRY FINDS? TRACING MESOLITHIC SETTLEMENT IN BOG AREAS OF LOWER SAXONY, GERMANY

Abstract author(s): Mahlstedt, Svea (NIHK)

Abstract format: Oral

A recently running project is dealing with a survey for waterlogged mesolithic sites in the Northwestern part of Germany. As Mesolithic remains in this area are mostly known from surface sites on sandy soils, well-preserved finds and structures are missing so far. To get a better understanding of landscape use, material culture and subsistence strategy in Mesolithic Lower Saxony, we are following an intense survey strategy: In a first step we are bringing together the known sites and geological information on raised bogs, kettle bogs and early Holocene coastal peat growth, to select the most interesting places. There, we are expecting that peat growth may have covered and preserved camp sites, as well as primary waterlogged activity and drop zones. In a second step in the field, size and situation of the sites are checked by field walking, raster coring and sampling from mega-drills. Thus, a reconstruction of the sandy relief below the peat can be developed and former surfaces can be recognized. The mega-drills are bringing up larger samples of these drowned landscapes. The samples are sieved and searched for anthropogenic finds and datable material. On the most promising sites small test trenches are opened.

Still, the remaining questions for the project are: Do we only find, what we know already, when we start searching in the vicinity of known sites? And how much landscape reconstruction is needed to find new sites below the bog?

In this paper the preliminary results from the first two years of the project are presented. Successful and less successful surveys in several different micro-regions are discussed.

3 CHANGING PATTERNS OF INTERPRETATION. NEW PERSPECTIVES ON MESOLITHIC LIFE, EXEMPLIFIED BY NEW RESULTS FROM DUVENSEE WP 10

Abstract author(s): Groß, Daniel (Centre For Baltic And Scandinavian Archaeology - ZBSA; CRC 1266: Scales of transformation: Human-environmental interaction in prehistoric and archaic societies - SFB 1266) - Corradini, Erica (Institute of Geosciences, Applied Geophysics, University of Kiel; CRC 1266: Scales of transformation: Human-environmental interaction in prehistoric and archaic societies - SFB 1266) - Dörfler, Walter (Institute of Pre- and Protohistoric Archaeology, Kiel; CRC 1266: Scales of transformation: Human-environmental interaction in prehistoric and archaic societies - SFB 1266) - Lübke, Harald - Meadows, John - Schmölcke, Ulrich (Centre For Baltic And Scandinavian Archaeology - ZBSA; CRC 1266: Scales of transformation: Human-environmental interaction in prehistoric and archaic societies - SFB 1266) - Wieckowska-Lüth, Magdalena (Institute of Pre- and Protohistoric Archaeology, Kiel; CRC 1266: Scales of transformation: Human-environmental interaction in prehistoric and archaic societies - SFB 1266) - Zanon, Marco (CRC 1266: Scales of transformation: Human-environmental interaction in prehistoric and archaic societies - SFB 1266)

Abstract format: Oral

For almost a century, the Duvensee palaeolake has been a centre of attention for Early Mesolithic research in northern Germany and beyond. Having become a large lake and fenland during the early Holocene, the micro region repeatedly attracted several Mesolithic groups, who established short-term camps. While hunter-gatherers exploited the area heavily to harvest hazel nuts, other activities also left archaeological traces in the peat bog.

In this presentation, we will summarise the latest research results from the Duvensee area, with a special focus on the Preboreal/Boreal site Duvensee WP 10. We will give a brief overview of the methods we have applied to investigate the prehistoric landscape, including refined methods of remote sensing and further chronological analysis, and of the new insights obtained by modern re-evaluations of the sites. The results will be embedded into a wider geographical context and show the place of Duvensee in the Mesolithic socio-economic system.

4 INVESTIGATING PLANT SIGNALS IN LIPID RESIDUES OF NEOLITHIC POTTERY FROM A BLANKET BOG ENVIRONMENT AT THE CÉIDE FIELDS, IRELAND

Abstract author(s): Olet, Lilly - Casanova, Emmanuelle - Robson Brown, Kate - Evershed, Richard (University of Bristol) - Smyth, Jessica (University College Dublin)

Abstract format: Oral

The Céide Fields are an extensive field system of drystone walls in North Mayo, well-preserved under blanket bog. They are traditionally associated with herd management and, to some extent, arable farming. Archaeological and palaeoecological research suggests a high human impact on the landscape during the Early Neolithic, followed by a decrease of farming activity parallel to an increase in peat bog formation during the Middle and Late Neolithic. Analysing lipids entrapped in the ceramic matrix showed that Early and Middle Neolithic vessel use at several of the Céide Field sites (Behy, Glenulra, Ballyglass, Céide Visitor Centre and Belderg Beg) was predominantly linked to dairy production (Caulfield et al. forthcoming). Lipid residue analysis further showed that the majority of the samples not only yielded the typical molecular distribution attributed to animal (dairy or carcass) fat, but also contained compounds that point towards a peat-derived plant source. This effect is especially dominant among the Middle Neolithic Globular bowls. We are currently applying a range of techniques to pottery samples, including imaging techniques such as micro-CT; pyrolysis of root material; lipid residue analysis and radiocarbon dating of single compounds to establish the origin, the inclusion pathway and the time of

deposition of these peat-associated plant lipids. This suite of methods bears potential to study human subsistence parallel to peat bog formation and can help understand the interaction between societies and their changing environment at the Céide Fields as well as at other peat bog sites in the future.

5 THE NEOLITHIC PRE-BOG LANDSCAPE OF AHLEN-FALKENBERG IN NORTHERN GERMANY

Abstract author(s): Behrens, Anja - Mennenga, Moritz - Karle, Martina - Wolters, Steffen (Lower Saxony Institute of Historical Coastal Research)

Abstract format: Oral

Since 2019 the Lower Saxony Institute for Historical Coastal Research carries out investigations on the Neolithic landscape in the dist. of Cuxhaven and Stade, Lower Saxony, covered by bog for the past 5000 years. However, several prehistoric monuments including megalithic graves of the Funnel Beaker Culture (TRB) became visible again during the last 50 years due to intensive drainage measures and dry summers, which caused severe peat shrinking processes in these areas. By this the newly emerged megalithic graves of the Ahlen-Falkenberger Moor show excellent preservation conditions. The project „Preserved in the bog“ aims to investigate the original constructions and history of these monuments. Furthermore we want to estimate the impact of the changing environment on the Neolithic societies on a local and a regional scale. For this a number of field methods are applied to reconstruct the former landscape and how it developed during the Holocene, including coring, geomagnetic surveys, excavations, phosphate analyses, botanical and geological investigations as well as 3D-modelling. First results reveal a gently undulating landscape with already aquatic environments due to sea-level rise like saltmarshes and peat areas next to still dry places, which had been used to establish a burial and settlement landscape. Late Holocene sea-level rise also caused a marine incursion into the Neolithic pre-bog landscape, which followed the course of a fenland channel pre-shaped by the Saalian glaciation and providing the Neolithic community with a direct access to the North Sea. In order to understand the spatial and temporal landscape changes during the last 5000 years further excavations and measurements will be conducted with a focus on the short as well as long term effects of the environmental changes on the Neolithic societies in the Ahlen-Falkenberg region.

6 WET FEET IN THE STONE AGE? ENVIRONMENTAL-CULTURAL INTERACTIONS OF NEOLITHIC WETLAND DOMESTIC SITES ON THE SOUTHERN CIMBRIAN PENINSULA AND BEYOND

Abstract author(s): Brozio, Jan Piet - Feeser, Ingo (Institute of Pre- and Protohistoric Archaeology CAU Kiel)

Abstract format: Oral

Neolithic domestic sites in wetlands are a well-known phenomenon in the Northern German Plain. Good preservation conditions of artefacts and ecofacts are responsible for a long history of research interest of such sites. Comparing the evidence for known sites, a diverse picture emerges. They are located in different landscapes, such as the coastal area of the Baltic sea and inland situations. Thus they were exposed to different environmental challenges but also resources. Settlement sizes and architecture differs, probably reflecting different forms of subsistence practices. In this paper we will present several examples of sites, with a focus on the southern Kimbrian peninsula. Beside archaeological excavations palynological investigations have been carried out at the sites and allow to compare settlement structure and dynamics with evidence for environmental changes. In doing so, we will address the questions of how changes in the wetlands affected settlement activities and vice versa. Furthermore, we aim at exploring if changes in settlement intensities and/or population density can be observed and how they register in the archaeological and palaeoenvironmental records.

7 PUTTING THINGS IN (UN)USUAL PLACES: ANALYSIS OF THE SITING OF SELECTIVE DEPOSITIONS IN THE BOURTANGER MOOR, THE NETHERLANDS

Abstract author(s): Moree, Jelle (Faculty of Archaeology, Leiden University; Soil Geography and Landscape group, Wageningen University)

Abstract format: Oral

The practice of selective deposition – the intentional deposition of particular objects at specific places in the landscape – is a widely studied phenomenon in European archaeology (Bradley, 2017; Fontijn, 2019). The Bourtanger Moor, a former raised bog that stretched from the north-eastern Netherlands into north-western Germany, is renowned for its selective depositions. Although Wentink (2006) and De Vries (2016) studied the siting of Middle Neolithic and Iron Age depositions respectively, the siting of Late Neolithic and Bronze Age depositions had not been investigated yet. Hence, this study concerned an analysis of the physical and cultural landscape context of Late Neolithic and Bronze Age selective depositions in the area that encompasses the Hondsrug (a subglacially-formed ridge) and the adjacent Bourtanger Moor. It was found that objects were preferably deposited in or near (ephemeral) waterways in the Moor. They were deposited in or near brook rivers in the Moor itself and close to stream valleys bordering the Hondsrug. Additionally, selective depositions were often found close to bog trackways. It is hypothesized that an increase in bog surface wetness during the Bronze Age partly motivated the construction of such trackways, as they ensured continued access to hard-to-reach parts of the bog that remained favourable for deposition. As such, the trackways are argued to have connected different ‘deposition zones’ in the study area. The associations of depositions with waterways and/or bog trackways fits within a wider north-western and northern European tradition of deposition in or near bodies of water and/or near tracks (cf. Bradley 2017). However, a preference for deposition near flowing water within a bog has not been identified in other European bogs yet. Further

research in and reassessment of selective depositions in other north-western and northern European bogs will illuminate whether this association was specific for the Bourtanger Moor, or not.

8 BOG BUTTER IN IRELAND: A STUDY THROUGH TIME AND SPACE

Abstract author(s): O'Toole, Karen (University College Dublin)

Abstract format: Oral

Bog butter is among the most common finds recovered from Irish bogs. Recent phases of radiocarbon dating have demonstrated the practice of bog butter deposition was extremely long-lived in Ireland, beginning as early as the Early Bronze Age and persisting as late as the post-medieval period (Smyth et al. 2019; Synnott 2014; Cronin et al. 2007; Downey et al. 2006). As a result, bog butter is uniquely positioned to help archaeologists explore the role of developing bog on the economic life and ritual practices of people in the past. This presentation will focus on a pilot study exploring bog butter distribution across space and time in six counties located in central and western Ireland (Kildare, Laois, Mayo, Meath, Offaly, and Westmeath) that was recently completed as part of my PhD research. The pilot study took a GIS-based approach combining spatial data with radiocarbon measurements, lipid analysis and aDNA results to provide a large-scale picture of the phenomenon and trace the changes that occurred over time. Additionally, this pilot study also incorporated data on other types of artefacts recovered from bogs in the study area in a preliminary exploration of the associations between bog butter and other bog finds. This aimed to begin to integrate bog butter deposition into the wider practice of Irish bog deposition and exploitation. Some patterns are already beginning to emerge as a result of this research, including an apparent chronological divide along the east/west axis of the island and hints as to the role played by bog butter in wider practice of bog deposition in Ireland and beyond.

9 TRAFFIC JUNCTION THROUGH THE TIMES: THE BOG NARROW NEAR GNARRENBURG, LDKR. ROTENBURG/WÜMME (LOWER SAXONY)

Abstract author(s): Heumueller, Marion (Lower Saxony State Office for Cultural Heritage) - Hesse, Stefan (District Office of Archaeology Rotenburg, Wümme) - Behling, Hermann - Leuschner, Hanns (University of Göttingen, Department of Palynology and Climate Dynamics)

Abstract format: Oral

The 'Teufelsmoor' is one of northwest Germany's largest peatlands, stretching over 260 square kilometers. For the last three years, a small narrow between Gnarrenburg and Karlshöfen, known for their trackways and wheel finds, was examined in a joint project by the District Office of Archaeology Rotenburg (Wümme), the bog archaeologist of the Lower Saxony State Office for Cultural Heritage and the Department of Palynology and Climate Dynamics at the University of Göttingen.

Initially, after intensive drainage measures and peat cutting, hopes of finding remnants of trackways in the area, were dampened. Over time, however, the site has exceeded all expectations. At least five trackway constructions from the period between 2500 BC and 100 AD have been newly discovered. Their construction varies greatly, not least depending on climatic conditions. A comparison between path construction phases with stress-induced changes in the postglacial dynamics of dendro-dated peatland forestation phases can reveal such climatic relationships at high temporal resolution.

One particularly spectacular find consists of an unusually wide wooden road of the Neolithic period with a width of more than 4 m and a bridge-like construction of the pre-Roman Iron Age founded on three rows of pillars. The relatively large number of finds from the Iron Age and the Roman Imperial Period is also extremely unusual. Pollen analytical studies indicate activity in the settlement phase and thus embed the archaeological structures in the period of occupation history. This suggests little land use activities near the area of study. Results indicate several changes in drier and wetter conditions of the large peatland area surrounded by oak and alder forests. Several periods of stronger fire events have been identified.

219 THE HISTORICAL ECOLOGY OF RECLAMATION LANDSCAPES: TOWARDS A CROSS-CULTURAL COMPARATIVE PERSPECTIVE

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Haas, Tymon (Leiden University) - Schepers, Mans (University of Groningen) - Walsh, Kevin (University of York) - Gardner, Tom (Historic Environment Scotland) - Stratigos, Michael (Leverhulme Centre for Anthropocene Biodiversity, University of York)

Format: Regular session

Wetlands are extremely rich ecosystems, and have attracted humans throughout (pre)history. Although these areas are often perceived as marginal in urban societies, it was particularly in periods of growing socio-political complexity and population growth, that wetlands provided attractive landscapes to reclaim and exploit in more intensive and systematic ways.

However, the reclamation and exploitation of wetlands could come at a high price: the investments needed to reclaim wetlands could easily approach or exceed the capacities of a society; living and working in these landscapes was often strenuous; and different institutions and groups could have conflicting interests in their exploitation; and drainage measures could radically alter ecosystems and land-use potential.

Recently, de-watered landscapes are experiencing calls for restoration. While necessary to return a range of ecosystem-services, expansive restoration programmes require policymakers to balance wetland's archaeological/palaeoecological significance with potential ecosystem-service provision. Policymakers need established, comprehensive datasets to understand and mitigate the risks involved and add value to restoration efforts.

Thus, reclaimed wetlands provide excellent contexts to explore the impact of past societies on the long-term development of landscapes, which in turn crucially informs current restoration policies. The framework of historical ecology (and related concepts of sustainability and resilience) have been successfully applied to understand the complex interplay of cultural and environmental processes in the development of such reclaimed landscapes.

Building on such scholarship, this session explores how societies in different geographic and historical contexts faced the challenges involved in exploiting wetlands, and how the reclamation of such landscapes affected, and continues to affect, their development and exploitation. Regional case studies provide new insights into commonalities in the ecological and human responses to, often unforeseen, environmental and land-use change. They integrate historical, archaeological and ecological sources to reconstruct how different processes interact in the long-term, and how to safeguard these landscapes during restoration.

ABSTRACTS:

1 THE IMPACT OF RECLAMATION ACTIVITIES ON LANDSCAPES: A CONCEPTUAL FRAMEWORK

Abstract author(s): Schepers, Mans (Groningen University) - De Haas, Tymon (Leiden University)

Abstract format: Oral

The reclamation of various types of wetlands took and takes place across the world. We set out to identify overarching principles potentially associated with these reclamations, but soon came to the conclusion that an essential starting point, following academic standards, should be to explore what actually entails 'reclamation' and 'reclamation landscapes'. This paper addresses our search and findings and the concepts we developed so far, and strives to be a starting point for further discussion.

We argue that, talking about reclamation landscapes, rather than 'reclamation' proper, allows us to study reclamation as a process in what we consider to be three major (relative) time moments in a reclamation landscapes history, being (1) the landscape before reclamation, (2), the landscape during reclamation, and (3), the landscape after reclamation.

We will discuss the exact definition(s) (or lack thereof) of a number of terms and concepts associated with reclamation landscapes, which include reclamation itself, but also 'polders' and 'water management'. After having established what, according to us, reclamation actually is, we will present a broad overview, in time and space, of reclamation history. Subsequently, we will discuss the major goals and effects of reclamation projects. These effects can be separated in two major categories: Short-term effects and long-term effects.

We will also relate the former to well-established, yet at the same time heavily debated concepts related to the interaction between people and their environment, most notably resilience, sustainability, adaptation, and landesque capital.

2 BALANCING HABITAT AND HERITAGE: ISSUES AND OPPORTUNITIES IN WETLAND AND PEATLAND RESTORATION FOR POLICYMAKERS ACROSS THE UK AND IRELAND

Abstract author(s): Gardner, Tom (Historic Environment Scotland; University of Edinburgh) - Davies, Mairi (Historic Environment Scotland) - Ward, Kara (Heritage Advice and Regulation Branch, Department of Communities, Northern Ireland Government) - Hazell, Zoe (Historic England) - Grant, Fiona (CADW)

Abstract format: Oral

Wetland and peatland restoration are high on the international agenda, particularly in relation to the climate emergency, and across the UK and Ireland extensive targets for restoration are being set by national and local governments, exceeding 500,000ha by 2030. Overall, this development is positive due to the potential of restoration to safeguard and enhance biodiversity, ecosystem service provision, and carbon storage/sequestration. However, expansive wetland restoration has implications for the preservation and management of the historic environment of wetlands that play a key role in their archaeological and palaeoecological importance.

As a cross-governmental group of cultural heritage policymakers and decisionmakers, we need access to reliable and well-contextualised studies and data around restoration to allow us to make informed decisions on heritage management and land-use on behalf of the public. To this end, we use this paper as a platform to outline issues and identified gaps in available knowledge around the short-, medium-, and long-term impacts of restoration upon historic assets individually, and the historic environment generally.

Our contribution outlines the state of play and current available information relating to wetland and peatland restoration across Britain and Ireland and identifies the following issues, intended to galvanise researchers to generate data/information of a form usable by policymakers. Identified gaps in our knowledge include:

1. Lack of widespread understanding of peatland restoration in the heritage sector.
2. Few reliable case-studies.
3. Widespread poor-quality mapping of restoration sites.

4. Poor identification of 'unknown' archaeology or sub-peat landscapes in blanket peat.
5. Poor understanding of the impact of restoration on archaeological/palaeoecological records.
6. A lack of pre-restoration, and medium- to long-term post-restoration monitoring of restoration sites (hydrology, geochemistry, vegetation change).
7. Limited engagement with wetland/peatland adjacent communities.
8. Poor understanding of how cultural heritage contributes to climate science.

3 INTEGRATED APPROACHES TO UNDERSTANDING COMPLEX LONG-TERM RECLAMATION PROCESSES IN THE HINTERLAND OF RAVENNA

Abstract author(s): Abballe, Michele (Ghent University; University of Verona) - Cavalazzi, Marco (University of Bologna) - Fiorotto, Celeste (University of Verona; Ghent University)

Abstract format: Oral

In this paper, we aim to present the results of an interdisciplinary research project focusing on the hinterland of Ravenna, more specifically in the surrounding of the town of Lugo. The area is known for the extraordinary preservation of the centuriated field system, although its "Roman" origin has been rightly questioned in the last three decades. Our data show how this seemingly homogenous area has instead a very complex history, due to frequent flooding events often connected to river avulsions. Artefact surveys have been useful to study the main trends in the evolution of settlement patterns, which show resilience after the end of the Roman period for at least part of the study area, and archaeological and historical sources have revealed the strong impact that urban Communes and other contemporary powers had in the 12th-13th centuries. This was a moment of generalized population growth, during which these powers were able to change the existing settlement patterns, even modify river courses and build large-scale drainage systems. Only thanks to a multidisciplinary approach it has been possible to clearly understand these processes. Indeed, a geoarchaeological investigation has allowed to better understand the extension of a former wetland and the mechanisms that led to its complete reclamation. Finally, the area has also been ecologically characterized by archaeobotanical analysis (seeds, fruits, charcoal and pollen) to better understand the evolution of this reclaimed landscape also in terms of land use and land cover.

4 WETLAND RECLAMATION STRATEGIES AND LONG-TERM LANDSCAPE DEVELOPMENT: SOME OBSERVATIONS FROM MEDIEVAL AND ROMAN CONTEXTS

Abstract author(s): Haas, Tymon (Leiden University) - Schepers, Mans (Rijksuniversiteit Groningen)

Abstract format: Oral

Wetland reclamation has occurred under diverse geographic, socio-political and socio-economic conditions, and it seems evident that these conditions affect the strategies (in terms of scale, technology, organisation) used in such reclamations. However, the relation between such strategies and long-term regional landscape changes seems less evident: did reclamations using large technological and labour inputs necessarily lead to more radical and enduring landscape transformations, and if so, in what respects? This paper explores these question through a comparative analysis of two wetlands in different geographic contexts that were reclaimed under different socio-political regimes: the Pontine marshes, reclaimed as part of Rome's early Imperial expansion, and the coastal salt marshes of the northern Netherlands that were reclaimed by emergent state societies in the medieval period. For both cases we present a diachronic assessment considering pre-reclamation conditions, the phase of reclamation itself and its afterlife combining archaeological, historical and ecological evidence. This comparison suggests that the Pontine case, which drew on more centralised forms of organization and higher levels of technological knowhow, was in the end less successful in sustainably reclaiming this wetland.

5 SHIFTING ECOLOGIES OF A RECLAIMED WETLAND LANDSCAPE IN SOUTHERN ALBANIA

Abstract author(s): Allen, Susan (University of Cincinnati)

Abstract format: Oral

Radical landscape transformations such as wetland reclamation not only alter the physicality of terrain and ecosystems, but also actively suppress the place-based narratives of human experience that shape public memory over the long term. The 1940's drainage of the Maliq wetland in southern Albania, a focus of human settlement in the area for more than 7,000 years, provides a compelling example of this coupling. Immediately following World War II, Albanian dictator Enver Hoxha hailed the drainage and eradication of the wetland in southern Albania as one of his great political triumphs over nature. This rhetoric, grounded in the notion reclamation, effectively silenced less empowered narratives of the wetland itself, the people engaged in its drainage, and its cultural ecologies. A *longue durée* approach that integrates palaeoenvironmental, archaeological (Neolithic, Bronze Age, Iron Age), ethnoecological, and ethnohistorical evidence illuminates the diversity of these hidden ecologies and their grounding in place-based knowledge.

6 WHAT WETLAND ARE WE PROTECTING AND RESTORING? QUANTIFYING THE HUMAN CREATION OF DESIGNATED WETLANDS IN SCOTLAND

Abstract author(s): Stratigos, Michael (Leverhulme Centre for Anthropocene Biodiversity)

Abstract format: Oral

Wetland environments have been specifically designated and protected globally for their importance to biodiversity since the Ramsar Convention in the 1970s. These protected areas are often proactively managed and restored in order to prevent, halt and reverse human impacts to these environments. However, in many regions around the world, designated wetland environments are not only impacted by human activity in the present and recent past, but are themselves entirely a product of human activity, completely transformed from their pre-altered condition. This is a conceptual and management challenge for designation, legislative frameworks and restoration efforts which often situate their goals with reference to desired states along a 'natural' (ie. favourable) to 'anthropogenic' (ie. unfavourable) axis. Through exploring a range of case studies in Scotland which exemplify protected and restored wetlands across this axis, this paper will present a framework for quantifying the degree to which a protected area is designated as the result of human activity. The framework will then be used to contextualise different types of designation and restoration goals. This framework will be useful as part of decision-making for future restoration and wetland environment designation which provides a broader evidence base with improved outcomes for archaeology and cultural heritage.

221 CONNECTING PREHISTORIC ANATOLIA AND EUROPE THROUGH FOODWAYS

Theme: 6. Material culture studies and societies

Organisers: Dietrich, Laura (Deutsches Archäologisches Institut, Berlin) - Galik, Alfred (Österreichisches Archäologisches Institut, Wien) - Çilingiroğlu, Çiler (Ege Üniversitesi, İzmir)

Format: Regular session

In this session we want to discuss different aspects of food and diets and encourage contributors to address scientific questions dealing with foodways in prehistoric Anatolia and southeastern Europe, as well as their transmissions westwards. We choose these regions because of their geographic, cultural and economic roles as active zones of transmission between the Southwestern Asia and central Europe. We choose food as an indicator of interconnections or barriers as it constitutes one of the most important drivers in the emergence of cultural, social and economic identities and is at the same time formed, and transformed by them. Therefore, we intend to analyze both aspects of environmental agency of these regions on the formation of culinary traditions, as also local characteristics of prehistoric diets and their further complete or partial transmission or non-transmission throughout Europe. The session will use "foodways" and "foodscapes" as analytical concepts for discussion, including all activities, norms, and symbols enclosing the production, processing, cooking, serving, and consumption of food. The topics should be focused on the emergence of farmer-herder foodways and the process of Neolithisation; the formation of foodscapes, local cuisines and the emergence of traditions both in Anatolia and in Europe; on the identification of adoption or non-adoption, of possible routes of westward transmission, circulation of food and movement of ideas. We encourage contributors to present new research results and discuss novel ways for the identification of foodways with the methods of archaeological science. Theoretical approaches on the agency of food is also welcome.

ABSTRACTS:

1 NEOLITHIC FOOD PRACTICES AT THE SITE OF GÖBEKLI TEPE AND BEYOND FROM THE SURFACE DEFORMATIONS OF THE GRINDING STONES

Abstract author(s): Dietrich, Laura (Orient Department of the German Archaeological Institute)

Abstract format: Oral

The paper explores the significance of the analyses of grinding and pounding tools (GPT) for the reconstruction of food practices at the Early Neolithic site of Göbekli Tepe and their implication for the Neolithic in Southwestern Asia and Europe. GPT defines pairs of active (handstones or pestles) and passive (netherstones) tools which are used to process different food stuffs, like cereals, legumes, fruits or meat trough crushing. Thus, GPTs can offer information on changes in food processing techniques or the contribution of new food technologies to the Neolithization process. The site of Göbekli Tepe currently has the largest number of GPT of all known Neolithic sites in Anatolia. The functional analysis has revealed that the handstones were standardized tools for the production of fine and coarse flour from cereals. Both food processing techniques can be well recognized by analysing the surface formations of the netherstones. Unlike the handstones, these were not hewn intentionally in shape; instead, big basalt boulders were chosen in the basalt quarry near the site and brought to the site, then deepened through use. Combined macro- and microscopical analyses as well as the establishing of use-sequences („stratigraphies of traces") on 3d-models provide evidence of multiple, long-term use-ways of the netherstones from Göbekli Tepe. Both fine flour for bread-like products and coarse flour for porridge, but also legumes were processed on them, either with handstones or with pestles. Comparisons with GPT's assemblages from Central and Western Anatolia and Europe reveal different technological developments probably indicating different food practices.

2 MULTIPLE ISOTOPIC AND ADNA ANALYSES OF NEVALI ÇORI SHED LIGHT ON A SOCIO-SECTION OF ANCIENT SOUTHEAST ANATOLIA

Abstract author(s): Wang, Xiaoran (Institute for Pre- and Protohistoric Archaeology and Archaeology of the Roman Provinces, Ludwig Maximilian University Munich) - Skourtanioti, Eirini (Department of Archaeogenetics, Max Planck Institute for the Science of Human History) - Pöllath, Nadja - Peters, Joris (Department of Veterinary Sciences, Institute of Palaeoanatomy, Domestication Research and the History of Veterinary Medicine, Ludwig Maximilian University Munich; Bavarian State Collection of Anthropology and Palaeoanatomy) - Schultz, Michael (Department of Anatomy, University of Göttingen) - Roberts, Patrick (Department of Archaeology, Max Planck Institute for the Science of Human History) - Krause, Johannes (Department of Archaeogenetics, Max Planck Institute for Evolutionary Anthropology; Faculty of Biological Sciences, Friedrich Schiller University) - Stockhammer, Philipp (Department of Archaeogenetics, Max Planck Institute for Evolutionary Anthropology; Institute for Pre- and Protohistoric Archaeology and Archaeology of the Roman Provinces, Ludwig Maximilian University Munich)

Abstract format: Oral

Nevali Çori in Southeast Anatolia, the "eastern wing of the Fertile Crescent", is associated with a socio-economic system of Pre-pottery Neolithic B (PPNB) of the 10th–8th millennium BC. Together with other sites in the eastern upper Tigris region, southeast Anatolia became another independent region with one of the earliest Neolithic lifestyles in sedentism and domestication. The site was repeatedly settled also later during the Halaf period, the Early Bronze and the Iron Age.

In my paper, I will first present the results of strontium and oxygen isotopic analyses conducted on human and animal remains recovered from Nevali Çori. The results indicate a decline of mobility already during early PPNB. The carbon and oxygen data also revealed the seasonal hunting times of gazelles in that time. The carbon and nitrogen analysis informs about nutritional practices through time indicating changes in subsistence strategies. This enables a better understanding of the underlying mechanisms and motivations of Neolithization in west Asia. The genetic analyses of the PPNB people in Nevali Çori shed new light on the genomic structure of aceramic southeast Anatolian farmers and their genetic relations to adjacent Anatolian and Levantine regions. The post-PPNB inhabitants of Nevali Çori showed a different genetic makeup compared to the PPNB people related to the admixture event of regional gene pools across Anatolia and the Southern Caucasus during the Late Neolithic.

3 NEOLITHIC CULINARY TRADITIONS AND CUISINE IN ANATOLIA: LATEST RESULTS FROM ÇATALHÖYÜK

Abstract author(s): González Carretero, Lara (The British Museum; Museum of London Archaeology - MOLA)

Abstract format: Oral

Previous research into food preparation and cooking traditions in Anatolia has mainly focused on the potential ingredients from the archaeobotanical and zooarchaeological data and on the possible technologies used for the preparation of meals such as pottery, ground stone tools, fire installations, clay balls, etc. Very little has been said about the actual choice of ingredients and the different processes behind the preparation of food and meals during the Neolithic period in Anatolia. Çatalhöyük, spanning more than 1000 years and with remarkable preservation, provides an ideal site for the study of Neolithic cooking practices and cuisine as well as the changes in those practices over time. This paper presents the latest results from the study of cooking practices, food preparation and consumption at Çatalhöyük, with focus on the identification of food products and Neolithic recipes. Advances in the application of coherent and cohesive methodological approaches involving different types of microscopy (Digital Microscopy and Scanning Electron Microscopy) have enabled the successful identification of a variety of archaeological food remains, shedding light on Neolithic cuisine in Anatolia and wider Southwest Asia.

4 ANIMAL FOODWAYS IN LATE NEOLITHIC ÇATALHÖYÜK: INTEGRATING SPATIAL, POTTERY, AND FAUNAL DATA

Abstract author(s): Pyzel, Joanna (University of Gdansk) - Pawłowska, Kamilla (Adam Mickiewicz University in Poznań) - Barański, Marek (Academy of Fine Arts in Gdańsk)

Abstract format: Oral

Excavations in the TP Area (Team Poznań) of the East Mound at Çatalhöyük exposed a sequence of deposits covering a span of ca. 280 years (6280-5900 cal BC) at the end of the Neolithic occupation of this UNESCO site. Abundant finds, including about 220,000 animal bones and 13,000 pottery fragments, were obtained from various contexts such as floors, ovens, hearths, and special deposits within domestic buildings as well as from middens.

Pottery data, especially of vessel types and sizes as well as ware groups, supported by lipid analysis give an insight into cooking practices, while zooarchaeological data provide information on the cultural, social, and economic practices relating to production, processing and consumption of animal foods.

We combine these lines of evidence with spatial and functional changes in the TP Area around Çatalhöyük's Late and Final periods of occupation in order to track changes in animal foodways, detect commensality practice, and discuss them on the broader background of social and economic transformations in the Late Neolithic in Anatolia.

5 CULINARY PRACTICES AS A MATTER OF SCALE: CALCITIC DEPOSITS ON POTTERY IN PREHISTORIC ANATOLIA AND EUROPE

Abstract author(s): Rosenstock, Eva (Freie Universität Berlin, Einstein Center Chronoi) - Hendy, Jessica (BioArCh, University of York)

Abstract format: Oral

Scale-like substance adhering to the inside of pottery vessels is a rare, yet regular phenomenon on Neolithic sites in Anatolia and the Balkans. Moreover, there is anecdotal evidence for similar deposits from later periods and other regions in Southwest Asia and Europe. However, easily to be confused with post-depositional sinter, such concretions have so far received little attention in archaeological research (Sauter et al. 2001; Vieugué et al. 2015). Analyses performed on samples from Çatalhöyük West dated to 5900 – 5800 cal BCE have recently shown that such deposits have the potential to trap several food biomarkers including proteins (Hendy et al. 2018) and can hence allow unprecedented insights into prehistoric food processing and consumption. The paper reviews the current state of knowledge on calcitic deposits, possible implications with hard water, dairy and beer, and outlines how further targeted research on these concretions can contribute to our understanding of food practices in prehistoric Southwest Asia and Europe in general and Neolithic Anatolia and the Balkans in particular.

- Hendy, J., A. C. Colanese, I. Franz, R. Fernandes, R. Fischer, D. Orton, A. Lucquin, L. Spindler, J. Anvari, E. Stroud, P. F. Biehl, C. Speller, N. Boivin, M. Mackie, R. R. Jersie-Christensen, J. V. Olsen, M. J. Collins, O. E. Craig, and E. Rosenstock. 2018. 'Ancient proteins from ceramic vessels at Catalhöyük West reveal the hidden cuisine of early farmers', *Nat Commun*, 9: 4064.
- Sauter, Fritz, Leopold Puchinger, Aloisia Graf, and Diane Thumm. 2001. 'Studies in organic archaeometry II. Analysis of the ancient content of a flask excavated in Troia', *Arkivoc*, 3: 22-25.
- Vieugué, Julien, Laure Salanova, Martine Regert, Sigrid Mirabaud, Anne-Solenn Le Hô, and Éric Laval. 2015. 'The Consumption of Bone Powder in the Early Neolithic Societies of Southeastern Europe: Evidence of a Diet Stress?', *Cambridge Archaeological Journal*, 25: 495.

6 NEOLITHIC FOOD-WAYS AND SUBSISTENCE IN NORTHWESTERN AND WESTERN ANATOLIA

Abstract author(s): Galik, Alfred (Austrian Archaeological Institute)

Abstract format: Oral

The Neolithic archaeozoological material from three sites is the initial point of the presentation, the Çukuriçi Höyük at the western coast of Anatolia and Barcın Höyük and Aktopraklık Höyük northwest of Anatolia. The interpretation on food ways bases largely on archaeozoological assemblages, which answers potentially central questions on agricultural and dietary developments, when husbandry certainly supplied a large part of animal protein. Hunting, fishing and gathering of molluscs contributed to the daily diet on the Neolithic foundation and settling period. The scientific focus lies on animal exploitation pattern at the beginning of the 7th millennium Neolithic and the development of animal exploitation throughout the subsequent phases of the Neolithic period.

Intra- and inter-site examinations reveal pattern of husbandry and environmental exploitation comparable with other contemporary nearby European sites. The "Neolithic Package" at the 7th millennium settlers will be discussed from an archaeozoological and food-way point of view, especially due to the earliest stock keeping, mobility as well as potential regional and interregional interactions. An attempt is undertaken to pattern diachronic trends in husbandry and exploitation of natural resource in varying environs at such Neolithic coastal and inland sites.

7 BRIDGING NEOLITHIC TURKEY, GREECE AND BULGARIA THROUGH FOODWAYS: INTEGRATED ZOOARCHAEOLOGICAL AND ISOTOPE DATA

Abstract author(s): Cakirlar, Canan - Kamjan, Safoora (University of Groningen) - de Groene, Donna (University of Reading)

Abstract format: Oral

Investigating the role of cultural transmission in dispersing foodways along the Neolithic routes in the Anatolian-Balkan region has been restricted due to difficulties in data compatibility. So far, NISP (Number of Identified Species) and published stable isotopic records have been tackled in relation to geographical properties of sub-regions and climatic conditions. This paper assesses the zooarchaeological and isotopic evidence for animal-based food production and processing behavior of Early Neolithic (ca 6700/6600 to 5500 cal BC) farmers in western Turkey, Bulgaria and Greece. New interoperable zooarchaeological and stable isotopic data from the region inform on taxonomic choices, animal husbandry strategies, and carcass processing (the latter for the first time). Combined with new radiocarbon dates, data from Istanbul, Izmir, and northern Bulgaria allow a closer examination of how animal-related foodways are transmitted and transformed across this vast region during this transformative period. Results provide insights into modes of cultural transmission across early farming societies in this pivotal area.

8 THE NEXT MEAL: STORAGE PRACTICES IN NEOLITHIC ANATOLIA AND SOUTHEAST EUROPE

Abstract author(s): Cilिंगiroglu, Ciler (Ege University)

Abstract format: Oral

Food producing economies based on animal herding and cultivation of cereals and pulses emerged in southwest Asia in the Early Holocene. Plant cultivation based on the so-called the "founder crops" is adapted in few millennia by groups in diverse environmental settings across Neolithic Anatolia and Southeast Europe. Increased production of food, unless they are immediately consumed, necessitated some form of storage facility for preservation. Neolithic groups across time and space tackled this vital problem implementing various approaches. Different materials were used to store food, both organic and inorganic. The most eye-catching storage technique is the clay bin and box placed inside the houses. In this talk, I would like to explore key Neolithic sites across Anatolia and Southeast Europe to compare and contrast archaeological features that pertain to the storage practices in order to assess whether patterns and regularities can be observed through time and space in the long-term process of Neolithization.

9 FOODWAYS DURING THE NEOLITHIC PERIOD OF NORTHERN GREECE

Abstract author(s): Lymperaki, Marianna - Kotsou, Dushka (Democritus University of Thrace) - Kotsos, Stavros (Ephorate of Antiquities of Thessaloniki City) - Metoki, Areti (Ephorate of Antiquities of Kozani)

Abstract format: Oral

Understanding culinary traditions entails the thorough examination of the utensils used for the preparation of food, which provides an insight into prehistoric societies. Cooking pots constitute a use category whose study can offer a great deal of information, not only about diet and dietary preferences, but also about broader issues such as construction of social and cultural identities, social relations and economies.

In this presentation, the local characteristics of foodways and the formation of foodscapes during the Neolithic in the area of Northern Greece will be explored. Our focus will be on the information we gain from the macroscopic, chemical and microbotanical analysis of the cooking pots in order to understand the differences and similarities of local cuisines and culinary traditions. To that end the spatial distribution of cooking facilities at the Neolithic settlements of Northern Greece will be linked to the processes of food preparation in forming foodscapes. Everything about eating, including what we consume and how we prepare it, is a form of communication imbued with meaning. Therefore the study of food preparation practices can give us insight into the intangible practices, attitudes and beliefs that formed the foodways of Northern Greece.

10 WHEN THE 'PACKAGE' HIT THE MOUNTAINS: THE EMERGENCE OF NEOLITHIC FOODWAYS IN THE CENTRAL BALKAN HIGHLANDS

Abstract author(s): Filipovic, Dragana (Institute for Pre- and Protohistory, Christian Albrecht University, Kiel) - Bulatović, Jelena (Laboratory for Bioarchaeology, Faculty of Philosophy, Belgrade) - Burke, Clare (Austrian Archaeological Institute, Department of Prehistory and WANA Archaeology, Austrian Academy of Sciences, Vienna) - Milić, Bogdana (Archaeology and History of Art Department, Koç University, Istanbul, Turkey) - Horejs, Barbara (Austrian Archaeological Institute, Department of Prehistory and WANA Archaeology, Austrian Academy of Sciences, Vienna)

Abstract format: Oral

Elements of the southwest Asian Neolithic 'package' appeared in the central Balkans at the end of 7th/start of 6th millennium BC. Northeast of the Axios/Vardar course – a corridor of Asia-to-Europe cultural transfers – the package hit the mountains of southern Serbia, the narrow valleys of the Južna (South) Morava river and its tributaries, and a more continental climate. Settling into these environments likely entailed adjustments in the behaviour of humans, domesticates and crops. Perhaps this partly explains why, apparently, only few Neolithic groups initially resided here and, unsurprisingly, near the rivers, where sources of food and raw materials would have been plentiful and sustenance secured even without, or with very limited, farming and herding.

Until recently, little could be said about how these groups met their subsistence needs beyond broad descriptions as crop growers and animal herders. In the last two decades, excavations of some previously (un)detected Early Neolithic settlements in the region offered an opportunity to systematically collect plant and animal remains and use them to determine which plants were grown or collected and which animals herded or hunted, and to what extent, and infer how the environment shaped these food economies. We present the evidence of plant and animal food sources from the Early Neolithic site of Svinjarička Čuka, at the foothills of the Radan Mountain, investigated by the NEOTECH project ("Neolithic technological trajectories in the Balkans") of the Austrian Archaeological Institute. The typology and function of stone tools and ceramic pots found here give us a glimpse into food provision and consumption strategies, aiding the reconstruction of foodways in the highlands. We aim to compare this evidence with that from the neighbouring but biogeographically distinct northern Serbia and explore if, even within a relatively small geographical area, different foodways developed on the south-north Neolithisation route.

222 LOST IN TRANSLATION: TRANSFORMED AND FORGOTTEN KNOWLEDGE

Theme: 6. Material culture studies and societies

Organisers: Kneisel, Jutta (Kiel University) - Damm, Charlotte (Tromsø University) - Eriksen, Berit Valentin (Centre for Baltic and Scandinavian Archaeology)

Format: Regular session

Knowledge production is a pivotal driving force of the 'human condition'. It stimulates social, cultural and economic changes. The accelerated expansion of scientific, technical, behaviour and other forms of knowledge may alter societies and environments. Knowledge, whether practical or theoretical, tacit or discursive, is in many ways the glue of human societies. Our individual survival depends on it, but in particular any society's mutual understanding rests on many overlapping "knowledges" that are transmitted within and between collective networks of practitioners. For knowledge to persist it relies on continued transmission.

But we know for certain that much past knowledge was forgotten, be it technologies, environmental know-how, healing practices, symbolic meaning etc. In many cases, technologies were replaced by other technologies, or the use of tools/things/symbols got lost. In other cases, particular events, such as accidents, environmental disasters, diseases, migration, warfare and deliberate destruction of books or removal of knowledgeable people led to knowledge being lost or suppressed.

Forgotten knowledge can be traced in many ways. Be it networks routes, means of transport, cosmology, images and symbols, cultural practice such as processing of poisonous food, crafts such as pyrotechnology, flint technology, access to resources or parts of landscape etc.

However, there are examples of knowledge not being entirely lost, but transformed as it was adjusted to new circumstances (trade routes, means of transport, construction work, skeuomorphism in artefacts); cases where knowledge previously transmitted discursively, became tacit and embedded in practical performances or routine activities (raw material procurement, food preparation); and examples of revitalisation of forgotten knowledge (crafts specialization, hunting practices).

This session will deal with the wide range of topics related to lost knowledge:

- How and under what circumstances may knowledge have been lost in the past?
- What were the consequences?
- And was it really forgotten or rather translated and latent?

ABSTRACTS:

1 RE-GAINING KNOWLEDGE – DEVELOPING WAYS TO TRACE CHANGE

Abstract author(s): Hinrichs, Moiken (Cluster of Excellence ROOTS, Subcluster Knowledge)

Abstract format: Oral

From the Late Neolithic to the Early Bronze Age – ca. 2350–1500 calBC – the skill and knowledge of flint knapping in Scandinavia reached its peak, not only as a craft but also as an art. The knowledge of flint knapping was ever so slowly lost for the major part of the population and became specialist knowledge before it vanished from the pool of technologies.

Centuries later, dedicated flint knappers, like Errett Callahan, Greg Nunn and Jan Apel, set out to regain the knowledge of working elaborate bifacial daggers. Most analysis focus on the prestigious type I or IV daggers and was concerned with the how and why of production. Here, the focus is laid on the learning aspect of the production of bifacial sickles and daggers. How was the knowledge transmitted? Is it possible to detect technological fingerprints in the archaeological record, hinting to a strict and taught tradition for production? Does this change over time? If so, which parts do change? Does this involve loss of knowledge or even the opposite; re-gaining of prior lost or unused knowledge?

A first step in answering the questions is to determine the possibility of detecting differing production sequences in the same technology complex. First part of the study is therefore dedicated to the analysis of experimental inventories conducted by several knappers. Comparing knappers from different regions and with different backgrounds will show if it is possible to separate individual ways of production. And maybe, by comparing works from successive years and mutual contact, even how learning can be traced. For this, the chaîne opératoire analysis is used. Preliminary results show that some attributes seem to be dependent on personal choice, like edge angle and preparation and form of striking platforms.

2 CHANGING SOCIAL CONTEXT OF LITHIC PRODUCTION IN THE SOUTHERN GERMAN NEOLITHIC. CONSEQUENCES FOR PRODUCTION AND TRANSMISSION OF KNOWLEDGE

Abstract author(s): Fisher, Lynn (University of Illinois Springfield) - Harris, Susan (Santa Barbara, California) - Knipper, Corina (Curt Engelhorn Zentrum Archäometrie) - Schreg, Rainer (Otto-Friedrich-Universität Bamberg)

Abstract format: Oral

Stone tool production took place on a changing cultural landscape in the Central European Neolithic. Activity at quarries and mines intensified and diversified over time, including skilled production of standardized forms such as axes at some locations while others showed little evidence for standardized production. This paper explores repercussions of change in the location and social context

of lithic production for production and transmission of knowledge. Questions to be considered include: How might shifts in the location of knapping affect access to knowledge? Does attention to the context of knapping provide ways to assess specialization through characteristics of a network of practitioners rather than attributes of products such as standardization?

Evidence to examine these questions comes from a program of landscape archaeology on the southeastern Swabian Alb in southern Germany. Geomagnetic surveys and test excavations at a chert quarry and two settlements allows comparison of spatial and social contexts of lithic production over the course of the Neolithic. In the Early Neolithic, all stages of production were observed in settlement features, suggesting dispersed production in a household context. In the Middle Neolithic, early stages were carried out at the quarry while tool production was concentrated at a nearby settlement. Later Neolithic quarry features include all stages of production, suggesting that lithic production may have moved away from settlements. These patterns suggest change over time in characteristics of a network of knappers. We explore the implications of these changes for distribution of knowledge, considering whether the practice of lithic production became more specialized over the course of the Neolithic in the study area even while products themselves remained unstandardized.

3 TRAVELLING CRAFTSMEN AND ARTEFACTS IN MOTION. THE DECLINE AND FALL OF FLINT CRAFTSMANSHIP IN BRONZE AGE DENMARK

Abstract author(s): Eriksen, Berit Valentin (Centre for Baltic and Scandinavian Archaeology)

Abstract format: Oral

During the Late Neolithic and Earliest Bronze Age the art of flint knapping reached an exceptionally high level in Denmark. Few, very skilled, artisans produced one-of-a-kind masterpieces in flint. Few hundred years later the situation had changed and bronze tools were becoming increasingly important while flint tools were clearly less wanted. This paper will address the demise of knowledge during the early metal using societies from the point of view of the now increasingly obsolete flint knapping craft. Questions to be discussed include – what happens during the last millennia of apparent decline and fall of flint technology? For how long does flint tools and flint knapping maintain a general importance in everyday life? And what happens to flint knapping specialists?

The lithic inventories examined in the case study belong to a series of Bronze Age settlement sites situated in the flint rich province of Thy, Denmark. Based on a contextual chaîne opératoire analysis the presentation will focus on the technological and socio-economic processes pertaining to the production of flint sickles. It will address raw material exploitation patterns and procurement strategies through time and it will examine the question of control over and access to resources. The concluding discussion will address the role of flint craftsmanship and craft specialization on a diachronic scale in relation to contemporary socio-economic structures in the region.

4 LOST IN TRANSLATION OR LOST IN RESEARCH? SURVIVING STONE KNAPPING EXPERTISE IN BRONZE AGE SOUTHERN ITALY

Abstract author(s): Vilmercati, Melissa (Sapienza - University of Rome)

Abstract format: Oral

Interest in Bronze Age lithic technology in Italy has been generally scarce, due to the paradigm of its progressive abandonment contextually to the rise of metallurgy. This has resulted into biases in archaeological research. Bronze Age stone artefacts are scarcely diagnostic in terms of chronology but can be very useful for the understanding of the manufacture/use processes and of the social organisation of productions. Archaeologists, nevertheless, have focused much on other categories of artefacts, developing a model of a completely lost and forgotten lithic expertise. In Southern Italy archaeological evidence pertaining to the Bronze Age is abundant, but publications related to lithic industries remain limited. Thus, was the lithic technology entirely lost, or did it become more latent, not simply transmitted, but embedded in the knowledge of communities?

The availability and use of metal progressively increase during the Bronze Age; notably in the Late Bronze Age a vast range of metal objects was produced, substituting some curated lithic tools (e.g. sickles, arrowheads). Yet, the analyses of stone artefacts from the Bronze Age long-lived settlement of Coppa Nevigata (Apulia) are demonstrating that stone knapping remained a common activity, although it underwent substantial modifications over time. Does this picture apply to coeval centres in Southern Italy? In this presentation I will discuss the results of techno-morpho-functional analysis of stone artefacts from Coppa Nevigata and revisit the available evidence of stone manufacture in southern Italian Bronze Age contexts. I will try to evaluate as to whether the knowledge of knapping processes was completely lost, or whether it did persist, changing over time, rooted in the know-how and in the skills of the communities. The aim is to understand if the idea of the forgotten lithic technology is more related to research biases rather than to the real loss of knowledge in distant past.

5 MIND THE GAP - INVESTIGATING KNOWLEDGE TRANSMISSION AS THE STOREGGA TSUNAMI BATTERED THE COASTAL SETTLEMENTS OF WEST-NORWAY 8200 BP

Abstract author(s): Nyland, Astrid (Museum of Archaeology, University of Stavanger) - Damlien, Hege (Museum of Cultural History, University of Oslo)

Abstract format: Oral

Mesolithic hunter-gatherer-fisher societies are traditionally interpreted as small scale, mobile societies. Furthermore, knowledge of technology, social practices, traditions and world views are presumed to have been orally transferred or through master-apprentice or other types of relations. Approximately 8200 years ago, the Storegga tsunami battered parts of the Norwegian coast. As a result, some communities may have been wiped out, while others may “only” have had their infrastructure and environment destroyed. Nevertheless, having one’s ontological security challenged, what happened in these societies? From modern disaster studies, we know that although events like tsunamis are destructive, they may also make room for change. Our paper uses this known event as a point of departure to discuss whether knowledge of lithic technology changed or was modified as a consequence, or whether we can use identified continuity in technological elements to argue strong institutions making knowledge transmission resilient when challenged. In the project Life After the Storegga Tsunami (LAST), we investigate whether studies of lithic technology in multiple case study areas along the coast of South-Norway can identify gaps in knowledge transmission or other changes that can potentially be ascribed a reorientation after the tsunami. If no gap can be found, is that a testimony to the institutional power of craft, traditions, social practices, and technological tradition? Can our study give insight into the scale of social networks necessary for a technology to survive?

6 TRADITIONS ON A MICROSCALE

Abstract author(s): Mahlstedt, Svea (NIHK) - Niekus, Marcel (University of Groningen)

Abstract format: Oral

Microliths are known as the diagnostic flint implements of the European Mesolithic. They are made of blades and microblades. Their outer appearance seems to change or diversify throughout the mesolithic period. Starting with micropoints and triangular forms, a major new development in shape shows up around 6000calBC with the introduction of trapezes. For the area of the so-called Northwest Group in the northern Netherlands and northwestern Germany the early types and the trapezes seem to go on and be produced synchronically. In the final Mesolithic the trapezes are proofed to develop from narrow to broad forms (Niekus 2008). Is this a sign of on-going tradition from broad trapezes to the use of the tanged transverse arrowheads of the Funnelbeaker Culture? What happened to the knowledge of micropoints and triangles? Was it lost at the end of the Mesolithic? Or earlier?

This poster will take the microlith tradition in the Netherlands and Northern Germany as point of departure and discuss possible breaks and persistence.

7 A THRICE INVENTED, TWICE LOST TECHNOLOGY: CERAMIC TILED ROOFS IN ANCIENT GREECE

Abstract author(s): Jazwa, Kyle (Maastricht University)

Abstract format: Oral

Ceramic roofing tiles have a unique technological history. On three separate occasions, they were independently invented in mainland Greece – during the Early Bronze Age (3100-2100 BCE), the Late Bronze Age (1600-1050 BCE), and the Archaic Period (700-479 BCE) – and, in each of the first two instances, forgotten after just a few centuries of use. Only with the third episode of invention did the technology endure, spreading throughout the Mediterranean and beyond. This paper explores the processes that led to the “forgetting” of this technology in ca. 2100 BCE and 1050 BCE, along with the social, political, economic, technological, and visual contexts that prompted each rejection.

What is immediately apparent is that the two episodes of “forgetting” were contemporary with periods of intense change/crisis in mainland Greece and environs. I argue, however, that the crises themselves were not the sole reason for the failure of the technology to successfully anchor. Instead, the prehistoric ceramic tiled roofs were forgotten because of their high cost in resources and manpower (specialist and non-specialist), related developments in ceramic production and technology, and the movement of population within, to, and out of Greece. Perhaps, most impactful on the tiles’ long-term outcomes was that the surrounding areas and people never adopted the tiled roof to sustain the technology through these crises. This contrasts with the Archaic period when the tiled roof was quickly disseminated throughout the Mediterranean by Greek colonists. As a coda, I explore how in that third, successful invention, the technology was adapted and transformed by different groups adopting the technology.

8 „LOST AND (RE)FOUND“: MERCURY REDEFINED?

Abstract author(s): Szigli, Kinga (Ludwig-Maximilians-Universität München)

Abstract format: Oral

The correlation between pre-Roman and Roman religious systems shows a colourful and complex picture in terms of archaeology and geography. While certain provinces of the Roman Empire (e.g. Gaul, Germania, Britannia) indicate a clear continuity of indigenous cults, Illyrian and African regions seem to signal subtle differences: discontinuity, oblivion or innovation.

Moreover, within the same province itself various categories of archaeological material provide a highly diverse information. Literary testimonies can serve, despite their fairly precarious value, as a basic reference knowledge of sociocultural and religious life. Despite representing a general continuity (or transfer) of indigenous beliefs, the sources merely give a general description of cults and essence (vis) of deities.

Epigraphic sources, on the other hand, tend to provide a more coherent picture of deities (giving names & identity) merely in the Western and Northwestern provinces. In other provinces, inscriptions do not contain any additional information about them. Similarly, statuettes of gods seem to illustrate only in certain territories a pre-Roman set of knowledge and particular cultural identity.

Is this discrepancy a matter of forgotten knowledge in certain provinces, a part of a translation process (interpretatio or translatio), or a switch in the reference frame of certain groups, that update their original collective „reserve of knowledge“ and symbolic meanings? Which consequences could such behavioural pattern have on society and culture?

Current work attempts to answer such questions in a multidimensional context from the perspective of religion, sociology, cultural theory, with the help of a case study about the cult of Mercury in Pannonia, in which statuettes are compared to votive inscriptions and literary sources as well as to significant epigraphic sources and statues from provinces with a different intensity of Romanisation, such as Gaul, Germania and Britannia.

9 VISUAL ART AS A RESOURCE FOR VIKING AGE POETRY

Abstract author(s): Neiß, Michael (Uppsala University, Department of Archaeology & Ancient History)

Abstract format: Oral

A recurring theme within Old Norse literature is a about a skald who encounters pictures on a beautiful building, shield or tapestry and who feels inspired to recite a poem – thus generating ekphrasis! Yet in real life, archaeologists tend to encounter Viking pictures more often on utensils. Amongst scholars in archaeology and Old Norse, the discourse on Viking ekphrasis tends to focus on human figures from monumental picture stones and wood carvings that are perceived as narrative compositions, whereas the Animal Art on utensils is dismissed as meaningless décor, or – at best – as symbolic representation. The focal point of my work is a brooch type that is best likened to interactive sculptures that change shape as the viewer changes perspective. Recent studies revealed several parallels between sculptural brooches and skaldic poetry in regards to context, cognition and imagery. Therefore, it seems fair to ask whether both expressions of Viking culture could have been linked through ekphrasis. In regards to ekphrasis, different schools of thought rely on diametric concepts. On the one hand, we have ekphrasis as the creation of a poem by verbalizing a picture, on the other hand ekphrasis as the creation of mental images by reciting poems. The first concept derives from Art History and suffers from a heavy bias towards logocentrism. The other concept derives from Literary Studies and is more suitable for sociosemiotic inquiries that focus on multimodal texts that combine verbal, visual and other resources. By leading the current discourse about ekphrasis onto sculptural brooches, I challenge established hierarchies that place humans above animals, narratives above symbols and written texts above pictures. This enables me to present a new concept of ekphrasis that seems better suited to understand the interplay between picture and poetry within the memory culture of Viking Scandinavia.

10 WHEN THE WORLD BURNS, THE NETTLE DOES NOT

Abstract author(s): Kauhanen, Riku (University of Turku)

Abstract format: Oral

Nettle (*Urtica dioica*) is one of the oldest fibre plants used by humans. After cotton became the most common fibre in 18th and 19th century, the use of nettle declined and in many parts of world, it was a weed plant. However, during the 20th century nettle was again used during times of war as food, fodder, fibre and even pesticide.

Central Powers used nettle increasingly in World War I and in Finland during Second World War the plant was promoted as a healthy food and source of fibres. Using the plant was encouraged in several ways, and many newspapers promoted it with a variety of recipes. In Finland museum pieces of old textiles made of nettle were used as examples of craftsmanship to show, that there was nothing new in using nettle as fibre. Nettles use and its worth was still promoted after the depression that ensued the war.

After the conflicts and depression following times of war loosened, the plant was again forgotten and considered to be weed. This representation addresses the use of nettle during times of crisis, the ways with which this forgotten and scorned plant was promoted and the oblivion, which usually followed. The rediscovering and forgetting of this “war time plant” shows, how a connection to the material culture of conflict is damaging, even though the subject itself remains the same and is even more useful than alternatives.

11 ETHNobotany and written sources on floral resources in everyday life as proxy data for Bronze Age economy reconstructions

Abstract author(s): Slusarska, Katarzyna (Uniwersytet Szczeciński)

Abstract format: Oral

The European Lowlands’ environmental conditions do not support the possibility of survival merely based on the Bronze Age economy’s agricultural products. Villagers use to incorporate wild resources to their everyday practice even in after industrial revolution times. Written sources attest quite well the plant resources’ importance in not so remote past. Though all these attestations come

from modern times, some can be traced back to prehistory, to “everlasting” knowledge that allows survival in Northern European Plains.

This project’s primary goal is to look through written sources attesting wild plant in dietary and medical use and compare these records with archaeobotanical data available for the Bronze Age and early Iron age from Polish Plain. Archaeobotanical record from later prehistory and medieval offer also proxy data. This procedure does not allow a full and comprehensive “reconstruction” of the past economy. Moreover, this is not a goal. The archaeobotanical data are relatively sparse, but many other factors, besides the preservability, limit the possibility of plant-derived residues detection in an archaeological context. In archaeology, we do not have access to “living culture”. We observe a distorted and incomplete picture, similar to looking through the keyhole, and we usually do not know the scope of the distortion and incompleteness. Written sources review and listing the plant resources mentioned there offer insight in living culture even if the written sources are not complete, subjective and time distant. Having these observations listed, we can consider why we do not have a particular plant source attested by the archaeobotanical record. Furthermore, this procedure provides the possibility to discuss the scope of wild resources input in the past economy and the scope of tradition change, potential taboos, remembering and oblivion of traditional knowledge.

12 THE RICHNESS OF THE MATERIAL AND IMMATERIAL HERITAGE IN THE ALGARVE MEGALITHISM (PORTUGAL)

Abstract author(s): de Oliveira Teixeira, Luisa (Universidade Autónoma de Lisboa)

Abstract format: Oral

The Megalithic monuments of the Algarve region have been the subject of interest and numerous studies over several decades. Their importance increases with each investigation that is carried out. The landscape in which they are inserted, contains crucial information about the reality and complexity therefore, studies of the Algarve Megalithic monuments are fundamental for the understanding of the communities that idealized, planned, built and used them, as well as for toponymy, legends and local traditions that are still in use, as many of them are in the process of disappearing due to the globalization process.

The legends and traditions that are directly or indirectly linked to Megalithism, have enriched the imagination of peoples across time and geography. They are testimony and historical wealth that the populations had to make these places eternal. Rescuing the forgotten original knowledge and understanding the transformed one by oral tradition, will provide key information that until now has not been addressed in the context of Algarve Megalithism.

The study and analysis will be a major contribution to the identification and protection of the material and immaterial cultural heritage of the Algarve region, with an interdisciplinary approach, compiling information, methods and results on Megalithic monuments, thus articulating the knowledge of archaeologists, anthropologists, geographers and historians.

13 REMEMBRANCE OR LOST KNOWLEDGE? – SEPULCHRAL CULTURE IN THE NORTHERN BRONZE AGE

Abstract author(s): Kneisel, Jutta (Christian-Albrechts-University of Kiel; Johanna-Mestorf-Academy)

Abstract format: Oral

Remembrance and reference to the past are an important process in many cultures, contributing to the strengthening of the social fabric. At the same time, political and social power can be claimed as a result. The legitimation of one’s social position can thus be achieved, for example, with the erection of burial mounds or urn- graves at or nearby the “ancestors” burial. This presupposes that the knowledge of the burial place of the ancestors was known. In a ritual context, this can be traced in northern Europe throughout the Bronze Age and into the Iron Age.

Burial sites have been used, transformed, and expanded since the Late Neolithic, and reference to the older burial mounds is still made in Late Bronze Age and Iron Age. In addition, in Period V of the Later Bronze Age the custom of constructing large burial mounds is revived. In more recent times, they not only serve as landmarks, but are also used as boundary marks, e.g. for “Celtic Fields” as well as medieval to modern boundary markings.

This paper examines the complexity of ritual connections, their continuity and discontinuity at selected burial sites in Northern Europe. The dynamics in the temporal use of the burial sites will be demonstrated.

With the help of new 14C-datings gaps in the occupation can be identified. Isolated cases of destroyed mounds and natural elevations erroneously addressed as barrows testify to discontinuities. Robberies from later epochs such as the late Iron Age and reports from the modern period attest to traditional knowledge about the purpose of these prominent features in the landscape.

14 TRANSLATING KNOWLEDGE AND IDEAS. A 1. MILLENNIUM AD BURIAL SITE AT POINT HOPE IN ALASKA

Abstract author(s): Odgaard, Ulla (Independent researcher) - Houmard, Claire (Chrono-Environnement CNRS, Université Bourgogne Franche-Comté)

Abstract format: Oral

At Point Hope in Alaska a large site from the Ipiutak culture was excavated in the 1940ties. The Ipiutak culture is known from only a few sites. Because of its uniqueness, especially in its carvings, and its relatively short time of existence from around AD 200 –900 with an intensive blossoming before its disappearance, it has been characterized as “mysterious”.

At the same time in other parts of the world, far away from the Arctic hunting societies, the Iron age technology, ecology, and ideology was prevailing. In Alaska, however, only a few small pieces of metal have been found, although small in size and numbers, indicating some kind of contact. Although smelting metallurgy never came to the Arctic regions, the knowledge about it was not totally lost for the Ipiutak people. The fantastic openwork ivory carvings of the Ipiutak craftsmen probably mirrors knowledge about metallurgy and shamanistic ideas of transformation connected to it. Translated into other materials, the numerous carvings reflect how this culture, although being restricted in their choices of materials, was mentally connected to the wider world and was able to take part in knowledge and ideas on a macro-regional level.

15 ROCK ART IN NORTHERN FENNOSCANDIA: ABANDONMENT AND REVIVAL

Abstract author(s): Gjerde, Jan Magne (NIKU - Norwegian Institute for Cultural Heritage Research) - Damm, Charlotte (UiT - The Arctic University of Norway)

Abstract format: Oral

Rock art in northern Fennoscandia has for more than 100 years been almost exclusively associated with hunter-gatherers. A general assumption is that rock art ends c. 0 AD, which is also when farming consolidated in many areas, and when Sámi and Germanic languages replaced former ones. There are, however, several rock art panels with figures, initials, names and years which clearly date to early modern times. Some of these occur at sites with prehistoric motifs. Often this "modern" rock art was viewed as miscellaneous graffiti, and hence received little attention during the initial documentation. Some of the site names at prehistoric rock art panels holds appellative information, such Värrikallio (the coloured rock) in northern Finland and Rukksesbákti (the red rock) in northern Norway demonstrating long term local awareness of the sites. The early modern rock art in northern Norway is typically situated at places associated with Sámi landscapes, and even Sámi ritual landscapes. The selection of motifs may refer to the motifs on the Sámi drums, but also has affinities with Christian motifs. The early modern rock art is here viewed in the light of forced abandonment of the traditional Sámi drums as well as syncretism between the Sámi and Christian religion. It is in this context latent memories and practices of rock art were revived. The paper will cover briefly the transmission from rock art panels to Sámi drums, but in particular focus on the revival of lost practices with examples from sites in northern Norway and the implications of the neglect in the initial documentation for the interpretation of "modern" rock art.

228 AGRICULTURAL CHANGE AND SOCIAL INEQUALITY: APPROACHING COMPLEXITY

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Kerig, Tim (ROOTS Subcluster Social Inequalities) - Lechterbeck, Jutta (Arkeologisk Museum Universitetet i Stavanger) - Wilkes, Fynn (ROOTS Subcluster Social Inequalities)

Format: Regular session

Social inequality and agricultural change are both "hot topics" in current societal debates, especially when facing the challenges of global climate change. It is obvious that there is a systemic connection between agricultural production and social inequalities. Those connections are evident, but the complexity of these interactions is not well understood: Archaeological approaches which assess social inequality and agricultural change offer a unique long-term, deep-time perspective. Today, vast amounts of archaeological and archaeobotanical data is available. New perspectives towards social inequality in archaeology have arisen in the last couple of years through the implementation of economic, demographic, and evolutionary methods. The Gini-index for measuring social inequality, for example, has been successfully applied to different archaeological datasets.

Progress in scientific methods makes it possible to analyse agricultural change in greater detail. Isotope analyses, sediment aDNA analyses, high resolution pollen analysis and land cover reconstructions enable us to measure land use change on various scales. Modes of production and societal organisation are intertwined. This applies to the level of societal organisation, ownership of production and the mobilisation of the workforce, to name but a few.

In this session we want to address the following issues: Does production determine societal complexity? Does social inequality constrain choices in the past and is it possible to discover path dependencies? What sources do we have and how do we combine them?

This session aims to explore the complex interconnections between production and social inequality. We invite evidence-based papers which discuss changes in social inequality, agricultural production, (or a combination of the two) on local, regional, interregional, and continental scales for all archaeological periods.

ABSTRACTS:

1 LONG-TERM DEVELOPMENT OF EURASIAN AGRARIAN PRODUCTIVITY AND ITS RELATION TO SOCIAL COMPLEXITY AND INEQUALITY

Abstract author(s): Kerig, Tim (Cluster of Excellence ROOTS, CAU Kiel) - Markert, Cornelius - Amlinger, Marc (Institut für die Geschichte und Zukunft der Arbeit - IGZA)

Abstract format: Oral

A relation between the development of productivity and the emergence of social inequalities seems obvious but difficult to describe archaeologically. High social inequality requires a high level of productivity, but does higher social complexity always require high surplus?

Knowing and differentiating productivity levels is important when looking for social inequalities eg. by constructing the social inequality frontier: unequal access to the modes of production as well as the structure of the labour force are actual restrictions or opportunities for the potential income of households.

An index for agrarian productivity will be presented: The amount of labour required to produce a bread from 1 kg of wheat. The index fits the Eurasian and North-African zone, where wheat has been regularly produced for millennia. The index can be understood as giving market basket values allowing comparisons across time and space, measured in standardised working hours.

The index is based on the Cologne Tableau (KöTa), inter alia a collection of hundreds of agrarian practices gathered from historical, ethnographic, ethno-archaeological literature as well as from archaeological experiments. For every considered good, the inputs, used resources and technologies, and the outcomes are recorded. From this, minimal and maximal efforts, average costs, "best practices" and the archaeologically most likely scenarios can be constructed.

Here we present the development of the index for paradigmatic case studies, or test modes, starting before the neolithization up to the 18th cent. AD and representing different Eurasian ecological settings. Doing this, allows to relate the index to critical economic stages in the particular social evolution (introduction of plant-production, animal husbandry, storage practices, urbanism) and look for general lessons to be learnt from the relationship between productivity and social complexity and social inequality.

The most striking finding is that the case studies of emerging state societies show the same level of productivity.

2 WHAT IF EQUALITY WAS EQUALLY –OR EVEN MORE– COMPLEX?: RECONSIDERING THEORETICAL MODELS FROM THE LANDSCAPE OF AN ANDEAN AGROPASTORAL SOCIETY

Abstract author(s): López Lillo, Jordi A. (Institute of Heritage Sciences, National Research Council - Incipit-CSIC) - Franco Salvi, Valeria L. - Salazar, Julián (National University of Córdoba - UNC; National Scientific and Technical Research Council - CONICET)

Abstract format: Oral

Located in Northwest Argentina, Tafí cultural tradition (250 BC-AD 850) is among the most outstanding expressions of the so-called Formative or Neolithic period of this region. It gets its name from one of the main valleys connecting the plains and "yunga" forest of Tucumán Province with the Andean Highlands, a position which provides a relatively temperate climate and an almost continuous prairie vegetation. Such traits, but above all the ubiquity of the remains of circular stone structures along the road that crosses the valley, favored an early knowledge of this tradition by Archaeology. Not for nothing, scholars noticed the carved monoliths which have popularly characterized it in the late 19th century; and despite their archaeological context was partially lost, it is known that a few were gathered around an earth mound excavated in turn in the 60s. The uniqueness of the latter structure together with the monumentalization implied by monoliths, the newly developed agropastoral-based livelihood, and its co-occurrence with an unprecedented population density led to a social interpretation in terms of emergent hierarchies and chieftainship. However, the most prominent –and monumental– characteristic of Tafí tradition are in fact those aforementioned stone structures, most of which correspond to households sharply segregated from the outside and scattered all over the landscape in more or less blurred clusters; so in the following decades, self-sufficiency and egalitarianism have been primarily stressed. Our aim is to problematize this apparent paradox as the result of a weak understanding of primitive politics, ultimately rooted in the teleological mythology of Modernity. An alternative approach will be discussed instead from the point of view of the agents, their political goals and ontologies, as they were actualized by inhabiting the landscape. To this end, GIS analyses were conducted in Tafí and neighboring areas, where previously unknown mounds have been documented.

3 INCREASING RETURNS TO AGRICULTURAL INTENSIFICATION AT ANGKOR, CAMBODIA

Abstract author(s): Klassen, Sarah (Leiden University) - Ortman, Scott (University of Colorado Boulder) - Lobo, Jose (Arizona State University) - Evans, Damian (École française d'Extrême-Orient)

Abstract format: Oral

A dominant view in economic anthropology is that agricultural intensification implies decreasing returns. This is difficult to reconcile with the emergence of urban systems that require agricultural surplus for non-food producers living in urban centers. The quandary is starkly posed by the rise of urbanism in the Greater Angkor Region (Cambodia, 9th-14th centuries CE), which arose from an economy underpinned by rice production. We use settlement scaling theory to argue that supra-household scale organization of agricultural production yielded increasing returns to farming labor, enabling a sizeable urban population to be supported. We find spatial patterns

in temple communities consistent with the Alonso-Muth-Mills model of urban land use and the incorporation of agricultural production within the urban economy. Our results suggest the rise of urbanism at Angkor was enabled by increasing returns to agricultural labor, resulting from social processes and use of infrastructure common in other urban systems, past, and present.

4 REPRESENTATIONS OF POPULATION DYNAMICS

Abstract author(s): Zimmermann, Andreas (Inst. Prehistoric Arch. Köln)

Abstract format: Oral

There are different kinds how to represent population dynamics (Whitmore et al. 1990). None of these representations are wrong. However, for a better understanding of systemic relations between agricultural change and social inequality as well as their interactions with population dynamics, the properties of these representations have to be taken into account. Of major importance are the scale of population axis as well as scales of time and space of the respective area analyzed.

In this talk the standard linear model ("arithmetic-exponential" in terms of Whitmore et al. 1990), the logarithmic model ("logarithmic-logistic") as well a regionally differentiated segmental model of the Gordon Childe type are discussed with their specific properties and illustrated by standardized estimations of population densities covering Europe or Central Europe in the time since the Upper Paleolithic (Schmidt et al. 2020).

It is proposed to choose population dynamics in specific representations as a response to production in general and food procurement as a specific factor. A side line of the argumentation considers space requirements based on the plant-animal ratio of food-stuffs. This ratio may be controlled by a compilation of isotopic analyses of human bones. Finally, it is discussed where to place hunter-gatherers as well as early farmers with their typical patterns of population dynamics on the gradient between egalitarian groups and societies with marked social inequality.

References

- TH. WHITMORE et al., Long-term Population Change. In: B.L. TURNER, WILLIAM C. CLARK, ROBERT W. KATES JOHN F. RICHARDS, JESSICA T. MATHEWS, WILLIAM B. MEYER (HRSG.), The Earth as Transformed by Human Action, Cambridge 1990, 25-39.
- I. SCHMIDT et al. Approaching prehistoric demography: proxies, scales and scope of the Cologne Protocol in European contexts. Philosophical transactions of the Royal Society of London. Series B, Biological sciences 376,1816, 2021, 20190714.

5 PATTERNS OF DEMOGRAPHIC CHANGE AND LAND USE IN SEDENTARY SOCIETIES

Abstract author(s): Hilpert, Johanna (CAU)

Abstract format: Oral

A modeling approach to quantify past agricultural systems is presented. Its stringent application allows the comparison of (pre-) historic land cover change and agricultural production volumes of different time slices. It balances the supply of nutrients provided by plants and animals with the human demand, thus calculating the necessary amount of farmland and the production volume to provide the subsistence of the people (Wendt et al. 2019). The model integrates archaeological information as well as historical, ethnographical and modern data about energy yield of different plant and animal species. Population numbers regarding the covered time slices were generated using an upscaling model to estimate population densities. The methodical framework bases on the controlled transfer of data between different archaeological scale levels of space (Schmidt et al. 2021). The results are helping to integrate processes of cultural history into interpretation.

Assumptions about food habits are basic for the reconstruction of field sizes and meadows as well as the stocking rate for selected time horizons from ~5.300 BC (Bandkeramik) to 1830 AD (Preindustrial Modern Times). Bandwidths of demand and production volumes were determined considering regionally differing conditions. The periods under consideration vary greatly regarding their economic and social organization. This allows diachronic analyses of time immanent patterns as well as general economic trends. The model discloses not yet fully exploited possibilities of visualization and comparative analysis.

- I. Schmidt, J. Hilpert, I. Kretschmer, R. Peters, M. Broich, S. Schiesberg, O. Vogels, K. P. Wendt, A. Zimmermann, A. Maier (2021), Approaching Prehistoric Demography: Proxies, Scales and Scope of the Cologne Protocol in European contexts, Philosophical Transactions Series B, (2021), 376: 20190714
- K.P. Wendt, J. Hilpert, A. Zimmermann, Landschaftsarchäologie IV - Ein Modell zur Rekonstruktion von Landwirtschaftssystemen am Beispiel der Linearbandkeramik und der späten vorindustriellen Neuzeit, Ber. RGK 96, 2015(2018), 9 - 218"

6 WHAT DROVE INEQUALITIES?

Abstract author(s): Gronenborn, Detlef (Römisch-Germanisches Zentralmuseum, Mainz; Johannes-Gutenberg-Universität, Mainz)

Abstract format: Oral

The trajectory between c. 5500 cal BCE and c. 3500 cal BCE in Temperate Europe saw a succession of three large cycles during which Neolithic societies underwent considerable internally and externally driven transformations.

The last two cycles, generically called the Middle and Young Neolithic respectively, also saw the emergence of considerable forms of social and political inequalities. Despite the sometimes enormous archaeological manifestations of political power, the individual representations of this phenomenon never seem to have persisted for more than several generations at most. They seem to be phase-dependent, probably also indicating changing concepts of inequalities within the societies themselves.

The presentation will look at the period of the first emergence of political inequalities in Neolithic societies across Temperate Europe after 5000 cal BCE and will try to find answers for the phenomenon: why did societies begin to develop political inequalities, why social inequalities? Why did these phenomena only last for brief periods, why do they appear during certain phases? And how have they changed societies internally, both from the perspective of the elites as well as from those under their rule?

7 ASSESSING WEALTH INEQUALITY VIA GINIS: A WORLDWIDE RETRO/PROSPECTIVE

Abstract author(s): Kohler, Tim (Washington State University; Santa Fe Institute; Crow Canyon Archaeological Center)

Abstract format: Oral

I briefly review the main findings of a 2017 Nature Letter in which wealth inequality was assessed via Gini coefficients calculated from household size distributions in a number of penecontemporaneous settings, discuss reactions to it, and assess the present state of inquiry into patterns in the prehistory of wealth inequality around the world. Profitable future directions for such work include development of long local and regional sequences at high chronological resolution to (1) compare with other proxies for wealth inequality; (2) investigate the relationships of wealth inequality with differential power and status; and (3) assess relationships with political and economic structure and violence through time; (4) develop connections with the contemporary world through investigation of Ginis computed with house-size data compared with Ginis computed on data on wealth.

Reference:

- Kohler, Timothy A., Michael E. Smith, Amy Bogaard, Gary M. Feinman et al. 2017 Greater Post-Neolithic Wealth Disparities in Eurasia than in North or Mesoamerica. Nature 551:619-622 doi:10.1038/nature24646

8 HOUSE SIZE DOES NOT ALWAYS MATTER! INEQUALITY IN THE PREHISTORIC BURIAL LANDSCAPE OF THE CARPATHIAN BASIN

Abstract author(s): Wilkes, Fynn (ROOTS Cluster of Excellence; Christian-Albrechts-Universität zu Kiel)

Abstract format: Oral

Recently, the topic of quantitative inequality research in archaeology has been supplemented by the incorporation of house-related data (Kohler et al. 2017). Multiple studies have replicated this premise by incorporating house sizes and household demography into their quantifications (e.g., Porčić 2019, Basri/Lawrence 2020, Ames/Grier 2020). While houses remain useful for positioning inequality within a "living society", the burial-derived data allows overcoming many archaeological problems related to household archaeology such as the estimation of the number of inhabitants or the identification of structures used for housing. While focusing on burial data as a proxy for inequality remains a classical direction in such research (e.g., Zalai-Gaál 2010, Siklósi 2013), it provides a sound basis for inequality-based research in areas where high-quality house data can generate a fragmented dataset.

This talk focuses on combining burial data and inequality measurement to discuss the development of wealth disparities in the Carpathian Basin. With a set of case studies representing a transect from the Late Neolithic to the Early Bronze Age, it aims to show the overall development of inequality, as well as its dynamics related to different social groups. It is intended to look beyond the "household" approach and open a discussion of the involvement of a difficult group of archaeological sources in the quantitative exploration of prehistoric inequality. While the socio-economic interpretation of the data is of primary significance, the talk will also focus on outlining the methodological issues related to the on-going PhD research project "Social Inequality in the Carpathian Basin from the Neolithic to the Bronze Age" (working title).

9 TESTING HYPOTHESES OF SOCIO-ENVIRONMENTAL HAZARD IN FOSTERING SOCIAL INEQUALITY ACROSS LATE NEOLITHIC AND BRONZE AGE EUROPE

Abstract author(s): Großmann, Ralph (Kiel University; Cluster of Excellence ROOTS)

Abstract format: Oral

It is evident that environmental hazards recurred throughout the Holocene. Episodes of heightened socio-environmental stress combined with resource narrows have probably fostered inequality and possibly triggering migration. Here we test hypotheses of socio-environmental dynamics in a trans-European perspective and presents the first results regarding the impact of climate and environmental hazards on past societies. In particular, the project questions how past societies dealt with changing climatic and environmental conditions and how these changes affected material and ritual culture.

The project focuses the time period between 3500 and 1500 BCE. Within this time frame we are aiming to quantify settlement structures and settlement intensities and calculate social inequalities based on house size and household differences. Additionally, these results are correlated with climatic and ecological data to evaluate the impact of environmental hazards and especially of the 4.2 kyr climate event. In focus are several regions with high diachronic agglomerations of settlement records (Central Germany, Alpine Foothills, and Southern France). In comparing these regions enable to identify Late Neolithic to Bronze Age settlement dynamics and transformations of social inequality, which may have been accompanied by changes in agricultural production.

10 CHANGING BEHAVIOUR IN STOCKPILING? NEW APPROACHES TO THE YOUNGER AND LATE NEOLITHIC OF HESSE AND EASTERN WESTPHALIA (4200-2800 BCE)

Abstract author(s): Hoffmann, Robert - Schwarck, Nadine (Institut fuer Ur- und Fruehgeschichte Kiel; CRC 1266)

Abstract format: Oral

This paper is focused on ceramic finds connected to subsistence as an indicator of economic transformations in the region of the German Lower Mountain Range during the transition of the Younger to the Late Neolithic during the 4th millenium BCE. The results shall be used to contribute towards a better understanding of the shift from Michelsberg to Wartberg culture in the region of eastern Westphalia and Hesse. The alteration in the collective idea, which changes e.g. from the construction of large enclosures to the erection of gallery graves, testifies that significant transformations in the second half of the 4th millennium BCE took place.

New data concernig economic practice will be gained on settlements. Therefore, find material linked to harvest, production and storage of food is evaluated to answer questions about subsistence strategies. Previous analyses of settlement structures and house sizes have shown that there is a notable change from the Middle to Younger and Late Neolithic and one aim of this project is to find out if these changes have an impact on subsistence strategies or vice versa.

In a first analysis, we are examining the ceramic inventory of selected settlement sites, since pottery is the most numerous and informative category of the movable goods of households. In a second step, out of find catalogues, storage vessels are extracted and examined in terms of form and capacity with statistical analysis, as the capacity of stockpiling in a settlement might indicate a change in agricultural strategy from the Younger to the Late Neolithic. The first results of our approach will be presented here.

11 PREPARING THE GROUND SUBSISTENCE ECONOMY AND HIERARCHY IN LATE NEOLITHIC SCANDINAVIA

Abstract author(s): Johannsen, Jens (ROMU; Aarhus University - Department of Archeology and Heritage Studies)

Abstract format: Oral

The Scandinavian Late Neolithic (2350-1700 BC) is part of a comprehensive discussion of the hierarchical society's origin and the beginning of the Scandinavian Bronze Age. Here, the elite's agency is in focus, and the development is seen as a result of the elite's widespread network and power. However, the social development at the end of the Neolithic cannot be understood in the light of elite agency alone. By mainly focusing on the elite, its network, and the connected material culture, the rest of the population and the subsistence economy's role is neglected.

The idea behind the present project is that an efficient subsistence economy, capable of providing the society with plenty of food, is an underlying prerequisite for social development since a food surplus must be fuelled into all power sources to keep them going. The project is based on a synthesis of material related to the Scandinavian Late Neolithic subsistence economy. The preliminary results indicate several changes compared to the preceding period. New agricultural methods made it possible for people to feed better than earlier, resulting in increased average stature and a denser distribution of settlements. The social changes in the Late Neolithic were not a consequence of these developments but a prerequisite for them to happen.

12 THE POLITICAL ECONOMY OF SLAVES, UNFREE OR CAPTIVES IN THE NORDIC EARLY BRONZE AGE?

Abstract author(s): Sørensen, Casper (Viborg Museum) - Kristiansen, Kristian (University of Gothenburg) - Mikkelsen, Martin (Viborg Museum) - Earle, Timothy (Northwestern University)

Abstract format: Oral

In the Nordic Early Bronze Age (1500-1100 BCE), Northwest Jutland had unprecedented amounts of wealth in bronze and gold placed primarily in graves. Recently, the role of captives and slaves have been documented as a global phenomenon in fairly small-scale societies and introduced into macro-level interpretations of prehistoric political economies. Two models involving these aspects have been presented to explain ability of people in Early Bronze Age NW-Jutland to accumulate wealth, challenging the classic view of amber as the Nordic gold. Building on ethnographic and Viking Age analogies, one presents the maritime mode of production focusing on slave raiding as a means to obtain a valued exchange commodity. Based on a detailed analysis of regional settlement patterns and supported by recent advances in aDNA and isotope studies, the other model presents a decentralized agro-pastoral mode of production, dependent on a stable segment of unfree for surplus production. Besides being an integral part of subsistence production, it is suggested that they also were exchanged as a valuable commodity.

This paper aims to compare these two models to create a comparative platform for future discussion and elaboration of the subject. Furthermore, we emphasize a conceptual distinction between captives and unfree in a Nordic perspective. It is key to comprehend the social role and cultural context of the unfree to progress future discussion and elaboration into this topic. With the archaeological record of burials and households in the contexts of ecology and demographic conditions, we scrutinize the two models in a bi-scalar manner focusing on the internal record of the region and scaling up to supra-regional maritime routes of communication, raiding and exchange. One possible resolution may be to show that the two models solved different and perhaps complementary problems involving local vs. distant processes in the political economy.

13 EGALITARIANISM IN COMPLEX AGRARIAN SYSTEMS: ALTERNATIVE INTERPRETATIONS IN IRON AGE ARCHAEOLOGY

Abstract author(s): Sastre, Inés - Currás, Brais - Orejas, Almudena (CSIC) - Álvarez, Yolanda (Terra Arqueos)

Abstract format: Oral

The usual connection between agriculture, complexity and inequality deserves an in-depth review. The archaeological record of some agrarian societies challenges this apparently obvious systemic connection between changes in agricultural production and social inequalities and points to social factors that allow other forms of development. Control over the size of settlements and control over surplus production are two of their main indicators.

We propose an overview of the Northwestern Iberian Iron Age record on storage systems and different forms of organising production. We will show that the practice of a complex agriculture is not univocally related to hierarchies or visible inequalities and how this changes depending on different historical factors, mainly imperialist domination. The link between production and societal complexity must be seen as a proactive, two-ways, relationship, not as a determinism of the means of production. We propose to look back at social egalitarianism as an historic factor that marks its own historical paths.

14 AGRICULTURAL AND SOCIAL CHANGE IN NORWAY BETWEEN EARLY BRONZE AGE AND LATE IRON AGE – EVIDENCE FROM SOILS AND HOUSES

Abstract author(s): Lechterbeck, Jutta - Dahl, Barbro (Arkeologisk Museum, Universitetet i Stavanger)

Abstract format: Oral

There is a systemic connection between agricultural production and social inequality though it is not easily assessable in the archaeological record. In this study from South West Norway, we use anthropogenic soils as an archive for agricultural change and the house sizes as indicator for social change. We establish a correlation in time between these two sources by radiocarbon dating. The shift in land use strategies implies several possible changes: arable fields would be more stationary, more work would be put into them and animal dung would become a scarce good, to name only a few. Social changes might concern family structures and sizes, unfree labour, or hierarchies.

Anthropogenic soils are widespread in South Western Norway. They have been recorded and dated in the last decades during archaeological excavations. Over a hundred radiocarbon dates are taken from these soils. A sum calibration of the dates reveals that the practices leading to anthropogenic soils started at latest in the Pre-Roman Iron Age, furthermore the sum calibration shows clear phases of land use.

As well, numerous three-aisled houses have been excavated and radiocarbon dated showing a development in house size and architecture from the Early Bronze Age to the Late Iron Age. We will use the house size as a simple proxy for household size and the summed radiocarbon dates for occurrence over time, both for large and small houses.

In this study we will concentrate on the region of Rogaland in South Western Norway and use the site of Forsandmoen as a starting point where the remains of 255 houses show a continuous settlement from 1500 BC to AD 700.

15 FEEDING ANGLO-SAXON ENGLAND: THE BIOARCHAEOLOGY OF AN 'AGRICULTURAL REVOLUTION'

Abstract author(s): Hamerow, Helena - Bogaard, Amy - Forster, Emily - McKerracher, Mark - Stroud, Elizabeth (University of Oxford) - Holmes, Matilda (University of Leicester)

Abstract format: Oral

Across much of Europe, the period from c AD800-1200 saw the advent of new forms of cereal farming capable of yielding regular, large surpluses. These enabled landowners – for the first time since the Roman period -- to amass wealth by exploiting the labour of others. By 1066, England had thousands of such landowners with their own estates, prospering from rents extracted from peasants who worked the land. A link thus existed in medieval Europe, as in prehistory, between the expansion of cereal farming and the growth of wealth inequalities. The 'medieval climate anomaly' may also have played a role. Medieval farmers appear to have expanded cereal production largely by adopting increasingly extensive forms of farming (in which the area of land under cultivation increased while the amount of manure and human labour per land unit decreased), systematic crop rotation and the heavy mouldboard plough. This paper will present selected results from a project that is reconstructing medieval cultivation regimes by applying a range of analytical methods to the remains of early medieval crops, arable weeds, livestock, and pollen and comparing the results with the archaeological evidence for farms. The results provide direct evidence of the conditions in which early medieval crops were grown, enabling us to address longstanding questions from a new perspective.

16 THE VOICE OF THE MEDIEVAL FARMER LOCAL TOPONYMS AS A SOURCE FOR AGRICULTURAL CHANGE AND SOCIAL INEQUALITY

Abstract author(s): Schreg, Rainer (Medieval and postmedieval archaeology, Otto-Friedrich-Universität Bamberg)

Abstract format: Oral

Even in historical times we often face a lack of documents, reporting about daily life and the agency of the 'normal' people, especially in rural landscapes. Even in the Middle Ages agricultural change and social relations in rural communities are often invisible. Written documents are highly influenced by a manorial perspective.

However, local toponyms are an important source for understanding social and economic spaces of medieval farmers. Whereas early research was well aware of these sources they lost attention during the last decades. In Germany their documentation and interpretation was in general a topic for local amateur historians. Their main interest was in the etymology of the names of fields and forests, mainly in their own village. While most toponyms are already present in late medieval rentals, their exact chronological context remained controversial.

This paper widens the horizon by integrating toponyms research into the debate about medieval agricultural change and the role of various social groups in the process of village formation. Different methodological approaches combining toponyms and archaeological data will be used in order to look closer at the interdependencies between changing social complexity within rural communities, settlement reorganisation, and agricultural innovation. Examples from Southern Germany show the potential of an archaeological perspective in order to make toponyms to a valuable voice of the otherwise silent farmers, herders and even woodsmen.

17 VITIS VINIFERA, OLEA EUROPAEA, AND CASTANEA SATIVA ANTHRACOLOGICAL REMAINS AS MARKERS OF SOCIAL COMPLEXITY IN THE MEDIEVAL WESTERN MEDITERRANEAN

Abstract author(s): Santeramo, Riccardo (Università degli Studi di Genova) - Buonincontri, Mauro (Università degli Studi di Siena) - Di Pasquale, Gaetano (Università degli Studi di Napoli Federico II) - Bianchi, Giovanna (Università degli Studi di Siena) - Quirós Castillo, Juan Antonio (Universidad del País Vasco)

Abstract format: Oral

The anthracological study of medieval rural settlements located in the Upper Ebro Basin (northern Spain) and southern Tuscany (central Italy), allow us to discover important correlations between landscapes dynamics and economic and social changes in the western Mediterranean. According to anthracological and historical sources, the 10th-11th century turned out to be a key moment for landscapes of the studied areas. In central Italy, expansion of olive and chestnut began while viticulture increase in the Upper Ebro Basin. Those events are globally related to the set-up of the economic establishment of the lordship domination and the political organism of the medieval towns. It is not a linear process, but in spite of a continuous tension between different social agents, lords and municipal councils established a landscape, apparently fruit of their own will. However, the rural communities did not have to participate passively in such process. In particular, anthracological and archaeological analysis for the Upper Ebro Basin can show how during the Early Middle Ages rural communities can develop a strong identity and a capacity of active transformation of the agrarian landscape. In particular, viticulture was already practised by certain rural communities before being promoted by the supralocal lords in the 10th century. Those communities were already able to manage the workforce, to organize collective-practices, and to realize complex agronomic and silvicultural practices, factors possibly presupposing the existence of a collective identity. In this research, we want to discuss the presence/absence of some iconic Mediterranean woody species (grapevine, olive tree and chestnut), in the context of the medieval rural settlements, in order to stress the connection between the landscape construction, the agricultural production strategies and the social complexity.

18 CHARRED PLANT REMAINS AS A PROXY FOR DETECTING INEQUALITY. CASE STUDIES FROM THE NEOLITHIC TO BRONZE AGE IN SOUTHERN POLAND

Abstract author(s): Korczynska, Marta (W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków) - Nowak, Marek (Institute of Archaeology, Jagiellonian University, Kraków) - Kapcia, Magda (W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków) - Kenig, Robert (W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków; Institute of Archaeology, Jagiellonian University, Kraków) - Moskal - del Hoyo, Magdalena (W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków)

Abstract format: Oral

The first farmers of the Linear Pottery culture implemented husbandry practices in southern Poland. Their successors – communities of the so-called Lengyel-Polgar complex pursued the intensive agriculture. This way of cultivation changed, as a new economy and settlement pattern of the Funnel Beaker culture required the exploitation of extensive areas. In general, due to the lack of convincing determinants of a social hierarchy in the archaeological record, this three cultural groups are traditionally described as rather egalitarian societies. It is worth noticing, however, that during the first half of the fourth millennium BC in the south-eastern group of Funnel Beaker culture, appeared large settlements (like e.g. Bronocice, Mozgawa, Gródek Nadbużny). As they cumulated production activity, they might be interpreted as the central and highest points in the network of micro- and mezo-regional decision making. In the following presentation, we will examine if the social and/or functional (in)equality might be visible in diversification of charred plant remains, both in qualitative and quantitative terms. Further, the site catchment areas, as well as predictive agricultural potential of the Neolithic settlements, will be discussed.

In the long-established discourse social inequality is connected with formation and development of Bronze Age societies. For that reason, in the second part of our presentation we will compare the degree of diversification of Neolithic patterns (and further land-use strategies) with differentiation of the archaeobotanical and environmental data, obtained from Lesser Poland Bronze Age settlements. In order to do so, we will take into consideration functionally diverse sites (like hill forts, open hilltop settlements, or settlements connected with a specialized production).

A. AGRICULTURAL PRACTICES DURING THE ITALIAN BRONZE AGE: C AND N STABLE ISOTOPE ANALYSIS AS INDICATORS FOR FERTILIZATION AND IRRIGATION

Abstract author(s): Cortese, Francesca (Prehistoric Archaeology Laboratory, University of Rome Tor Vergata) - Carrara, Nicola - Dalla Longa, Elisa (University of Padua) - De Angelis, Flavio (Centre of Molecular Anthropology for Ancient DNA Studies, University of Rome Tor Vergata) - Silvestri, Letizia (Prehistoric Archaeology Laboratory, University of Rome Tor Vergata; Durham University, Department of Archaeology; Sovrintendenza Capitolina ai Beni Culturali) - Rickards, Olga (Centre of Molecular Anthropology for Ancient DNA Studies, University of Rome Tor Vergata) - Rolfo, Mario (Prehistoric Archaeology Laboratory, University of Rome Tor Vergata)

Abstract format: Poster

The spread of agriculture leads to innovative soil management techniques: earlier fertilization and irrigation records date back to the Late Neolithic. During Copper and Bronze Ages, exploitation strategies were improved and intensified, leading to a better soil fertility and productivity; nonetheless archaeological signs of agricultural practices are scarce. In this context, Carbon and Nitrogen stable isotope analyses are noteworthy to analyse agricultural change and production methods, such as fertilization and irrigation. Published works demonstrate that manuring mainly modifies Nitrogen values, while intensive watering practices alter Carbon data.

This work aims to examine the results of stable isotope analyses carried out on carpological remains from Bronze Age Italian sites: Pastena Cave and Ledro. The former, in central Italy, is a funerary and a cult cave. Among several finds of different material categories, this site presents hundreds of thousands of burnt seeds of *Vicia Faba* (90%) and cereals (10%). In northern Italy, Ledro is a pile-dwelling site returning several carpological remains: grains were the focus of stable isotope analyses.

Preliminary data show that, at least in Pastena Cave, seeds seemed to be manured and watered: fertilization appears to have been homogeneous for all the species; instead, irrigation seems to have mainly concerned legumes. Such enhanced agricultural management technique might have been carried out by specifically trained individuals, indicating a diversification of tasks within the community and therefore an increasing social complexity. Nevertheless, combined stable isotope analyses on the human remains and the seeds do not necessarily testify to social inequality in this context, due to the small sample and the scarcity of comparative studies. For the same reason, the evidence of similar dietary habits for all the analysed individuals does not exclude the presence of a social stratification within the wider community.

Further analyses are still ongoing to validate the obtained results.

B. A MULTI-PROXY CASE-STUDY OF MIDDLE BRONZE AGE (1600 – 1250 BCE) LAND USE PRACTICES IN THE NORTH-WESTERN ALPINE FORELAND

Abstract author(s): Höpfer, Benjamin - Scherer, Sascha - Deckers, Katleen (University of Tuebingen) - Lechterbeck, Jutta (University of Stavanger) - Lehdorff, Eva (University of Bayreuth) - Marinova-Wolff, Elena (State Department for Cultural Heritage Baden-Württemberg) - Meister, Julia (University of Wuerzburg) - Scholten, Thomas - Kühn, Peter (University of Tuebingen) - Knopf, Thomas (University of Tuebingen & Keltenmuseum Hochdorf/Enz)

Abstract format: Poster

We present results from a soil-scientific and archaeological, -botanical and -zoological collaboration focused on Middle Bronze Age (MBA) land use practices in the north-western Alpine foreland. We combined data on onsite archaeological features, near-site (<5 km to the site) colluvial deposits and offsite pollen bogs. The study-site, Anselfingen, lies ca. 20 km west of Lake Constance and is one of the most completely excavated MBA settlements in the region. Optically stimulated luminescence (OSL) and radiocarbon (AMS 14C) dating of colluvia showed a first major erosion phase during the MBA. Charcoal spectra indicate forest management favouring *Quercus*. Analyses of faecal biomarkers (5β-stanols) and bone remains suggest forest pasture of pigs, especially north of the village. To the south, an arable field with a buried plough horizon was discerned micromorphologically and by low phytolith-concentrations from grass inflorescences. Onsite botanical remains stem from *Hordeum distichon/vulgare*, *Triticum dicoccum*, *Triticum monococcum*, *Triticum spelta*, *Triticum aestivum/turgidum*, which were probably stored in stilted pantries within the settlement. Urease-activity and faecal biomarkers from colluvia and buried topsoils indicate grazing on fallow land and/or manuring. Polycyclic aromatic hydrocarbons (PAHs) and their spatial distribution indicate fire-use for various purposes, e.g., landscape maintenance, domestic burning, and technical applications. An MBA peak of micro-charcoal and alternating *Quercus* and *Fagus* curves in the offsite pollen spectra reflect these anthropogenic vegetation changes also on a regional scale.

Our data give insights into the MBA subsistence economy in a depth that had hitherto been hardly available apart from wet-preserved sites. They indicate a very diversified, self-sustaining subsistence, which, along with technological developments (e. g. bronze tools like sickles, stockpiling etc.), might have improved the resilience and versatility of the MBA landuse system to a degree that allowed not just for a consolidation, but even for an expansion of the settlement networks - despite deteriorating climate.

230 STORIES AND COMPASSION: MATERIAL CULTURE, MEMORY, AND EMOTION

Theme: 6. Material culture studies and societies

Organisers: Nilsson Stutz, Liv (Linnaeus Univeristy) - Tarlow, Sarah (University of Leicester)

Format: Regular session

"Everything is held together with stories. That is all that is holding us together, stories and compassion."

Over the past decades, materiality and material culture have highly theorized in a range of academic disciplines outside of archaeology, including history, cultural anthropology, and sociology. Material items can be containers of collective and individual memory, devices capable of triggering emotional, psychological, and even physiological reactions, and tools for expressing or retaining identity. At the same time, the cross-disciplinary field of memory studies has grown out of psychology, cognitive science, history, museum and archive studies etc., and has addressed the processes of memory, the creation of memory and concepts such as collective memory, bringing a deeper analysis to the creation and perception of the past in self-definition and identity processes.

Material culture and memory studies can enrich and sharpen theoretical and methodological approaches to the things that have always been at the center of our discipline. Archaeological approaches can add sophistication to the ranges of memory, emotion and affect of lived experience in the past and in the present, as discussed in other disciplines. At the same time, we can incorporate their insights to enrich our own understanding of the past.

This session seeks to explore theories of memory and emotion through archaeological case studies. Through the analysis of material culture - from small objects such as heirlooms or everyday tools, to large structures such as monuments or buildings - these studies will explore the connections between materiality, emotion, and memory in the lived experience of the past and present.

ABSTRACTS:

1 ON THE EDGE OF MATERIALITY: STORIED LANDSCAPES AND COMMUNITY NARRATIVES

Abstract author(s): van den Berg, Mathilde (University of Oulu)

Abstract format: Oral

Much of the landscape in Kilpisjärvi, Finland, is characterized by what has never been built nor penned in ink. Reindeer grazing pastures; ancient migration routes; old milking grounds; ancient and new camp sites: these all leave minimal to no traces in the landscape from a modern perspective. Many of these remains are bodiless, and to the one beholding this landscape with its bodiless remains, it might appear empty. These landscapes are not empty however, on the contrary. Rather, modern infrastructures and buildings now often come to influence what has never been demarcated or built before: tourist paths meander through age-old pastures and signs have been put up in attempts to protect 'nature' from reindeer, even though historically these grounds have been grazing pastures for centuries. In contrast to these built over landscapes are the spacious and seemingly empty landscapes surrounding Kilpisjärvi. But emptiness must be in the eyes of the beholder, as material and disembodied remains have stories lingering over and hidden inside of them. These are the small, local and intimate, stories of the village, its enveloping landscape, and the inhabitants that make the past and the present 'touchable'. 'Dis-enstoried' remains are contrasted here with storied, disembodied remains. This essay glances at what has never been built nor written down, what has been built over, the local anecdotes that speak to these, and how this assemblage intermingling of materiality and disembodiment shape a emic and etic understandings of Kilpisjärvi and its inhabitants. Furthermore, it views how ancient remains and an ancient way of living becomes entangled with modern infrastructure, and how an ancient way of thinking becomes questioned by modern takes on reality.

2 MORTUARY RITUALS AS TECHNOLOGIES OF REMEMBRANCE: THE CASE OF THE HUNTER AND GATHERERS OF CHECUA SITE, COLOMBIA (9500-5000 CAL BP)

Abstract author(s): Archila, Sonia (Department of Anthropology, University of Los Andes) - Ospina, Juan (Cultural Heritage Studies Faculty, Universidad Externado de Colombia; Department of Anthropology, University of Los Andes)

Abstract format: Oral

Archaeological studies have shown that the inscription of social memory is not necessarily correlated to monumental marks in the landscape, on the contrary, it is accepted that human societies have drawn upon diverse mechanisms either to remember or forget. In some cases, people in the past relied on ritual events to enhance social memory, where they borrowed elements and actions of daily life to make them solemn as they were involved and intertwined in the scaffolding of rites. Ritual events associated to death commemoration can be approached as technologies of remembrance, which might allow us to understand how structured ideas about death and life are strongly related to the contriving of collective memory. In this paper, we will present the archaeological case of the hunter and gatherers that inhabited the site of Checua (9500 to 5000 Cal BP), and we will discuss how a ritual event, accomplished to commemorate death, turned into an active device for memory construction. We will show evidence of ritual activity, where hunter and gatherers deliberately reunited nine dead people at a posthumous event that must have operated as a well-planned and methodical act of remembrance. Our purpose is to problematize the ways in which different materials associated to the ritual paraphernalia such as human bodies, burial goods, fire and smells became temporary containers of memory. Each of these elements, we believe, has its own biography, and they were carefully selected to make part of this act of memory. Furthermore, some

goods such human and animal bones might have been conceived as "ancient heirlooms". Finally, this discussion will consider distinct manners in which memory can be vividly materialized without monumentality; instead, we focus on efficient tasks that re-signified elements, places and actions that might have triggered deep emotional reactions.

3 EMOTIONS, EMOTIONAL EXPERIENCES AND ARCHAEOLOGY: A CASE STUDY FROM LATER MEDIEVAL BRITAIN

Abstract author(s): Standley, Eleanor (University of Oxford)

Abstract format: Oral

In this paper I use the new concept of 'emotants' to explore emotions and material culture in the later medieval period. I have defined an emotant as a physical agent that is characterised by or serves in the capacity of emotion (Standley 2020). Using this concept, I attempt to advance our understanding of emotions in the past by presenting a case study that investigates emotional experiences in the later medieval period.

The case study is based on an archaeological find that is not an obvious 'emotional' object: a plough iron excavated in a medieval site from the North-East of England. I argue that this everyday tool was an emotant characterised by feelings of hope, and was part of both an individual and communal emotional-practice.

The final part of the paper will consider how archaeologists can approach material, emotion and memory. By investigating the interdependency of the material world, aesthesis, feelings and the body, I hope to further our interpretations of the agency of things. The approach is influenced by the literary concept of ekphrasis and enargeia. I argue that the metaphysical or immaterial (memories, feelings and imagination) are experienced and affected by the 'energy' of an emotant when it is seen or touched.

4 PROBLEMATIC STUFF: REINTERPRETING THE STRUCTURED DEPOSITS OF IRON AGE BRITAIN

Abstract author(s): Büster, Lindsey (University of York)

Abstract format: Oral

The deliberate deposition of cached objects in Iron Age Britain is well acknowledged, and is commonly used as a proxy for the presence of ritualised behaviour. Traditional modes of study (based on criteria such as intrinsic value, context, presence/absence of a human body) have, however, created arbitrary divisions between the categorisation and interpretation of these assemblages (as hoards, structured deposits, grave goods, cenotaph burials etc).

By considering contemporary attitudes to death, dying and bereavement, this paper explores the relationship between material culture, the living, and the dead, and considers these assemblages as the disposal of 'problematic stuff' associated with deceased individuals, particularly in later prehistoric Britain where normative visible funerary rites are rare. The concept of problematic stuff takes us beyond the sub-disciplinary boundary of mortuary archaeology, which places the physical remains of the dead centre stage, and allows us to consider broader categories of cached objects within a single interpretative framework. It also demonstrates how contemporary attitudes to important rites of passage can provide opportunities to embed emotion into our archaeological narratives, without resorting to pseudo-phenomenological approaches, and helps us better understand the nuanced behaviours represented by the 'ritual' deposits that we so often encounter in the archaeological record.

5 FAMILY HEIRLOOMS: BRIDGES BETWEEN INDIVIDUALS AND CONTEXTS

Abstract author(s): Wessman, Anna (Bergen University Museum)

Abstract format: Oral

This is a fascinating story about two Viking Age objects: an arm ring and a penannular brooch deriving from the Curonian peninsula in Latvia. A Finnish soldier who was a volunteer in the German Jägers infantry (in Finland called the Jäger Movement) purchased them in 1917 and he brought them home with him one year later. He gave the arm ring to his young wife as a gift and she wore it on her arm until she died 40 years later.

While the arm ring was in constant use and is today heavily worn, the penannular brooch was stuffed into a chest with other personal belongings and not touched for 50 years. The brooch was later framed and placed on the wall and is in mint condition even today.

Very little is known about the archaeological lives of these objects, but we are able to study their contemporary use histories. In an object-centred interview conducted by the author, new and personal meanings to these objects have come up. They are heirlooms that function as catalysts for a broader family saga. Still in the possession of the same family after 100 years, they form the basis of a narrative with grandchildren and great-grandchildren who are not only curating but also passing on the story.

6 MEMORY AND LANDSCAPE STABILITY ON THE WELSH SEVERN ESTUARY

Abstract author(s): Dwan, Christopher (The University of Sheffield)

Abstract format: Oral

Past studies of memory within the archaeological record have examined the continuities and reuse of past features and materials across generational, historical and mythical time. This approach takes a primarily human-centric perspective on how memories were

created and transmitted. Much less consideration is given to how materials and landscapes participate in and shape the formation of memory.

My research aims to understand how a landscape's relative stability and rate of change affected how memories were incorporated, interpreted, and recalled. This paper presents a theoretical approach and a case study from the Welsh Severn Estuary. The Severn's intertidal landscape was divided into various 'stability zones' based on the rates of change in sedimentation and vegetation: from the daily rhythms of tides and the seasonal cycles of salt marsh to long term processes of marine sedimentation and erosion. The study area emerges as a patchwork landscape of shifting temporalities, which offered different potentials for remembrance and erasure. The stability zones were compared with the archaeological evidence for prehistoric life on the intertidal zone. The analysis examines how the stability of landscape zones correlated with different forms of human occupation and continuities.

7 NORTH-WEST OF EDEN: UTOPIAN NARRATIVES AND THE STATE OF OREGON

Abstract author(s): Witcher, Robert (Durham University) - Hanscam, Emily (Amsterdam University) - van Helden, Daan (Leicester University)

Abstract format: Oral

Stories bind us together, but can also bring us into conflict. This paper considers civilizational imaginaries and their relationship to the material world. We explore how groups and individuals project onto real and imagined spaces their values and anxieties about how people lived in the past and about how they should live in the future. We explore these issues through the case study of Oregon in the Pacific Northwest. Oregon was founded in 1859 on the eve of the American Civil War (1861-1865). It was established as a white supremacist state, its founders seeking to define a particular future for the territory in the context of the deep social and political division what would soon bring the northern and southern states into conflict. Writing two decades later, Jules Verne chose Oregon as the setting for his 1879 novel *The Begum's Fortune*, which concerns the conflict between two newly founded cities, one utopian, the other dystopian. The novel both nationalizes and historicizes these imagined places, one a French Athens, the other a German Sparta. From its very origins, therefore, the space of Oregon has been used to project different stories and identities.

A century and half later, narratives are still being projected onto Oregon, now centering around the idea that the city of Portland, and the broader Pacific Northwest, are either a liberal paradise or a hotbed of anarchy and violence. Moreover, these stories – more often than not told by outsiders – are being used to precipitate real-world conflict, in places such as Portland, where these contrasting imaginaries are materialized. Using the Portland federal courthouse as a focus, this paper considers the ways in which these narratives combine and conflict in the experience of physical space, thereby materializing competing stories about civilization, the past and the future.

8 FAC-SIMILE CATACOMBS IN EUROPE BETWEEN THE 19TH AND THE 20TH CENTURY AS MONUMENTAL EXPRESSION OF MEMORY AND EMOTION

Abstract author(s): Cecalupo, Chiara (Universidad Carlos III Madrid)

Abstract format: Oral

In the 19th century, due to the discoveries of early-Christian catacombs in Rome the enthusiasm about Christian art exploded in Europe up to the point that several architectural buildings and constructions were built, inspired by the layout of Roman catacombs. The speech will focus on two of these places: the fac-simile, temporary catacomb created by the Vatican State for the Universal Exhibition of Paris in 1867, and the Roman Catacomb Museum opened in Valkenburg (The Netherlands), the "real" fac-simile Christian catacomb built in 1910 replicating the ancient ones as seen in Rome.

These two monuments of archaeological taste are fairly known; however, they should be investigated in further detail and inserted into the wider European framework to understand their role in the building of shared memory and in the living experience of the past for all Europeans. These cases fit perfectly in the session aim. The Vatican fake catacomb in Paris will help to prove the international diffusion of Christian archaeology as a propaganda tool for expressing Roman historical identity, just before the end of the Papal State; while the Valkenburg fake catacomb complex will be used to underline how the spatial re-creation of ancient monuments in different contexts was conducted and what kind of psychological repercussions it had on the society where it was implanted.

In the second part of the speech, archival texts and old newspapers will be presented for both cases, to provide evidence regarding public response to those monuments. The incredible fascination of original Roman catacombs appears to remain really vivid in these fac-simile exemplars, to generate emotions and enrich visitors' understanding of the past. In this sense, the speech will strongly contribute to the definition of the role that reception of antiquity had in Europe with regard to the emotional experience of past and present.

9 TATTOOED SKIN, DEFORMED SKULLS, FILED TEETH: EMBODIED MEMORIES AND EMOTIONS IN ARCHAEOLOGICALLY EVIDENT PERMANENT BODY MODIFICATIONS

Abstract author(s): Kerk, Lukas (Westfälische Wilhelms-Universität Münster, Historisches Seminar, Abteilung für Ur- und Frühgeschichtliche Archäologie)

Abstract format: Oral

Archaeologically documented permanent body modifications such as tattoos, skull deformations and dental modifications hold a high potential of knowledge regarding the human body as socio-cultural unit and projection surface of culturally determined messages. In this context, body modifications are to be seen as embodiment, thus a focus is put on their quality as carriers of various meanings and functions within a social framework. In addition, the ability to shape the human body provides important indications for conceptualizing it as an artefact and part of material culture, and for systematizing it as a medium of communication processes. However, due to its materiality and malleability, the body not only represents an artefact, but can also be considered a 'mentefact' (Eggert 2014), whereby its semiotic dimension comes to the fore. Because of the unique character of permanent body modifications in archaeology, it is possible to pose questions regarding the embodiment of memory and emotion to the research object and to answer them in a theoretically well-founded way. Not least thanks to the involvement of a variety of disciplines, statements about their history and the lived past can be elicited from the silent bodies of the past. Moreover, archaeologically evidenced cases of tattoos in particular continue to contribute a not inconsiderable share to the culture of remembrance and identity even today.

Starting from the probably best and most intensively studied tattooed mummy, known as Ötzi the Iceman, plausible possibilities, but also limits of the analysis of the embodiment of emotions and memories are pointed out by adding further cases of archaeologically evident permanent body modifications, thus laying the foundation for further considerations.

10 ANIMATE OBJECTS, EMOTION, AND THE NON-PERSON: DEPOSITIONAL PRACTICES IN SCANDINAVIA FROM THE BRONZE AGE TO THE VIKINGS

Abstract author(s): Eriksen, Marianne Hem (University of Leicester)

Abstract format: Oral

Deposition of carefully selected artefacts in three-aisled houses occur over deep time in prehistoric Scandinavia. Eclectic things ranging from beads to Neolithic axes, from anthropomorphic images to ceramic vessels, are placed in pits, postholes, and hearths across generations. Rather than seeing these as merely 'house offerings', I consider these practices to be inherently relational, connected to community, memory, storytelling, and affect. Deposition weaves together different temporalities as well as different agencies, e.g. the maker of an object and its users, the human inhabitants and their non-human collaborators, ancestors and incumbents. In this way, a deposited loom weight in a posthole can embody affective stories of a specific ancestor, textile production and gender, clay sourced from a specific landscape, and house-building and kinship, criss-crossing time and space.

However, not all deposition is necessarily about compassion. From the Pre-Roman Iron Age onwards, disarticulated human remains start to appear in settlements. Some of these 'body-objects' show signs of trauma, and some are reworked. The second move of this paper is to consider the transformation of a human body to an object, and whether this necessarily constitutes commemorating cherished persons. In some cases, may it be that the status of the dead as a non-person is what makes the transformation into 'body-object' possible or even desirable? While depositing a cranial fragment or an infant in the house can certainly be about creating mnemonics of belonging and place; the question is, for whom, and at whose cost?

231 EMBRACING CHANGE: NEW INSIGHTS AND THEORIES ON THE CHANGING "EUROPEAN WORLDS" FROM THE 3RD AND 2ND MILLENNIUM BC

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Basílio, Ana Catarina (Fundação para a Ciência e Tecnologia; Interdisciplinary Center for Archaeology and Evolution of Human Behaviour of University of Algarve) - Becerra Fuelleo, Paula (Departamento de Prehistoria y Arqueología, Universidad de Sevilla) - Schlicht, Jan-Eric (Institute for Pre- and Protohistoric Archaeology, CAU Kiel; CRC 1266 - Scales of Transformation, CAU Kiel)

Format: Regular session

The strange times we are living in are showing us how quickly humans can adapt to change. Keeping in mind that transformations are most likely a constantly occurring aspect of human life we want to ask: How was change in prehistory? Was it perceptible on a human scale? Were past communities able to readjust and reinvent themselves in the face of adversity?

These, and other questions, are particularly applicable to the fluctuations that occur during the transition between the 3rd and 2nd millennium BC, a period marked by cultural shifts archaeologically visible throughout Europe. Transformative processes in populational dynamics, mobility practices and material exchange networks have been in the spotlight for quite some time. The Iberian Peninsula in particular functions as an excellent example for this development whereby a plethora of prehistoric contexts may indicate different socio-political trajectories. Adding to that, the existence of multiple ongoing long term projects in key sites (as ditched enclosures) has allowed the application of new methodologies like research on ancient DNA, paleoclimatic reconstructions

and mobility studies (mainly through isotopic analysis) that have made the Iberian Peninsula a stage on which current theoretical backgrounds are being questioned.

As such, there is a pressing necessity to confront, match and reconcile new sets of data and the archaeological evidence not only in Iberia but also throughout the rest of Europe, allowing to rethink and update theories and biographic narratives that will contribute to a possibly closer grasp on the lifeways of prehistoric communities.

For this session, we invite presentations dealing with change in European contexts of the 3rd/2nd millennium BC in order to stimulate comparisons between different theories and methodologies. We would also appreciate input from archaeological science researchers (aDNA, mobility, demography).

Eventually, we intend to provide new insights to the prehistoric lifeways, based on solid interpretive hypothesis.

ABSTRACTS:

1 CHANGING EUROPEAN WORLDS? A CLOSER LOOK AT COASTAL COMMUNITIES DURING THE 3RD MILLENNIUM BC IN NORTHERN EUROPE

Abstract author(s): Kleijne, Jos (Groningen Institute of Archaeology)

Abstract format: Oral

The MSCA-IF project MicroTRASH started in January 2021. In this talk, we will give the first results of some parts of the project. The 3rd millennium BC is a period in which most communities already follow a fully agricultural way of life, but simultaneously many social and cultural changes take place across Europe. For the coastal communities along the North Sea and Baltic coasts, it is often unclear how much these large-scale changes have an impact on local practices. Therefore, our focus is on the refuse middens that were formed during this period. By taking a microscopic approach, we gain an insight in very local practices: subsistence practices and the importance of coastal resources, the temporality, rhythm, and chronology of occupation, and ways in which the local landscape was modified. These various aspects are central to understanding coastal communities, and the ways in which these communities dealt with social and cultural changes.

2 MOVING BETWEEN SCALES OF TIME AND SPACE: HOW CAN THE CURRENT MOMENT INFORM OUR UNDERSTANDINGS OF 3RD-2ND MILLENNIA BCE IBERIA?

Abstract author(s): Lillios, Katina (University of Iowa)

Abstract format: Oral

Over the past year, we have witnessed and experienced profound and rapid changes to our lives and the world around us, which naturally make us reflect, as archaeologists, on periods of marked cultural change in the ancient past, such as the 3rd-2nd millennia BCE in the Iberian Peninsula. It is even tempting to imagine that a pandemic might have been a factor in the abandonment of settlements and the transformations in ritual and mortuary practices that are detected archaeologically at this time. However, scale – both temporal and geographic – needs to be taken into account, as the scales of analysis that we have access to as archaeologists are generally quite different from those experienced at the individual level. How can we move across these scales to understand what happened in the Iberian Peninsula over the 3rd and 2nd millennia BCE? This paper will draw on my observations of material changes in the use of space in my local community over the summer of 2020 that were consequences of the reduced mobility of people, and use these material traces as a way to think in new ways about the complex demographic, cultural, and ecological shifts of mid-Holocene Iberia (Lillios et al. 2016; Blanco et al. 2018).

References

- Lillios, K.T., Blanco-González, A., Drake, B.L. and López-Sáez, J.A., 2016. Mid-late Holocene climate, demography, and cultural dynamics in Iberia: A multi-proxy approach. *Quaternary Science Reviews*, 135, pp.138-153.
- Blanco-González, A., Lillios, K.T., López-Sáez, J.A. and Drake, B.L., 2018. Cultural, demographic and environmental dynamics of the Copper and Early Bronze Age in Iberia (3300–1500 BC): towards an interregional multiproxy comparison at the time of the 4.2 ky BP event. *Journal of World Prehistory*, 31(1), pp.1-79.

3 TRANSFORMATIONS DURING THE THIRD MILLENNIUM BC IN THE IBERIAN PENINSULA: ASSESSING THE PAST AND FUTURE CONTRIBUTIONS OF ANCIENT DNA

Abstract author(s): Olalde, Iñigo (Institute of Evolutionary Biology - UPF-CSIC, Barcelona)

Abstract format: Oral

The 3rd millennium BC in Iberia is arguably one of the most intensively sampled periods in the ancient DNA literature over the past 5 years. These studies documented the arrival of groups from central Europe starting ~2,500 BC and their widespread long-lasting demographic impact so that after ~2,000 BC, all the Bronze Age individuals with available genomic data, from north to south and from west to east, derived 30-50% of their ancestry from these newcomers. It is also clear from the genetic data that during this event the local Chalcolithic paternal lineages became virtually extinct and were replaced by the lineages carried by the incoming groups, whereas the local maternal lineages were maintained, pointing to a sex-biased event. However, to understand the underlying human processes at local and familiar scales that eventually resulted in the large-scale patterns we observe with ancient DNA, all this pal-

aeogenomic evidence needs to be interpreted together with other type of bio-archaeological evidence and contextualized with the rich archaeological record for this time period in Iberia. In this contribution, I will explore ways to integrate the available ancient DNA data with the archaeological record and discuss multidisciplinary study designs that will help to achieve this goal.

4 STRONTIUM ISOTOPE ANALYSIS IN IBERIA: A REVIEW OF THE EVIDENCE

Abstract author(s): Becerra Fuello, Paula (Departamento de Prehistoria y Arqueología, Universidad de Sevilla) - Vicent García, Juan (Departamento de Arqueología y Procesos Sociales, CSIC) - Pérez Villa, Alberto (Independent Researcher) - Uriarte González, Antonio - Díaz-del-Río Español, Pedro (Departamento de Arqueología y Procesos Sociales, CSIC)

Abstract format: Oral

This oral presentation summarizes current available data on strontium isotopic values from Iberian archaeological samples. Although a very recent development, publications on the subject matter have increased substantially over the last decade.

We review the location, chronology, context, sex and age group for over 1300 values of 87Sr/86Sr ratios recovered in more than 50 archaeological sites. The ratios of these strontium isotopes 87Sr and 86Sr are being used in archaeological sciences to identify human migration and mobility patterns.

The quality of the evidence and its regional distribution will allow us to discuss some geographical patterns and critically discuss the possibilities of building an informed approach to late prehistoric regional mobility patterns. Furthermore, gathering all this data provides us with several approaches which could be used to reconstruct, at least partially, the migration processes inside the Iberian Peninsula, applicable to the changes that took place during the 3rd and 2nd millennium BC.

5 THE LOWER AND MIDDLE GUADALQUIVIR VALLEY AT THE END OF THE 3RD/BEGINNING OF THE 2ND MILLENNIUM BC

Abstract author(s): Bartelheim, Martin - Chala Aldana, Döbereiner - Díaz-Zorita Bonilla, Marta (Universität Tübingen)

Abstract format: Oral

The Bronze Age in the Lower and Middle Guadalquivir Valley is strongly under-researched compared to that in neighbouring regions in the southeast and southwest of the Iberian Peninsula. While the Chalcolithic and the so-called "Tartessian" Final Bronze Age and Early Iron Age have been well studied in this region, which is favourable for settlement and rich in raw materials, little is known about the intervening Bronze Age. On the basis of a comprehensive new investigation of the Bronze Age in the Guadalquivir Valley as well as recent fieldwork there and in the neighbouring Sierra Morena, new insights into the development of the settlement landscape at the transition from the 3rd to the 2nd millennium BC are presented. The main focus is on questions of resource use, mobility and connectivity, and the validity of the previous perception of the region as the periphery of other Bronze Age cultural centres is questioned.

6 RITUALS AND FUNERARY PRACTICES IN MARROQUÍES BAJOS (JAÉN) DURING THE 3RD MILLENNIUM BC: A BIOARCHAEOLOGICAL GENDER APPROACH

Abstract author(s): Díaz-Zorita Bonilla, Marta (University of Tübingen) - Rísquez, Carmen - Torres, María Isabel (University of Jaen) - Alemán, Inmaculada (University of Granada) - Serrano, José Luis - Zafra, Narciso (University of Jaen) - Vilchez, Miriam (University of Granada) - Herranz, Darío (Complutense University of Madrid)

Abstract format: Oral

This paper presents the multi-proxy results investigating diet ($\delta^{13}C$ and $\delta^{15}N$) and mobility (87Sr/86Sr and $\delta^{18}O$) through isotope analysis but also mtDNA analysis and radiocarbon dating (14C), on human and faunal remains from a series of funerary structures from the Copper Age mega-site of Marroquíes Bajos, Jaén (Spain). The site is a ditched enclosure located in SE Iberia made up of about 113 ha and defined by a densely occupied sector including huts, workshops, storage pits and funerary areas, surrounded by crops and several necropolises.

The comparative analysis of the funerary contexts including the analysis of the buried bodies and the interesting offerings and the sacrificed animals is done regarding the different areas of necropolises and funerary spaces. This is considering the chronological differences marking the changes in social relations and kinship relations which in the local community will be defined by gender and age relationships, to approach how individual and group identities were constructed.

In addition, we could investigate through isotopic analysis and mtDNA the mobility patterns of this community including the herding strategies which indicates a complex network of interactions, as appears to be clear from the results of the analyses carried out. The reconstruction of the dietary patterns and the ecological niche for this community based on isotopic analysis was also carried out and gave us hints regarding the settings of Marroquíes Bajos.

7 THE CHANGE OF THE SETTLEMENT PATTERN DURING THE BELL BEAKER PHENOMENON IN THE VINALOPÓ AND SERPIS BASINS (ALICANTE, SPAIN)

Abstract author(s): Saura Gil, Pedro José (University of Alicante)

Abstract format: Oral

The archaeological evidences in the southeast of the Iberian Peninsula shows multiple social and economic changes since the middle of the 3rd millennium BC. A good example is the change in the location of some settlements in the Vinalopó and Serpis basins (Alicante, Spain), but also in their neighbouring areas, between 2600 and 2200 cal. BC. This period coincides with the development of the Bell Beaker and the appearance of significant changes in the archaeological register, such as burial practices, ornaments, or pottery. Our proposal tries to analyse different variables (settlements location, catchment resource areas, visibility, etc.) that allow us to define the evolution of the settlement pattern according to the principles of the Archaeology of the Territory. We will approach this topic from two perspectives. On the one hand, the synchronicity of these transformations in the southeast of the Iberian Peninsula, especially in the Vinalopó and Serpis basins, will be observed. On the other hand, the evolution of these changes, from the Chalcolithic to the Bronze Age, will also be analysed. Data derived from other units of observation, mainly material culture, domestic spaces, and areas of activity, will complement the territorial analysis. The concatenation of these levels of information will be the basis to make a representation of the process of social changes in this context, which seems to have their most evident archaeological expression in the displacement of settlements from the plain to high places.

8 WEAVING CHANGES: TRANSFORMATIONS IN TEXTILE PRODUCTION IN THE 3RD AND 2ND MILLENNIUM BC IN THE SOUTHEAST IBERIA

Abstract author(s): Basso Rial, Ricardo (University of Alicante)

Abstract format: Oral

Between the end of the 3rd millennium and the beginning of the 2nd millennium BC, important changes took place around Europe and the Mediterranean area. The Southeast of the Iberian Peninsula is one of the territories where archeology has been able to verify with greater clarity the magnitude and significance of these transformations. Some authors associate them with an episode of climate change. Others, on the other hand, with social and political factors, in addition to population movements. Regardless of what the determining factor of these transformations may have been, the disappearance of Los Millares cultural group and the formation of the Argaric group in the same territory is observed from notable changes in the archaeological record. Nevertheless, while archaeological research focused on issues such as changes in funeral rituals, architecture and settlement patterns or the development of production processes such as metallurgy, jewellery, and pottery, it left aside some significant aspects in the archaeological record. Among them is textile production, a subsistence activity whose evidence is present in practically all excavated archaeological sites. With this contribution we intend to analyze and evaluate to what extent these changes also affected the production and consumption of fabrics, as well as what their social significance could have been during this relevant process.

9 SOCIAL RESILIENCE AND CLIMATE CHANGE IN SOUTHERN IBERIA DURING THE CHALCOLITHIC AND BRONZE AGE

Abstract author(s): Schirrmacher, Julien - Ribeiro, Artur - Kneisel, Jutta - Rinne, Christoph - Weinelt, Mara (CAU Kiel)

Abstract format: Oral

The Chalcolithic to Bronze Age transition on the southern Iberian Peninsula is a period of major societal turnover. Transformations in the archaeological record are evident on various scales including economy and subsistence as well as ritual and social practices. The sudden abandonment of nearly all ditched enclosures in south-west Iberia serves as an outstanding example. At the same time, this abandonment exemplifies the spatial diversity within social trajectories and transformations at that time. During the same period, a series of major climatic anomalies – commonly known as 4.2 ka event – was threatening many societies across the entire Mediterranean region. Against the background of this climatic deterioration, the question arises whether the spatial diversity in the archaeological record may point to differences in social resilience and adaptation of past societies in southern Iberia.

A comprehensive analysis of compiled palaeoclimatological data from the Iberian Peninsula including own investigation of marine sedimentary archives provides a detailed reconstruction of past seasonal climate constraints with respect to precipitation and temperature during the 4.2 ka event. In combination with the investigation of human activity based on compiled radiocarbon dates from south Iberian settlement sites, we are able to define certain geographic regions of social stability during this period. But we also note phases of varying social resilience with migration being one potential adaptation strategy.

10 DO YOU EVEN HUNT? LONG-TERM CHANGES IN CENTRAL AND SOUTHERN PORTUGAL FAUNAL RECORDS DURING THE CHALCOLITHIC AND THE BRONZE AGE

Abstract author(s): Almeida, Nelson - Detry, Cleia (Uniarq, Centro de Arqueologia da Universidade de Lisboa)

Abstract format: Oral

The 3rd and 2nd millennium BC were times of important changes in SW Iberia. In Portugal, the study of these occurrences has traditionally focused on archaeological sites, their material culture, and chronologies. Faunal remains have been occasionally included in these discussions more as an accessory variable, traditionally linked to the Secondary Products Revolution and the development

of agriculture. These perspectives started to change in recent years, mainly by acknowledging animals' relevance on structured depositions and funerary contexts, while an increase in stricter economic analysis accompanied the still incipient development of stable isotopic data on animal diet and mobility.

Existing data demonstrates differences in faunal representativeness during the Chalcolithic, between the coastal Estremadura and inland Alentejo regions. Data for the Bronze Age is scarce, thus hindering comparisons even if some sites, specifically Late Bronze Age large settlements, demonstrate the relevance of domesticated species. The evidenced differences can relate to several factors as the type of sites (e.g., larger vs smaller, walled vs ditched, settlement vs non-settlement, funerary vs non-funerary), the ecological characteristics of the surroundings (e.g., coastal vs inland) and environmental and climatic pressures, as well as other harder to discuss possible socio-cultural and ideological aspects of these societies. We present a diachronic update on Chalcolithic and Bronze Age faunal evidence for Central and Southern Portugal, and discuss the species different representativeness in relation to long-term changes in the archaeological record.

11 EMERGENCE OF SOCIAL SPACES: RAW MATERIAL DISTRIBUTIONS AS PROXIES FOR HABITUAL PRACTISE BETWEEN 4000 AND 2000 BCE IN SOUTH PORTUGAL

Abstract author(s): Schlicht, Jan-Eric (CRC 1266 - Scales of Transformation; Kiel University)

Abstract format: Oral

The southwestern Iberian peninsula has been shown to be host to highly dynamic and diverse developments over the course of prehistoric times, especially during the 4th and 3rd millennia BCE. During this period, it is evident that south western Iberian populations were involved in far reaching networks of exchange and interaction. While much research has been and is being conducted towards a better understanding of these large and far-reaching connections it is still apparent that the focus on a larger part of conducted studies lies and lay on site-based and regional research, particularly so in Portugal. Achieved results on regional scales are often being extrapolated towards over-regional interpretations, when at the same time large scale studies can often lose grip on 'the subtle differences'.

This paper aims to establish a perspective on a meso-level between large scale and regional scales of observation, whereby integrative considerations based on Complexity Theory as well as Bourdieu's 'Theory of Social Practise' form the theoretical frame of this work. The research focus therein lies with the investigation of raw material distributions which are put in place as a proxy for habitual practise in two areas of southern Portugal: Estremadura and Alentejo. Data collected from literature as well as online databases are being used to conduct a series of hierarchical cluster analyses based on 21 raw material categories. While clear cut distinction could not be achieved, the results show large potential for further investigations and anchor points for the redevelopment of explanatory approaches towards the changing and dynamic social systems of southern and central Portugal between 4000 and 2000 BCE.

12 DIET AND MOBILITY THROUGH STABLE ISOTOPE ANALYSES IN HUMAN REMAINS BETWEEN THE CHALCOLITHIC AND IRON AGE IN SOUTHERN PORTUGAL

Abstract author(s): Melo, Linda (Foundation for Science and Technology - FCT-SFRH/BD/130165/2017. Laboratory of Prehistory, Research Center in Anthropology and Health - CIAS, Department of Life Sciences, University of Coimbra) - Díaz-Zorita Bonilla, Marta (Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters, Tübingen Universität) - Silva, Ana Maria (Laboratory of Prehistory, Research Center in Anthropology and Health - CIAS, Department of Life Sciences, University of Coimbra. UN-IARQ-WAPS, University of Lisbon) - Soares, António Monge (Centro de Ciências e Tecnologias Nucleares - C2TN, Instituto Superior Técnico, Universidade de Lisboa)

Abstract format: Oral

This study is based on an interdisciplinary methodological approach combining anthropological, archaeological and biochemical data. We analysed a total of 82 samples (70 human and 12 faunal remains).

In one hand, we worked with strontium and oxygen ($^{87}\text{Sr}/^{86}\text{Sr}$, $\delta^{18}\text{O}$) in dental enamel. In another hand, we worked with nitrogen and carbon isotope ratios ($\delta^{15}\text{N}$, $\delta^{13}\text{C}$) in bone collagen. The goal of this study is try to understand if /how the communities life changed over this period. Mobility data will help us to understand if were there any exogenous individuals in the communities. Through diet data we will try to understand if it changed within and between communities. We also consider very important to address other questions such as: evidences of disease and signs of physiological stress, and if there were inequalities between community members/social distinction (age, sex or status) during 2500 years in Beja geographic area, in southern Portugal.

13 GETTING OUT OF THE "BOXES": PRELIMINARY DEMOGRAPHIC APPROACH BASED ON THE PREHISTORIC CISTS FROM SOUTHERN PORTUGAL

Abstract author(s): Basílio, Ana Catarina (ICArEHB / FCT)

Abstract format: Oral

The transition from the 3rd-2nd millennium BC in Europe is a key-theme to understand a set of simultaneous cultural shifts and declines. In Iberia, this transition has different regional rhythms, one of the most intriguing in southern Portugal. Here this cultural transition is apparently abrupt, with a sharp archaeological contrast between the overwhelming Chalcolithic visibility, either in terms of materials, architectures, practices and sites, and the Early Bronze Age, marked by general invisibility of archaeological remains.

Several interpretative hypotheses have been drawn in the last decades. Still, due to the growing significance of the human-environment relationships, some already suggested but unexplored proxies gain new attention.

That is the case of the variable demography. It is suggested that a demographic decline might explain the transition between these two historical moments. This idea originates from the comparison between the uncountable Chalcolithic monuments and the reduced Early Bronze Age funerary expressions, mainly in cists.

While Chalcolithic structures present extended biographies that encapsulate collective burials with ossuaries, primary and secondary depositions, the Bronze Age structures are the opposite. In general terms, the cists represent a phenomenon with multiple chronological and cultural moments characterised by individual or multiple burials with ossuaries or primary depositions. They are morphologically and typologically variable, being found in addition to previous funerary structures (megalithic monuments), but also isolated or forming clusters.

However, these contexts have not been used as a demographic proxy so far, although being part of the transition explanatory narratives. In this sense, and to empirically test the validity of these hypotheses and start assessing the possible role that populational variability had on this transition in southern Portugal, a preliminary demographic approach based on cist burials will be presented. Some of the existing problems and limitation will also be highlighted and discussed.

232 SWORDS TO PLOUGHSHARES – CONCILIATION AS AN ALTERNATIVE TO CONFLICTS. A DIACHRONIC PERSPECTIVE BETWEEN LATE NEOLITHIC AND VIKING AGE

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Skorna, Henry - Kneisel, Jutta (Kiel University, Cluster of Excellence ROOTS) - Jaeger, Mateusz (Adam Mickiewicz University Poznań, Institute of European Culture) - Schneeweiß, Jens (Kiel University, Cluster of Excellence ROOTS; Centre for Baltic and Scandinavian Archaeology - ZBSA)

Format: Regular session

Thoughts on non-violent conflict solution strategies within pre- and proto historic societies are scarcely published, while works on warfare, warriors and violence are quite prominent in recent archaeological research. Violence and conflict can easily be read from material culture such as finds of weapons, war booties or even mass graves. But what about peaceful solutions? Naturally it is beneficial for everyone to either avoid, prevent, dissolve or end conflicts before the escalate ultimately.

The aim of this session is to spark a discussion about strategies to solve conflicts without violent means and identifying such strategies in the archaeological record. Fortifications as tool of spatial organisation defining borders can be seen as deescalating/deterrent and conflict reducing factor. Borders and territoriality might be another solution for conflict avoidance. Regional meeting places indicating coexistence. Weren't fortifications built as a deterrent as avoidance of conflicts? Do pit alignments in the landscape mark areas of influence or territorial claims? Does the joint use of rare resources suggest peaceful coexistence? Can diachronic patterns be observed that point to a connection between violence and a. o. the construction of fortifications, the laying down of weaponry hoards or mass graves?

Contributions which approach the following questions are welcome:

- What archaeological proxies can we use to identify violence avoiding strategies?
- Can we observe diachronic changes in the level of violent conflicts where a decline could be attributed to peaceful conflict resolution strategies?
- Is there a potential for reinterpretation or reevaluation of archaeological features like pit alignments, fortifications, (causewayed) enclosures, war booty sacrifices and weaponry hoards in the light of conflict avoidance or peaceful conflict resolution strategies?
- Can historical sources on peaceful solutions and conflict suppression (e.g. inter-group social relations as marriages, gift exchange, keeping/giving hostages etc.) can provide a clue for a new reading of archaeological sources in prehistoric Europe?
- How to balance the models between "real" or "symbolic" proxies of warfare and warriorhood?

ABSTRACTS:

1 GRASPING CONCILIATION IN THE EARLY BRONZE AGE

Abstract author(s): Skorna, Henry (Institut fuer Ur- und Fruehgeschichte Kiel; Kiel University, Cluster of Excellence ROOTS) - Batora, Jozef (Institute of Archaeology of the Slovak Academy of Sciences, Nitra)

Abstract format: Oral

Conflicts in archaeology are often equated with war and violence. This one-sided perception of the phenomenon is implicitly grounded on two premises: the emphasis on artefacts related to combat, interpreted as tools used for inter-group violence, and the interpretation of social discontinuities where conflicts are equated with catastrophic events. However, conflicts are a common encounter in social settings, representing contexts of divergent opinions, opposite choices as well as different outlooks on how to proceed in specific instances. Therefore, in order to fully understand instances of conflicts, it is necessary to expand the common sense

archaeological definition by identifying historical processes leading up and following their occurrence by incorporating the notion of conciliation. Since the formation of societies is always a process of solving problems or providing opportunities to overcome their potential ramifications, defining and determining forms of conciliation is necessary towards developing viable models of social developments.

The aim of this presentation is to explore the potential conflicts and conciliation on the basis of the Early Bronze Age fortified, multi-layered settlement of Vráble-Fidvár (Slovakia). By drawing from the anthropological theory of conflict and conciliation studies, the presentation aims at presenting the narrative of the historical trajectory of the site in order to identify the potential historical and everyday conflicts in order to determine social means of conciliation.

2 NEIGHBOURS MAKE BETTER ENEMIES – LOCAL SOCIETIES IN WAR AND PEACE DURING THE NORDIC BRONZE AGE

Abstract author(s): Horn, Christian (Gothenburg University) - Artursson, Magnus (Arkeologarna) - Austvoll, Knut (University of Oslo) - Nordvall, Linn - Potter, Rich - Ling, Johan (Gothenburg University)

Abstract format: Oral

On a broad scale, the Nordic Bronze Age (1800/1700- 550/500 BC) has produced a remarkably similar material culture across large swathes of Scandinavia and Northern Germany. Differences exist, but often come down to scale, with more accentuation during the Late Bronze Age. These societies are, therefore, often seen as uniform and coexisting without much conflict or competition. These are more often seen as having existed vertically between different social classes rather than horizontally between neighbouring groups. Other conflicts are often thought to have moved into the north through external groups. However, modelling local data such as rock art, weapon depositions, use-wear, and human remains indicate that most conflict was probably carried out between neighbours belonging to the same socio-cultural framework, interpreted as ranked societies, decentralized complexity, or chiefdoms. The data and theoretical considerations also indicate conflict avoidance strategies and conciliation in the form of depositional practices and natural boundaries in the landscape.

3 VATYA CULTURE FORTIFICATIONS IN CENTRAL HUNGARY. BUILDING INNER AND OUTER BORDERS IN THE MIDDLE BRONZE AGE

Abstract author(s): Jaeger, Mateusz (Adam Mickiewicz University in Poznań)

Abstract format: Oral

One of the most characteristic features of the Vaty culture communities dominating in the first half of the II millennium BC in the area of the central Danube basin, were massive fortifications built around the settlements.

For decades, the presence of fortifications has been interpreted as an expression of a specific defensive strategy to contain the tide of migrating Tumulus culture communities. The reason for this was not only the structure and scale of the fortifications, but also their location in space, suggesting the desire to defend the undefined borders of "archaeological cultures" equated with living communities.

Finds and discoveries from recent years indicate the likely more complex processes behind the fortification of settlements and their regional and chronological diversity.

The submitted paper aims not only to confront information about fortifications with knowledge about other sources related to warfare, but it will also concern specific cases of settlements whose fortifications not only surrounded the inhabited space, but also divided it into separate parts.

The long-term habitation of individual settlements, resulting in the creation of multi-layer and tell archaeological sites, allows for a discussion on the significance of territoriality phenomenon developing in the Bronze Age and the construction of boundaries (spatial and social) reflected in the preserved fortifications.

4 VISIBLE AND INVISIBLE BOUNDARIES IN LANDSCAPE

Abstract author(s): Kneisel, Jutta (Christian-Albrechts-University of Kiel; Johanna-Mestorf-Academy) - Rose, Laura (Christian-Albrechts-University of Kiel; ROOTS)

Abstract format: Oral

Conflict studies in prehistory is a topic that has received much attention in the past. But what about the reverse case of pacification or conflict resolution. Not only can fortified sites contribute to mutual territorial demarcation, they can also be erected as conflict resolution or conflict prevention. In recent years, large-scale linear boundaries have also been increasingly uncovered in the landscape, e.g. in northern or central Europe. These include pit alignments and pit zone alignments, but also cooking pit alignments and rows of palisades that stretch across the landscape for hundreds of metres. The construction of field boundaries and field divisions, house and settlement enclosures also show the need for demarcation, a phenomenon that begins in the Bronze Age and becomes increasingly common in the Iron Age.

The following contribution examines the significance of these linear boundaries, their occurrence in the landscape and their chronological classification. Did they serve to delimit territories and can a simultaneous evidence be found in material culture for conflict

potential such as weapons and defensive technology? Or did they serve other purposes, such as ritual gatherings, as is often assumed for the cooking pit alignments.

5 CHANGES IN LATE BRONZE AGE TRANSDANUBIAN WEAPON HOARDING

Abstract author(s): Tarbay, János Gábor (Hungarian National Museum)

Abstract format: Oral

The paper discusses trends in Late Bronze Age (ca. 1500-900 BC) weapon hoarding and its interpretation in Transdanubia, West Carpathian Basin. In this area, weapons were mainly selected to different kind of large scrap hoards besides burials, funerary hoards, and wetland sites. Based on use-wear analysis, a hoarded Transdanubian weapon can be an as-cast, a miscast, a used, or a heavily used object. Although the main trend is the selection of finished and functional products with minor or intense traces of use. From the perspective of the entire Transdanubian Late Bronze Age, hoarding of weapons is a continuous phenomenon. However, at the time of the Ha A1 (ca. 1200-1100 BC), we can observe a 'radical' increase in the quantity and variety of hoarded weapons compared to the previous and followings periods. These are generally used or heavily used objects that were intentionally fragmented and manipulated by plastic deformation. Towards the following periods (Ha A2/Ha B1–Ha B2) the quantity of hoarded weapons decreased intensively. One can also observe changes in styles, ways of manipulations and the reduction of functional types and disappearance of armours. The paper introduces this local trend in the context of the West Carpathian Basin and the Northern Balkans. It also seeks out explanations to the processes and causes behind these changes in weapon hoarding. Our main question is can the Ha A1 mass deposition and destruction of used weapons be interpreted as a manifestation of a collective conflict resolution strategy?

6 BROTHERS IN DISARM. A DE-ESCALATION PERSPECTIVE ON PREHISTORIC WEAPON SACRIFICES

Abstract author(s): Gentile, Valerio (Leiden University)

Abstract format: Oral

Archaeological and osteological data from Bronze Age and Early Iron Age Europe provide evidence for substantial armed encounters. In the same period, specific kinds of weaponry such as swords and spears were deliberately taken out of circulation and intentionally buried in hoards underground or deposited into rivers and lakes throughout the continent. In some cases, these weapons were also altered by the means of intentional destruction.

Current archaeological discourse often interprets these deposits as 'war booty' and sacrifices in which the weaponry of the enemy group was offered as a tribute to the gods by the victors. Such an interpretation sees the weapon sacrifice as an ultimate display of supremacy and an effort for the legitimization of 'status' by one party. Although these circumstances plausibly occurred in the past, one has to consider whether also other possible scenarios could have taken place.

In this talk, I will briefly present the reconstruction of the life-path of a sample of Late Bronze Age and Early Iron Age weaponry from different contexts through an in-depth artifact analysis. I will then expand on alternative perspectives on prehistoric weapon deposition and consider aspects such as togetherness, de-escalation of conflict, and short-term function as opposed to long-term memory formation.

7 IS THE WORLD FORCED OR PLANNED?

Abstract author(s): Chikunova, Irina (Tyumen scientific center SB RAS)

Abstract format: Oral

The Trans-Urals southern taiga was characterized by a favorable natural and climatic situation and was especially convenient for settlement in ancient times. The abundance of flowing lakes and numerous tributaries of large rivers contributed to a fairly dense settlement of this territory by a diverse population. This territory could satisfy the population with different economic preferences: hunters, fishermen, gatherers, cattle breeders and horse breeders. Various raw materials were also enough: clay, wood, marsh ore, hemp, bast, hides, leather, bone. Excavations of the settlement Lisiy Bor 2 have shown that in the early Middle Ages there were close relationships between the population of several cultural entities. Fragments of dishes of Bakalsky, Karymsky, Kushnarenkovsky and Ipkul cultural types were found together in one of the studied dwellings. The characteristics of the housing structure and the ceramic collection indicate the existence and use of this structure in the transition period from the Early Iron Age to the Middle Ages, in the IV-VII centuries AD. It is possible that the carriers of different cultures, having similar economic and cultural characteristics, practiced not only trade and exchange, but also marriage relations. These assumptions are indirectly confirmed by the materials of the neighboring settlement and the nearby Ipkul burial ground, which combines multicultural artifacts in one burial and/or burial mound.

What made them exist together? We can offer at least two possible answers:

1. The scattered remnants of the tribes, driven from their habitats by the Great Migration of peoples, were forced to find a suitable place for their economic life and put up with co-existence with refugees like them.
2. This area is very rich in archaeological sites. It is possible that the shores of Lake Ipkul were a "base", transshipment, guard or exchange point for traders or nomadic groups of multicultural population.

8 THE FUNCTION OF EARLY MEDIEVAL FORTIFICATIONS IN THE VOLGA-KAMA REGION: AN ARCHAEOLOGICAL PERSPECTIVE

Abstract author(s): Vyazov, Leonid (Kazan Federal University)

Abstract format: Oral

Hillforts occupy central positions in the Migration period agglomerations of the Middle Volga region, playing a formative role in spatial structure of local settlement groups. Slightly more than 100 of them, nearly all of promontory type and comparatively small, are known from the river Sura in the west to the river Belaya in the east and from the Kama to the Samara in the north-south direction. Despite being for a long time of investigations suggested to be used as refuges or fortified communal storages, those are of a very scarcely supported military implication. The geomorphological settings make a bulk of them useless in any kind of protection for widely opened nearby settlements, usually situated adjacent to the front side of rampart. The gateless type of earthworks devaluates the assessment of these enclosures as emergency protection for stored goods or fleeing people.

Typically, simultaneous houses inside the hillforts were not abundant and formed a homestead-type development with one central dwelling and several outbuildings around it (Maklasheevka, Osh-Pando, Imen'kovo). Outside homestead, numerous cache-pits and campfires fill the space. Artifacts found here support neither elitist nor communal-storage explanation of hillfort construction since there is no direct evidence of any difference in their assemblages between hillforts and nearby settlements. On the other side, it is hard to imagine hillforts with their impressive fortifications as dwelling places for some regular family communities.

We suppose that the archaeological evidence rather indicates the utilization of hillforts as some special centers of communal being and areas of public festivals. This can explain mandatory presence of hillforts within settlement groups as well as solid fortifications and excessive presence of some groups of artifacts in assemblages (such as hundreds of spindle-whorls and their fragments in Sholm). Some details of hillforts found parallels in ethnographic materials of Kama peoples.

9 NO FORTIFICATION IS NOT THE SOLUTION. CAN FORTIFICATIONS PROVIDE PEACE?

Abstract author(s): Schneeweiss, Jens (University of Kiel, Centre for Baltic and Scandinavian Archaeology; Cluster of Excellence ROOTS; University of Göttingen)

Abstract format: Oral

Conflict potential arises when several people come together. The potential for conflicts and the ways of coping with them are as manifold as people's interests are. Archaeologically, we can only approach a few of them. Peace leaves no traces that could be clearly interpreted. Concrete findings allow reliable statements to be made only when conflicts escalated and resulted in destruction and violence.

Most prehistoric and early historic fortifications reveal such traces. Nevertheless, it is possible to claim that fortifications have predominantly contributed to the de-escalation of conflicts, although they can never ultimately prevent them completely. There is more than a hillfort to an effective defence system set up against a concrete threat. Its efficiency and configuration depend on the type and strength of the threat. In addition to the actual military-strategic function of a fortification, which can be directed against a siege, for example, it has also a symbolic dimension, which is not only expressed in the deterrence of potential opponents. The construction of a fortification is a great collective work that creates a sense of community and can have an identity-forming impact, especially if it is directed against an external threat. It does not matter how real this threat is. Strengthening the community has a de-escalating effect internally and externally.

In most cases, the castles will have fulfilled their de-escalating potential, even if they sooner or later became subject to an escalation of violence. For the identification of peace phases from an archaeological perspective, it is therefore important to know the entire lifespan and period of use of a stronghold and to put it in relation to the verifiable evidence of battle and violence. Often the destruction is only the end of a longer, sometimes decades-long peaceful or at least non-combatant use of a fortification.

10 THE BUSINESS OF WAR. THE ROLE OF THE ROMAN ARMY IN BUILDING NEW POLITICAL AND ECONOMIC REALITIES IN LOWER MOESIA

Abstract author(s): Duch, Michal (Adam Mickiewicz University in Poznan)

Abstract format: Oral

The expansion of the Roman Empire since the 1st century BC in the Balkans was carried out as part of extensive and often very brutal military operations. As a result, territories along the lower Danube were included in the Empire. One of the provinces resulting from these conquests was Lower Moesia (Moesia Inferior).

The proposed presentation focuses on the stage that followed the period of intense military actions by the Roman army. The sources that show the Roman army primarily as a stimulator of economic changes, enabling the inclusion of the conquered area into the economic structures of the Roman Empire will be analyzed.

The effects of the economic actions taken by the army, its individual units and individual soldiers, which had an impact on the shape and functioning of the local economy, will be discussed. From the very beginning of the existence of Lower Moesia, the Romans adapted its economy to the needs of the army stationed in its area. As a result, this led to the development of a peculiar economic system in which almost every aspect of the economic life of Lower Moesia was related to the military. In order to achieve this goal, it

was necessary, on the one hand, to maintain the military readiness of the legions, and on the other hand, to build peaceful relations with the local communities of the conquered inhabitants of the province.

11 CLAD IN PEACEFUL TOGA. ON THE ROLE OF DRESS IN THE CULTURAL EXCHANGE BETWEEN ROMAN EMPIRE AND DANUBIAN PROVINCES

Abstract author(s): Kaczmarek, Zofia (Adam Mickiewicz University)

Abstract format: Oral

On their path to the military and economical conquest of the known world, Romans met different indigenous communities. As a result of meeting the other, the identities of both Romans and indigenous population had to be renegotiated to find their place in the fluctuating society. This could be achieved with violent solutions, like rebellions, but also peacefully – with the cultural exchange. The latter is clearly visible regarding dress and fashion. It can be also considered an universal medium of communication - clothing for Romans was of vital importance, as it determined gender, age, function, identity or status of the wearer. It seems that for indigenous populations of Roman Noricum and Pannonia in the 1st to 3rd centuries AD clothes have also become a medium of sustaining and reinforcing their identity. The analysis of the provincial material and visual cultures proves that clothing can also be considered a symbol of peaceful opposition and disagreement with the process of integration with the Roman Empire (i.e., Romanization).

233 IN SEARCH OF THE URBAN HABITAT: EXPLORING THE CONNECTION BETWEEN TOWNS AND THEIR ENVIRONMENT IN TIME AND SPACE (URBAN ARCHAEOLOGY)

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Bouwmeester, Jeroen (Cultural Heritage Agency of the Netherlands) - Balbi, Nicholas (Colchester Archaeological Group) - Belford, Paul (Clwyd-Powys Archaeological Trust)

Format: Regular session

The town and the environment are closely connected. A determining factor within the environment is the landscape, but other aspects can also play an important role like climate, natural resources, stars and cardinal points. It is this environment which determines the location of towns – and not only the location, but also spatial orientation, form and layout, infrastructure, buildings. Even the reasons for their existence, and the way towns functioned and developed can't be understood without the environment. In this main session of the EAA Urban Archaeology Community we would like to investigate this relationship more closely.

The relationship between towns and their environment can be explored on four different levels:

- The location of towns;
- The layout of towns;
- The type of buildings and structures within towns and how they are constructed;
- The way towns function in relation to its surroundings.

The main questions for this session are how these levels are manifested and more important why and when, as towns are not static entities and are continuously changing. The next main question is whether the interaction with the environment is a local or supra-local phenomenon. Are interconnections between towns, regions and periods recognisable and how do they manifest?

In this session we will explicitly not focus on one specific period and region. Exploring the diversity throughout time and space can help us develop a better understanding of underlying patterns and interconnections. This will also be the focus in the discussion slots of this session.

We welcome contributions from across Europe and outside Europe which addresses one or more of these themes.

ABSTRACTS:

1 THE IMPORTANCE OF THE ENVIRONMENT FOR THE EARLY URBANIZATION IN DENMARK

Abstract author(s): Runge, Mads (Odense City Museums)

Abstract format: Oral

In the research project, From Central Space to Urban Place, funded by the VELUX FOUNDATION, the early urbanization in southern Scandinavia is analyzed based on the relationship between town and hinterland within the period 400-1100 AD. The project involves archeology, history, place names and natural sciences and the participants come from a streak of museums and universities. The project has just come to an end.

The focus of the project is the urbanization process leading to the emergence of the two Danish towns, Aalborg in North Jutland and Odense on Funen. Both towns emerged in fjord landscapes rich in archaeological prestige findings, predating the towns' establishment around 900 AD. However, the two fjord landscapes are very different. The Limfjord, where Aalborg is located, is a central waterway with an important function for national and international traffic east-west. At the same time, the hinterland is characterized by distinctive hill islands and large marine foreland, which have set very sharp boundaries for the settlement's location. The fjord landscape around Odense has a different character, where several natural harbors are an important element. At the same time

the landscape around Odense fjord is less "hilly" although with some distinctive plateaus. The landscape variations lead to varying driving forces in the urbanization process.

The landscape's variation between the two areas meant that communities in Aalborg and its hinterland were oriented towards the water and, to some extent the international contacts, while Odense rather oriented itself towards the inland and the local and regional connections. On this background the two areas underwent various developments within the study period. Where significant centrality-creating factors for Aalborg seem to be trade and international contacts, centrality in the religious and military sphere is decisive for Odense's background. These conditions meant that the earliest towns had a different design.

2 CROSSING THE LINES – URBAN RELATIONSHIPS WITHIN VIKING-AGE IRELAND

Abstract author(s): Boyd, Rebecca (University College Cork)

Abstract format: Oral

Boyd's current work explores the emergence of towns in Viking Ireland. Despite a homogeneity of architecture in the Viking Age, these three towns of Dublin, Waterford and Cork, develop in quite different environments and at different points in the chronology. This paper seeks to expand our understanding of the different landscape and chronological contexts within which Dublin, Waterford and Cork emerged and grew between the 9th and 12th centuries AD. Whilst much attention has focussed on Dublin's 9th and 10th century relationships between Dublin and York or Kaupang, or on 12th and 13th century connections with Bristol or Chester, less is known about links between these towns in Ireland.

Beginning with a physical comparison of their surroundings, we will compare their physical locations and different types of landscape settings – rivers, hills, mountains, coasts, marshes. We will look at town boundaries – constructed walls or natural boundaries such as waterways – as well as connecting routeways between the towns. Especially important will be the connections via waterways – rivers, lakes and coasts. We will consider how these towns began to transgress these boundaries over time, establishing suburban growth, connecting with suppliers outside the town walls and connecting with each other. This can be achieved through comparisons of material culture, find spots and environmental data.

Finally, we will consider questions of scale, pace and change over time in each town and comparatively between the towns. Can we reflect the pace and nature of developments of 9th century Dublin with developments of the first urban phases in 11th century Cork or Waterford? How quickly did these later settlements develop suburban growth in comparison to Dublin? Historically, Dublin has always outpaced other urban centres in Ireland – does this stretch back to its origins as Ireland's first town?

3 ARLES: THE STUDY OF CULTURAL AND POLITICAL PROTAGONIST AS PROTECTION AGAINST URBAN DEVELOPMENT

Abstract author(s): Balbi, Jose (Colchester Archaeological Group; Dirección de Cultura y Educación BA) - Leone, Isabella (SIA (Società Italiana de Archaeo Astronomia) - Balbi, Carolina (FADU - Facultad de Arquitectura, diseño y Urbanismo - Universidad de Buenos Aires)

Abstract format: Oral

This work is oriented with historical-archaeological rigor to study the city urban development and the relationships with History, Culture and conservation. Arles, in French Provence, where we can go back millennia to study its history and which today essentially faces that what we call a "tourist urbanization", with a very important cultural heritage.

Our question is: If modern societies have in many cases destroyed their cultural heritage in pursuit of development and progress and the search for the preservation of cultural treasures stop urban transformations, could heritage protection be an end to the line of the city time? The tasks would include the definition of identity, protection of the remains, the opening of its contents for use in studies and, eventually, tourism development at different levels, with a strict protection and conservation program.

The proposal is a brief but impressive journey on the History of this city, small in size but of enormous cultural, religious and political importance; the archaeological analysis of its buildings and monuments and its comparison with the usual indicators: urban development and demographic variations, adding a brief observation on its economic and cultural present.

We will see the functionality of its buildings, the Archaeo-astronomical orientations, the relationship of the constructions with the landscape and the disappeared constructions, and their functions and position in the current city.

At the end we will be able to feel the historical development of a city appreciated by Ligurians, Phoenicians, Greeks, Romans, medieval Christians, Burgundians, Franks and Germanics among others, its royal coronations, its religious and political importance in the Middle Ages and the protagonists who positioned the city in the European power game for centuries and whose landscape was immortalized, almost at the turn of the last century, with the brushstrokes of an inspired Vincent Van Gogh.

4 TOWNS BY THE KING'S WILL – URBANISATION IN THE NORTH-EASTERN TRANSDANUBIAN REGION OF HUNGARY BETWEEN THE 11TH-16TH CENTURIES

Abstract author(s): Kolláth, Ágnes (Institute of Archaeology, Research Centre for the Humanities)

Abstract format: Oral

The Hungarians had established their kingdom at the turn of the 10th-11th centuries in the Carpathian Basin. The ruling Árpád Dynasty had chosen the middle part of the country as their core territory, constantly moving between smaller manor houses and a few main seats. The locations of the latter had been chosen with particularly great care and the kings constantly supported their development. Large-scale building projects (town walls, churches, marketplaces, etc.) had been carried out, and they had been first made ecclesiastical, then secular administrative centres. The Árpáadian kings and their successors of various dynasties had given out privileges to them as well, but not all of these would-be towns could use them equally. Their development was influenced by both external and internal factors, like the Mongolian invasion of 1241-1242; or losing their rights as free cities to the episcopates rising in power. Consequently, they have reached different levels of urbanisation, with Buda emerging as the true capital of the kingdom by the end of the 15th century.

The paper aims to examine the topographic features that had played a role in choosing the sites of these settlements, their changes in territory and infrastructure through the centuries. The main focus will be on Székesfehérvár (the coronation town of the Hungarian kings) to present the results of its archaeological topography project in progress, but the other cities of the region (e.g. Esztergom, Győr, Veszprém, Buda and Visegrád) will also be discussed.

5 TOWN REDEFINED. SOCIO-ECOLOGICAL SYSTEMS OF TAKLAMAKAN DESERT'S OASES AND THE PROBLEM OF ENVIRONMENTAL RESILIENCE

Abstract author(s): Hanus, Kasper Jan (TBD)

Abstract format: Oral

The arid environment of the Taklamakan Desert (contemporary Xinjiang, western China) might be seen as a hostile one from a perspective of temperate Europe. Nevertheless, since prehistoric times there were human societies, which called that place "home". My presentation highlights how the inhabitants of oasis-towns, focusing on the first half of the first millennium CE, interacted with their environment. The study of archaeological and historical record suggest ingenuity in landscape modification, which were facilitating resilience. Those resilience-improving endeavours included a distinct layout of settlements and types of building and structures. During the presentation, I will introduce the audience to comprehensive models of local socio-ecological systems, which allowed me to evaluate connections between various human and environmental problems. The configuration is not surprisingly different from regional socio-ecological systems of historic Europe and provides a new perspective on possible arrangements between people, towns they inhabited and the environment they were part of.

6 OPPIDUM AS AN URBAN LANDSCAPE. MULTIDISCIPLINARY APPROACH TO THE STUDY OF EMPTY SPACES 'INTRA MUROS'

Abstract author(s): Golánová, Petra (Masaryk University, Department of Archaeology and Museology, Brno) - Hajnalová, Mária (Constantine the Philosopher University, Nitra) - Lisá, Lenka (Institute of Geology CAS, Prague) - Milo, Peter (Masaryk University, Department of Archaeology and Museology, Brno) - Patrik, Flammer (Oxford University, Department of Zoology) - Petr, Libor (Masaryk University, Department of Botany and Zoology, Brno) - Petřík, Jan (Masaryk University, Department of Geology and Department, Brno) - Fránková, Markéta (Institut of Botany CAS, Department of Paleocology, Brno)

Abstract format: Oral

'Empty spaces' within urban centres are deliberately not built up and are maintained as such for a prolonged period of time. The archaeological excavations of oppida - the fortified urbanized centres spanning the Late Iron Age to Early Roman transition - almost exclusively focus on the originally built-up areas. Projects studying the entire enclosed area as one urban space, and thus, also looking at the role and function of seemingly 'empty' areas, are rare. The extensive use of geophysics at these sites during the last decade has substantially extended the knowledge gained through excavations. The possible structures detected during these surveys have only rarely been verified by subsequent archaeological excavations, and no special attention has been paid to the areas where no traces of buildings have been found. The function of large areas within the hilltop oppida with almost no traces of human activities is not clear. Several possible functions have been suggested for their role, such as use as fields, pastures, space for social events (gatherings, marketplaces), refuge, or spare land for urban development.

This paper presents a multidisciplinary approach for the examination of such a large empty spaces based on a case study - oppidum Bibracte/Mount Beuvray (Burgundy, France).

7 THE ORGANISATION OF THE URBAN SPACE: A GEOARCHAEOLOGICAL PERSPECTIVE

Abstract author(s): Devos, Yannick (Vrije Universiteit Brussel)

Abstract format: Oral

Many European historical town centres are affected by major transformations. This frequently results in the removal of tons of soils and sediments, including the ubiquitous Dark Earths: thick, dark coloured, humic, homogeneous units that cover large surfaces

and that are often rich in archaeological remains, including 'floating' archaeological structures (Nicosia et al., 2017). Due to a lack of internal stratigraphy they compose a major challenge for urban archaeologists. Over the last decades geoarchaeology, and soil micromorphology in particular, has shown to be a particularly valuable approach as it permits to recognise the major processes involved in their formation and to detect human activities and natural events triggering them. Beyond understanding the stratigraphy of each individual site and the reconstruction of the individual site biographies, systematic research on the Dark Earth in the historical centre of Brussels significantly contributes to the understanding of the evolution of the spatial organisation of the town as the location of houses, gardens, quarries, crop fields and grasslands can be detailed for different time periods, including the periods for which almost no other resources are available.

Reference:

- Nicosia, C., Devos, Y. & Macphail, R.I., 2017. European "Dark Earth". In: Nicosia, C. & Stoops, G. (Eds.), Archaeological Soil and Sediments Micromorphology. Wiley, Oxford, pp. 331-343.

8 SPA TOWNS AS SPECIAL SETTLEMENTS LINKED TO THE NATURAL RESOURCE OF HEALING SPRINGS

Abstract author(s): Schaer, Andrea (Berne University, Institute of Archaeological Sciences)

Abstract format: Oral

The emergence of spa towns is linked to two factors: the presence of the healing springs and the appreciation of these springs by the people. The latter, in particular, determines the short- and long-term development, the existence or disappearance of this particular type of settlements during the times.

Some spa towns are developing into regional centres with the corresponding functions and infrastructures. Others remain rather isolated and focused of the single purpose of bathing-tourism.

Against the backdrop of changing political and social structures, value systems and developing medical science, the importance and the image spa towns is constantly changing.

The paper presents the development of the Swiss spa town of Baden (Canton Aargau) through two millenia from the roman Aquae passing by the medieval "Wildbad" to today's modern city, that is just about to rediscover its unique history as a spa.

In addition to the presentation of the archaeology and history of the particular infrastructure of the spa, the paper examines the specific interactions between the special settlement type of the spa as a place of otium and the "ordinary every day" city of the negotium.

9 WHEN PROFIT CREATED A TOWN – URBAN LANDSCAPE OF MEDIEVAL MINING TOWNS IN CENTRAL EUROPE

Abstract author(s): Cembrzynski, Pawel (Cluster of Excellence ROOTS, Kiel University)

Abstract format: Oral

The economy of mining towns was based on the extraction of mineral resources. This fact impacted their localization, morphology and built environment. This paper aims to show how mining shaped the urban form in case of medieval towns. To achieve that I will analyse archaeological and written sources from several sites in Central Europe (Germany, Czechia, Slovakia, Poland).

Medieval miners tended to settle down close to mines. In some cases, mining settlements developed into a town (a place with urban status). Many of them had never grown larger than a village and were eventually abandoned, but several became major urban centres. Such centres were located on mining fields or very close to them in rough terrain. They developed "organically", without organised structure, along older communication routes and settlement nuclei or in some cases were founded by lords as a town with a regular grid. The layout was often shaped by existing elements of mining operations (old shafts, waste heaps etc.). Buildings belonging to mining authorities alongside infrastructural elements (shafts, ore mills, smelters) were typically located in the town's area. Large incomes generated by mines attracted investors, merchants and artisans, who created a wealthy urban commune. They manifested their status by outstanding, highly decorative elements of architecture (churches, houses). Nevertheless, living in the vicinity of mines had a price. The land was deforested and eroded, smelting sites were often close to the town causing a constant threat to health due to toxic fumes. Besides, mining towns were very vulnerable to crises in mining production. These could easily lead to the impoverishment of miners and urban commune resulting in depopulation. Once flourishing centre could quickly fall into decay and lose its' position as a hub of financial and social development.

10 "LIFE IN A COLD, REMOTE PLACE": EXAMINING THE RELATIONSHIP BETWEEN THE ENVIRONMENT AND A 20TH CENTURY ICELANDIC HERRING TOWN

Abstract author(s): Westmont, V. Camille (University of the South)

Abstract format: Oral

Changes in Icelandic society in the 19th century spurred previously small villages on Iceland's North Coast to develop into full-fledged towns supported by fishing industries. Although these towns developed well into the late modern period, their marginal environments and remote locations meant that the development of the fishing towns was oftentimes heavily shaped by both the landscape and available natural resources. This paper examines the industrial rise and decline of Siglufjörður during the 20th century with particular reference to the relationship between the environment and the structure and development of the town. Drawing on

aerial and ground photography, I examine how feedback loops between the environment and human activity brought Siglufjörður to the brink of collapse -- but also created reservoirs for new potential. By examining the development and growth of the town from an environmental perspective, we can develop a fuller understanding of the relationship between human industrial activities and nature.

11 BUILDING (ON) THE URBAN LANDSCAPE IN THE NETHERLANDS. FROM ADAPTING TO CREATING THE URBAN ENVIRONMENT

Abstract author(s): Bouwmeester, Jeroen (Cultural Heritage Agency of the Netherlands)

Abstract format: Oral

Traditionally the landscape and environment were considered as a very, if not the most, deterrent factor on urban development and the way buildings within towns were constructed. In my paper I would like to argue that during the rise of towns in the Netherlands a change of attitude arose towards buildings in relation to the landscape. It is true that in the early towns the way buildings were constructed was very much adapted to the type of soil and landscape. For example, heavy buildings would sink into the wet peat and clay subsoils, so as a consequence the buildings were small and lightweight. During the high Middle Ages this changed. New technologies were introduced. Foundations were adapted to meet the special requirements of these environments. In Dordrecht they went even one step further and made heavy adaptations to the subsoil of a new town quarter. They constructed large wooden frameworks filled with clay on which heavy brick houses had been built.

The environment and subsoil weren't the decisive criteria anymore for the construction method. Far more important became other factors like the availability of certain building materials like brick and wood. This could also explain why in some regions the construction of brick town walls were relatively late compared to other parts of the Netherlands.

In this dynamic period the concept of dealing with the environment changed. Men changed the environment to be able to build where and what they wanted. This became one of the pillars of the medieval urbanization of the Netherlands resulting in one of the most dense urbanized regions within Europe.

12 EMBEDDING AND DEFENDING ANCIENT MESSENE IN ITS LANDSCAPE: THE CASE OF A GREEK CITY OF THE 4TH C. BC

Abstract author(s): Mùth-Frederiksen, Silke (National Museum of Denmark)

Abstract format: Oral

The city of Messene in the south-western Peloponnese was founded as the new Messenian capital after the liberation of the Messenians from Spartan supremacy in 369 BC and was laid out at the south-western foot of the prominent rock Mt. Ithome (802 m). This contribution will analyse how the layout of the city and its defences was adapted to the terrain and how the landscape was actively used to strengthen its protection. Moreover, it will investigate the location of fortifications in the closer surroundings as well as the whole region of Messenia with the aim of evaluating possible overarching protection plans.

The street network of the new city was organised almost regularly and stretched homogeneously over all its area, a few deviations probably representing reminiscences to old sanctuaries and reflecting the city's search for historical identity. The grid was oriented after the general slope of the hill, but as it was the custom of Classical Greek cities, it did not react to smaller changes of terrain and was rather implemented in spite of such challenges. The city walls followed the best possible line of natural protections around the city in order to fully exploit the terrain for defence. Additional fortifications can be observed on prominent hills and crests around Messene and although difficult to date, they seem to be related to the city walls, which could point to a landscape-integrated fortification programme at some point before the Roman conquest of Greece. Furthermore, there are indications for the systematic protection of the most important routes into Messenia from neighbouring regions by fortifying distinctive features in the border landscapes, and it will be evaluated in this contribution, in how far this allows conclusions on an overarching fortification plan on the regional scope.

13 ANCIENT MAKYNEIA IN WESTERN GREECE: THE EVOLUTION OF AN AETOLIAN SITE THROUGH TIME AND ITS CONNECTION TO THE SURROUNDING LANDSCAPE

Abstract author(s): Georma, Fragoula - Saranti, Foteini (Hellenic Ministry of Culture and Sports / Ephorate of Antiquities of Aitolokarnania and Lefkada) - Vlachopoulos, Andreas (University of Ioannina)

Abstract format: Oral

Makynia is known through ancient texts as a Greek town of Western Lokris that was incorporated in Aetolia around the middle of the 4th century BC. Settlement remains, most probably belonging to this small town, were excavated in 2009-2015 during the construction of a highway crossing the Prefecture of Aitolokarnania in West Greece.

The habitation site is located a few kilometers northwest of the Antirrio pass, at a favorable location: next to a copious stream, along a central land route and close to the coast. Due to these advantages it attracted habitation since prehistoric times and had a long-lasting history extending mainly from Late Geometric to Hellenistic times. The settlement remained un-walled throughout its history, while a small citadel with excellent view, a few hundred meters to the northwest, served as a refuge for the urban and rural communities in times of danger.

The excavated part of the settlement comprises of 32 buildings, representing private houses of different periods and types. They are valuable examples of domestic architecture in the region of Western Greece in terms of layout and spatial organization of the town, house plans, building techniques and materials.

The features and overall layout of the settlement eloquently indicate the interactive relationship with the surrounding landscape, especially as throughout its life an irregular town plan, with clusters of buildings adjusted to the natural slope and ground morphology, was retained. The houses were oriented southwards, making best use of the light and sun and adapted to ground features, while irregular roads and pathways followed the contour lines. Other constructions as wells, water-tanks and drains indicate the treatment of water as a valuable natural resource through communal works aiming at the sustainability of the settlement.

235 IS MACHINE LEARNING IN ARCHAEOLOGY FACT OR FICTION?

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Price, Henry (Imperial College London) - Girotto, Chiara (Ludwig-Maximilians-University Munich)

Format: Discussion session

Based on last year's session "Traum -Tracing Reality in Archaeology Using Machine learning" we aim to expand on this idea. The tremendous potential of machine learning is starting to be explored in archaeology alongside network models and other more traditional statistical applications. However, if these are used to explore new societal structure quite often social theory as well as methodological assumptions are neither discussed nor explored. Predominantly, this applies to the fact that human society is a complex system and therefore inherently more than the sum of its part.

We fully endorse the idea that including complexity is not requisite in all models and one should always choose the most basic approach that still explains the phenomenon. However, current social models are often harnessing the power of machine learning and modelling as they are able to spot new patterns, invisible to humans and standard approaches. This power comes with new problems, as the usual approaches are black box based. Whilst these can be judged by their accuracy, they cannot be easily understood. Without prior white box modelling and feature engineering these results are almost non-interpretable. Without strict, clear feature classification and knowledge of the data itself the model's outcome more often resembles magic than usable results.

In our session we aim to discuss new approaches to Machine Learning in archaeology, to work on a framework for these models in social and theoretical archaeology as well as explore their ties to complexity theory and how it can improve results.

ABSTRACTS:

1 SHINING A LIGHT INTO A BLACK BOX USING GRAD-CAM APPROACHES TO MAKE AUTOMATIC CLASSIFICATION MORE EXPLAINABLE

Abstract author(s): van Helden, Daniël - Woldegeorgis, Eliyas - Zhou, Quinghua - Tyukin, Ivan - Allison, Penelope - Nuñez Jareño, Santos (University of Leicester)

Abstract format: Oral

Machine Learning outputs traditionally have a high 'black box-ness'. We can evaluate the accuracy of the results and use this to evaluate the machine's performance on a specific task, but this often comes down to just believing the machine does what it is supposed to until it makes a demonstrable mistake. In very simple tasks, it is sometimes possible to reason backwards from patterns of mistakes to make educated guesses about what went wrong, but we do not really know. Furthermore, as Machine Learning's major selling point is that it can be used to spot patterns in very complex material where humans cannot, this option is generally not available in real-life applications of Machine Learning.

In this paper, we present the results of an experiment we ran as part of the Arch-I-Scan project, in which we used Grad-CAM to gain insight into our classifier's performance for recording Roman pottery, and specifically tablewares. We have an AI classifier trained to classify photographs of whole vessels. Grad-CAM examines the gradients in the feature space to see which layers in the classifier contributed the most to a particular classification. This can then be visualised as a heat map on the original photograph, showing which regions of the image were considered to be distinctive by the classifier. This form of transparency can contribute a lot to the trustworthiness of our classifier, since we can see what influenced its decisions. In a later stage, it can potentially be used as a feedback mechanism, informing us about the difficulties the classifier has and allowing us to modify the training set to better equip the machine for its task.

2 AUTOMATED CLASSIFICATION OF CERAMIC FABRICS WITH CONVOLUTIONAL NEURAL NETWORKS: A CASE STUDY FROM THE SITE OF GUADALUPE IN NORTHEAST HONDURAS

Abstract author(s): Lyons, Mike (University of Bonn; German Archaeological Institute)

Abstract format: Oral

This paper proposes a new method using machine learning with convolutional neural networks to automatically classify ceramic fabrics. The characterization and classification of ceramics are among the more fundamental and long-practiced archaeological goals through which questions regarding ceramic technology, provenance, and exchange can be better understood. One of the well-estab-

lished means of pursuing these goals is with ceramic petrography, which analyzes ceramic material in thin sections under a polarized light microscope. A major issue in petrographic thin section analysis of ceramic materials is the challenge and time-consuming nature of classifying fabrics. This requires an expert to look through a collection of thin sections and manually sort them based on their experience in the field and knowledge of existing ceramic fabrics. Here, a model was trained on 1069 labeled thin section images of five ceramic fabrics from the site of Guadalupe in northeast Honduras. The model is able to classify fabrics with an accuracy of 96.3% while ensuring that sherds unfamiliar to the model are tested, and 99.1% when using the standard 80:10:10 partitions of training, validation, and testing images. The approach is based on a rather small sample of 24 sherds but has great potential to be applied to larger, more extensive collections and archives of ceramic thin sections from other regions as well. The method is not a replacement for expert analysis or the in-depth understanding that accompanies it. Still, it does present the possibility of extending expert knowledge in such a way that expedites and eases the difficulty of classification for broader use.

3 BALANCING BIOARCHAEOLOGY AND MACHINE LEARNING AS INTERDISCIPLINARY YIN AND YANG

Abstract author(s): Mircea, Cristina (Department of Molecular Biology and Biotechnology, Faculty of Biology and Geology, Babes-Bolyai University, Cluj-Napoca; Molecular Biology Center, Interdisciplinary Research Institute on Bio Nano Sciences, Babes-Bolyai University, Cluj-Napoca) - Mircea, Ioan (Department of Computer Science, Faculty of Mathematics and Informatics, Babes-Bolyai University, Cluj-Napoca) - Kelemen, Beatrice (Department of Molecular Biology and Biotechnology, Faculty of Biology and Geology, Babes-Bolyai University, Cluj-Napoca; Molecular Biology Center, Interdisciplinary Research Institute on Bio Nano Sciences, Babes-Bolyai University, Cluj-Napoca)

Abstract format: Oral

It has become now more apparent than ever that we are facing a bottleneck when it comes to achieving true interdisciplinarity between Machine Learning and Deep Learning and other areas of scientific research. Although domains of deep social importance such as the medical or economical fields have already progressively started complying with the requirements imposed by the Machine Learning realm, leading the research deeper into exciting uncharted territories, there is still much to be achieved to enabling true interdisciplinarity between contemporary archaeology and the enormous potential offered by novel machine learning techniques.

The purpose of the present study is to distinguish the bottlenecks that prevent a better manifestation of interdisciplinarity between the realms of state-of-the-art Artificial Intelligence and the already interdisciplinary world of Bioarchaeology based on the analysis of concrete case studies. The assessment of such bottlenecks will provide solutions to overcoming the current standstill and widening new interdisciplinary horizons in the form of a novel rendition of archaeological data harvesting methodologies both on-site and in the laboratory on the one hand and new measures of performance for machine learning-based algorithms, customized to the Bioarchaeological scientific needs, on the other hand. These two complementary actions are intended to bring balance to the interdisciplinary duality of the monad that organically and inextricably binds Machine Learning and Bioarchaeology altogether.

4 THE TREATMENT OF MISSING VALUES IN THE ANALYSIS OF PREHISTORIC EUROPEAN ANTHROPOLOGICAL DATA

Abstract author(s): Ryan-Despraz, Jessica (University of Geneva) - Villotte, Sébastien (University of Bordeaux) - Desideri, Jocelyne - Besse, Marie (University of Geneva)

Abstract format: Oral

In recent years, the fields of archaeology and anthropology have begun to see a shift in the standard methods of data analysis. In addition to the traditional hypothesis testing, various methods of machine learning and modeling are also becoming more common. A recent study examining skeletons from the Bell Beaker period of the third millennium BCE in Europe attempted to address and apply modeling methods in terms of data missingness. Osteological remains, especially those dating to prehistory, are rarely well-preserved and for this reason even the most thorough methods of data acquisition will contain missing data. This study therefore applied data imputation models to missing at random (MAR) datasets using the MICE (Multivariate Imputation by Chained Equations) package in R for quantitative data and the missMDA (Handling Missing Values with Multivariate Data Analysis) package for qualitative data. These approaches not only enable analyses applying dimension reduction (e.g. PCA and MCA), but imputations also allow for the exploitation of data that listwise deletion would have otherwise excluded. This communication will additionally explore the application of these methods to datasets containing various data types, including both quantitative and qualitative data, as well as evaluate the efficacy of these methods. Lastly, it is worth considering the other functions of these imputation modeling tools, such as for regression analyses. A critical look at these methods will evaluate not only their feasibility for non-statisticians, but also their reliability as a tool in anthropological and archaeological science. Applying such additional steps to a complete data analysis protocol has the potential to provide valuable supplementary insights to numerous studies in archaeology and anthropology.

236 REPRESENTATION MATTERS – DIVERSITY IN VISUAL REPRESENTATIONS OF THE PAST

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Scheyhing, Nicola (Seminar of Oriental Archaeology and Art History, Martin-Luther-University Halle) - Gutschmidt-Schumann, Doris (Department of Archaeology and Cultural Anthropology, Rheinische Friedrich-Wilhelms-University Bonn) - Matias, Jo Zalea (Department of Social Science, Wilbur Wright College Chicago)

Format: Regular session

Visual representation of the past are powerful tools to communicate archaeological research to the general public. Image of the past can be found in popular media as well as in museums, books, and heritage communication, to name a few. These images shape not only the popular perception of the past, but also the popular understanding of archaeological scientific work.

In the last few years, the representation of men, women and children in the visual picture of the past has been discussed in detail. However, other aspects of diversity and intersectionality still remain underrepresented, namely the representation of people of color, disabled individuals, and the elderly.

Therefore, important members of society are often missing in visual representations of European past. This is especially important as past individuals could serve as integrative links in museums, books and documentations. Representation and visibility in the past matters as much as it does in the present.

In this session, we would like to ask for contributions focusing on the diversity of past societies in visual representation and popular science communication. What representation exists, especially for marginalized groups? In which ways are they displayed and in what roles are they represented? Do these create a true representation of the past that can be linked to the archaeological record or do they fall into stereotypes?

ABSTRACTS:

1 REPRESENTATION MATTERS – HOW DIVERSE IS OUR VISUAL REPRESENTATION OF THE DE FACTO PAST?

Abstract author(s): Scheyhing, Nicola (Seminar for Oriental Archaeology and Art History, Martin-Luther-University Halle) - Gutschmidt-Schumann, Doris (FU Berlin) - Matias, Jo Zalea (Department of Social Science, Wilbur Wright College Chicago)

Abstract format: Oral

The situation of Museums and other Institutions during the Covid-19 pandemic event stirred a newly enlivened discussion on the responsibilities and roles of science communication.

The 2020 NEMO (European Network of Museum Organisations) conference "Museums and Social Responsibility – Values Revisited" stated that Museums have a significant responsibility in the development and preservation of social values in communities. They declared analogous to a new statement of ICOM the importance of such institutions for moral guidance throughout the present challenges in Europe. Both explicitly mentioned migration, integration and inclusion of all parts of society.

In archaeology, visual representations are a common used tool. Pictures, drawings, videos or animated images are an easy accessible, low maintenance possibility to communicate and vivify information. Yet, are the images we create representative of past societies?

In the last decades, several conference sessions, publications, discussion groups and round tables focused on the representation of gender and childhood in the picture of the past. However, we are still missing a discussion on the virtual representation of the past towards the visibility of BIPOC, those with disabilities, and the elderly.

To challenge this absence, we would like to address broader diversity in the visible picture of the Past, with the goals of inclusion and fighting harmful stereotypes. We would like to challenge the presumption that in most cases the visible representation created for past societies is coded as white, young, and visibly able-bodied. Therefore, we ask:

- Do visual representations in archaeology offer a realistic image of past societies? Are they rooted in archaeological data or affected by other factors (personal bias, creative license, etc.)?
- Besides gender stereotypes, are other stereotypes dominating reconstructions in museums and publications?
- What picture of past societies are we offering to the public?
- Do archaeologically-created visual representations of the past reference the public?

2 CRITICAL APPROACHES TO ARCHAEOLOGICAL VISUAL REPRESENTATIONS: THE PASTWOMEN PROJECT

Abstract author(s): Masriera-Esquerri, Clara (Universitat Autònoma de Barcelona - UAB; Universitat de Barcelona - UB) - Colomer-Solsona, Laia (Norsk Institutt for kulturminneforskning - NIKU) - Delgado-Hervás, Ana (Universitat Pompeu Fabra - UPF) - Díaz-Zorita-Bonilla, Marta (Eberhard Karls Universität Tübingen) - González-Marcén, Paloma (Universitat Autònoma de Barcelona - UAB) - Herranz-Sánchez, Ana Belén (Universidad de Jaén - UJA) - Jardón-Giner, Paula (Universitat de València - UV) - Rísquez-Cuenca, Carmen (Universidad de Jaén - UJA) - Sánchez-Romero, Marga (Universidad de Granada - UGR) - Soler-Mayor, Begonya (Museu de Prehistòria de València - MUPV)

Abstract format: Oral

The visual image of ideas about the past has played a key role in understanding the past and illustrations have had long lasting power in spreading those ideas in popular culture and society. Thus, representation in archaeology can be defined as the production of meaning through visual language to communicate the past. Meaning is not established through words and then given visual image; rather it is created by a series of pictorial conventions that are loaded with symbolic content.

In the 19th century, both Romantic and Orientalist painters and the first reconstructions of primitive humans by evolutionism generated a whole series of images that tended to establish representational stereotypes associated to specific cultural and moral values. At present, this connotative value of archaeological visual reconstructions continues to appear in most of the informative supports directed to all type of public (historic or scientific popularization, education, publicity, visual creation, etc.). Certainly, the communicative content of these illustrations is only considered as historical representation if it contains human representations that are those that visually express the social relations and cultural values attributed to those societies of the past.

In this presentation we intend, besides reviewing these canons of representation of human bodies in historical situations, to present and discuss the implications of the Pastwomen project aimed at creating new and inclusive images of the archaeological past based on a critical perspective of gender/social identities and relations.

3 ENGENDERING SPANISH MUSEUMS: A RECENT HISTORY

Abstract author(s): Torres Gomariz, Octavio (University of Alicante) - Moreno Conde, Margarita (Museo Arqueológico Nacional)

Abstract format: Oral

The interpretation and visual representation of past societies plays a fundamental role in the transmission of knowledge produced by archaeologists to the general public. Museums are one of the most visible and privileged scenarios for this transmission. In museums the forms, rhythms of the exhibition and the decisions about the display are fundamental in the understanding of the past. Archaeologists working in museums have been pioneers in the critique, revision, and introduction of a gender perspective in museum exhibitions. In this paper we undertake a historical analysis of the development of the way gender is represented in archaeological museums in Spain. We will explore the pace of change from an initial stage in which the past was fundamentally male, to a more balanced gender perspective that can be seen in a few archaeological museums in Spain. We explore who is behind the recent engendering of museum displays and examine the socio-political and cultural context in which some curators started to perceive the display of gender in their museums as problematic and decided to make something about it. Moreover, we assess whether there are also issues of gender behind the group of initiators of this change, as it seems clear that the curators who have fostered this change are, *sauf* exception, women. A comparison will be made between national and regional museums, and also among museums of different Autonomous Communities in Spain. This paper is part of the ArqueólogAs project (www.ub.edu/arqueologas), a project aiming at discussing the role of women in Spanish archaeology.

4 BRINGING INVISIBLE PEOPLE TO THE FORE: NEW APPROACHES TO REPRESENTATIONS OF THE PALAEOOLITHIC ERA IN MUSEUM

Abstract author(s): Karkazi, Elli (Department of Cultural Technology and Communication, University of the Aegean; Museolab)

Abstract format: Oral

The archaeology of the Palaeolithic Era and the origins of humankind have long fascinated the public. Nevertheless, they have usually been conceived in a confusing and incomprehensible way, partly due to the popular culture which has been providing a distorted picture. Several museums in Europe include findings concerning human evolution and the Palaeolithic Era in their collection, while a number of museum exhibitions are totally devoted to them. The last decades, activities organized by museums have contributed decisively to restoring misconceptions about Palaeolithic societies, offering an essential, although limited perception about our Palaeolithic ancestors. During the last few decades the archaeological research has been widened and oriented towards new topics, resulting in a bulk of new data, which can provide a better understanding of social life's aspects. The present project emphasizes on the representation of aspects of social life related to Palaeolithic children and disabled individuals, which are so far set aside, in museum exhibitions. The aim of this presentation is to point out the main of the existing misconceptions and to propose new topics based on recent archaeological data, which could generate relative representations in museums, so as to better understand Palaeolithic societies. Furthermore, we stress the educational role of the museum in communicating scientific knowledge to the public and restoring the Palaeolithic narratives.

5 WHO IS WHO IN ROMAN FOREIGN AFFAIRS OR ROMAN STRATEGIES OF MARGINALIZING THE SOUTH-EAST

Abstract author(s): Adlung-Schönheit, Lilian (Hamburg University)

Abstract format: Oral

In Roman art foreign people are mainly characterized as defeated barbarians. In this respect Roman art does not distinguish much between near and far neighbors – at least since the second century AD. Still there are people, who did not fit into those generalizing depictions. Therefore, another group of undifferentiated strangers encounter in roman depictions. People with whom Romans stood in contact, but never fought. In semiotic history there were only few conventions for non-romans, non-enemies. Part of these were People from India and Ethiopia. Parts of them were highly entangled trading partners who seldomly visited roman territories in particular Italy. Still there was a fair good knowledge as demonstrated in descriptions of India and Ethiopia in e.g., Pliny or Strabo. Even better known were imported products, which did a good deal to mental images in the Roman Empire. Mercantile contacts, historical knowledge and imported goods interacted to construct the Roman image of Indians and Ethiopians. To depict images of unfamiliarity, luxury and exotic artists used the same traditional semiotic conventions for both (generalized). On the basis of these matching semiotic characteristics for stereotyped Indians and Ethiopians in Roman depictions this contribution is going to deduce Roman self-location in an entangled ancient world and ways of European provincializing in antiquity.

6 IMAGES OF SCYTHIAN NOMADIC HORSE RIDERS IN PUBLICATIONS AND MUSEUMS

Abstract author(s): Iwe, Karina (Staatliches Museum für Archäologie Chemnitz)

Abstract format: Oral

Scythian nomadic horse riders of the first millennium BC are represented not only for their specific form of life and economy but also by a remarkable art, the so-called Scytho-Siberian Animal Style. Their domain, the Eurasian steppe belt, is characterised by a variety of climatic conditions and landscapes.

For decades, the public and scientific interest in the archaeological stories of these groups from the Iron Age remains unchanged. The artifacts are regularly at the centre of larger and smaller special exhibitions in many different countries worldwide.

This contribution is about diversity within Scythian societies in the Eurasian steppe belt. Focusing on various modern visualizations, I would like to analyze the common images and key players which are part of the spread of media information, used in scientific publications and on display at various museum exhibitions in different countries. Who is always on display? Who is missing? Can we detect stereotypes?

7 WHITEWASHING, HETERONORMATIVITY AND EUROCENTRISM: THE STONE AGE ACCORDING TO PRIMARY SCHOOL TEXTBOOKS

Abstract author(s): Foldøy, Isabella (University of Stavanger)

Abstract format: Oral

School textbooks are among our earliest encounters with representations of the past. However, they are also political documents: they are approved by governments to teach children how to make sense of the world. Analysing the visual representations in such books tells us about the society that made them, its values and its ideologies. My PhD research explores representations of the pre-agricultural Stone Age in Norwegian school textbooks, and the underlying ideology and messages these representations transmit to the reader. In the textbook representations, Stone Age hunter-gatherers are portrayed through a colonial gaze that undermines diversity through the use of stereotypes, dehumanization and essentialism. However, the representations speak not only through what they show, but also through what we are not shown. There is not a single person of colour in the books, no queer people, there are no people with disabilities, and there are very few elderly. In this paper I will discuss why the choice was made to exclude these groups. I will also examine how problematic representations of Stone Age hunter-gatherers also affect representations of contemporary minority groups. The indigenous population of Norway, the Sami, are frequently compared to Stone Age hunter-gatherers in school textbooks. The representations convey the idea that “we”, the contemporary Norwegian society, evolved and became modern, while the Sami, through their hunter-gatherer lifestyle continued to live in the Stone Age.

8 ARCHAEOLOGICAL REPRESENTATIONS IN VISUAL FICTION

Abstract author(s): Annis, Karissa (University of Wisconsin-Milwaukee)

Abstract format: Oral

Representations have been a contentious topic in the past, and representations made by the public have been a point of disagreement and debate within the field. My research focuses on representations of archaeology and the past in fiction. Whether we openly recognize it or not, the public's image of the past and archaeology often informs us as much as we inform them. This presentation will discuss the archaeological representations within various popular fiction within the last few years, and whether these images do or do not create accurate representations or fall into the stereotypes that have often followed popular representations. All of these representations are visual, whether in a graphic novel, TV show, or video game, to ensure that there is a link between visual images made by archaeologists and those made by the public. How the public forms their images will often inform our own stereotypes, and

archaeologists need to be aware of these images in order to interact with them and ensure that we are not furthering beliefs that may be inaccurate and to approach the public with their viewpoint in mind.

9 THE ONE-HANDED HERO. INCLUSIVENESS IN HISTORICAL FICTION FOR CHILDREN

Abstract author(s): de Roest, Karla (University of Groningen, Groningen Institute of Archaeology)

Abstract format: Oral

Growing up with a disabled sister, meant growing up with the reality of hurdles in daily life. It also meant automatically taking this normality into the fictional world of the past. Therefore, when Drem from Sutcliffe's *Warrior Scarlet* (1958) crossed my path, I didn't think much of it. He was just a boy with one functional arm. Only when I taught history classes, I realised he's one of few protagonists with a disability playing the lead role in a historical novel. This lack of inclusiveness is problematic.

Firstly, it is problematic in terms of being able to identify oneself with the physical fitness of the hero or heroine. For disabled children, this can take the form of escapism (leading the protagonist's abled life) or deception (I could never achieve this). In either form, it helps to build the self-image of the young reader. Simultaneously, an able child is not given the opportunity to imagine life without their fully functional body.

Secondly, from an archaeological perspective, the number of healthy, unharmed people in historical children's novels is rather unlikely. The representation of the past is too idealistic; reminiscing the noble savage living in paradise. In reality, past populations often had lower life expectancies than present-day, as shown by osteological evidence. Being born with a disability would have made this even harder. The fact that it concerns 'fictional stories for children' should not entirely justify this idealisation.

I explore here whether the author or publisher should acknowledge and actively raise such issues. As archaeologists, we can provide them with a more informed description of the past. We must engage in dialogue with writers and readers. Not with the aim to criticise their choices, but to explore what is truly fiction. The past was inclusive; it is us that tend to forget.

10 VISUALISING THE ROLE OF PAST WOMEN AS ARTISTS: A PROPOSAL FROM ARSMAYA RESEARCH GROUP

Abstract author(s): Vidal Lorenzo, Cristina (Universitat de València) - Mejjide Jansen, Erika (Universidad Complutense de Madrid) - Feliú Beltran, Núria (Universitat de València) - Horcajada Campos, Patricia (Universidad Complutense de Madrid) - López Bertran, Mireia - Martí Bonafé, Àngels (Universitat de València) - Muñoz Cosme, Gaspar (Universitat Politècnica de València) - Parpal Cabanes, Esther - Vázquez de Ágredos Pascual, María Luisa (Universitat de València)

Abstract format: Oral

In this contribution, we would like to present the project "Women, Art and Antiquity. Breaking clichés", created by Arsmaya Research Group of the University of Valencia (Spain). It is intended to make visible the role played by women in ancient societies, especially in the performance of tasks beyond the household context. On this occasion we present two visual representations of the past set in the Maya culture and in the Iberian culture, in which women appear involved in works related to the artistic field.

The Maya visual picture takes place in a room of the Royal Palace of K'anpat (Chilonché), whose murals and hieroglyphic frieze that runs along the vault were discovered by the La Blanca Archaeological Project, to which Arsmaya researchers belong, and dated to the 8th century AD. The Iberian scene takes place inside a pottery workshop of the city of Edeta (Llíria, València), where a female artist is painting an inscription on a kalathos, a local type of clay vessel, of the 3rd-2nd century BC. Both visual pictures show different phases in the execution of painting works. The presence of women in this kind of activities is a proposal that attempts to break clichés about their involvement in these artistic activities. In addition, we have also included images of children and the elderly, which are usually underrepresented.

The pictures were made by the artist Erika Mejjide under the supervision of the Arsmaya Research Group team. Therefore, through this presentation, we would like to expose how the joint creation process was. In addition, we want to share the reasons to undertake this project, in order to overcome the lack of greater diversity of ways when we represent women in the recreated scenarios of the past.

11 WHAT IS WRONG WITH THIS IMAGE? REFLECTING ON PAST DIVERSITY THROUGH VISUAL REPRESENTATIONS OF GENDER STEREOTYPES IN ARCHAEOLOGY

Abstract author(s): Gaydarska, Bissierka (Durham University; Archaeology and Gender in Europe - AGE - Community of the EAA) - Coltofean-Arizancu, Laura (Archaeology and Gender in Europe - AGE - Community of the EAA; University of Barcelona) - Matić, Uroš (Austrian Archaeological Institute, Austrian Academy of Sciences) - Radosavljević, Nikola (Faculty of Applied Arts, University of Belgrade)

Abstract format: Oral

Gender and feminist archaeologists have fought for decades against gender stereotypes through academic writing, museum exhibitions and popular literature, among others. Despite their efforts, many of these stereotypes – e.g. from the classical image of men as hunters and producers of tools, and women as gatherers and caregivers, to same sex practices being considered a modern invention or a disorder – continue to live and even flourish, both in academic and non-academic settings, especially in countries where gender archaeology does not exist or where gender in archaeology is barely discussed. These stereotypes reflect essentialist inter-

pretations and (visual) representations of the past, which often replicate contemporary ontologies, perceptions and dichotomies. The past, however, was probably just as diverse as our contemporary reality. This paper discusses the possibilities and challenges of creating more diverse and inclusive visual representations of the past. It does so by presenting the case study of an editorial project resulting in an illustrated booklet on gender stereotypes in archaeology, edited under the aegis of the Archaeology and Gender in Europe (AGE) Community of the European Association of Archaeologists. The booklet thought-provokingly and openly addresses through images and texts often uncomfortable topics concerning gender in archaeology, in an attempt to raise awareness both among the professionals and fans of the discipline.

238 HUMAN VISUAL ARCHIVES, GLOBALLY. MATERIALS, FORMS AND MEANINGS OF HUMAN REPRESENTATIONS IN ANCIENT TIMES

Theme: 4. Globalisation and archaeology

Organisers: Gallinaro, Marina (Dipartimento Scienze dell'Antichità - Università di Roma La Sapienza) - Lesure, Richard (Department of Anthropology, University of California, Los Angeles - UCLA)

Format: Regular session

Since the Upper Palaeolithic (at least) humans represent themselves. The oldest evidence known from Europe and North Africa shows standardised forms mainly expressed through figurines (in different raw materials) and some examples of rock art (both petroglyphs and paintings). With the introduction of the first forms of food production (Mesolithic; Neolithic; other equivalents), we see a drastic increase of human representations all over the world, with a lower standardisation of forms and a growing variety of media, including pottery and an array of other materials. Different approaches have characterised the study of this evidence, spanning from diffusionist to micro-contextual overviews; from pre-iconographic to iconographic to iconological studies; from gender-based to body performative to general covering model; from behavioral considerations to ritual and religious ones. Where have those discussions left us? How do we approach the phenomenon of human representation in ancient contexts, which analytic tools do we use, and what meaning (implicit or explicit) do we attach to the imagery?

The session aims to bring together scholars with experience engaging of data from research areas characterised by lively theoretical and interpretative traditions (e.g. Europe; Near East; Northern Africa; Mesoamerica) to discuss the different approaches adopted, going beyond descriptive presentations of a single case study. As contemporary research is experiencing the definition of new analytic tools and methods (such as image processing and material analyses, 3D modelling and large databases) and at the same time is applying theoretical frameworks (such as materiality, gender theory and critical approaches) introduced by post-processual research, an open-ended discussion of the development for the future is timely.

ABSTRACTS:

1 EXPLORING THE EMERGENCE OF SCENES AND ANTHROPOCENTRISM IN ROCK ART: LEVANTINE ROCK ART AS A CASE STUDY

Abstract author(s): Domingo Sanz, Ines (ICREA; University of Barcelona)

Abstract format: Oral

Levantine rock art (LRA) is a rock art tradition unique to Mediterranean Iberia dating sometime around 7500 years ago. It represents a singular change in the history of prehistoric art in this part of the world: a new explicit focus on humans, their material culture, and their cultural practices, with narrative scenes used for the first time as innovative visual storytelling conventions. This new binomial humans-scenes marks a shift on the evolution of visual storytelling and of human perception of the self, or at least on the way humans decided to project their own images, behaviors and practices in the visual arts.

Narratives of hunting, warfare, violence, honey hunting, maternity and others dominate now the panels of more than a thousand sites located in the open air.

What are the causes behind such a shift in the art? Are they due to exogenous or endogenous pressures?

Our aim with this presentation is to go beyond LRA to explore other major rock art traditions around the world experiencing similar shifts in the content of the art. Our idea is to catalog the variety of endogenous and exogenous variables causing these sorts of shifts and to analyse if there are any underlying universal relations causing this global change in the way humans started depicting themselves in scenes.

2 SAHARAN HERDERS. ABOUT THE VISUAL REPRESENTATION OF HUMANS IN THE PASTORAL NEOLITHIC

Abstract author(s): Gallinaro, Marina (Dipartimento di Scienze dell'Antichità - Università di Roma La Sapienza)

Abstract format: Oral

Since the upper Palaeolithic, we assist in Northern Africa to the emergence of the first human representations in the form of unfired clay figurines or petroglyphs. Such evidence seems to be confined/limited to the Mediterranean shore, somehow defining the southernmost border of the wide phenomenon that involved the Eurasian continent. It is only at the beginning of the Holocene that we observe the flourishing of a long-lasting tradition of rock art (both painted and carved) in the central Sahara that will develop until

recent times. Humans represent the prominent motif in the thousands rock art sites dotting the central Saharan massifs, in the heart of the desert.

Such an impressive visual archive has been investigated through several approaches, including structuralist perspectives, semiotic and contextual analyses, ethnoarchaeological suggestions, and gender-oriented approaches. However, these interpretations were based on a few systematically recorded sites, or on generic data without specific reference to the quantitative and detailed datasets.

This paper will propose a synthesis of the main approaches adopted and a new tentative to build significant ontologies for Pastoral rock art. In particular, the preliminary analysis of an ongoing project* based on the full archive of the Pastoral petroglyphs and paintings of the Tadrart Acacus and Messak massifs will be discussed. The research process will move from a site-specific analysis, outlining variability and local sets of regularities, to a subsequent search for enforcing regularities at the macro-regional scale, in order to identify possible patterns of the contacts and ideological interactions inside Sahara during the Pastoral Neolithic period, since its formative phases.

* ASArt-DATA Project (Funded by the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 795744).

3 PREHISTORIC ANTHROPOMORPHS FROM THE CENTRAL WESTERN DESERT OF EGYPT: A STUDY OF FORM AND MEANING

Abstract author(s): Polkowski, Pawel (Poznan Archaeological Museum)

Abstract format: Oral

Prehistoric rock art in Egypt (apart from the Predynastic tradition, as well as various painting 'styles' from Gilf Kebir/Gebel Uweinat region) is largely dominated by zoomorphic depictions. Anthropomorphic component seems to be less explicit; such petroglyphs being usually simpler in form, smaller in size etc. But exceptions do exist and one such group of anthropomorphic images that strikes us with its level of detail, as well as its involvement in larger compositional 'syntaxes', encompasses images that are known only from the central Western Desert.

These petroglyphs have already attracted some attention from scholars, although an overall discussion and specific interpretations are lacking. Most often they are considered depictions of women, and for a number of examples this seems to be true. The vast majority of these figures have highly exaggerated lower bodies in contrast to their upper parts and many have a specific protrusion that has been usually interpreted as indication of pregnancy – the feature that has played a major role in previous conceptualisations of their meaning. There are, however, fairly numerous examples devoid of features unequivocally feminine, putting certain identifications into question.

In this paper I intend to present a study of the relevant material from Dakhleh, collected by the Dakhleh Oasis Project over the years. Beginning with a short overview of previous interpretations, I'd like to set a point of departure for further discussion. I will focus not only on formal features of recorded petroglyphs, but also on their potential meaningful relationships with other motifs. Certain recurrent associations of motifs seem to be particularly important in this context, among them pairs of anthropomorphs that involve a thinner and an 'obese' specimens, sometimes connected by a line. All of this should be followed by a discussion on potential role(s) of this rock art among Dakhleh prehistoric communities.

4 IMBALANCE IN ORDER TO REIGN: ONTOLOGICAL SHIFT DURING EGYPTIAN PREDYNASTIC PERIOD AND ESTABLISHMENT OF THE REDEMPTIVE ROLE OF THE RULER

Abstract author(s): Graff, Gwenola (French Institute of Research for development)

Abstract format: Oral

A recent review of the study of the painted vases of Nagada I (the White Cross-lined) with geometric and apparently non-figurative decorations has shown that they were in reality a dynamic, often three-dimensional representation of a conception of the universe and the arrangement of its elements. This cosmography is expressed through a simple, recognizable pattern. An ordered, self-stable universe then appears, which regulates itself by integrating variants and recompositions of the basic scheme. The forms are rendered in a very allusive way. They are shown in perpetual transformation. This universe does not require the intervention of an external agent. Human representation is absent.

This figuration of the universe corresponds to a period, at the beginning of the fourth millennium, when social structuring and hierarchisation had not yet led to the concentration of all powers in the hands of a single man. The cosmography transcribed by C-Ware predates the introduction of this dynamic stabilising vector embodied by the sovereign. To justify this central role of royal ideology, it was necessary to introduce the notions of duality, the permanent opposition of balance and chaos and the impotence of the universe to stabilise itself, so that the sovereign, paragon of humanity, could invest himself with a role indispensable to its maintenance. Without threat, there is no reason to be in power.

It is this dialectic and this shift between two relationships to the world that we would like to explore and present in order to contribute to understanding how the transition to production societies impacts human representation.

5 ANTHROPOMORPHIC FIGURINES OF SOUTH-WEST ASIA THROUGH THE NEOLITHIC TRANSITION: SOCIAL FUNCTION AND INTERACTION NETWORKS

Abstract author(s): Atakuman, Cigdem - Gemici, Hasan Can - Sürer, Elif (Middle East Technical University)

Abstract format: Oral

Anthropomorphic figurines constitute one of the most interesting and equally enigmatic objects of the prehistoric era. These miniature statues of the human form are often perceived as representations of gods or goddesses, and treated as static images of worship. More recent approaches investigating their context and materiality, however, have begun to highlight these objects' active agency in the construction of personhood and the creation of a sense of place and identity in prehistoric societies, with references to a variety of issues such as gender, identity, regeneration, and ancestry.

In tandem with the recent developments in the theory and method of prehistoric figurine studies, this presentation aims to focus upon the thematic variation, raw material choices, manufacture processes, discard patterns and spatial contexts of the Neolithic figurines of South-west Asia through time (c.10000-6000 BC). Our purpose is to understand the shifts in social function and cultural interaction spheres represented by these objects. We will discuss some of our results within the context of our ERC funded ancient DNA project that explores the Neolithic transition in the region.

6 THE HUMAN IMAGE IN THE PRE-POTTERY NEOLITHIC OF THE NEAR EAST. POSSIBILITIES OF ENGAGEMENT

Abstract author(s): Dietrich, Oliver (Freie Universität Berlin)

Abstract format: Oral

For a long time research into anthropomorphic in the Near East has focused on later Neolithic clay figurines with an interpretational emphasis on fertility cult centering around the 'great goddess'. The last three decades of research have confronted archaeologists working in the Near East with a continually growing number of anthropomorphic (and zoomorphic) stone sculpture from early periods, including a large number of male depictions. Particularly Pre-Pottery Neolithic (9600-7000 BC) sites like Nevalı Çori or Göbekli Tepe in Turkey have delivered a wide array of sometimes life-sized and quite detailed depictions in varying degrees of abstraction. While the subdisciplines of archaeology dealing with the historical periods of the Mediterranean and the Near East have long developed a methodology to interpret visual art, a methodological framework beyond intuition and ethnographic or historic comparisons is still widely lacking for prehistoric periods, for which written sources giving at least basic information on the meaning of imagery are absent. New approaches so far tested include Panofsky's iconology as well as semiotics and psychological reasoning. The contribution will explore the possibilities of inferring meaning from Early Neolithic stone imagery.

7 HUMAN FACES DEPICTIONS OF EARLY NEOLITHIC IN THE NEAR EAST

Abstract author(s): Huet, Thomas (LabEx ARCHIMEDE, ANR-11-LABX-0032-01) - Ibañez, Juan (Archaeology of Social Dynamics IMF-CSIC) - Pozo, Jose - Alexander, Craig (Independent researcher)

Abstract format: Oral

The early Holocene witnessed the end of Upper Paleolithic imaginary with its range of wild animal depictions, and the progressive adoption of a farming life-style with a proliferation of human representations. It is commonly accepted that this proliferation is linked to demographic growth and settlement densification; the Neolithic is as much a domestication of animal and vegetal species as it is a self-domestication of human beings. From then on, human depictions will be one of the privileged means of official speech aiming to manipulate "collective representations" as defined by E. Durkheim. Among human depictions, the human face and human silhouette are the most common modes of representing a person. Faces in particular, seem to hold a special importance in the ancestor veneration cult with its well known modeled skulls, but also stone funerary masks, small clay figurines, plaster statuettes, etc., where the face is often the most detailed part of the human depiction.

Our purpose is to present a first quantitative study of the spatial variability and chronological variations of the human face compositions, stricto sensu, throughout the Near East Natufian-PPN. First, we present a detailed analysis of the spatial organization of the elements of the human face (presences/absences, modalities, etc.): headdress, hairnet, earrings, T-shaped facial representation, eyes, nose, facial tattoo, mouth, beard, etc. Among these variables, we pay particular attention to the different modalities of the depictions of eyes and mouth with their two antagonistic/complementary modalities: closed or open. We will use the new R package iconr (<https://cran.r-project.org/web/packages/iconr/index.html>) which implements concepts and functions for modeling prehistoric iconographic compositions.

8 PREHISTORIC HUMAN REPRESENTATION IN ANCIENT CHINA

Abstract author(s): Dematte', Paola (RISD)

Abstract format: Oral

Human figural representation is limited in prehistoric China as compared to other parts of the world. However, though Paleolithic art is practically non-existent, some evidence of human representation is documented in few Neolithic contexts.

The Chinese Neolithic was characterized by significant geographic and cultural diversity and the various traditions did not share the same material, stylistic or spiritual expressions. I identify four main traditions of human representation: 1) The northeast (Hongshan and related cultures) which is characterized by a small number of clay statues and figurines of what appear to be female individuals. Located at the edge of China proper bordering north Korea, this culture is different in key aspects from the agricultural Neolithic traditions of the Chinese core and was probably constituted by semi-settled north Asian populations; 2) The northwest (Yangshao, Majiayao and Qijia) with few clay figurines but a larger number of painted ceramic vessels with representations of single human figures, faces, or groups involved in communal activities; 3) The eastern coastal area of the Yangzi river delta (Liangzhu, Lingjiatan etc) presents several jade objects with representations of human and semi-human figures; 4) The middle Yangzi river valley (Shijiahe culture) where human figurines in clay and jade have been discovered alongside animal figures in ritual contexts.

The meaning of this material has been explored in mostly simplistic terms which have ranged from goddess cults, to fertility, or shamanistic interpretations. However, what is perhaps more interesting is the limited presence of human representation in comparison to animal, floral or abstract figuration.

9 FROM UNIQUE ANIMALS TO A GENERALIZED HUMANITY? A DIACHRONIC PERSPECTIVE ON CLAY FIGURINES IN THE PITTED WARE CULTURE

Abstract author(s): Lindström, Tobias (Stockholm University)

Abstract format: Oral

Ever since they were first discovered in the early 1900s, the zoomorphic and anthropomorphic clay figurines found on Middle Neolithic (c. 3200-2300 BC) Pitted Ware culture sites in eastern Sweden, Gotland and the Åland islands (Finland) in the Baltic sea have generally been treated as works of art or as enigmatic ritual objects. Thorough attempts at understanding the figurines have been few and far between, often culminating in general discussions of their supposed ritual or symbolic connotations. In this paper, I instead attempt to ascertain what the figurines might tell us about the society in which they were produced and used, with special reference to their possible implications for human-animal relations during the period in question.

A closer consideration of the chronological and geographical distribution of the clay figurines indicate certain differences between the zoomorphic and the anthropomorphic figurines. Zoomorphic figurines are present in comparatively small numbers on many sites during the entirety of the Middle Neolithic period. Anthropomorphic figurines, however, start to appear around 2900 BC, with notable concentrations on two sites: Tråsättra in eastern Sweden and Jettböle II on the Åland islands. An examination of the morphology of clay figurines reveals further disparities between the zoomorphic and the anthropomorphic figurines, with the latter category exhibiting a higher degree of standardization than the former.

The chronological, geographical and morphological differences between zoomorphic and anthropomorphic figurines might suggest changing relationships between humans and animals, as well as a shift from small-scale manufacture and use of figurines to a more standardized manufacture of figurines used in communal settings.

10 BODYSCAPES IN NORTH-CENTRAL CHILE. EXPLORING HUMAN BODY DEPICTIONS THROUGHOUT PRE-HISPANIC HISTORY

Abstract author(s): Armstrong, Felipe (Departamento de Antropología, Universidad Alberto Hurtado) - Troncoso, Andrés (Departamento de Antropología, Universidad de Chile)

Abstract format: Oral

Over the past few decades, archaeology has seen an array of studies on the human body as a social phenomenon, going beyond traditional biomedical approaches. Such understanding has offered new ways of thinking about the relationship between the human body and its social, historical and political milieu. One particular type of relationship is that between the human body and anthropomorphic objects and images. In this paper, we offer a discussion on the differential ways in which the human body has been depicted throughout the pre-Hispanic history of North-Central Chile, from the scarce hand imprints produced by hunter-gathers on rockshelters (ca. 3000 BCE - 500 CE), to an array of dressed bodies depicted during the Inka occupation of the region (ca. 1470 - 1535 CE), both in rock art and in pottery. We focus specifically on rock art, but also consider other types of anthropomorphic objects/images, such as pottery decoration and figurines. We argue that these objects can be seen as examples of different bodyscapes (sensu Geller 2009), that are related to specific socio-historical contexts, playing part in particular relational fields. Our approach focuses on the historicity of human body and human body part depictions by hunter-gatherer communities, the first agricultural groups, and communities annexed into the Inka empire, in order to understand the transformation of bodyscapes and its social implications. We aim at discussing this evidence from a more-than-representational approach, stressing their material qualities and the relationships they established with other elements of their historical contexts. This work is part of the FONDECYT 1200276 research project.

Geller, P. L. 2009. Bodyscapes, Biology, and Heteronormativity. *American Anthropologist* 111/4. 504-516.

11 HUMAN IMAGES IN FORMATIVE-PERIOD MESOAMERICAN HOUSEHOLDS: CONTEXT, SCALE, AND INTERPRETIVE SYNTHESIS IN THE STUDY OF PREHISTORIC OF FIGURINES

Abstract author(s): Lesure, Richard (University of California Los Angeles)

Abstract format: Oral

Why did villagers across much of Formative-period Mesoamerica make small human figurines of fired clay? Figurines were common household objects in many communities, and their path to discard and deposition was similar to that of ceramic vessels, stone tools, and animal bone. Formative figurines seem to have represented people (rather than deities), yet they are generally understood to have been used in "household rituals." On the basis of particular collections, investigators have tried to specify that vague expression in various ways, suggesting that figurines were used specifically in divinatory rituals or to propitiate ancestors. Others have emphasized instead the social implications of use of figurines in domestic settings – for instance, that they were points of reference in the negotiation of social relations or models of comportment that helped constitute people as subjects.

This paper examines two interrelated problems in efforts to characterize the intended purpose of Formative figurines: the uneasy balance between ritual and social perspectives and the challenge of developing interpretations that are both sensitive to context and consistent with multiple scales of analysis. Evidence is drawn from two sizable collections from different areas of Mexico, the Soconusco region on the Pacific coast of Chiapas (1900-900 BC) and central Tlaxcala (900-400 BC).

Recent work on relational ontologies helps with the first problem (ritual versus social function) yet threatens to exacerbate the second (the attempt to balance context and scale). The radical contextualism of the ontological approach leads (ironically) to the resurrection of unhelpful simplifications along the lines of "the West versus the rest." This paper deepens the "household ritual" model of figurine function with inspiration from the ontological approach. To rein in that approach's simplifying tendencies, I draw on the framework of synthesis through multiple local contextualizations.

12 HUMAN REPRESENTATION BEYOND THE HUMAN

Abstract author(s): Joyce, Rosemary (University of California, Berkeley)

Abstract format: Oral

This paper explores the limits of what it means when we demarcate our object of study as "human representation". Aligned with feminist new materialism on the one hand, and anthropology "beyond the human" on the other, it considers a series of examples of materials with visually evocative markings that sometimes suggest a human presence, and at other times defy that suggestion. It draws on body phenomenology and monist ontological thought, specifically from indigenous scholars, to suggest that when human hands and eyes shaped the things under discussion, those gestures were part of a relational emergence of moments of self-consciousness that shaped a subject, but not a subject we can assume operated like the subject of modernist or postmodernist Euro-American philosophy. The alignments of subjectivity we need to attend to may very well have identified the human maker with the mineral, animal, or vegetal materials they were engaging with as part of the establishment of provisional boundaries of a corporeal self. This presents challenges that are not insuperable: we will need to bracket many of our preferred terms of engagement while we sketch out the experiential dimensions of what I will provisionally call image-making in specific moments and locales. We will need to thicken our descriptions of the "context", that is, the material relations of any of the things we regard as images. We will need to explicitly theorize the process of meaning production, and avoid any reliance on the idea that meanings are encoded in, or transmitted by, things as a kind of information vehicle. And we will need to ask about affect—the sensuous properties of things—while acknowledging that affect and emotion cannot be separated but also cannot be generalized as uniform human experiences, even if the bodies that are experiencing sensory engagements have the same physical capacities.

244 THE SEA AND THE CITY: UNRAVELLING STORIES FROM THE SEAFARING WORLD FROM THE 9TH TO THE 18TH CENTURY

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Toreld, Christina (Bohusläns Museum) - Johansson, Marianne (Viken fylkeskommune) - Poulain, Maxime (Ghent University)

Format: Regular session

We seek ways and good practices on how to unravel hidden stories of an early European seafaring world, and how to make these stories available to various audiences. A world inhabited by people who exchanged goods and ideas, who explored their world and made friendly alliances across borders, but who also fought and conspired against each other. The ships, the emerging coastal towns and ports were instrumental in this cultural exchange.

Today, these hidden stories only come to light for a brief amount of time in archaeological excavations and historical research. They are being studied by scholars, filed, documented, and subsequently reburied in archives, where they remain available for a selected few. There are ways to change this, to open our archives and bring the stories out to various audiences, by drawing from experiences in these post-covid times, with a multitude of digital and analogue outreach examples. By digital technology, creative artists, participatory research and activities, the stories generated by archaeological and historical research are livened and made available to Europeans of today, highlighting our common European heritage of trade, unions, transnational migration, and connections.

The goal of this session is to strengthen interaction between the academic, cultural heritage, museums, and creative sectors by using archaeology as a source of inspiration for contemporary creation and innovation. The scope of such interaction is transnational and inclusive, making shared narratives of sea trade and contact between Europe's member states and further, available to various audiences, engaging all sorts of people in experiencing, enjoying, and valuing arts and culture. We therefore invite papers that are set between the 9th and 18th century, follow the emergence of coastal towns, ports, networks and interactions of people and goods at sea, and that specifically aim to bridge the divide between archaeological research and public outreach.

ABSTRACTS:

1 THE SEA AND THE CITY – A NETWORK OF KNOWLEDGE AND STORIES IN THE MAKING

Abstract author(s): Toreld, Christina (Bohusläns Museum)

Abstract format: Oral

How to collect the stories of people who lived in a sea-faring world of the past, whose traces we can detect in archaeological remains and historical records? How to bring those stories alive and make them meaningful to present day people? How to disperse these stories in sustainable, innovative, and Covid-19-safe ways?

A group of people coming from museums, cultural heritage, and academia in different European countries, with scientific point of reference, felt an urge to highlight, to spread and to make this part of our history and cultural heritage available. A desire to strengthen interaction between the cultural heritage sector and other cultural and creative sectors by using cultural heritage as source of inspiration for contemporary creation and innovation. By joining forces with partners from interactive game design, film and visual storytelling, VR/AR, tourism, and artists the network and project Sea and the City was created.

In this paper the making and the ideas of the network and project Sea and the City are presented. A network whose core values are enhanced availability to, enhanced awareness of, and artistic approach to our common European heritage of trade, unions, and transnational migration.

2 'THE MAJOR HARBOUR' IN NYA LÖDÖSE AS DESCRIBED BY SIXTEN STRÖMBOM AFTER THE 1915 – 1918 EXCAVATION

Abstract author(s): Ortman, Oscar (The county museum of Bohuslän)

Abstract format: Oral

Before the excavation, Sixten Strömbom knew that the town he was about to investigate was the predecessor of Gothenburg. Nya Lödöse was founded in 1473 as the Swedish port to the North Sea. The town existed between 1473 and 1624.

The reasons for the excavation were twofold:

- A new suburb was required for the workers of SKF (The Swedish Ball Bearing Factory).
- More information about Gothenburg's predecessor was needed for the 300-year anniversary of the founding of Gothenburg in 1921.

In the 1916 excavations, two events occurred that affected the result of the excavation. First, the decision was made to dredge River Sävåån, which ran through the town site. The dredging resulted in an increased amount of finds. Second, during the excavation of the town they came across an over 200 metre long wooden construction running alongside River Göta Älv. The construction was interpreted as a large wooden pier; the major port of the town.

Strömbom's interpretation of where the actual harbour was situated was criticized by another researcher Albert Lilienberg who claimed that the harbour was located in River Sävåån. Lilienberg, Gothenburg's town architect at the time, based his assumption on written sources. This debate about the location of the harbour continued until the beginning of the 1950s.

In my presentation, I will discuss why it was important for Strömbom to insist on the existence of a major harbour at Nya Lödöse, and how presentation of Nya Lödöse as a main harbour town was important for the self-image of Gothenburg right up until the beginning of the 1970s.

3 TELLING A STORY THROUGH FORM, COLOR, OBJECTS AND IMAGES

Abstract author(s): Hansson, Pia (Bohusläns museum)

Abstract format: Oral

How do we make our story accessible and exciting for a wide audience? Maybe even arouse a curiosity about something that a person never showed the slightest interest in? Those are the questions a designer is faced with at each new exhibition project whether it is ancient times or contemporary subjects.

In this example, the project is about the 16th century, the port town of New Lödöse and a travelling exhibition. The target group is 10-12 year olds who are just reading about this time in school and as we know, it will usually be just as exciting for adults if it attracts children. The task was to show results from the excavations and tell about life in the 16th century in Nya Lödöse, Gothenburg, Sweden.

4 A SEA IN THE MIDDLE: CONNECTING PRESENT AND PAST MATERIAL ASPECTS AROUND GENDER AND COLONIALISM

Abstract author(s): Escribano-Ruiz, Sergio (University of the Basque Country, UPV/EHU) - Azpilicueta, Mercedes (Visual Artist living and working in Amsterdam and Buenos Aires)

Abstract format: Oral

This presentation is conceived as a reflective exercise among an artist (Mercedes Azpilicueta) and an archaeologist (Sergio Escribano-Ruiz). The first contacted the second in her search for collaboration for an exposition based on the figure of Catalina de Erauso, a 17th century Basque nun from the who travelled to the New World, where s/he lived under male identities and became a ruthless lieutenant in the Spanish colonial army. The resulting work is going to be exposed in Gasworks London from April to June 2021. Among other activities, the exhibition plans to record a discussion around this research for the show, between historians and archaeologists, with the artist acting as chair. We envision this session as a setting to think critically about the results of this collaboration. It brings us the opportunity to consider what has been the contribution of Archaeology to this artistic work, both from the side of the artist and the archaeologist. In addition, we might be able to reflect on the way in which the audience may have perceived the role of Archeology in the process of creation and communication of Art.

5 REVIVING THE LOST HARBOURS OF THE ZWIN: A FRUITFUL COLLABORATION BETWEEN CREATIVE ARTISTS, ARCHAEOLOGISTS AND LOCAL EXPERTS

Abstract author(s): Poulain, Maxime - De Clercq, Wim - Trachet, Jan (Ghent University)

Abstract format: Oral

Medieval Bruges has been coined as "the cradle of capitalism", a place where goods, ideas and people converged into a unique, international and productive environment. The development of the city into one of Europe's main commercial hubs was only possible via its connection to the North Sea. A tidal inlet, called the Zwin, linked Bruges to the rest of Europe and beyond and was dotted with a series of outports at its banks. Each one of these harbours had a particular role to play in a strongly connected socio-economic network dominated by Bruges. Natural, political and economic factors all resulted in the eventual downfall of Bruges and the Zwin in the 16th century. The outports shrunk from cities into hamlets or even disappeared entirely from the landscape.

In an effort to revive this lost harbour system, an interdisciplinary team of archaeologists, historians and geologists teamed up with local experts and creative artists. The result is a cycle route, along which VR viewers visualize what is now lost, and an immersive exhibition, where innovative technologies introduce the visitors to new insights on the medieval Zwin and the many people who lived and traded there.

This fruitful collaboration is a strong plea to recognize the potential of knowledge available within local communities and to incorporate artistic creation as an intrinsic part of the scientific process. 3D films are more than pretty pictures: they are a clear illustration of the current state of the art of research, they unveil the gaps in our knowledge and offer – for the first time – an experience of how it must have been to navigate these waters and be confronted with the symbols of power that were strategically positioned at its shores.

6 MANAGING CULTURAL LANDSCAPES: KAUPANGER STAVE CHURCH AND KAUPANGER HOVEDGÅRD IN SOGNDAL IN VESTLAND COUNTY

Abstract author(s): Knagenhjelm, Christoffer (Kaupanger Hovedgård)

Abstract format: Oral

Kaupanger Hovedgård (Kaupanger Manor) is a large private property in western Norway, owned by the same family since 1710. The Manor and surrounding area, approx. 30 hectares, are designated as national heritage site by the Norwegian Directorate for Cultural Heritage. The Manor lies deep in the Sognefjord, by a bay nestled between several lesser fjords branching out from the Sognefjord. Included in the heritage site is the archaeological remains of Kaupanger, one of 13 medieval towns in Norway and Kaupanger stave church, the only remaining building after the former town.

Parts of the open cultural landscape, which is an important part of the heritage site, and for the understanding of the old city of Kaupanger, can also be traced back to the Bronze Age, and today flowering meadows make the area an important habitat for pollinating insects. In other words, the cultural and natural values in the area are of significant value. At the same time, the development of infrastructure, and the establishment of large spruce seed plantations 60 years ago covering large parts of the protected area, have led to challenges, such as loss of biodiversity and cultural heritage.

As part of a necessary large-scale restoration of this diverse cultural landscape, Kaupanger Hovedgård, in collaboration with the local municipality and Western Norway University of Applied Sciences, established the largest privately funded restoration project in Norway of cultural landscapes.

The project aims to preserve and develop cultural heritage and biological diversity in a living cultural landscape in operation and make these resources available to the public. In order to engage and confront various audiences and create a better understanding of the importance of the history of the area, we have explored and conveyed the archaeology and history in different ways, while also distinguishing between the audience.

7 AN OLD PORT BY THE SEA: THE CITY OF SON AND CONTRIBUTIONS TO A LOCAL IDENTITY

Abstract author(s): Johansson, Marianne (Viken fylkeskommune)

Abstract format: Oral

The city of Son, in eastern Norway, is today mainly known as an idyllic small town and yachting harbour, with cafés, galleries and gift shops. However, this town was one of the region's main export ports for timber products in the 16th to 18th centuries. From the 16th to the late 18th century, this trade was dominated by Dutch ships that came to fetch Norwegian timber, while also bringing trade goods from many other countries to Norway. But the full story connecting Son to the Continent goes back to another archaeological site, just northeast of Son: the site of Labo. The character of finds from this site shows of a trading place established in the Middle Ages - perhaps already in the Viking Age. The archaeological finds from the 13th century onwards tell of trade, import of goods, and occupants of high status. This was obviously the forerunner of the small town of Son.

In this presentation we will tell the story of the sites of Son and Labo, and how the archaeological material has been used to promote local identity for the inhabitants of Son and the Follo region. Through exhibitions, books, informational signs, film and the school-programme Archaeologist for a Day, the local community has a raised awareness of their common history and local identity. For over ten years local schoolchildren have worked together with archaeologists, sifting for finds from the Labo site while learning about the objects, their own local history and Son's connection to Europe through commerce. One of the objects found at the site of Labo is a medieval horse-shaped weight - The Labo Horse. This item has become an object of identity for the inhabitants of Son, with its own statue in the city centre - and it has its own board game!

8 FORGOTTEN CITY - HISTORY OF THE MEDIEVAL HARBOUR IN PUCK BAY (POLAND)

Abstract author(s): Pydyn, Andrzej - Popek, Mateusz (Institute of Archaeology, Nicolaus Copernicus University, Torun)

Abstract format: Oral

The Puck harbour was discovered in late 70' of 20th century by three recreational divers. They were looking for pirate's harbour but they found a large number of wooden piles. After almost 40 years of research, archaeologists realised that in Puck Bay are located remains of three medieval harbours.

History of this harbour started in the 9-10th century. In that time very long wharfs and massive breakwaters were constructed. Communities that use these structures had contacts with different regions of the Baltic Sea. The best proof of these contacts is a shipwreck with both Slavic and Scandinavian features.

The second phase of the harbour falls on the second part of the 12th century A.D. The harbour of this phase was probably built on the unused area. Most of the relics from that phase were destroyed by dredging fairway that leads to Puck Mechanical Factories. However, some relics of wharves and moles survived on two sides of the fairway.

The third phase of the harbour is dated between the late 13th century and the 14th century. The main element of this phase was the mole with the entrance to the dock, where two shipwrecks were found. One of them is dated from the 12th century (P3), and the second one (P5) is dated from the 13th century. The constructions from that time were probably the remains of the fishing station called Trzęsawisko, given to the Cistercians monastery by prince Mestwin II (Mściwój II).

After this phase, the city of Puck was located about one kilometre to the east, and the old harbour was forgotten for more than 600 years. Recently underwater archaeologists from the Centre for Underwater Archaeology, Nicolaus Copernicus University reevaluated submerged structures and proposed reconstruction of three phases of this medieval harbour.

9 THE PROVIDENTZ 1721-RE-ESTABLISHING CONNECTIONS BEYOND NATIONAL BOUNDARIES

Abstract author(s): Fawsitt, Sarah - Johannessen, Jørgen (Norwegian Maritime Museum)

Abstract format: Oral

District court documents from Mandal, Norway, in 1721 describe proceedings to establish the cause of a shipwreck in a nearby strait. The cargo ship Providentz had sailed out of Cork harbour, in Ireland, bound for Arendal on the south coast of Norway. It sank on a clear, calm, moonlit night, a short journey from its final destination. The crew were drunk or the pilot mixed up starboard and port. The ship was carrying a cargo of grain, flour, malt and Irish butter.

This account having tantalised a local dive club for many years resulted in the discovery of a wreck site in late 2020. The Norwegian Maritime Museum investigated the wreck site in early 2021. A large area of wreckage remains intact below a shallow layer of sand. Loose artefacts of barrel staves, bottles and jugs were lying on top of the ships planking.

The shipwreck's dual nationality has provided obstacles and opportunities. Having a wreck that that is not Norwegian means it is harder to place it in the context of national importance. It falls outside of the responsibility of heritage agencies in Ireland. We are still trying to make contact with all stakeholders and, importantly, find funding to carry out a closer inspection of the ship. But even at this early stage in the process we have been able to share information with a much wider audience and find communities that this wreck is especially important to, in Norway and Ireland. Finding the wreck site has ignited a flurry of research and outreach between Irish and Norwegian stakeholders, from the public, to diplomatic services, to heritage organisations.

10 JOURNEYS CARVED IN STONE - DECIPHERING STORIES OF MARITIME TRAVELLERS THROUGH HISTORIC GRAFFITI AT THE NATURAL HARBOUR OF HAMNHOLMARNÄ

Abstract author(s): Nordell, Linnea (Bohusläns museum) - Strid, Lars (Vitlycke museum)

Abstract format: Oral

This paper deals with Hamnholmarna, a natural harbour on the west coast of Sweden and its historic graffiti. The aim is to show our process of digitally documenting these carvings and how these documentations simultaneously are used to tell the stories of the site.

Along the coast there are several natural harbours that have been used by international traders during medieval and early modern times. The bottom of the Hamnholmarna harbour basin has yielded rich finds including Danish and German pottery dating from 1300 to 1700 CE. Surrounding the harbour are more than 1000 individual carvings, making this the largest site in Scandinavia. The motives include merchant marks, initials, dates, and a unique collection of late medieval coats of arms.

Unlike an urban environment, the harbour has barely changed since the 17th century, providing a unique opportunity to experience the harbour as it was 400 years ago. Through the carvings we encounter hard working sailors and traders of different nationalities side by side with the cream of Danish aristocracy, while in transit across the sea.

Bohusläns museum and Vitlycke museum launched a research project with the aim of surveying and documenting the carvings for the first time, using a combination of onsite interpretation and digital documentation, i.e. SFM and laser-scanning.

The newly documented carvings draw a lot of public interest. Hamnholmarna however are not easily accessible, as getting there requires the use of a boat and getting around is physically demanding. The harbour will never become easily accessible, but it can be made accessible digitally. Our goal is to create a trans-digital destination with both ongoing onsite and digital communication. The scientific documentation plays a central role in achieving this. We aim to show how the documentation helps us visit the site and meet the persons behind the carvings.

245 LOST IN TRANSLATION? - INTERPLAY OF ARCHAEOLOGICAL THEORY AND SCIENTIFIC PRACTICE AS KEY FOR MODERN ARCHAEOLOGICAL REASONING

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Girotto, Chiara (Ludwig-Maximilians-University Munich) - Rose, Thomas (Department of Bible, Archaeology and the Ancient Near East, Ben Gurion University of the Negev; Scienze dell'Antichità, Sapienza - Università di Roma)

Format: Session with keynote presentation and discussion

The increase of new methodologies and scientific analyses in current archaeological studies have revolutionised archaeological questioning and reasoning. Quantitative approaches, such as isotope or genetic analyses have become ubiquitous in most modern research proposals. Undoubtedly powerful tools, they often are not embedded in a theoretical framework. They are applied because of their popular appeal and seeming simplicity, rather than methodological, theoretical or archaeological necessity. Scientific data is produced to exist, without prior hypotheses demanding its presence. Similar approaches are often seen in the applications of statistics or modelling, where archaeological data is mainly treated as big data, whereas in fact it is usually messy data with many limitations. Whilst this is often considered the epitome of interdisciplinary research, it rarely is. Generally neither side properly understands the methods and reasoning of the other leading to parallel research strategies.

In our discussion session we aim to find new pathways to generate true interdisciplinarity, and improved understanding and knowledge of "the other side". We aim to explore the transdisciplinary potential of scientific analysis and archaeological interpretation and theory to tighten the network of archaeological and analytical methodologies in our discipline. We particularly welcome young researchers, people working in transdisciplinary research projects, and those who wish to participate in bridging the gap and translating between different research frameworks and methods.

The keynote will be given by Mark Pearce (University of Nottingham):

In 1959, C.P. Snow drew attention to the existence of 'two cultures', the divide between science and the arts, and I shall use his famous essay as a starting point to highlight the failure of communication and indeed of comprehension between archaeological science and mainstream archaeology and try to explain the reasons that underly it.

Abstracts should introduce the discussants; there will be no traditional presentations except the keynote.

ABSTRACTS:

1 TWO CULTURES? IS THERE A COMMUNICATION PROBLEM BETWEEN ARCHAEOLOGICAL SCIENCES AND MAINSTREAM ARCHAEOLOGY?

Abstract author(s): Pearce, Mark (University of Nottingham)

Abstract format: Oral

There has been an explosion in the application of scientific techniques in archaeology (what Kristian Kristiansen has termed the “Third Science Revolution”) but in most cases it seems that their results are poorly integrated into archaeological discourse. Sometimes their results are archaeologically banal, and not situated in a theoretical framework or research questions. They are still often relegated to appendices and ignored in the main text. Likewise, archaeologists still often fail to understand the scientific techniques whose results they are interpreting, or use the wrong techniques to address research questions, leading to errors. The two sides’ publication arenas are often different, with separate journals and communities, constituting non-communicating silos. Even at conferences like the EAA there are few sessions which are truly interdisciplinary. Whose fault is all this? How can it be overcome?

I shall explore a number of case studies to discuss these issues, from applications of genetics, isotope studies, compositional analysis and radiocarbon dating. My aim is stimulate debate as to how this failure of communication and indeed of comprehension between archaeological science and mainstream archaeology can be overcome.

2 INVESTIGATIVE INTEGRATION THROUGH CRITICAL PURPOSE: WHAT TO DO WHEN SCIENTIFICATION REARS ITS HEAD

Abstract author(s): Vis, Benjamin (University of West Bohemia)

Abstract format: Oral

Finishing my studies in archaeology in the late 2000s there was a sentiment of disencumberment from the yoke of the grand paradigms that dominated discourse on disciplinary history and theory. Recurrent themes revolved around archaeology’s ability to make genuine theoretical contributions, persistence of paradigmatic remnants, neglect of non-Anglophone schools of thought, submitting archaeology to concepts and methods from other disciplines, and optimism about data sourced from new technologies and scientific methods. Concern about the overall direction of archaeological discourse seemed to be a predominantly (north-western) European preoccupation. The prevalent acceptance of ‘eclecticism’ essentially paved the way for permitting theoretically disengaged smörgåsbord approaches and pick’n’mix research designs. In 2011 I convened a session at TAG (Theoretical Archaeology Group) which identified the risks of the epistemological ‘tolerance trap’ and missing out on conscious efforts of integration to ensure commensurability between data, concepts, methods, techniques, and eventually interpretation. Since then, coming from Mesoamerican archaeology, crossing over into human geography, promoting digital humanities and geohumanities, I have come to pursue an agenda that addresses sustainable urban development and (mapping) methods in urban morphology. Consequently, I have contributed to many fora on the challenges of interdisciplinarity research and multidisciplinary collaborations. There is significant commonality in the puzzlement over how to navigate these contemporary research expectations and challenges, the hunger for data alongside a data deluge, and concerns about renewed scientification in archaeological discourse. There is also commonality in how novel technology-driven fields and scientification represent vogues in science policy, (re)presentation, financing, and support for careers. I will use this baggage to argue from a vantage of critically purposive and phenomenon-driven research design to avoid (archaeological) discourse and practice becoming determined by fashions and novelty in data or methods.

3 FINDING INTERDISCIPLINARITY

Abstract author(s): Loy, Anna (ROOTS Kiel)

Abstract format: Oral

My ventures into interdisciplinary research have started early on when I trained for my bachelor’s degree in Ancient History and Prehistory, Archaeology of the Middle Ages, and the minor of Archaeological Sciences in Tübingen. For my Master’s I went on with a combination of environmental and Landscape archaeology and at the same time was a student assistant in a project firmly located in Theoretical Archaeology at the Freie Universität Berlin. Currently I am part of the interdisciplinary Cluster of Excellence ROOTS in Kiel working on my PhD in the Subcluster ‘Conflict and Conciliation’. During all stages of my education I have experienced the problems and sometimes the accomplishments of interdisciplinarity in archaeology but am yet to find a way to truly experience and nurture deep mutual understanding. Nevertheless I am confident this understanding fosters a more comprehensive insight into archaeology. Consequently, I am passionate about bridging the divide to enable meaningful exchange, creative work and learning between different disciplines.

4 ARCHAEOOMETRY GROUP FROM THE INSTITUTE OF ARCHAEOLOGY OF THE CAS, PRAGUE

Abstract author(s): Danielisova, Alzbeta (Institution of Archaeology of the CAS, Prague) - Bursák, Daniel (Institution of Archaeology of the CAS, Prague)

Abstract format: Oral

As the assignment of this abstract is to introduce ourselves - we are two members of the Natural Sciences and Archaeometry Department of the Institute of Archaeology of the CAS, Prague. We currently finished a project aimed at geochemical analyses of the copper alloy, silver and glass objects from the Iron Age in central Europe (“Mobility of materials and life cycles of artefacts: archaeometry of metals and glass of the La Tène and Early Roman period”), our primary focus was provenance analysis with respect to historical questions. During the course of the project, we have encountered many issues that resonate strongly with the points made in this session proposal - especially the one regarding the lack of contextualization and proper archaeological or historical question underlying the analyses. Therefore, we would very much like to attend this discussion and welcome the keynote given by Mark Pearce. This last sentence is purely for completing the mandatory word count.

5 TRANSLATORS ON AN ARCHIPELAGO

Abstract author(s): Rose, Thomas (Ben-Gurion University of the Negev, Be’er Sheva, Israel; Sapienza – University of Rome, Rome, Italy)

Abstract format: Oral

On “both sides” the ever increasing knowledge and complexity of analytical methods requires a high degree of specialization from the beginning. During my studies, finding or creating one’s own niche of research was recommended as the best strategy to survive in academia. This development is fueled by the shift of archaeological publications towards article-like formats instead of books, narrowing down the focus of publications to specific aspects with little chances (or even the need) to develop a more holistic approach. As a result, “the other” is already among us on both “sides”. Or to put my perception more clearly, there is no “other side” anymore but an archipelago.

Being archaeologist and geoscientist by training and working in archaeometallurgy, I am used to combine different materials and methods, and concepts from different archaeological and scientific fields. Sometimes I struggle not to get lost in translation within my own thoughts. How much more challenging must it be for people with a different background to understand what I am doing and how I approach things!

There are two ways of not to get lost in translation: Stop to communicate and learning to become a translator, regardless how painstaking the latter might be. For me, the first is no valid option. Therefore I am looking forward to discuss how favorable conditions can be created to encourage researchers in becoming translators as well with the aim that one day we easily understand each other.

6 COMPLEXITY THEORY AS AN ONTOLOGICAL GUIDELINE: TOWARDS A BETTER INTEGRATION OF QUANTITATIVE AND QUALITATIVE APPROACHES

Abstract author(s): Schlicht, Jan-Eric (CRC 1266 - Scales of Transformation; Kiel University)

Abstract format: Oral

Jan-Eric Schlicht is currently working as a research associate in parallel to working on his doctoral dissertation in the subproject A1 of the CRC 1266 - “Scales of Transformation” at Kiel University in Germany.

During the course of his undergrad and graduate studies in Leipzig and Kiel he developed a keen interest in archaeological theory as well as philosophy while at the same time being rooted in quantitative methodologies in Archaeology. These two different fields of interest lead him to aim for integrative approaches between qualitative and quantitative perspectives culminating in his MA-thesis which aimed to integrate theoretical notions from the fields of Complexity Theory and Bourdieus Theory of Social Practise with archaeogeographic analyses using hierarchical clustering of aoristically weighted data on raw material distributions during the south Portuguese Late Neolithic and Chalcolithic periods as a proxy for an ‘emergence of social spaces’.

Following that, his doctoral thesis will focus on quantitative approaches towards ethnographical and archaeological data as means to conduct large scale cross-cultural analysis in the context of non-sedentary societies and transformative processes. This endeavour necessitates the development of a sound theoretical frame revolving around analogical reasoning, notions of ‘culture’, ‘similarity’, ‘universals’ and ‘particulars’ as well as developing a methodological framework allowing for the translation of qualitative, textual information into quantitative measurements and indexes. As such his work needs to find a balance between both perspectives and aims for an integrative approach following an ‘ontological guideline’ derived from Complexity Theory.

7 CONTRIBUTIONS OF GEOMETRIC MORPHOMETRICS TO ARCHAEOLOGY: POTENTIALITIES OF A NEW APPROACH TO ARTEFACT SHAPE ANALYSIS

Abstract author(s): Araujo, Renata (Museum of Archaeology and Ethnology, University of Sao Paulo) - Okumura, Mercedes (Laboratory for Human Evolutionary Studies, Department of Genetics and Evolutionary Biology, Biosciences Institute, University of São Paulo)

Abstract format: Oral

Archaeology could be considered the most interdisciplinary of all disciplines. As a currently Ph.D student in Archaeology, since the beginning of my career I have been experiencing diverse ways of thinking and approaching archaeology, manifested in fieldwork, laboratories, in the classroom and in the literature. The discussion proposed for this session pinpoints to the acknowledgment that archaeology is an idiosyncratic science presenting the great potential to be epistemologically intertwined with all sciences. In reason of this particular character, a reassessment and critical thinking of the advances, borrowings and new approaches in terms of theory, methods and techniques which our discipline has been experimenting through its history – and mainly in the last 50 years – is an absolutely necessary debate.

With this view, this session caught my special attention, as the thread it proposes is very much related to my topic of research, which is the application of a method for artefact shape analysis named geometric morphometrics (GM). GM is a quantitative method originated in the Biological Sciences and is most used in Evolutionary Biology studies for the analysis of organismal form. Evolutionary archaeologists have just recently (over the last ten years) started applying this method to material culture, shedding new light to artefact analysis. The use of GM in archaeology has seen very much increase in lithic studies in particular, where analyses of artefact shape offers new insights to traditional technological approaches.

I am currently developing a doctorate project in the Museum of Archaeology and Ethnology, University of São Paulo (Brazil). My research is on Brazilian prehistory, and it focuses on geometric morphometric analysis of formal lithic artefacts – bifacial projectile points and plan-convex artefacts – from Southeastern Brazil. The main goal of this research is to contribute to the understanding of human occupation of this geographic area.

246 IMPR – PHYTOLITHS IN INTEGRATED ARCHAEOBOTANICAL AND ETHNOARCHAEOLOGICAL STUDIES

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Dal Corso, Marta (Kiel University) - Out, Welmoed (Moesgaard Museum)

Format: Regular session

The session "Phytoliths in integrated archaeobotanical and ethnoarchaeological studies" is dedicated to the wide range of applications of phytoliths in archaeology, paleoanthropology and palaeoethnobotany. The identification of plant remains at an archaeological site can be indicative of the resources and environments exploited by peoples, their subsistence strategy and further economic and cultural practices. Research questions that can be addressed concern agronomy, economy and diet in the past, i.e. how phytoliths can be used to reconstruct the cultivation, processing and use of plants for food and animal fodder. In addition, phytoliths can help to disentangle plant uses for non-food purposes as well. In this case, information can be gained about, for instance, architecture, medicinal uses, textiles and other aspects of domestic, economic and ritual spheres.

In this session, studies of modern ethnographic contexts are also welcome, that offer insights into traditional plant uses and that can be used to calibrate the interpretation of the phytolith fossil assemblage from comparable archaeological contexts. Through this comparison, deposition processes, traditions and cultural choices behind human behaviour in the past can be better identified and understood. Presentations can focus on the investigation of phytoliths from specific objects or from different contexts from one or multiple sites. Contributions that show a comparison of the phytolith record with other kinds of archaeobotanical records (macro-remains, wood/charcoal, starch, pollen and NPPs, plant biomarkers), as well as with other proxies (stable isotopes of osteological records or seeds, faunal assemblages, etc.) are particularly welcome. Case studies and reviews may concern different periods and geographical regions.

This session is part of the 12th International Meeting for Phytolith Research, or IMPR, the official scientific conference of the International Phytolith Society.

ABSTRACTS:

1 TRACES OF LIFE: INTEGRATING PHYTOLITH AND ETHNOARCHAEOLOGICAL ANALYSIS IN LEVANTINE SITES

Abstract author(s): Jenkins, Emma (Bournemouth University)

Abstract format: Oral

The Neolithic in southwest Asia (c 11,700–7800 cal BP) is an important period in human history that saw the advent of sedentism, agriculture and ultimately paved the way for increased social complexity and urbanism. It is also, however, one of the most poorly understood. This is partly because of the paucity of Neolithic sites and also because when sites are found preservation is often limited, particularly for organic remains. This presentation outlines results from an integrated phytolith and ethnographic study conducted

on the 20th Century site of Al Ma'tan, Jordan which was similar in construction and layout to Levantine Neolithic sites. We split our samples into different context categories for example middens, hearths and floors. We found that phytolith signatures were in accord with what would be expected based on the oral histories provided by former residents of the settlement and that signatures were strongest for categories linked to construction practices rather than activities.

2 THE USE OF PHYTOLITHS ANALYSIS FOR THE INTERPRETATION OF THE CONTENT OF POTTERY: AN EXPLORATORY STUDY OF AFRICAN ETHNOGRAPHIC SAMPLES

Abstract author(s): Garnier, Aline (University of Paris East; Laboratory of Physical Geography CNRS - UMR 8591) - Mayor, Anne (University of Geneva) - Vieugué, Julien (CNRS - Prêtech UMR 7055) - Fichet, Valentine (Laboratory of Physical Geography CNRS - UMR 8591) - De Milleville, Lucile (Laboratory of Physical Geography CNRS - UMR 8591) - Regert, Martine - Drieu, Léa - Mazuy, Arnaud (CNRS - CEPAM UMR 7264)

Abstract format: Oral

Because it may be used for storing, transporting, preparing and serving food commodities, pottery represents a key evidence of the food practices of past societies. However, the plant content of archaeological pottery is difficult to track because of (i) the low preservation of their molecular biomarkers in organic residues, (ii) the scarcity of well-preserved botanical remains and (iii) the lack of interpretative references.

This communication aims at presenting the potential and limits of phytoliths as an indicator of plant content of pots, and culinary practices of past societies.

Because of their siliceous structure, phytoliths analysis offers new perspectives for identifying plants remains in organic residue, where other biological and molecular indicators are poorly preserved. Differentiating the parts of plants and Poaceae subfamilies may furthermore supply detailed information about the substances prepared inside pottery (seeds, leaves, roots, etc.).

This preliminary study focuses on the phytoliths analysis of the residues and clay paste from more than 20 ethnographic pots from Senegal used for different purposes.

These were collected in two present day communities in Casamance and Bedik Country representing two regions with different traditional food systems, according to their farming practices (rice farming vs rainfed agriculture). This study has been developed in the framework of an international research program with a wider perspective of establishing an ethnoarchaeological reference of the functions of pottery that combines different proxies (typometry, use-wear, lipids, proteins, phytoliths and starch grains analyses). The first results highlight a contrasted signal of phytolith assemblages according to the content of the pots and reveal the necessity to adopt a salient sampling strategy.

3 THE POTTER, BETWEEN SPECIALISED PRODUCTION AND ROUTINE ACTIVITIES? MULTIDISCIPLINARY STUDY OF A COPPER AGE KILN

Abstract author(s): Dal Corso, Marta (Kiel University / CRC1266 / ROOTS) - Hofmann, Robert (Kiel University / CRC1266) - Ohlrau, Renè (Kiel University / ROOTS) - Dreibrod, Stefan (Kiel University / CRC1266) - Müller, Johannes (Kiel University / CRC1266 / ROOTS) - Benecke, Norbert (DAI Berlin) - Videiko, Mihail (Borys Grinchenko Kyiv University) - Kirleis, Wiebke (Kiel University / CRC1266 / ROOTS)

Abstract format: Oral

One of the peculiar aspects of the Trypillia sites in Eastern Europe (beginning of the 4th mill. BCE) is the first attestation of some fired constructions in earthen architecture, mostly interpreted as technologically advanced kilns for pottery making. These structures had separate compartments for the heating material and the pottery to be fired and two or more parallel channels in the under-construction. Based on the fine quality and large quantity of painted ware assemblage at Trypillia sites, pottery production is seen as one of the earliest specialised handicrafts in Europe. In order to understand more about the potter's activities and the role of the potter in society, at the mega-site of Maidanetske, in central Ukraine, we applied a multidisciplinary approach to the investigation of one of these structures, including its surroundings and related pits. Evidence from charred botanical macro-remains, phytoliths, faunal remains, geochemistry, archaeological finds and stratigraphic information related to the kiln will be discussed and, when possible, compared with data from other excavated structures unrelated to the kiln. How do cereal processing, wood selection, and an unusual faunal record enter the potter's lifestyle? Can we trace a first, strict, labour division or is there attestation also of daily routine activities at the kiln? Through the archaeological, archaeobotanical and zooarchaeological record at Maidanetske, in comparison with similar excavated kilns at other Trypillia sites, some socio-economic aspects will be discussed about Copper Age society and production, on the light also of ethnographic models.

4 USING PHYTOLITHS TO RECONSTRUCT ARCHAEOLOGICAL STORAGE PIT FUNCTION IN BRONZE AND IRON AGE ANATOLIA (TURKEY)

Abstract author(s): Turnbull, Molly (University of Queensland School of Social Science, Archaeology) - Crowther, Alison (University of Queensland School of Social Science, Archaeology; Max Planck Institute for the Science of Human History) - Fairbairn, Andrew (University of Queensland School of Social Science, Archaeology) - Omura, Sachihiko (Japanese Institute of Anatolian Archaeology)

Abstract format: Oral

Excavations at Kaman-Kalehöyük in Central Anatolia (Turkey) have identified the partial remains of several thousand storage pits, many of which had clearly visible linings. Identical lined storage pits appear across Bronze and Iron Age archaeological sites in Anatolia, coincident with significant socio-political reorganisation and environmental change, and are even referred to in ancient Sumero-grams and Classical records. Despite their abundance, reconstructing the function and construction technology of pits been difficult, largely due to damage caused to them during continuous rebuilding in long lived settlements and the poor preservation of their contents. To overcome these issues, phytolith analysis was used to reconstruct the lining and fill of pits from the Early Bronze Age and Late Iron Age occupations of Kaman-Kalehöyük. The phytoliths recovered from the linings were dominated by inflorescence and culm long cell types from wheat/barley (*Triticum/Hordeum*), *Setaria/Panicum* (millet) and wild grass (*Pooideae*), likely reflecting the in situ decay of formerly stored crop contents and botanical materials used to line the pits to improve storage performance. In contrast, fills were dominated by high frequencies of grass short cells along with various *Cyperaceae* and spheroid dicotyledon/monocotyledon types, likely the remains of refuse from the end of the pit's use life. Taxonomic variation in the phytolith composition of pit linings and fills likely reflects local plant selection, availability and management strategies related to socio-political and environmental change in Bronze and Iron Age Anatolia.

5 PLANT WAYS IN MIDDLE BRONZE AGE ANATOLIA – AN ARCHAEOLOGICAL INTERPRETATION OF PHYTOLITHS AND PLANT REMAINS AT ZINCIRLI HÖYÜK, TURKEY

Abstract author(s): Ögüt, Birgül (German Archaeological Institute) - Karakaya, Doga (Eberhard Karls Universität Tübingen, Institut für Naturwissenschaftliche Archäologie)

Abstract format: Oral

The Middle Bronze Age is marked by the increasing internationalism in the Near East through the seizure of political control by Amorite kings. Various texts mention these nomadic tribes as threatening the political order of the Ur III dynasty in southern Mesopotamia at the end of 3rd millennium BC. With the beginning of the Middle Bronze Age, however, Amorite kingdoms were successfully established in large parts of the Near East. International contacts are also apparent from the Mari and Kültepe texts which document that rulers from Mesopotamia, the Levant and Minoan Crete were exchanging gifts and commodities among each other. While some of these texts mention long-distance trade of value-added commodities like olive oil and wine; they are not particularly descriptive of the production and processing stages of these products. In this paper, we present the joint results of the micro-botanical (phytoliths) and macro-botanical (seeds and fruits) remains from a Middle Bronze Age layer (ca. 1650 BCE) at Zincirli Höyük (Turkey). The study area was destroyed after a single conflagration event with several food processing installations and restorable vessels in-situ. In addition, the archaeological contexts were minimally disturbed by later sedimentary and anthropogenic activities. This preliminary contribution aims to comprehend the potential link between micro- and macro-botanical remains by focusing as to whether different crops have been stored and processed in different locations in the studied context.

6 IDENTIFYING THE WATER REGIME AND ITS ASSOCIATION WITH CROP HIERARCHIES DURING 1850-1750 CAL BC IN THE XINZHAI SITE, CHINA

Abstract author(s): An, Jingping - Dal Corsol, Marta - Kirleis, Wiebke (Pre- and Protohistorical Archaeology, Kiel University) - Jin, Guiyun (Institute of Cultural Heritage, Shandong University)

Abstract format: Oral

A vital factor in the rise of urbanization is the development of a complex farming system employing labor-intensive irrigation. It is, therefore, of great significance to probe the water regime in the Xinzhai period (1850-1750 cal BC), a key period pursuing the emergence of early urbanization in China. To recover the water management in the Xinzhai period, correspondence analyses based on phytolith ecological categories and ratio analyses of Sensitive to Fixed morphotypes of 59 phytolith sediment samples from the Xinzhai site were performed. They clearly show that rice and millet were grown in different ecological settings with possibly intensive rice farming under an irrigation system and a rainfed millet farming system. Meanwhile, a regional comparative-research of phytolith and macro-remains suggests that rice was more concentrated in central settlements and the aristocratic residential area in the Xinzhai site. Since there was a rice-favorable warm and wet climate during the Xinzhai period, we argue that the uneven distribution of rice can be explained by cultural factors instead of climatic factors. Due to the intensive labor inputs, irrigated rice has been chosen from ordinary ingredients into luxury food for the wealthy and powerful while rainfed millet was more for calorific needs probably as a major staple. More than that, the practice of irrigation likely had a prolonged impact on the agricultural pattern and the social complexity in the subsequent Erlitou (1750-1550 cal BC) and Shang (1550-1046 cal BC) periods. This research proves archaeobotanical evidence can enable us to evaluate how certain crops became powerfully associated with social-cultural distinction under an irrigated system and also how it possibly contributed to the social complexity.

7 PHYTOLITHS, SEEDS AND WOODEN CRAFTS: THE STUDY OF JAPANESE COLONIALISM IN NORTHERN TAIWAN (HEPING DAO, KEELUNG)

Abstract author(s): Chevalier, Alexandre (Royal Belgian Institute of Natural Sciences) - Martín-Seijo, María - Serrano Herrero, Elena (Universidad de Cantabria) - Tsang, Chenghwa (National Tsing Hua University) - Cruz Berrocal, María (Universidad de Cantabria)

Abstract format: Oral

The archaeological site of Heping Dao (northeast Taiwan) has produced relevant information about the ephemeral material culture related to the day-to-day life of the Japanese occupation of the island. The exceptional preservation of organic remains by water saturation has provided the opportunity of developing a multidisciplinary study. The study of a set of wooden remains dated to mid-20th century including the base of a bucket or a small cask, a takamakura, a koma geta and other items of unknown function has provided the opportunity of combining wood analysis, and morpho-technological studies with phytolith identification. The base of the wooden container preserved an organic adherence in the inner part which contained plant macro-remains visible at naked eye (*Cucurbitaceae* seeds) and phytoliths. This case study highlights the relevance of integrated archaeobotanical studies in colonial contexts to address aspects related to the daily life of these communities such as food storage or consumption but also about objects, wood, and identities.

8 PHYTOLITHS, STARCH GRAINS AND ANDEAN CROPS: THE INPUT OF THEIR DIVERSITY FROM AMERICA TO ARCHAEOBOTANICAL RESEARCH

Abstract author(s): Musaubach, Maria (National University of Jujuy; Institute of Andean Ecoregions - CONICET-UNJu) - Plos, Anabela (Museo Argentino de Ciencias Naturales - CONICET; GBIF Argentina; Sistema Nacional de Datos Biológicos)

Abstract format: Oral

This paper presents preliminary results of the archaeobotanical study of South-Central Andes Culinary Heritage Digital Database. We review Andean crops collection sample and reference collection of starch grains and phytoliths making procedures. Besides, both collections include processed products from these crops (for example, flour, roasted seeds, and mote), which were found and collected from fairs and markets. Finally, samples obtained during our ethnoarchaeological and ethnobotanical fieldwork are incorporated. The collection sample includes, plants in natural or dry state, as well as those already transformed throughout culinary processing. Phytoliths and starch grains are a useful tool to identify which crops were part of ancient food. They are analyzed and described with description and identification protocols used in our archaeobotanical research. Usually, Andean crops are defined as traditional crops, growing on the Andes, with a diverse taxonomy, having in common characteristics such as drought, frost and salinity-resistant. Some of them, such as corn, potatoes, quinoa, beans, among others are produced and consumed by families from the central and south central sector of the Quebrada de Humahuaca (Argentina) at small-scale agriculture. Andean taxa with food uses, its culinary processing knowledge and practices, food serving and consumption are retrieved and systematized in a digital database. These reference materials are relevant for archaeobotanical studies. They also contribute to community bio cultural heritage recovery. Their description and registration allows us not only to catalog them in the JUA Herbarium heritage, but to enhance, visibility, safeguarding and management of South-Central Andes Culinary Heritage.

9 SONDONDO'S AGRICULTURE AS REFLECTED IN PHYTOLITHS. USE OF SOIL ANALYSIS TO UNDERSTAND SOCIAL DEVELOPMENT IN PREHISPANIC TERRACES IN PERU

Abstract author(s): Aparicio, Patricia (Pontificia Universidad Católica del Perú; Universidad de Oviedo) - Korstanje, Alejandra (Instituto de Arqueología y Museo, Universidad Nacional de Tucuman, Instituto Superior de Estudios Sociales - CONICET-UNT)

Abstract format: Oral

In Peru, studies of pre-Hispanic agriculture have been adopted a number of different approaches. Some researchers have focused on botanical aspects, others on agrarian technologies, while others have concentrated on social and economic relationships. However, in almost all cases, typological and structural views have prevailed leading to conclusions strongly based on relative chronologies and broad generalizations, especially for the more complex stages of social development, mainly the horizons of the Wari and Inca Empires. Aligned with the theme of this conference, our team has begun to conduct phytolith analysis in relation to soil and land use to more fully interpret terrace construction, use, and their social implications.

The interdisciplinary methodologies and techniques that we are applying on the terraces allow the implementation of new approaches in Agrarian Archeology in Peru that examine the cultivation sites themselves without relying exclusively on ethnographic or ethnohistorical analogies. In our paper, we will present the results of the first multiple microfossil analysis of soils analyzed from agricultural terraces in the Sondondo Valley (Department of Ayacucho, Peru) at 3200 m.a.s.l.. For example, we have been able to identify the standardization of agricultural terraces in the southern Peruvian Andes during the expansion of the Inka Empire and directly related to the need to harvest corn. Our innovative methods not only shed light on the types of crops cultivated, but also demonstrates how shifts in cultigens can serve as measures of sociopolitical transformations.

10 DARK EARTHS PLANT MANAGEMENT AND THE REGIONAL DEVELOPMENT OF TAPAJÓ CULTURE IN THE LOWER AMAZON

Abstract author(s): Alves, Daiana (Federal University of Pará) - Iriarte, Jose (University of Exeter)

Abstract format: Oral

The highly fertile Amazonian Dark Earths (ADE) results from landscape transformations found in association with archaeological sites throughout Amazonia. In the Santarem region (Lower Amazon), ADEs are mainly found in ancient Tapajó settlements (AD 1000-1600), though observed in some older occupations. Our paper brings together results from different lines of evidence (phytoliths, geochemistry, micro-charcoal, and archaeology) to address landscape and social changings following the regional organization of the Tapajó culture. The data stems from three ADE sites sampled on terrestrial cores, excavation profiles, and cultural features such as house floors, fire pits, hearths, caches and refuse pits. Phytolith revealed an overall increase in plant foods, consisting of food crops and edible native species concomitant to a shaded vegetation cover. Additionally, inter-site comparison indicated a gradient of vegetation change correlated to the formation of ADEs, varying according to site size (population) and length of occupation. Microcharcoal (<125µm) showed a sharp increase throughout the ADEs layers on the studied sites indicating intense charcoal input resulting in soil amelioration confirmed by the geochemical data. Altogether, these data suggest a long-term polyculture agroforestry practice, including crop cultivation, management of edible native species, and soil enrichment beginning before the Tapajó advent and intensified by them. Therefore, regional socio-cultural and landscape transformations during the Late Holocene connect to traditional ecological knowledge and ancient subsistence practices, which applied controlled fire as a tool for shaping their surrounding environment.

11 4000 YEARS OF RESILIENT PASTORALISM: THE PHYTOLITH ASSEMBLAGE FROM A MULTIPERIOD HABITATION SITE IN NORTHWESTERN MONGOLIA

Abstract author(s): García-Granero, Juan José (Spanish National Research Council - IMF-CSIC; University of Oxford) - Égüez, Natalia (Universidad de La Laguna) - Seitsonen, Oula (University of Oulu) - Wright, Nathan (University of New England) - Broderick, Lee (Oxford Archaeology) - Bayarshaikhan, Jamsranjav (National Museum of Mongolia) - Houle, Jean-Luc (Western Kentucky University)

Abstract format: Oral

Currently, the development of mobile pastoralism and the chronology and nature of early pastoralist societies in Mongolia is known almost exclusively from burial and ritual contexts. Here we present the results of archaeological excavations carried out at a deeply stratified multiperiod habitation site situated in a protected valley draw in the Züünkhongai region of northwestern Mongolia, an area used by present-day pastoralist as a winter camp. Our data include artefacts, botanical and faunal remains, geological information and chronology that document the development of pastoralism in this region since the Early/Middle Bronze Age (c. 2000-1700 cal. BC). Our findings attest to the adaptive resilience of pastoralism for 4000 years, up to the present day, despite major changes in the sociopolitical, socioeconomic and environmental conditions through time. The phytolith assemblage is composed almost entirely of wild pooid grasses, which predominate in the Mongolian steppe. Interestingly, inflorescence phytoliths are extremely scarce throughout the site occupation sequence, suggesting that this area has been consistently used by herders as a winter camp for four millennia. Moreover, the ratio between Poaceae phytoliths fixed and sensitive to water conditions (short and long cells, respectively) suggests that during the earlier (Bronze Age) occupation of the site environmental conditions were drier than during later occupations (Iron Age and subsequent periods).

12 RECONSTRUCTING BRONZE AGE AGRO-PASTORAL PRACTICE IN THE MESOPOTAMIAN-ZAGROS FOOTHILLS: PHYTOLITH AND FTIR ANALYSIS OF DUNG-RICH SEDIMENTS FROM KHANI MASI (IRAQ)

Abstract author(s): Laugier, Elise (Dartmouth College) - Cabanes, Dan (Rutgers University)

Abstract format: Oral

The Zagros foothills have one of the longest histories of agro-pastoral practice globally, beginning in the Epipaleolithic. While the domestication process and Neolithic subsistence in this region have recently received much archaeological science research, the subsequent Mesopotamian Bronze Ages (late 4th–2nd millennium BCE) remain principally assessed with traditional excavation and textual evidence. As texts are often related to state-level institutional affairs in distant regions, our knowledge of local, day-to-day agro-pastoral management strategies remains conjectural. Phytolith analysis is a particularly productive method for assessing agro-pastoral practice in regions with poor macrobotanical preservation. While this approach has not been widely applied in Mesopotamia (Iraq), it has the potential to shed light on the production systems supporting its Bronze Age cities, states, and empires.

In this study we use phytoliths, dung spherulites, and Fourier Transform Infrared (FTIR) spectroscopy to identify and examine dung-rich sediments from Khani Masi, an 8 hectare mid-second millennium BCE Kassite site located in the Kurdish Region of Iraq. Our aim was to investigate (1) the range of local pastoral management strategies, (2) the degree of integration between agricultural and pastoral practice, and (3) the presence of signals related to the local ecology, seasonality, and environmental change and continuity.

Phytolith analysis reveals that sheep/goats were primarily free grazed on wild grasses. The dominance of wild grass inflorescences, a potentially strong seasonality indicator, may suggest transhumant pastoralism. However, further evidence, including occasional foddering with cereal chaff, a diverse range of crop types, and significant accumulations of burnt dung within the site, collectively

suggests a closely linked local agro-pastoral subsistence economy. This study provides much-needed empirical botanical data as well as productive insights for future application of phytolith studies in the Mesopotamian region, and sheds new light on agro-pastoral practice in the Zagros foothills during Kassite imperial rule.

13 BEDDING LAYERS FROM BORDER CAVE, SOUTH AFRICA: A PHYTOLITH AND FTIR INVESTIGATION

Abstract author(s): Esteban, Irene (ERAAUB - Universitat de Barcelona; Evolutionary Studies Institute, University of the Witwatersrand) - Wadley, Lyn (Evolutionary Studies Institute, University of the Witwatersrand) - Backwell, Lucinda (Instituto Superior de Estudios Sociales - ISES-CONICET; Evolutionary Studies Institute, University of the Witwatersrand)

Abstract format: Oral

Border Cave is a well-known South African Middle and Later Stone Age archaeological site located in KwaZulu-Natal, that has provided exceptional plant preservation, probably unparalleled in South African archaeology. The site preserves multiple bedding structures in numerous layers, some survived as visually ephemeral fragments of silicified plant material while in others desiccated plant is preserved. We recently reported the discovery of grass bedding used to create comfortable areas for sleeping and working by people who lived in Border Cave at least 200,000 years ago. The complexity and distinctiveness of these deposits provide an excellent opportunity to study the relationship between plant exploitation strategies and sleeping behaviours of the ancient inhabitants of Border Cave. This study presents ongoing research on the phytolith and chemical composition of sediments from bedding layers dating from ~227 to 24 ka. The results here presented are further investigated from a taphonomical perspective, that is critical to conducting a more reliable interpretation of plant-human behaviours in the cave.

14 TAPHONOMY, ENVIRONMENT OR HUMAN PLANT EXPLOITATION STRATEGIES? DECIPHERING CHANGES IN PLEISTOCENE-HOLOCENE PLANT REPRESENTATION AT UHMLATUZANA ROCK SHELTER, SOUTH AFRICA

Abstract author(s): Murungi, May (Human Evolution Research Institute, University of Cape Town; Evolutionary Studies Institute, University of the Witwatersrand) - Esteban, Irene (ERAAUB, Dept. Història i Arqueologia, Universitat de Barcelona; Evolutionary Studies Institute, University of the Witwatersrand; Centre for Coastal Palaeoscience, Nelson Mandela Metropolitan University) - Sifogeorgaki, Irini (Faculty of Archaeology, Leiden University) - Dusseldorp, Gerrit (Faculty of Archaeology, Leiden University; Palaeo-Research Institute, University of Johannesburg)

Abstract format: Oral

The period between ~40 and 20 ka BP encompassing the Middle Stone Age (MSA) and Later Stone Age (LSA) transition has long been of interest because of the associated technological change. Understanding this transition in southern Africa is complicated by the paucity of archaeological sites that span this period. With its occupation sequence spanning the last ~70,000 years, Umhlatuzana Rock Shelter is one of the few sites that record this transition. Umhlatuzana thus offers a great opportunity to study past environmental dynamics from the Late Pleistocene (MIS 4) to the Late Holocene, and past human subsistence strategies, their social organisation, technological and symbolic innovations. Although organic preservation is poor (bones, seeds, and charcoal) at the site, silica phytoliths preserve generally well throughout the sequence. These microscopic silica particles can identify different plant types that are no longer visible at the site because of decomposition or burning to a reliable taxonomical level. Thus, to trace site occupation, plant resource use, and in turn reconstruct past vegetation, we applied phytolith analyses to sediment samples of the newly excavated Umhlatuzana sequence. We present results of the phytolith assemblage variability to determine change in plant use from the Pleistocene to the Holocene and discuss them in relation to taphonomical processes and human plant gathering strategies and activities. This study ultimately seeks to provide a palaeoenvironmental context for modes of occupation and will shed light on past human-environmental interactions in eastern South Africa.

15 TOWARDS A MODEL OF A MAMMALIAN INTERFACE WITH THE PHYTOLITHS IN THEIR NATURAL ENVIRONMENT: INSIGHTS FROM TAÏ CHIMPANZEE FAECAL PHYTOLITHS

Abstract author(s): Power, Robert (Institute for Pre-and Protohistoric Archaeology and Archaeology of the Roman Provinces, Ludwig-Maximilians-University Munich; Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Leipzig) - Wittig, Roman (Department of Primatology, Max Planck Institute of Evolutionary Anthropology, Leipzig; Taï Chimpanzee Project, centre Suisse de Recherches Scientifiques, Abidjan) - Stone, Jeffery (Department of Earth and Environmental Systems, Indiana State University) - Kupczik, Kornelius (Max Planck Weizmann Center for Integrative Archaeology and Anthropology, Max Planck Institute of Evolutionary Anthropology, Leipzig, Germany; Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Leipzig) - Schulz-Kornas, Ellen (Max Planck Weizmann Center for Integrative Archaeology and Anthropology, Max Planck Institute of Evolutionary Anthropology, Leipzig; Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Leipzig)

Abstract format: Oral

In recent years, there has been increasing use of human dental calculus as a source of phytoliths for inferring dietary data on ancient human subsistence and behaviours. The dental calculus of contemporary human and non-human populations with known diets have been used as reference data sets, including the chimpanzees of Taï National Park (Côte d'Ivoire), but explaining the preservation mechanism involved is challenged by our incomplete knowledge of the microremain content within the diets of these reference

populations and our rudimentary information on the process of microremain incorporation into dental calculus. This paper presents phytolith analysis of faecal samples from a population with previously published dental calculus phytolith assemblages to assess to what extent dietary phytoliths are reflected in the dental calculus as well as in the egested faeces.

In this study, we detect and identify faecal phytolith assemblages as an indicator of plant consumption in two Western chimpanzees of the Tai National Park (Côte d'Ivoire) before (wet season), during (dry season) and after (dry season) a dust-rich period. In tandem, observational dietary records of these two individuals were compiled to improve the interpretability of this dental calculus phytolith dataset. The most common phytolith morphotypes were eudicot plates, single-cell and multi-cell tracheids, monocot rugulose and echinate spheroids. Using observational dietary records as a starting point and our faecal results as a terminus, we consider how dental calculus can accumulate phytoliths. Our findings enable identification of the phytolith morphotypes that are under-represented in dental calculus such as eudicot plates, single-cell and tracheids, which is informative for future dental calculus research strategies.

16 INVESTIGATING DIETARY CHANGES AT TELL KAMID EL-LOZ, BETWEEN THE 2ND-1ST MILLENNIA B.C.E USING PLANT MICROREMAINS RECOVERED FROM DENTAL CALCULUS

Abstract author(s): Gur-Arieh, Shira (Ludwig-Maximilians-Universität München)

Abstract format: Oral

Tell Kamid el-Loz, identified as the site of Kumidi in the Amarna Letters, is located in the Lebanese Beqa Plain on the central trade axis between the southern Levant and the early urban centers of Syria. The tell was inhabited since the late Neolithic (5th millennium BC) and flourished during the Middle (ca. 2000-1600 BC) and Late Bronze Age (ca. 1600-1200 BC), as attested by the temples and palaces uncovered during excavation. The settlement lost its importance in the Iron Age (1200-600 B.C.), the most important find in the subsequent Persian period (600-330 B.C.) being a large cemetery.

Approximately 108 burials of individuals dated between the Middle Bronze Age and the Persian period were uncovered at the site. These burials had previously been investigated within the framework of the Max Planck Harvard Research Center for the Archaeoscience of the Ancient Mediterranean (MHAAM) at the Max Planck Institute for the Science of Human History in Jena (MPI-SHH) to identify population genetic developments, biological relationships between individuals, their mobility and diseases. In addition, all of the individuals were radiocarbon dated. Of these burials, fifteen usable samples of dental calculus from individuals dating to the Middle Bronze Age through to the Persian period were studied using phytolith and starch analysis to understand the diversity and dynamics of individual human nutrition. Here, I will discuss the results of the micro-remain analysis carried out on dental calculus from individuals at Kamid el-Loz, and integrate this new dataset with the existing bioarchaeological data to inform on the dietary changes of its inhabitants.

17 A GLIMPSE INTO SHELLMOUND BUILDERS DIET DURING MID-TO-LATE HOLOCENE ON MARAJO ISLAND

Abstract author(s): Hilbert, Lautaro (University of São Paulo) - Alves, Daiana (Federal University of Pará) - Iriarte, José (University of Exeter)

Abstract format: Oral

Shellmounds are anthropic intentional constructions produced by pre-Columbian fishing/gathering communities. In general, they are composed of a primary layer of mollusc carapaces, fish bones and, in some cases, human burials. This paper briefly reviews the literature on Marajo Island's landscape transformations, highlighting anthrosols formations following social changes during the mid-to-late Holocene. Our case study is the Tucumã shellmound located on western Marajó Island. The site has two occupation components comprising sequential formation of anthrosols: the shellmound layers buried under an Amazonian Dark Earth soil. These soils are addressed as ecological legacies resulting from a cumulative knowledge of the environment and related to social changes within the island. Our results reveal the impact on the vegetation composition and a shift in plant dietary preferences from the beginning to the end of the occupation. Changes from known domesticates such as maize (*Zea mays*) and squash (*Cucurbita* sp.) shifted to palms and cassava (*Manihot* sp.) at the upper layers.

18 DUNG IN THE DUMPS: AN ARCHAEOBOTANICAL COMPARISON OF PHYTOLITHS, POLLEN AND SEEDS IN DUNG PELLETS FROM EARLY ISLAMIC SHIVTA (ISRAEL)

Abstract author(s): Dunseth, Zachary (Brown University) - Langgut, Dafna (Tel Aviv University) - Fuks, Daniel (McDonald Institute for Archaeological Research, University of Cambridge)

Abstract format: Oral

Dung pellets and degraded dung sediments are increasingly studied in archaeology. In this paper, we present a methodological comparison of three archaeobotanical proxies: phytoliths, pollen and seeds of dung pellets and corresponding archaeological refuse sediments in tandem with geoarchaeological analysis. The pellets and sediments were sampled from three Early Islamic (6th-9th centuries CE) middens excavated at Shivta, located in the Negev desert (modern Israel). Our research goals were to: 1) evaluate the strengths, weaknesses and compatibility of the three methods regarding archaeobotanical interpretations of dung; 2) infer on-site herding and foddering practices; and 3) assess the relative input of botanical remains from dung in archaeological refuse assemblages.

Methodologically, incomplete reconstructions appear when only one method is used, with each proxy possessing its own advantages and limitations. Focusing on phytolith analysis, the main advantages of phytoliths include: 1) preservation in both desiccated and charred dung pellets, as well as archaeological sediments, and 2) identifying consumption of sedges and foddering with cereal by-products, both missing in the other analyses. Evaluating seasonality based on phytoliths alone is unreliable, especially when there is a significant dietary component of chaff/hay fodder. However, phytolith studies may be helpful in supporting other archaeobotanical evidence of seasonality. Additionally, our combined results demonstrate that Shivta's Early Islamic refuse middens are only partially composed of dung remains and originated primarily from domestic trash.

This study's significance lies both in its methodological contribution to archaeobotany, and in lasting discussions regarding the influence of dung remains on the composition of archaeological deposits. We offer a rigorous archaeological method for determining whether deposits derive from dung alone, contain no dung, or are mixed assemblages. This has important ramifications for archaeological interpretation, generally.

19 PHYTOLITHS, POLLEN, AND PALEOECOLOGY AT A MIDDLE WOODLAND SITE IN THE AMERICAN SOUTHEAST

Abstract author(s): Balco, William (University of North Georgia) - Scott Cummings, Linda (PaleoResearch Institute)

Abstract format: Oral

Phytoliths and pollen are complementary forms of evidence attesting to paleoecological conditions at archaeological sites. When considered together, ancient environmental conditions can be posited, helping to reconstruct the paleoecological contexts that humans lived in and interacted with. Here, we present a study of pollen and phytoliths from a midden context at Rice Farm, a Middle Woodland Native American site in the American Southeast. Sample collection and analysis methods will be presented before discussing the social and environmental significance of the results. Our data contextualizes a record of native vegetation alongside use or discard of the cultigen maize by Native Americans at the Rice Farm site. The pollen and phytolith records couch this local signature within the broader environmental context of north Georgia's Piedmont during the Middle Woodland period. Taken alone, the phytolith data would not have provided an adequate means to properly contextualize past human-environmental interaction at the site, demonstrating the necessity of combining the results with pollen analysis to best reconstruct the paleoecological context at this site and archaeological sites in general.

A. FURTHER EVIDENCE FOR SEASONAL TRANSHUMANCE OF YAMNAYA COMMUNITIES DURING THE LATE COPPER – EARLY BRONZE AGE OF THE CARPATHIAN BASIN

Abstract author(s): Lisztes-Szabó, Zsuzsa (Isotope Climatology and Environmental Research Centre, Institute for Nuclear Res) - Filep, Anna Fruzsina (Pál Juhász-Nagy Doctoral School of Biology and Environmental Sciences, University of Debrecen) - Heyd, Volker (Department of Cultures, University of Helsinki) - Kulcsár, Gabriella (Institute of Archaeology, Research Centre for the Humanities) - Włodarczak, Piotr (Polska Akademia Nauk, Instytut Archeologii i Etnologii, Ośrodek Archeologii Gór i Wyzyn) - Dani, János (Déri Museum)

Abstract format: Poster

To learn more about the diets of Yamnaya communities (LCA/EBA, 3rd Millennium BC) in the Carpathian Basin, we studied the dental calculus of a woman's remains from a burial place (Bojt, Great Hungarian Plain). Plant microfossils (starch grains and phytoliths) were identified in the matrix of the calculus. Based on our findings, millet could be a consumed crop. Besides meat and milk – as the primary food source for the Yamnaya people – the young Yamnaya woman might have supplemented her diet with immature grass or crop shoots. However, the most exciting result is that the calculus matrix was rich in conifer phytoliths, apparently from *Abies alba* (silver fir) and *Picea abies* (Norway spruce) needles. As there were no conifers in the Great Hungarian Plain of the Carpathian Basin about five-thousand years ago, this may be new evidence for immigration or transhumance. The closest conifer habitat is located in the Transylvanian Apuseni Mountains, with higher pastures on the mountains' top. A traditional transhumant route of Yamnaya people between the western part of the Apuseni Mountains and the microregion of the burial site has been presumed based on evidence of both archaeological and stable isotope data sets of human remains. The hypothesis is that the transhumance with livestock passing the winter and spring in the Great Hungarian Plain's milder regions and returning to higher pastures in the warmer months is supported by our results. Consequently, we found further evidence for the seasonal transhumance of Yamnaya communities during the LCA-EBA Transitional Period of the Eastern Carpathian.

B. GRINDING PLANTS FOR FOOD AT THE EARLY BRONZE AGE SITE OF AGIOS ATHANASIOS: A MULTIPROXY APPROACH

Abstract author(s): Kasapidou, Georgia (LIRA Laboratory, Department of Archaeology, School of History and Archaeology, Aristotle University of Thessaloniki; Center for Interdisciplinary Research and Innovation - CIRI-AUTH, Balkan Center, Thessaloniki) - Tsartsidou, Georgia (The Malcolm H. Wiener Laboratory for Archaeological Science, The American School of Classical Studies at Athens; Ephorate of Palaeoanthropology-Speleology) - McNamee, Calla (The Malcolm H. Wiener Laboratory for Archaeological Science, The American School of Classical Studies at Athens) - Chondrou, Danai - Valamoti, Soultana (LIRA Laboratory, Department of Archaeology, School of History and Archaeology, Aristotle University of Thessaloniki; Center for Interdisciplinary Research and Innovation - CIRI-AUTH, Balkan Center, Thessaloniki)

Abstract format: Poster

In recent years, multiproxy approaches to ground stone tool analysis, which incorporate plant micro-remains with use-wear, have become integrated component of archaeological projects around the world, increasing our understanding of plant processing and culinary practices. These methods however have not been frequently applied in Mediterranean research. This poster aims to demonstrate the value of combining the results of phytolith and starch grain analyses with multi-scale use-wear analyses through the examination of 10 ground stone tools recovered at the Early Bronze Age short-term settlement of Agios Athanasios, in northern Greece. The selected tools were recovered from both interior and exterior occupational contexts and, for comparative purposes, the analysis was conducted on residue extracted from utilized and unutilized surfaces. The results indicate that the inhabitants of the site were exploiting a wide variety of plant products, including different kinds of legumes and cereals. The condition of the micro-remains also suggests that a range of practices were employed during the processing of different plants. Above all this study demonstrates the usefulness of a combined methodological approach for enhancing our understanding of tool use and plant processing activities at archaeological sites in Greece.

C. UNDERSTANDING CROP PROCESSING MODELS AND THEIR SOCIAL MEANINGS DURING THE XINZHAI PERIOD (1850-1750 CAL BC)

Abstract author(s): An, Jingping - Kirleis, Wiebke (Pre-and Protohistorical Archaeology, Kiel University) - Jin, Guiyun (Institute of Cultural Heritage, Shandong University) - Zhao, Chunqing (Institute of Archaeology Chinese Academy of Social Sciences)

Abstract format: Poster

In China, the Xinzhai period (1850-1750 cal BC), which is exclusively recorded in the Central Plain, has widely been regarded as a critical period for the formation of Chinese urbanization. However, little is known about the labor and social organization in this period. In this research, archaeobotanical assemblages were used to explore the crop-processing model and further provide insights into the mobilization of labor and the organization of society at the archaeological site of Xinzhai on the Central Plain. It offers the first case study linking agricultural activities and social organization about the Xinzhai period. By integrately discussing macro-botanical remains and phytolith remains, it concludes that hulled cereals foxtail millet, common millet, and rice and also the free-threshing pulse species soybean were all semi-processed before storage with minor labor involved in the initial harvest period. Since they are all summer crops and harvested during the later summer and autumn, the practice of semi-processing might imply less labor was deployed before storage. Thus, the labor in crop processing appeared to be organized on a small scale in more focused units of production such as household basis. This pattern is different from the bulk processing of crops before storage by the communal community in the contemporaneous Dongzhao site. Differentiation of social organization among settlements in the Xinzhai period thus can be suggested. This conclusion contributes to a comprehensive understanding of the social development in the Central Plain by indicating it highly possibly witnessed a constant increase in social complexity before urbanization.

D. BEFORE AND AFTER OF THE HUDSON VOLCANO ERUPTION: PALEOECOLOGICAL APPROACH BY MULTIDISCIPLINARY ANALYSIS OF CAMELID COPROLITES

Abstract author(s): Benvenuto, María Laura - Burry, Lidia Susana - Velázquez, Nadia - Martínez Tosto, Ana Cecilia - Petrigh, Romina (IIPROSAM, CONICET-UNMDP. Centro de Asociación Simple CIC PBA; Facultad de Ciencias Exactas y Naturales, UNMDP) - Camiolo, Ivana (IIPROSAM, CONICET-UNMDP. Centro de Asociación Simple CIC PBA) - Bozzuto, Damián (INAPL-CONICET; Facultad de Filosofía y Letras, Universidad Nacional de Buenos Aires) - Fernández, Natalia (IMHICIHU-CONICET) - Maveroff, Nicolás (INAPL-CONICET; Facultad de Filosofía y Letras, Universidad Nacional de Buenos Aires) - Guichón, Ricardo (Laboratorio de Ecología Evolutiva Humana y Núcleo de Estudios Interdisciplinarios sobre Poblaciones Humanas de Patagonia Austral; Facultad de Ciencias Sociales, Universidad Nacional del Centro de la Provincia de Buenos Aires)

Abstract format: Poster

The earliest human occupation evidence in the Pueyrredón-Posadas lake basin (Santa Cruz, Argentina) is dated to ca. 8,600 cal BP. However, there are no archaeological records between ca. 8,100-7,700 cal BP. This hiatus coincides with the H1 Hudson volcano eruption about 7,900 cal BP, as indicated by the presence of tephra in the stratigraphy of two archaeological sites in the area. This eruption was recorded as the largest in the southern of the Andes during the post glacial period. The proposed hypothesis is that this event influenced the permanence of camelids and the human population in this region. Camelids were the main resource of hunter-gatherer populations of Patagonia during the Holocene. At regional scale, archaeological studies showed variations in lithic technology, styles of projectile points, instrument size and rock art among the sets recorded before and after the H1 eruption. The

hypothesis will be tested in part through a multiproxy analysis of camelid coprolites collected from layers immediately below and above the Hudson ash level at the Cueva Milodón Norte 1 site (47.30°S 71.89°W). Silicophytoliths, pollen, plant remains, stable isotopes (C and N) and aDNA of coprolites will be analyzed to evaluate changes in the frequency and abundance of these proxies that may be associated with paleodiet, seasonality in the use of the site before and after the H1 eruption. In the present work, results of silicophytoliths, pollen and plant remains in current guanaco feces collected near the site are presented as a reference model for the coprolites analyses. Forest taxa such as, *Nothofagus* spp. (Nothofagaceae) and steppe taxa such as, Caryophyllaceae, Cyperaceae, *Poa ligularis* (Poaceae subf. Pooideae), *Empetrum rubrum* (Empetraceae), *Mulinum spinosum* (Apiaceae), among others, were identified. These results will contribute to interpreting the changes and interactions in pre- and post-eruption scenarios.

E. PREDATOR-PREY RELATIONSHIPS INFERRED BY COPROLITE PHYTOLITH ANALYSIS FROM ARGENTINE PATAGONIA

Abstract author(s): Benvenuto, María Laura - Velázquez, Nadia - Martínez Tosto, Ana Cecilia (IIPROSAM, CONICET-UNMDP. Centro de Asociación Simple CIC PBA; Facultad de Ciencias Exactas y Naturales, UNMDP) - Fernández, Natalia (IMHICIHU-CONICET) - Civalero, María Teresa (INAPL-CONICET) - Osterrieth, Margarita (Instituto de Geología de Costas y del Cuaternario, UNMDP-CIC) - Burry, Lidia Susana (IIPROSAM, CONICET-UNMDP. Centro de Asociación Simple CIC PBA; Facultad de Ciencias Exactas y Naturales, UNMDP)

Abstract format: Poster

Knowing about past biological interactions is possible thanks to the study of coprolites found in archaeological sites. Evidence of herbivores consumption by omnivorous organisms was found in Patagonia through bone remains studies. With the aim to recognize the limitations and potentialities of the phytolith analysis to infer predator-prey relationships, a comparative analysis among the content of phytoliths obtained from omnivores and herbivores coprolites was performed. The coprolites were found in the archaeological site Cerro Casa de Piedra 5, Perito Moreno National Park, Patagonia, Argentina, in an archaeological layer dated to 7,402 cal BP. According to their morphological features and content, the coprolites were assigned to omnivores organisms and camelids. Samples were rehydrated, filtered, concentrated, dried, and mounted in immersion oil. Counting and identification of phytoliths were made under optical microscope. The results showed the dominance of phytolith association of the subfamily Pooideae in the omnivore and camelid coprolites suggesting that the grasses were part of the diet of these organisms. This result was even confirmed through pollen and plant remains analyze. Also, isolated and articulated phytoliths and preserved silicified cells within the producing plant tissue were observed in camelid coprolites, while in omnivore samples only isolated phytoliths were observed. The presence of isolated phytoliths in these last samples could indicate that the phytoliths consumed could have been subjected to alteration processes, such as chewing, food processing prior to consumption, digestion or were indirectly incorporated by the consumption of guanaco viscera, exposing phytoliths on more than one occasion to the alteration processes. Future studies on the qualitative and quantitative production of phytoliths in species linked to the diet of herbivores and omnivores as well as on the effects of taphonomic processes from the digestive systems of consumers may contribute to the knowledge of past biological interactions.

247

PLEISTOCENE EARLY WEAPONRY TECHNOLOGIES: A MULTIFACETED MOSAIC OF NEW EVIDENCE AND BEHAVIOURS (PAM)

Theme: 6. Material culture studies and societies

Organisers: Milks, Annemieke (UCL Institute of Archaeology) - La Porta, Alice (University of Manchester, Department of Earth and Environmental Science) - Moncel, Marie-Hélène (Muséum National d'Histoire Naturelle, Paris) - Rios-Garaizar, Joseba (Consorcio CENIEH - Centro Nacional de Investigación sobre la Evolución Humana)

Format: Regular session

Direct and indirect evidence of weaponry in the Pleistocene archaeological record provides a framework for evaluating numerous facets of human evolution, including hominin subsistence behaviours, hunting strategies, cooperative group behaviours, cognitive flexibility, technological complexity, innovation, use of landscape, and the ability to adapt to different ecological niches. In the last few decades in particular, our ability to identify and evaluate the use of hunting weapons during the Middle and Late Pleistocene has been improved through remarkable archaeological discoveries and advances in methodological approaches. This has reshaped the dialogue around perceptions of performance differences between weapon technologies and hunting strategies of different species of *Homo*. Therefore, this session invites abstracts from researchers currently looking at the diversity of evidence on Middle and early Late Pleistocene use of early weapons (with a specific focus on hand-delivered weapon technologies) for hunting and/or confrontational events, including evidence of early weapons or hunting lesions, experimental archaeology, biomechanical approaches, use-wear methodologies, social perspectives (e.g. gender, age, learning, cooperation), ethnoarchaeology, indigenous perspectives, and zooarchaeological studies that provide evidence for hunting. We also invite contributions that aim to contextualise both existing evidence and/or newer research within the developing comparative models of weaponry and hunting strategies utilised by different species of *Homo*.

1 NEANDERTHAL STONE-TIPPED SPEAR TECHNOLOGY: AN EXPERIMENTAL INVESTIGATION

Abstract author(s): La Porta, Alice (University of Manchester; University of Exeter)

Abstract format: Oral

This research investigates the use of the Middle Palaeolithic stone-tipped spear technology among Neanderthal populations. Although the presence of stone tool projectiles in European Middle Palaeolithic sites may suggest the adoption of composite hunting weapons possibly from MIS 6 onwards, the use of these weapons as close-range thrusting spears or long-range throwing spears and their effectiveness is still an outstanding argument in the Palaeolithic archaeology. Here we present controlled experiments that extensively tested the use of hand-delivered throwing and thrusting stone-tipped spears, using Levallois point replicas. Trained human participants threw and thrust experimental stone-tipped spears into animal carcass targets. For each throw and thrust, several variables were recorded. The influence that different experimental variables, such as delivery modes (throwing vs thrusting), and ballistic parameters, can have on the formation of macroscopic and microscopic traces during projectile impacts was investigated. Integrated results between macroscopic and microscopic use-wear analysis and ballistic investigation show that trace patterns provide useful markers for distinguishing throwing from thrusting hand-delivered spear systems. These findings provide methods for further testing of the hypothesis that the hand-delivered throwing stone-tipped spear technology was in use at least from MIS 5 in the European Middle Palaeolithic.

2 TIPS FOR BEGINNERS: FIRST EVIDENCE OF LITHIC WEAPONS IN THE MEDITERRANEAN OF THE IBERIAN PENINSULA AT COVA DEL BOLOMOR (VALENCIA)

Abstract author(s): Cuartero, Felipe (Fundación Atapuerca) - Fernández-Peris, Josep - Hortelano, Laura (Servei d'Investigació Prehistòrica, Diputació de València) - Blasco, Ruth (Institut Català de Paleoeologia Humana i Evolució Social - IPHES)

Abstract format: Oral

The first use of lithic points as weapons remains a subject of intense debate, sometimes due to different methodological approaches. In this paper we analyze the case study of Cova del Bolomor (Valencia, Spain), a Middle Pleistocene sequence spanning 400 ka to 100 ka BP with a repeated series of occupations throughout this period. Throughout the sequence lithic points are always present. At lower levels Tayac points (and other thick, retouched by hard-hammer) are dominant, while in the upper levels (XII to I, MIS 6 to 5e) Mousterian points, Levallois points and Levallois technology are more often present. Some levels, such as level VII, have a high representation of points; breakage of the tips could indicate a key use of these points as weapons in hunting activities. This increase of Mousterian points along with some evidence of use as weapons during MIS 6 onwards agrees with some other examples in South-western France and the Northern Iberian Peninsula, and could represent the first occurrence in the Mediterranean area of the Iberian Peninsula. We hypothesise that the use of lithic points (both Levallois and Mousterian) as weapons was typical from MIS 6 onwards in the Mediterranean area of the Iberian Peninsula, when Levallois technology and the systematic use of hafting spread in the area.

To test this hypothesis we have developed a large experimental program recording the fractures produced in different activities on three axes: 1) the relationship between shape of the point (different tip penetrating angle, retouch angle, thickness) and the raw material; 2) the location of breakages and their relationship to micro-wear traces; and 3) the preservation of all these macroscopic and microscopic traces after several taphonomic processes in the artifacts used in the previous experiments.

3 HIT OR CRACK? AN EXPERIMENTAL STUDY ON BREAKAGE PATTERNS OF SOLUTREAN FOLIATE POINTS AS HUNTING WEAPONS IN INLAND IBERIA

Abstract author(s): Castillo-Jiménez, Samuel (University of Alcalá) - Cuartero, Felipe (Atapuerca Foundation) - Mangado Llach, Xavier - Sánchez de la Torre, Marta (SERP. Prehistory and Archaeology Section, University of Barcelona) - Alcolea-González, José-Javier - Alcaraz-Castaño, Manuel (University of Alcalá)

Abstract format: Oral

Bifacial and unifacial foliate points were the main hunting weapons during the Solutrean technocomplex of Southwest Europe (~25 - 19 ka cal BP). In this contribution we aim to understand functional and technological processes involved in their production and use in the poorly-known regions of inland Iberia. We focus on the archaeological record of the Solutrean layers of the Peña Capón rock shelter (Central Spain), where a large foliate point collection has been recorded during recent fieldwork. Preliminary technological analysis of these points and associated lithic assemblages has shown a fragmented Chaîne Opératoire, as products found at the site are limited to the final knapping stages, including thinning flakes and finished points.

Most of these points are distal fragments broken by bending once the piece was finished or nearly finished. However, it remains unclear whether these points were broken during (1) the final stages of knapping reduction and retouch or (2) as a result of impacts during hunting activities. In the latter case, the distal fragments of the points would have been taken to the shelter into the corpses of hunted preys. We aim to test these alternative hypotheses by means of an experimental study with the main objective of clarifying the causes originating the type of fractures found in the Solutrean assemblages of Peña Capón. To achieve this goal, we designed an experiment involving four steps: (1) technological analysis of the Solutrean foliate points and associated assemblages; (2) experimental replication; (3) recreation of hunting activities using the experimental points; and (4) comparison of breakage pat-

terns between the experimental and archaeological samples. Our results will contribute to the understanding of techno-economic behaviors of Solutrean hunter-gatherers in the poorly-known regions of inland Iberia, including the adaptations of these groups to the harsh environments of the upland regions of the Spanish hinterland.

4 HOW DOES A PROJECTILE FLY? USING BALLISTICS AND FRACTURE MECHANICS TO TRY AND RECOGNISE PALAEO-LITHIC WEAPON SYSTEMS

Abstract author(s): Coppe, Justin - Rots, Veerle (TraceoLab / Prehistory, University of Liège, Belgium)

Abstract format: Oral

Ballistics and fracture mechanics are important disciplines for understanding the variables that influence the breakage of lithic armatures on impact. In particular, kinetic energy and angle of impact have been judged to be key variables for understanding impact fracture formation. In this presentation, we take the investigation of these parameters a step further and explore the variability in kinetic energy and the direction of applied stress. We do this for each of the four modes of propulsion traditionally considered relevant for the Palaeolithic (bow, spear-thrower, hand-cast spear, thrusting spear). Our goal is to evaluate whether each propulsion mode produces a reactional impact stress that is sufficiently distinct to offer clues to the propulsion mode on the basis of the fractures on archaeological stone projectiles.

5 COMPREHENSIVE 3D MODELING AS AN IMPORTANT TECHNIQUE IN OPTIMAL CONSERVATION OF WATERLOGGED WOODEN ARTIFACTS – A PALEOLITHIC WOODEN POINT (EXPERIENCE)

Abstract author(s): Eric, Miran (Institute for the Protection of Cultural Heritage of Slovenia) - Guček Puhar, Enej (Faculty of Computer and Information Science, Ljubljana University) - Korat, Lidija (Slovenian National Building and Civil Engineering Institute) - Solina, Franc - Jaklič, Aleš (Faculty of Computer and Information Science, Ljubljana University)

Abstract format: Oral

Paleolithic wooden tools and weapons represent one of the most precious and rare remnants of human cultural heritage. There are eight similar specimens in Europe. Protection represents responsible and demanding approach if the wooden artifact have to be preserved as closely as possible for future generations. A particularly responsible approach requires the preservation. As a rule, archaeologists and conservators opt for traditional and proven methods and techniques of conservation. In recent years, more researcher are opting for new methods with which they want to keep the artifact as protected as possible in its in situ conditions. In order to avoid hasty decisions and negative experiences in wood conservation (pronounced volumetric changes, bends, fractures, etc.), new technologies, such as e.g. 3D modeling using structured light, lasers or computed tomography are being used. Surface as well as volume modeling can significantly facilitate decision-making and work for conservators, as well as permanent monitoring of the condition of artifacts.

An indicative example is the experience of 3D modeling and conservation of a Paleolithic wooden point from the Ljubljanica River. Volumetric comparisons 3D models showed that the point length was shorter by 6.5%, width reduced by 7.5%, thickness by 21.3%, and volume by 20.6%. A comparison of the 3D models showed that large volumetric deviations occurred during the process of preserving wood with melamine. This information is useful for conservators in planning the preserve and protection of valuable artifacts. Consistent use of 3D modeling in all phases of conservation of wooden artifacts is highlighted as a necessary standard in the design, implementation of wooden remains and as an incentive in finding new solutions for conservation and storage of valuable remains of wooden cultural heritage. This is not just a commitment stemming from the London Charter and the Seville Principles, but a commitment to future generations.

6 AGE? SKILL? PHYSIOLOGY? COMPARING SPEAR THROWING PERFORMANCE OF ADOLESCENT AND ADULT BAYAKA FORAGER AND BONDONGO FISHER-FARMER MALES

Abstract author(s): Milks, Annemieke (UCL) - Lew-Levy, Sheina (Simon Fraser University, Department of Psychology; Aarhus University, Department of Archaeology and Heritage Studies) - Kiyabiya Ntamboudila, Francy (Marien Ngouabi University, Brazzaville)

Abstract format: Oral

Experimental studies of hand-delivered spears have increased significantly in the last few decades, typically focusing on damage to weapons and/or animal bodies. However, there remains a dearth of understanding of the influence of age, skill, and physiology as variables in spear thrusting and spear throwing, a key technology throughout the Middle and Late Pleistocene. We have extended our previous work with javelin athletes to work with BaYaka forager and Bondongo farmers, including both adolescents and adult participants. These groups both regularly use thrusting and throwing spears for hunting in the Congo rainforest basin. We further compare experimental outcomes (velocity and accuracy of spear throwing) amongst the BaYaka with those of a ranking task in which adults assessed their peers on their spear hunting skills and overall hunting skills. Our results improve existing data on spear throwing ballistics and the effects of age, skill and physiology. Furthermore, we are able to explore links between these experimental results and social perceptions of hunting success. We emphasise the benefits when researchers engage with and learn from communities who develop a range of skills over entire lifetimes in their use of technologies. Not only does this improve our ability to understand and accurately replicate technologies, but it provides richer contexts of how technologies are embedded in social worlds whilst being inclusive of indigenous perspectives.

7 THE ROLE OF HIDE THICKNESS IN TESTING THE HUNTING EFFICACY OF PLEISTOCENE WOODEN SPEARS

Abstract author(s): Hardy, Bruce (Department of Anthropology, Kenyon College) - Turner, Paula (Department of Physics, Kenyon College)

Abstract format: Oral

Wooden spears represent the earliest known hunting technology and appear as early as c. 400 ka at Clacton-on-Sea. At c. 300ka, the preserved spears (n=10) at the Paleolithic site of Schoeningen constitute the majority of wooden spears preserved from the Middle Pleistocene. Although they were initially interpreted as throwing spears, many researchers questioned this interpretation due to their large size and weight, suggesting that their range would have been limited to 5-10m if thrown. Instead, these researchers proposed that they were thrusting spears used in close-quarters hunting of large game. Experimentation with modern replicas has been used to support both sides of this argument. Recent experiments with trained throwing athletes demonstrate the ability to hit a target in at least the 15-20m range. While these experiments show that wooden spears have flight capabilities to hit targets at a significant distance, they do not address the efficacy of the spears at penetrating hide and thus wounding an animal. We describe a series of experiments that suggest that hide thickness is a significant variable that must be considered in the evaluation of wooden spears as effective throwing weapons.

8 DID COOPERATIVE ATLATL HUNTING DRIVE NON-GENDERED LABOR PRACTICE AND HUMAN DISPERSAL DYNAMICS IN THE PLEISTOCENE?

Abstract author(s): Haas, Randy (University of California, Davis)

Abstract format: Oral

Recent research suggests that early big-game hunting may have been a gender-neutral activity, or nearly so. Toward understanding why this pattern differs from the man-the-hunter pattern observed in ethnography, we consider that certain technological, social, and ecological conditions of the Pleistocene may have favored cooperative hunting strategies with female participation. From basic geometric principles, life history traits, technology performance characteristics, and ethnographic observations on cooperative vicuña capture by Aymara communities in the Andes Mountains, we show that cooperative hunting is economically profitable and entails increasing returns to scale when big-game densities are high. Such conditions would often have been met in the Pleistocene, favoring female big-game hunting. We further show that this socioeconomic pattern would have been meta-stable. The simple economic model drives ideal free distribution dynamics in the context of Pleistocene human dispersals. Initial populations would tend to occupy the most game-rich territories first, with the efficiency of cooperative resource extraction increasing super-linearly in response to human population growth. At some critical point, the population-resource balance would invert, creating an economic dilemma, social discord, and population fissioning into new territories where the cycle would repeat. This model captures a number of qualitative features observed or suspected in Pleistocene archaeology including the apparent emphasis on big game, female participation in big-game hunting, the use of atlatl technology, rapid terrestrial dispersals, system meta-stability, and intense interest in social signaling as suggested by the ubiquity of red ocher and showy lithic technologies.

249 FORESTRY, SUBSISTENCE AND INDUSTRY: THE CHARACTER AND CONSERVATION OF WOODLAND HERITAGE

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Holyoak, Vincent (HE - Historic England) - Byrnes, Emmet (Forest Service, Department of Agriculture, Food and the Marine)

Format: Regular session

The nature and extent of Europe's modern forestry cover is a key characteristic of its landscapes and of their history. Exploitation of forestry for subsistence, agriculture and industry shaped earlier settlement patterns, and as a result, ancient forestry is not only strong in cultural significance and folklore, but a rich repository of archaeological evidence of past activity. Because of this, new planting (for carbon sequestration, nature, public goods such as health, wellbeing and access, or simply timber production) provides an opportunity for recognising, celebrating and enhancing historic character. This session will explore, compare and contrast the historic and archaeological character of woodland and forestry across a range of countries. It will discuss the challenges for sustaining the heritage and the historic character of forestry and woodland, and the differing national approaches to doing so. Papers will also explore the suite of affordances, both natural and cultural that the forest offers, from raw material to the support of industries and how evidence of this is being recorded and understood today. With the increased role which woodlands now play around health and wellbeing, as well as the social benefits seen through community archaeology and public engagement, the session will also examine the role of this work around the recording, promotion and protection woodland heritage.

ABSTRACTS:

1 SUCCESSES AND FAILURES OF THE ARCHAEOLOGICAL HERITAGE MANAGEMENT IN SAXON FORESTS

Abstract author(s): Strobel, Michael - Westphalen, Thomas (Landesamt für Archäologie Sachsen)

Abstract format: Oral

In forests archaeological sites are well preserved. Visible ramparts or grave hills were the first remains that were listed in inventories and registered as protected monuments. The extent in which archaeological areas in forested lands are nonetheless threatened, depends on various factors: In GDR-times planting pine trees or spruces in monocultures as well as using the forest plough during the 1960ies to 1980ies caused disastrous damages to monuments which are still endangered today by an improper management and thinning. On humid ground heavy harvesters and forwarders can leave behind severe on site-destructions and mush up sites hauling logs along a wrong traced skid trail. Finally the building of paths and storm damages should not be underestimated. Whether the extensive airborne lime fertilisation of forests has negative effects on soil structures and finds is yet unknown.

For a number of years the Saxon archaeological heritage management and the state forestry department have been maintaining a close partnership by exchanging data, implementing joint projects and organising common information events. Best practice projects will show the efforts and successes, but also the limits of an intensive cooperation now facing new challenges: climate change, bark beetles attacks and forest restructuring. On a state level the cooperation is almost always effective and sustainable. On the other hand much more problems need to be resolved in private forests. Storm damage repair and forest restructuring are often conducted irrespective of well preserved and protected archaeological monuments. Worst case examples are also object of the paper.

2 ARCHAEOLOGICAL MANAGEMENT STRATEGIES AND CLIMATE-RESILIENT FOREST CONVERSION

Abstract author(s): Cott, Eva (LVR-Amt für Bodendenkmalpflege im Rheinland)

Abstract format: Oral

Due to climate change, the forests are subject to strong changes. In the German state of North Rhine-Westphalia (NRW), this affects many tree species, but spruces in particular. Current counts estimate effected areas of about 600 km², caused by drought and bark beetle infestation. This concerns approximately 15% of the forests in NRW. The resulting actions taken for reforestation by far exceed the regular forestal activities, thus becoming an increased threat to archaeological sites in the wood lands. It is for this reason that an intensification of the cooperation between the archaeological state services as well as the forestry agency is desired. Four points are focused on especially:

First, the digital exchange of specific data relevant to both agencies is to be facilitated, in order to better coordinate the necessary actions. This involves the digital integration of the archaeological data into the databases and geographical information systems of the forestry agency. Similarly, data from the forestry agency is to be made accessible to the archaeological state service to identify potentials for conflict in time to ascertain protection strategies.

Second, different categories of archaeological sites are defined, which indicate the vulnerability of the objects to the forest manager. That way the planned procedures can be adjusted to the special circumstances.

Based on these categories, damage monitoring is to be conducted in different landscapes, in order to carry out damage evaluation of cleared areas or those which are planned to be cleared in the future.

Third, crop strategies are to be developed which are specifically suitable to protect different categories of archaeological sites.

Fourth, a recurring training event is to be established to strengthen mutual understanding and to gain further multipliers for the protection of archaeological heritage in forests.

3 ARCHAEOLOGICAL HERITAGE MANAGEMENT IN FLANDERS FORESTS: OPPORTUNITIES AND THREATS

Abstract author(s): Cordemans, Karl (Flemish Land Agency) - Meylemans, Erwin (Flanders Heritage Agency) - Goeminne, Nele (Archaeological Monument Watch)

Abstract format: Oral

The combination of the low visibility of archaeological traces (features as well as finds) on the ground and on aerial photographs and the limited number of interventions, resulted in few known archaeological sites in forested areas. The emergence of LIDAR data changed this dramatically. Especially the second generation of the Digital Elevation Model of Flanders (2013-2015), available for the whole of Flanders in very high resolution (min. 16 points/m²) for free, accelerated the number of new detected archaeological sites. At the same time, this huge dataset provides us valuable insights on the preservation state of these sites. From this it is clear that (sub)recent and future forest management practices (in light of ecological diversification, climate change, etc.) had and have a potential major impact on this valuable and less known archaeological heritage. Through a number of cases we highlight some of the challenges but also the opportunities these new insights present.

4 IF YOU ARE THE BIG TREE; A TREE TRUNK COFFIN BURIAL IN A LANDSCAPE OF DROWNING FORESTS

Abstract author(s): Allen, Tim (Historic England) - Willmott, Hugh (University of Sheffield) - Panter, Ian (York Archaeological Trust)

Abstract format: Oral

What does it mean to be buried in a tree trunk? The trees of the late Neolithic to early Bronze Age emerge from the shores of England's east coast as stumps and fallen boughs, but more rarely they are revealed beneath its fields, hollowed out, shrouding the dead. This is a landscape of dynamic change on the shifting boundary between wet and dry, between trees and sea. In August 2018 a large, apparently Bronze Age, tree trunk coffin was unearthed during ground-works on a site in Lincolnshire, England. The find was brought to the attention of the local authorities when human remains were found. Examination revealed that the barrow comprised a gravel mound buried by later alluvium such that only its top was visible as a slight rise. A tree trunk coffin containing human remains accompanied by a hafted stone mace/axe had been set into the underlying clay below the mound. This paper outlines work following the emergency intervention of Historic England (the national heritage body) to secure, analyse and conserve the remains in partnership with the University of Sheffield; supported by York Archaeological Trust and individual specialists. Research questions and initial results span; wood working, burial practice, environmental reconstruction, climate change, dendrochronological dating and the challenges of emergency intervention as a curatorial response. For an overview of previous finds of tree trunk coffins see Pearson M. P., Sheridan, A., and Needham, S. Bronze Age Tree-Trunk Coffin Graves in Britain in N. Melton, C. Knusel and J. Montgomery, Eds, 2013 Gristhorpe Man.: A Life and Death in the Bronze Age, Oxbow.

5 CLIMATE CHANGE, NATURE RECOVERY AND THE HISTORIC ENVIRONMENT: WOODLAND CREATION IN ENGLAND

Abstract author(s): Robertson, David (Forestry Commission England) - Shaw, Lawrence (Forestry England)

Abstract format: Oral

The British government's 25 Year Environment Plan outlines ambitious targets for large-scale tree planting and woodland creation to increase carbon sequestration, improve confidence in domestic timber supply, and secure economic and environmental benefits at a landscape scale. It presents aspirations to plant 180,000 hectares of new woodland in England by the end of 2042, with the aim of increasing woodland cover from 10% to 12%.

Forestry Commission England has a pivotal role to play in achieving these ambitions, as forestry regulator, administrator of woodland creation grant schemes and custodian of the public forest estate. This paper will outline how Forestry Commission England (Forest Services and Forestry England) is using the UK Forestry Standard, advice, training, incentives, and research to ensure the conservation and incorporation of the historic environment within these ambitions is seen as a significant public benefit of work undertaken for climate change mitigation and nature recovery. It will use case studies and pilot projects to explain how approaches have developed in recent years and are likely to evolve in the future.

6 FARMING AND FORESTRY IN THE BLACKSTAIRS MOUNTAINS, IRELAND; LOOKING TO THE PAST TO MANAGE THE FUTURE

Abstract author(s): Ó Murchú, Séamus (Forest Service, Department of Agriculture, Food and the Marine, Ireland)

Abstract format: Oral

Situated in South-East Ireland, the Blackstairs Mountains are the focus of a locally-led European Innovation Partnership (EIP) project initiated in 2018. Entitled 'Blackstairs Farming Futures', the project aims to manage the upland resource in a manner which is sustainable for the farmer whilst simultaneously improving biodiversity on the commonage. In looking to the future, it is useful to reflect on the past, particularly in establishing baselines or targets. Archaeological research on these same uplands indicates that modern farmers represent the present custodians of a landscape which has been farmed and exploited since the prehistoric period, as evidenced by a multitude of sites and monuments including pre-bog field walls, settlement sites and burial features. Consequently, the seemingly wild landscape we see today has been shaped by thousands of years of human activity. In the absence of palynological data, archaeology combined with historical research can contribute to a more detailed understanding of past land cover in the area. In particular, archaeological, documentary, cartographic, folklore and placename evidence demonstrate that woodland was far more prevalent in the past. Exploited and removed by the early 20th century, large expanses of the lowland slopes have been afforested in recent decades with private or state-owned commercial plantations. Whilst most of these modern forests are sterile and largely devoid of human interaction apart from periodic harvesting events, some have become the focus for development works including recreational trails and wind-farms. Local folklore and documentary evidence indicate an even more diverse use of the woodland resource in the Blackstairs region historically which ranged from individual to communal activities and events. The Blackstairs Farming Futures Project, in combination with archaeological and historical research, offers the opportunity to reflect on how we manage the upland resource into the future and the potential role of forestry in sustainable upland land management.

7 FOREST HISTORY AND INDUSTRIAL DEVELOPMENT INTERLINKS AT TERRITORIAL SCALE INFERRED FROM A COMBINATION OF WOOD AND CHARCOAL PAST USE EVIDENCES

Abstract author(s): Robin, Vincent (LIEC - Lorraine University - CNRS) - Knapp, Hannes (LabEx DRIHM CNRS) - Gocel-Chalté, David (Chrono-Environnement CNRS) - Guérold, François (LIEC - Lorraine University - CNRS) - Rochel, Xavier (LOTERR - Lorraine University)

Abstract format: Oral

Previous studies have shown the importance of wood as a key resource for long-term socio-economic development, as well as the environmental consequences of the use of this resource. However, only a few studies have examined the historical exploitation of forest biomass related to local industrial needs. Therefore, we present one of the first attempts to study historical wood consumption related to industrial development at the territory scale. This study is based on a combination of data from charcoal kilns and written archives from a territory unit, the "Pays de Bitche" (Northern Vosges, France). Analysis of 124 charcoal kilns and 415 written records provided information on woodland exploitation, industrial consumption, and forest dynamics. The datasets were chronologically coherent, because the kilns date to the 17th and 18th centuries, and archival records were found for that period. *Quercus* and *Fagus* were the most abundant taxa, with *Fagus* dominating the west and *Quercus* the east of the investigated territory. This spatial pattern fit the preferential consumption of *Fagus* by glassworks in the west and the consumption of *Quercus* for on-site charcoal production in the east for forges. However, it is not clear whether previous changes in forest composition determined the type of resource available locally and thus the location of different types of industries, or if this forest spatial pattern was related to the type of substrate, which significantly varied from west to east within the investigated territory. Moreover, we have identified that the past forest distribution, inferred from written sources and charcoal data, presented significant similarities with the current distribution of trees in the area. Finally, we showed that the combination of the methods we used was highly complementary for assessing the historical use of forests and providing relevant and valuable insights for the reconstruction of forest history.

8 WOODEN MATERIAL CULTURE. PRACTICES AROUND THE UTILITY AND USE OF TREES DURING THE EARLY MEDIEVAL AND VIKING PERIOD IN IRELAND

Abstract author(s): O Carroll, Ellen - O'Donnell, Lorna (School of Archaeology, University College Dublin)

Abstract format: Oral

Many of the historical objects that form part of our cultural heritage are made of wood. In the past woodlands were valued as a resource for many objects used in everyday life. This paper will present a selection of wooden objects identified and studied by the authors in understanding how these materials were obtained, manufactured, and valued in Ireland as well as giving us an insight into the everyday life of these people as well as places they may have travelled to and traded with. There are clear associations between characteristics of each tree species and the use of its wood. Each wood species was selected for object use based on the attributes of the wood type, its availability as well as the natural beauty of certain wood species. Objects include wooden vessels, wheel fragments, spear shafts, tool handles, gaming objects, domestic objects and several highly finished enigmatic objects. These objects are tangible evidence of the importance, skill and in-depth knowledge related to Ireland's woodlands that our ancestors passed on from generation to generation.

9 NATURE VERSUS HERITAGE: NATURE INCLUDING HERITAGE

Abstract author(s): Schreurs, José (Cultural Heritage Agency of the Netherlands)

Abstract format: Oral

In the Netherlands large-scale nature restoration projects and forest planting schemes are being carried out. These tasks arise from nature restoration objectives in Natura 2000 areas, among other goals. Natura 2000 is the largest coordinated network of protected nature areas in the European Union and one of the largest in the world. It offers a safe haven to Europe's most valuable and threatened species and habitats. These areas are under threat by nitrogen emissions from agriculture, traffic and industry. Not only do these protected areas contain valuable habitats, but also they are often rich in historical and archaeological sites of which some are also protected. However, most likely many sites are still not discovered. Moreover, the preservation potential of archaeological remains in nature reserves is much higher than in agricultural areas.

As a rule, cultural heritage is not included in planning and implementation in many natural restoration projects since in most cases only a small part is listed and as a result no permits are required.

The Cultural Heritage Agency of the Netherlands, in collaboration with Staatsbosbeheer (State Forestry department), has drawn up a working protocol to take cultural heritage into account when planning. So in addition to ecological studies, culture historical and archaeological studies are included. Dissemination of culture historical and archaeological information is part of the protocol.

This will be discussed in more detail in the presentation.

EVIDENCE FOR A HORNBEAM WOODLAND FROM CHARCOAL KILNS IN MEUSE LOWLANDS (NORTHEASTERN FRANCE): PAST MANAGEMENT RECORD OR LOCAL ANOMALY?

Abstract author(s): Oliveira, Cláudia - Bouquerel, Jonathan (LIEC - Université de Lorraine) - Rochel, Xavier (LOTERR - Université de Lorraine) - Devin, Simon - Robin, Vincent (LIEC - Université de Lorraine)

Abstract format: Oral

An anthracological study is being conducted in Meuse (northeastern France) to assess past forest resources exploitation to produce charcoal for local industries.

The study area comprises 57 km² of mainly broadleaved-mixed forests in a lowland region with former royal (now state-owned), municipal and private forests. The analysis of airborne LiDAR images allowed to infer that there are around 2600 potential charcoal kilns in the area.

The sampling campaigns yielded the validation of 285 platforms and 48 of them were sampled for charcoal remains in an area of 3.5km². Results from charcoal analysis provided the identification of 12 taxa being *Carpinus betulus* (hornbeam) the dominant taxon with over 66% of total diversity, followed by *Fagus sylvatica* (c. 12%) and *Corylus avellana* (c. 7%), *Quercus* sp. (3%) and the remaining taxa are residually represented.

These results, especially the dominance of hornbeam relegating to a second plan the presence of *Fagus* and *Quercus*, appear to be in contradiction to the so far admitted forest trajectory in the area. Indeed, today lowland temperate forests in northeastern France are largely dominated by oak and beech woodlands. This was also the case in the past since, at least, the antiquity and, at least at regional scale.

Several questions arise from this disparity between the dominance of oak and beech in the woodlands and their relative subrepresentation in the charcoal assemblage. Are they a consequence of a prioritization of understorey vegetation for charcoal production instead of oak and beech? Or the display of former management practices (e.g. coppicing), while standing trees, possibly oak or beech, were reserved for other purposes?

To develop these hypotheses, this study will be enriched with data from written sources since the 17th century onwards, allowing a better clarification of former woodland exploitation in the region, according local industrial development.

CELEBRATING THE WOODLAND HERITAGE OF THE SOUTHERN PENNINES: A COMMUNITY ARCHAEOLOGY INVESTIGATION

Abstract author(s): Atkinson, Christopher (University of Sheffield; Pennine Prospects)

Abstract format: Oral

Woodlands of the South Pennines, a region including West Yorkshire, Lancashire and Greater Manchester covers approximately 75km² of the landscape. A combination of ancient woodland and woodland plantation, these woods are largely found hugging the steep slopes of the narrow valleys, below the fertile plateaus and sweeping moors.

Though accessible and popular for public recreation, the historic development and management of woodlands in the region is traditionally less understood. Under the title 'Celebrating Our Woodland Heritage', Pennine Prospects led a community project between 2016 and 2020 to reveal the history and archaeology of the region's woodlands. Through programs of community engagement, which included community archaeological surveys, excavations, workshops and forest schools, 37 woodlands across the region were investigated. Each investigation served to connect participants to 'their woodlands' and promote and explore the hidden history within each site.

The project raised awareness and appreciation of the contribution woodlands have played in society, with over 4,000 young people from inner city conurbations experiencing woodlands, many for the first time, and over 1,300 new archaeological records were produced by the public.

This paper will summarise the results of the project, and highlight the unexpected impact of the investigations. In particular, land-owners are now involving the public in the archaeological investigation of landscapes as part of new woodland management and planting strategies across the region.

Three community excavations of charcoal burning platforms undertaken as part of the project have also led to further research into the value of these monuments in enhancing our understanding of historic woodland management/development.

DARK FORESTS: AN ARCHAEOLOGY OF THE FRANCOIST INDUSTRIAL FORESTATIONS IN SPAIN

Abstract author(s): Millan-Pascual, Rafael (CSIC- Spanish National Research Council, Institute of Heritage Sciences)

Abstract format: Oral

This contribution examines the social and historical impact of the Francoist forestry plans in Spain focusing on its archaeological consequences. Industrial forestry combines the political and bureaucratic administration with technology and engineering services in order to transform rural land through legal statements of expropriation, but also through the agency of trees. The Dictatorship used this mechanism to appropriate and transform many private and communal properties all around the country in an exercise of internal coloniality of power. In fact, industrial forestry was part of large-scale operations developed by the Francoist regime in his quest for the material construction of his ideal Spain with more or less unexpected consequences. On the one hand, the forestation

implies the final migration event of many rural inhabitants and the formal extinction of their municipalities. On the other, the progressive rising of the pines converted many villages into a forest, destroying their historical landscape and concealing its remains. Industrial forestry was here an agent of ruination and abandonment. The sequence of this process is straightly related to the historical Spanish rural depopulation, as the State intervention intensified the already structural weakness of the countryside. Today, the forestation process reveals its strategic functionality for the Dictatorship in the long term, since the forestry policy is one technique of "naturalization" of old peasant's places and so of the political actions that change those lands. Different social agents from the far-right movement to more popular ecologist's common-sense defend this forestry heritage as valuable and positive, while some others point out its dramatic effects. Here I will highlight how the Francoist forestry policy still determines the access of rural land and prevents the knowledge of the historical and popular roots of the countryside. Archaeology could reveal what is hidden in the woods.

A. AUTOMATIC DETECTION OF CHARCOAL PRODUCTION PLATFORMS BY DEEP-LEARNING TECHNIQUES – A CASE STUDY IN NORTHEASTERN FRANCE

Abstract author(s): Oliveira, Cláudia (LIEC - Université de Lorraine) - Aravecchia, Stéphanie - Pradalier, Cédric (GeorgiaTech Lorraine) - Robin, Vincent - Devin, Simon (LIEC - Université de Lorraine)

Abstract format: Poster

Forest exploitation for wood resources has long lasting imprints on landscapes. Wood as a source of raw material for energy production was used for millennia until recent times and some reaching the 20th century as a primary source of energy for industrial purposes (e.g. iron smelting). Charcoal kilns are some evidences of these activities and they are spread and preserved in forest areas being recognizable in airborne images such as LiDAR (Light Detection and Ranging).

With the continuous availability of high-quality images, automatic methods can be developed to achieve a better quantification of these structures in the landscape. To improve the detection and quantification, automatic detection based on machine learning for image analysis, is being developed and tested in a forest area in Meuse Department (Northeastern France). On this area (57,3 km²), an expert-labelled dataset with more than 2600 potential kilns was identified, an algorithm using the TensorFlow Object Detection API was implemented and tested.

The first results of the method developed are encouraging where c. 90% of the kilns were detected, and only 15% of the predictions were not kilns. Despite these promising results, the method can be upgraded by improving the model. The detections proposed by the network will be validated or not by an expert, refining the available dataset to train the network.

The development of an expedite and reliable methodology highly adaptable to a new environment must be used to routinely perform analysis in airborne images to increment the detection of kilns in order to better understand the history and evolution of forest resources' exploitation.

IMPR – PHYTOLITH IDENTIFICATION, CLASSIFICATION AND MORPHOMETRY

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Out, Welmoed (Moesgaard Museum) - Vrydaghs, Luc (Maritime Cultures Research Institute - MARI – VUB)

Format: Regular session

Phytolith analysis is an established field of research that is applied worldwide to a broad range of research areas, including archaeobotany and palaeo-ecology, amongst others. On the one hand, classification of a large number of common phytolith morphotypes is very well established. As a result, it is well possible to identify phytoliths on (sub)family, genus and sometimes species level, and/or to assign them to plant parts. On the other hand, when considering all plants of the world, it is only partly known which plants produce phytoliths, what type of phytoliths they produce, and whether and how these phytoliths can be distinguished from those of other taxa and plant parts. Another challenge is the description of phytolith in a uniform way, so that outcomes of different studies can be easily understood and compared. While the publication of the International Code on Phytolith Nomenclature versions 1.0 and 2.0 were important milestones, improvement of phytolith taxonomy, which, by definition, includes description, identification, nomenclature and classification of phytoliths, continues to be an ongoing important line of research.

The session "Phytolith identification, classification, and morphometry" aims to discuss the above-raised topics and welcomes all types of contributions about phytolith taxonomy and classification, for example, but not limited to, the application of the International Code for Phytolith Nomenclature 2.0, studies concerning the development of new identification criteria based on morphology, and studies presenting or applying identification criteria based on phytolith morphometry. These studies can relate to both archaeological and modern plant material.

This session is part of the 12th International Meeting for Phytolith Research, or IMPR, the official scientific conference of the International Phytolith Society.

1 PHYTOLITH NOMENCLATURE AND TAXONOMY

Abstract author(s): Neumann, Katharina (Goethe-Universität)

Abstract format: Oral

Phytoliths are botanical objects. Like in any other field of biological research, a clear and unambiguous affiliation of phytoliths to biological entities is required, including clear and unambiguous names. Only an internationally accepted name will allow communication between researchers and comparison of different datasets. However, in contrast to whole plants or most morphological plant parts, like flowers, wood or pollen, many phytoliths originate from vegetative tissues poor in diagnostic feature, like parenchyma, sclerenchyma, or epidermis. The high degree of redundancy and multiplicity of elements in these tissues prevents the assignment of phytoliths to taxonomic entities. As long as their origin is not clear, these phytoliths are best described as morphotypes. The application of the International Code for Phytolith Nomenclature (ICPN 1.0 and ICPN 2.0) has brought great progress in standardizing naming and description of the most common morphotypes. But what about all the others? When is it justified to use names of well-established taxonomic entities, such as family, genus or species, or, more general, dicot or monocot? In which cases is identification of a plant organ or tissue, e.g. seed or epidermis, applicable? Recent studies on phytolith assemblages in modern plants have shown considerable variation in the presence of diagnostically relevant phytoliths among different plant families. My paper explores chances and pitfalls of naming and attributing phytoliths to morphological or taxonomic categories and is an appeal for more standardization.

2 AN ATTEMPT TO CHARACTERIZE ARTEMISIA SPECIES ON THE BASIS OF PHYTOLITHS

Abstract author(s): Attolini, Davide (Laboratory of Palinology and Archaeobotany - DISTAV, University of Genova; Department of Antiquities, Philosophy and History - DAFIST, University of Genova) - Caracciolo, Daniela (Regional Agency for the Protection of the Environment - Liguria - ARPAL) - Montanari, Carlo (Laboratory of Palinology and Archaeobotany - DISTAV, University of Genova)

Abstract format: Oral

Artemisia pollen characterizes the dry continental climatic phases of the Late Pleistocene in the Northern Hemisphere and it is often found in high abundance. The identification of this pollen type at species level is very challenging and it often leads to difficulty in the interpretation of palaeoenvironments. The identification of phytoliths belonging to species with ecological meaning, possibly indicating different environments, could represent a solution to this problem. There is a general lack of studies on *Artemisia* phytoliths; therefore, a descriptive approach to species that can be used as ecological indicators is needed to get fundamental palaeoenvironmental information. In this study, as a first step, we examined the phytoliths of 11 *Artemisia* species belonging to three different ecological groups: sub-desertic or steppe species, arctic or alpine tundra species, and anthropogenic-nitrophilous ones. The first preliminary results show that some types of phytoliths are common to different species, while others are observed more rarely, only occurring in two or three species among those studied. In particular, the species of alpine tundra are those exhibiting the lowest variety. It seems therefore possible that phytoliths could lead to a better definition of palaeoenvironments characterized by a considerable amount of *Artemisia* pollen, and further studies could provide useful complementary data.

3 PHYTOLITHS FROM PLANTS OF THE CERRADO - THE BRAZILIAN SAVANNA

Abstract author(s): Dias, Raphaella (Universidade Federal Fluminense) - Coe, Heloisa (Universidade Federal Fluminense; Universidade do Estado do Rio de Janeiro) - Vasconcelos, Alessandra (Universidade Federal dos Vales de Jequitinhonha e Mucuri) - de Carvalho, Alex (Universidade Federal de Minas Gerais) - Mendonça Filho, Carlos (Universidade Federal dos Vales de Jequitinhonha e Mucuri) - Chueng, Karina (Universidade Federal Fluminense) - Ricardo, Sarah (Universidade Federal do Rio de Janeiro - Museu Nacional) - de Sousa, Leandro (Universidade Federal Rural do Semi-árido)

Abstract format: Oral

The Cerrado is a kind of savanna that covers about 22% of Brazilian territory and is considered a global biodiversity hotspot. It presents an extreme abundance of endemic species and suffers from habitat loss. From the point of view of biological diversity, the Brazilian Cerrado is recognized as the richest savanna in the world, housing 11,627 species of previously catalogued native plants. There is a great diversity of habitats, which determine a remarkable alternation of species between different Phyto physiognomies. In this study, 38 plants from 15 families were analysed, in order to identify and characterize the presence of phytoliths in species from the Cerrado. The aim was to establish modern reference collections that will enable further environmental reconstruction studies using this indicator, thus contributing to a better understanding of the biome. The samples were collected from the South Espinhaço Mountain Range, in the state of Minas Gerais. The results showed that, in general, Cerrado plants produce many phytoliths, with TRACHEID, POLYHEDRAL, ELONGATE, BILOBATE and BULLIFORM types predominating. It is also possible to observe a great silicification of trichomes, which may indicate adaptation of the vegetation to the environment. However, it should be noted that there was considerable variation in quantity and morphotypes between species, indicating the need for further studies on the phytolith production of plants in the Cerrado. Phytoliths have shown to be promising tools for better understanding of the region's vegetation, as well as for use in palaeoenvironmental studies on the biome.

4 CONTRIBUTION TO REFERENCE COLLECTIONS OF PHYTOLITHS FROM CAATINGA PLANTS: A CASE STUDY IN THE SERRA DE URUBURETAMA, CEARÁ, BRAZIL

Abstract author(s): Aguiar, Antônia (CaSEs – Culture and Socio-Ecological Dynamics research group. Departament d'Humanitats, Universitat Pompeu Fabra; Universidade Estadual do Ceará, Departamento de Humanidades) - Coe, Heloisa (Universidade Estadual do Rio de Janeiro - UERJ) - Madella, Marco (CaSEs – Culture and Socio-Ecological Dynamics research group. Departament d'Humanitats, Universitat Pompeu Fabra; ICREA - CaSEs, Departament of Humanities, Universitat Pompeu Fabra) - Sousa, Leandro (Universidade Federal Rural do Semi-Árido, Departamento de Biociências) - Ruiz-Pérez, Javier (CaSEs – Culture and Socio-Ecological Dynamics research group. Departament d'Humanitats, Universitat Pompeu Fabra) - Gomes, Jenifer (Universidade Federal Fluminense) - Gomes, Emilly (Universidade Estadual do Rio de Janeiro - UERJ) - Almeida, Iaponan (Universidade Estadual de Pernambuco) - Cruz, Maria (Universidade Estadual do Ceará, Departamento de Humanidades)

Abstract format: Oral

The Caatinga, the only genuinely Brazilian biome, is typical of the Northeast Region, where there is a semi-arid climate characterized by vegetation adapted to high temperatures, low precipitation, and uneven distribution of rainfall throughout the year. The climatic variations that occurred in the Caatinga region over a period of 20 thousand years created this unique biome. Despite this exceptional and unique situation, the biome has been heavily damaged by agricultural expansion and remains poorly studied. The area that is the focus of this study is the Uruburetama massif, located in the northern portion of the State of Ceará, which, despite presenting an environment with slightly more humid conditions, can be taken as characteristic of Caatinga vegetation. Phytolith analysis is used to understand the evolution of the vegetal cover in the region and such studies require the use of modern reference collections for the vegetation. Eighteen species from 16 different families typical of the region were analysed, in order to establish a reference collection of modern phytolith production to serve as a basis for future palaeoenvironmental reconstruction work. The results showed that, of the 18 species analysed, 13 produce large amounts of phytoliths, with SPHEROID PSILATE predominating, followed by POLYHEDRAL, TRACHEARY, ACUTE BULBOSUS and ELONGATE, among others. The phytolith morphotypes identified will be used to investigate the sedimentary phytolith assemblages and identify vegetation changes in the area due to climatic fluctuations.

5 USING RONDELS IN BOP CLADE POACEAE TO BETTER RESOLVE CERTAIN TAXA AND HABITATS OF THE TEMPERATE ZONE: A PROPOSED CLASSIFICATION

Abstract author(s): Blinnikov, Mikhail (St Cloud State University; Kazan Federal University)

Abstract format: Oral

Rondels (after the Old French for “small circle” also known as hats, short trapezoids and various other synonyms in ICPN 2.0) have been an important morphotype (or, rather, a group of morphotypes) in the phytolith analysis of grasses. They are especially common in the members of the BOP clade, i.e., Bambusoideae, Oryzoideae, and Pooideae, representing over 5,400 known species of grasses throughout the world. While not exclusive to BOP clade, Rondels for sure have not been adequately described or analyzed within the clade and there is as yet no satisfactory overall nomenclature of these phytoliths. This presentation makes a humble attempt at reviewing some available evidence from the published literature and from field and lab studies in a few locations in the temperate zone of Northern Hemisphere conducted by the author (Alaska, Pacific Northwest, Minnesota, the Altay, Northern Caucasus, and the Middle Volga in Russia) on the utility of some basic classifications of Rondels in distinguishing certain taxa and also some habitats of the temperate zone (alpine, aquatic, meadows, forests, and steppe). Some potentially confusing nomenclature of Rondel subtypes is clarified. Positive and consistent identification of a few subtypes may adequately distinguish certain plant communities of the temperate region. It is hoped that the proposed classification will help in making open online databases of phytolith samples and photographs more consistent and easier to use.

6 GEOMETRIC MORPHOMETRICS AS A TOOL FOR ANALYSIS OF GRASS PHYTOLITH SHAPE EVOLUTION

Abstract author(s): Hošková, Kristýna - Herben, Tomáš - Neustupa, Jiří (Department of Botany, Faculty of Sciences, Charles University in Prague) - Pokorná, Adéla (Department of Botany, Faculty of Sciences, Charles University in Prague; Institute of Archaeology, Czech Academy of Sciences, Prague) - Pokorný, Petr (Center for Theoretical Study, Joint Research Institute of Charles University and Czech Academy of Sciences)

Abstract format: Oral

Phytoliths appear to be the most reliable source of fossil evidence for tracking grasses' evolutionary history. The recent work of Gallaher et al. (2020) quantitatively documented that grass phytolith (GSSCP) shape carries a phylogenetic signal, which can distinguish grass subfamilies and tribes. They investigated 70 species from the early-diverging grasses, plus Oryzoideae, and Bambusoideae. Nevertheless, phytolith shape evolution in other taxonomic groups (even of lower levels), same as intra-individual phytolith shape variation remained unexplored.

We analysed 3650 grass phytolith outlines from 73 extant species, 48 genera, 18 tribes, and 8 subfamilies (special attention paid to Pooideae) using geometric morphometric methods (GMMs). GMMs quantitatively assess the entire 2D phytolith shape (Hošková et al. 2020). We aimed to explore phylogenetic pattern in phytolith shape against the background of intra-individual phytolith shape variation. The phytolith shape variation was proven to be phylogenetically constrained at the subfamily level; moreover, we found significant differences even between some genera and species. Geometric morphometrics proved to be suitable to analyse large numbers of phytolith outlines which also makes it an excellent tool within paleo- and archaeological context.

References:

- Gallaher, T., et al. "3D shape analysis of grass silica short cell phytoliths: a new method for fossil classification and analysis of shape evolution." *New Phytologist* 228.1 (2020): 376-392.
- Hořková, K., et al. "Inter-and intraspecific variation in grass phytolith shape and size: a geometric morphometrics perspective." *Annals of Botany* 127.2 (2021): 191-201.

7 AUTOMATED, QUANTITATIVE IMAGING ANALYSIS OF GRASS SILICA (PHYTOLITH) FOSSILS: A TOOL TO SHED LIGHT ON GRASS EVOLUTION AND DOMESTICATION

Abstract author(s): Stromberg, Caroline (University Of Washington) - Gallaher, Timothy (University of Washington; Bishop Museum, Hawai'i) - Akbar, Sultan - Jessett, Kari (University of Washington) - Klahs, Philip (Iowa State University) - Marvet, Claire - Sen-ske, Ashly - Zard, Kailyn - Zender, Callie (University of Washington) - Clark, Lynn (Iowa State University)

Abstract format: Oral

Grasses (Poaceae), which today dominate in 40% of terrestrial ecosystems, play an outsize role in Earth history during the last 30 million years and in human history. Plant silica (phytoliths) are vital tools to uncover these histories, because of their excellent preservation in many depositional settings and their taxonomic specificity within Poaceae compared to pollen and grass macrofossils. For example, analysis of phytolith assemblages from the Americas and eastern Mediterranean has shed light on the evolution and ecology of ancient grasses. This work has shown that, prior to the Oligocene (33.9 million years ago), grasses were relatively rare and consisted primarily of forest-associated grasses. However, these inferences are based on taxonomic schemes for so-called grass silica short cell phytoliths (GSSCP) that suffer from being semi-quantitative, inherently subjective, and not strongly linked to phylogeny; for this reason, they remain untested.

We aim to create a quantitative method for robust taxonomic and ecological inference from fossil GSSCP. Specifically, we have developed new methods for confocal imaging of GSSCP stained with fluorescent dye and image conversion to 3D surface models that can be quantified and analyzed using 3D geometric morphometrics. We have compiled >4,000 3D models from 190 grass species across Poaceae, which we combine with 2D images of cleared grass epidermis showing the distribution and relative abundance of GSSCP in leaf tissue. Our work demonstrates that this approach can robustly classify fossil phytoliths into grass subclades (e.g., subtribe), although precision varies depending on subclade and method. We therefore use a mixed methods approach to data analysis which combines our new quantitative methods with traditional morphotype-based analysis. Application of our methods to Eocene-Miocene grass phytoliths from central North America and Turkey confirms the presence of woody and herbaceous bamboos in the Eocene, allowing a better understanding of Poaceae diversification and Cenozoic paleoenvironments.

8 TESTING QUANTITATIVE APPROACHES FOR PHYTOLITH MORPHOTYPE SHAPE DESCRIPTION AND CLASSIFICATION FOR CALIFORNIAN GRASSES

Abstract author(s): Evett, Rand (Department of Environmental Science, Policy, and Management, University of California, Berkeley)

Abstract format: Oral

Phytolith morphotypes have typically been distinguished and classified qualitatively through visual cues requiring an expert observer. An increasing number of phytolith studies have used quantitative approaches to differentiate closely related, visually indistinguishable morphotypes. While techniques for quantitative shape analysis have progressed dramatically in other scientific disciplines, qualitative approaches still dominate phytolith research. Most quantitative phytolith studies currently conducted continue to rely on simple size and geometric shape descriptors first utilized more than 30 years ago. To progress as a science and take advantage of recent time and labor-saving advances in computerized analysis developed in other disciplines, phytolith analysis must become much more quantitative. The broad purpose of my ongoing research is to combine traditional geometric with other shape descriptors that have proved useful in other disciplines to improve quantification of phytolith shapes, leading to standardized morphotype description and classification data that are amenable to automated analysis. In the current study, boundary outlines of qualitatively identified phytolith morphotypes found in 11 Californian grass species were digitized and input into software that output simple geometric and elliptical Fourier descriptors (EFDs). The range and mean of each shape parameter were described for each morphotype of each species, and a database was built to facilitate classification of unknown phytoliths through discriminant analysis. The database was applied to discriminate visually similar BILOBATE phytoliths produced by two common native grasses in California: *Stipa pulchra* and *Danthonia californica*. The discriminant function, consisting of 5 terms (including 2 EFDs), successfully classified 93% of the BILOBATE phytoliths examined. The discriminant function for the trichome morphotype had 6 terms (3 EFDs), successfully classifying 100% of the trichomes from the 11 grass species examined.

9 OAT CHAFF IDENTIFICATION BASED ON PHYTOLITH MORPHOLOGY AND MORPHOMETRY: A VIKING-AGE EQUESTRIAN BURIAL AT FREGERSLEV, DENMARK

Abstract author(s): Out, Welmoed (Moesgaard Museum, Department of Archaeological Science and Conservation) - Portillo, Marta (Department of Archaeology and Anthropology, Archaeology of Social Dynamics - 2017SGR 995, Institució Milà i Fontanals - IMF, Spanish National Research Council - CSIC, Barcelona) - Schifter Bagge, Merethe (Museum Skanderborg)

Abstract format: Oral

In 2017, an equestrian burial dating to the late Viking Age was excavated in Fregerslev, Denmark. Metal finds have revealed spectacular remains of a horse harness and a quiver with 22 arrows. Apart from highly degraded pieces of fur, wood and leather, organic remains were scarce, or their association with the grave was unclear. However, analysis of a single block sample attested the presence of plant remains in the form of multi-celled phytoliths, so well preserved that they were most likely taphonomically undisturbed. Hence, phytolith and pollen analysis was applied to the complete grave to further investigate the presence of vegetative grave goods.

The aim of the phytolith analysis was to get a better understanding of the grave and its contents. Questions were: 1) Which taxa and plant part(s) do the phytoliths in the area of the block sample represent? and 2) Was this material present all over the grave or deposited in a concentration?

The initially attested phytoliths concerned a concentration of grass silica skeletons (multi-celled phytoliths), interpreted as horse fodder. In order to identify the material, both morphological and morphometric analysis were applied, based on a large number of chaff fragments and phytoliths. The results of the two methods were compared with reference material and subjected to statistical analysis. The majority of the phytolith concentration consisted of oat chaff. The bottom of the grave was covered with straw, mixed with some other plants. This study is of methodological relevance since it allows thorough analysis and comparison of both morphological and morphometric identifications. Additionally, it is one of the first times that morphometric identification criteria are applied to material from historical periods, for which these methodological approaches are mostly lacking, and to oat chaff phytoliths.

10 TOWARDS FAIR PHYTOLITH DATA - FIRST STEPS DOWN A LONG AND WINDING ROAD

Abstract author(s): Karoune, Emma (The Alan Turing Institute) - García-Granero, Juan José (Spanish National Research Council) - Ruiz-Pérez, Javier - Madella, Marco - Lancelotti, Carla (Universitat Pompeu Fabra)

Abstract format: Oral

The phytolith community has in recent years started to move towards the standardisation of phytolith data through the development of a common nomenclature and guidelines for morphometric studies. However, the routine adoption of these standards is still not straightforward. Indeed, a recent assessment of open science practices in phytolith research has found that only a very small percentage of studies adheres to the FAIR principles of making data Findable, Accessible, Interoperable and Reusable.

Prompted by these results and the need to raise awareness of the positive returns for our discipline for interoperability and wider data sharing, we initiated an open science working group leading to a project that is taking the first steps along the FAIRification journey for the phytolith community.

The project aims to conduct a FAIR evaluation of a large set of diverse phytolith data, and also draw on the results of a community survey concerning current data sharing practices and attitudes, to build a collaborative strategy to move forward with the FAIRification of existing data and guidelines to ensure future FAIR phytolith data. We understand that this is an issue that cannot be completed without consensus in the phytolith community and therefore we want to encourage participation in this project from all phytolith researchers.

In this presentation, we will explain how researchers can get involved through completing our survey, providing existing datasets for our FAIR evaluation and attending training sessions to FAIRify datasets. These initial efforts of training for FAIRification will create tools for use in the wider phytolith community, as it is important that we address the need for open science skills training in our discipline. The widespread adoption of open science practices is a challenge we must embrace to move our discipline into the era of open research.

A. NEW METHODS TO REDUCE THE UNCERTAINTY IN MICROARCHEOLOGY

Abstract author(s): Andreu Diez, Oriol (University of Barcelona) - Albert Cristóbal, Rosa Maria (ICREA; University of Barcelona) - Boaretto, Elisabetta (Weizmann Institute of Science) - Pellicer Moscardó, Jaume (Institut Botànic de Barcelona - CSIC)

Abstract format: Poster

Phytolith analyses and the study of other microremains such as calcium oxalates, spherulites, starches, etc. have been shown to be critical to better understand past and vegetation landscapes directly related to human activities and use of plants. Nevertheless, there are still some limitations that have directly affected our research and that we believe we are currently in a position to address, thanks to the advance of other related disciplines. These limitations are, i) preservation and dissolution of siliceous and calcitic microscopic remains that may affect our correct interpretation of the archaeological record; ii) the problem of redundancy and multiplicity of phytolith morphologies that may elude a precise taxonomic identification; iii) the uncertainty regarding the source of the occluded carbon present in the phytoliths and, therefore, its reliability for ¹⁴C dating. To do this, we propose a methodological approach divided into two fields of action. Firstly, the implementation of the latest advances in computer science and artificial

intelligence, using Deep Learning algorithms (Convolutional neural networks) to classification tasks. Then, introducing the application of techniques from other scientific disciplines such as cytogenetics (i.e. flow cytometry), and radiocarbon dating methods (Accelerator Mass Spectrometry) that will complement and expand the multi-proxy microarchaeological approach to improve the understanding of the phytolith production processes, and the interpretation of results, in particular, to improve the taxonomic identification of phytoliths.

We prospect that the implementation of this novel methodological approach will allow us to advance further in our research. In particular, our objective is to apply our results to better understand two different fields of research: a) agriculture as a driver of social change and b) the characterization of fuel in archaeological sites.

B. PHYTOLITH CLASSIFICATION USING DEEP LEARNING: IMPLEMENTATION OF A U-NET NEURAL NETWORK FOR MORPHOTYPE IMAGE-SEGMENTATION

Abstract author(s): Andriopoulou, Nafsika - Petrakis, George - Partisinelos, Panagiotis (School of Mineral Resources Engineering, Technical University of Crete)

Abstract format: Poster

Phytoliths constitute microscopic plant biominerals of high importance to geosciences and archaeology. Despite of the valuable advances in phytolith analysis, typical phytolith classification is performed manually, which is usually time-consuming and may inherit human observer biases. Thus, an emerging challenge signifies the automatic classification of phytoliths that may enhance data homogeneity among researchers and facilitate reliable comparisons. The application of deep learning (DL) algorithms on phytolith analysis, offers an opportunity to classify morphotypes with a higher unbiased precision, continuous refinement as long as more data become available and even the potential to reveal inherent group dynamics. Herein, we implement a “fully convolutional network” (FCN) architecture to classify phytoliths extracted from wheats (*Triticum* spp.) using the dry method. Photomicrographs of phytoliths are acquired using optical microscopy, and morphotypes, morphologically unaltered at the highest possible level, are identified based on the standard literature. The photomicrographs are further manually annotated forming four classes of morphotypes linked to different anatomical plant parts (i.e. leaves, stem, and inflorescence). The resulting annotated dataset includes the classes of (a) Stoma, (b) Rondel, (c) Papillate, and (d) Elongate dendritic and is allocated to training, validation and testing data groups, feeding a U-Net neural network. The performance of the developed network architecture is assessed during training, by calculating the area of overlap between the predicted segmentation and the “ground truth”, in order to overcome the potential issue of unbalanced distribution of the classes. The results demonstrate that the model classifies and localizes the above classes of morphotypes in the predicted images with satisfactory accuracy. Although additional training samples and plant species datasets are required to optimise the results, the present dataset extracted from modern plant material is promising for building up the capacity of phytolith classification within unfamiliar datasets from natural sediments and archaeological contexts.

256 IMPR – PHYTOLITHS BIOGEOCHEMISTRY - FROM PHYTOLITHS FORMATION AND ROLE IN MODERN PLANTS TO NEW PROXIES FOR ARCHAEOLOGY AND PALAEOECOLOGY

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Dreibrodt, Stefan - Dal Corso, Marta (Kiel University) - Chevalier, Alexandre (Royal Institute of Natural Sciences)

Format: Regular session

Biosilicification in plants is a complex process under genetic and environmental control. Suggested functions of phytoliths are structural support, protection against grazing and pathogens, and regulation and storage of minerals and heavy metals. For phytoliths to be deposited, plants need to take up silicon from their environment. Some plants produce many phytoliths, while others produce hardly any. Also the degree of taxonomic identification of phytoliths to plant groups, or even plant parts, is diverse. Concerning phytolith formation, there are still questions to answer, for example, the variation of phytolith formation within individual species, quantitative aspects and chemical aspects. An additional challenge is how we can turn aspects of phytolith biogeochemistry into proxies to use in environmental and archaeological research, e.g. by using chemical elements within phytolith structure (e.g. Carbon, Calcium, Aluminium, Nitrogen) for isotope analyses or for radiocarbon dating. Furthermore, this session also deals with those chemical aspects of both phytoliths and pedological processes that affect phytolith preservation and distribution. Proper understanding of taphonomy is key to the interpretation of the original plant assemblages.

This session aims to discuss new methodological developments in phytolith formation and quantification while studying phytoliths in the fields of plant systematics, evolution, physiology and biochemistry. The session welcomes contributions that address questions such as, but not limited to: where in the plants are phytoliths formed? What types of cells or other structures silicify, and how does phytolith formation vary within plants and within species? Can we increase the use of chemical aspects of phytoliths as a proxy in archaeological studies, including dating Carbon in phytoliths? How can isotope studies be applied to phytolith records? Which compounds and elements other than silica are included in phytoliths?

This session is part of the 12th International Meeting for Phytolith Research, the official conference of the International Phytolith Society.

ABSTRACTS:

1 PHYTOLITH CHEMISTRY: WHAT WE KNOW AND WHAT WE DON'T

Abstract author(s): Hodson, Martin (Oxford Brookes University)

Abstract format: Oral

Variation in phytolith morphology is now routinely used in archaeological and palaeoecological research to determine what plants were present, used by humans, or eaten. However, phytoliths vary not just in their morphology, but also in their chemistry. Increasingly, researchers are attempting to use the chemical features of phytoliths as proxies. But what do we know about phytolith chemistry?

The mechanism of silica deposition in plant cells is still poorly understood, but it is now clear that the deposition environment is critical in determining phytolith chemistry. There are two main classes of phytoliths when we consider their chemistry: those deposited in the cell wall, and form on a carbohydrate template; and those in the cell lumen which contain proteins and amino acids, but may also have lipids and even nucleic acids. Often cell wall phytoliths have a C/N ratio of over 25, while lumen phytoliths have a ratio below 5. We should remember that when we are analysing bulk phytolith samples they will include morphotypes with many different chemistries.

Small, delicate phytoliths, and those with a large surface area to volume ratio, are more susceptible to dissolution in the soil, but we are unsure whether phytolith chemistry (e.g. carbohydrate composition) also affects this.

There have been many attempts to use the isotopic composition (O, Si, C) of phytoliths as proxies, and to date phytoliths using ¹⁴C. Likewise, there has also been a lot of interest in phytoliths and carbon sequestration. Unfortunately, our lack of understanding of phytolith development and chemistry often make the results from these studies difficult to interpret. The phytolith community needs more plant scientists and chemists to take an interest so that we can increase our understanding of phytolith chemistry, and give us more confidence in the results obtained from archaeological, palaeoecological and biogeochemical investigations.

2 ELEMENTAL COMPOSITION OF CENTRAL EUROPEAN TREE LEAVES DELIVERS HINTS TO ENVIRONMENTAL SETTINGS, BIOGEOCHEMICAL CYCLING AND SOIL FORMATION

Abstract author(s): Dreibrodt, Stefan (Kiel University, CRC1266)

Abstract format: Oral

Phytoliths of woody plants are found to contain higher amounts of alumina in contrast to grassland phytoliths. This is used to infer about vegetation history through phytolith analysis for instance. Databases are considerably small so far and little is known about the variability of elemental contents of trees from varying environmental settings. The presented paper is focussing on the elemental content of recent tree leaves, its relation to site conditions (parent material, water availability, climate), biogeochemical cycling and soil formation in central Europe.

60 samples of deciduous trees leaves and needles of conifers have been obtained from fresh litter fall at 40 sites in different European lowlands, focusing on northern and eastern Germany. The leaves were cleaned in deionized water (ultrasonic bath), burnt at 550 °C for two hours and the total elemental contents of the ash were measured using a p-ed-xrf device. Additional REM analysis on oak ash examples revealed the presence of alumina and iron in oak phytoliths.

The ash elemental contents related to 105 °C dried biomass show a certain variability between sites, reflecting the geochemical composition of the parent material. All samples contain measurable amounts of Sr, Zn, Fe, Mn, Ca, K, Al, Si, P, and Mg. At several sites, different tree species could be compared. PCA plots indicate genus specific differences of leaf elemental content and thus varying modes of biocycling. Selected elemental ratios, e.g. Al: Si ratios, show similar trends, with decreasing values in the order: *Pinus sylvestris*, *Quercus petraea*, *Fagus sylvatica*. Oak and beech trees from alluvial plains behave different than their counterparts on dry lowland sites.

Since iron and alumina present in all investigated samples are major constituents of diagnostic forest soil horizons, the maintenance of the fast biogeochemical cycle of deciduous tree leaves for central European forest soil formation is discussed.

3 PHYTOLITH PRODUCTION IN TWO DIFFERENT ENVIRONMENTS IN SOUTHEASTERN BRAZIL

Abstract author(s): Ricardo, Sarah (National Museum of Brazil - Federal University of Rio de Janeiro) - Coe, Heloisa (University of the State of Rio de Janeiro) - Alves, Ruy (National Museum of Brazil - Federal University of Rio de Janeiro)

Abstract format: Oral

Restinga is coastal strand vegetation distributed in mosaic, associated with Quaternary sandy and rocky deposits. It may present, according to the predominant Phyto physiognomy, herbaceous, shrub and tree strata. Campo rupestre (rupestrian grassland) consists of mountain top and plateau vegetation above 900 m asl. with rock outcrops, where herbs, grasses and shrubs predominate. In general, Campo rupestre occurs in mosaics and not in continuous stretches, in transition areas between Cerrado (Brazilian savanna), Caatinga (semi-arid biome) and Atlantic Forest. Several plant species are known to occur in disjunction in these two distinct vegetation types. The present study aimed to verify possible differences in the amount, type, frequency, and size of phytoliths produced by the same plant species in these distinct vegetation types. The study areas were restingas located in the state of Rio de Janeiro and

campos rupestres in the São José mountain range in Minas Gerais, both in south-eastern Brazil. The samples were collected in 2017 and 2018 and specimens were deposited in the herbarium of the National Museum/UFRJ (R). Phytoliths were extracted through the wet method, using a solution of nitric acid 65% and sulfuric acid. Nine of the ten selected species produced phytoliths and showed differences in quantity, morphotypes, frequency and size of phytoliths. Nevertheless, similarities were also found. Principal component analysis (PCA) showed that individuals from the same species, but from different environments, tended to cluster. Results indicate that not only the environment, but also the taxonomic affinity seem to influence the production of siliceous particles and that there are patterns in their production.

4 PHYTOLITHS IN FERNS: CYATHEA DELGADII STERNB. AND PTERIDIUM ARACHNOIDEUM (KAULF.) MAXON FROM DIFFERENT ENVIRONMENTS

Abstract author(s): Ricardo, Sarah (National Museum of Brazil - Federal University of Rio de Janeiro) - Coe, Heloisa (University of the State of Rio de Janeiro, Brazil) - Alves, Ruy (National Museum of Brazil - Federal University of Rio de Janeiro)

Abstract format: Oral

Ferns are vascular plants which often present silicification in their tissues. This study analyzed the tree fern *Cyathea delgadii* Sternb. (Cyatheaceae), and the bracken fern *Pteridium arachnoideum* (Kaulf.) Maxon (Dennstaedtiaceae). Both species are native, but not endemic, to Brazil. The specimens were collected in 2017 and 2018 in two environments with different characteristics: coastal strand restingas (RE) in Rio de Janeiro and campo rupestre (rupestrian grasslands) (CR), in Minas Gerais, Brazil. Phytoliths were extracted using nitric and sulfuric acids and analyzed for morphology, quantity, and size. Regarding the level of production, *C. delgadii* was classified as "Very high" (> 300 phytoliths in 3 transects) in both environments. The species presented 4 types of silicification in CR (ELONGATE, PUZZLE, stomata and trichomes), one more (trichomes) than in restinga. In both environments, the predominant type was PUZZLE (RE: 52%; CR: 59%). PUZZLE in *C. delgadii* presented almost twice the amount in CR. Silicified stomata were also slightly larger in CR. The production of phytoliths from *P. arachnoideum* was "Medium" (50-100) in RE and "High" (100-300) in CR. In restinga, ELONGATE, SPHEROID ORNATE, PUZZLE and trichomes were observed. In CR, the species produced practically the same types, although no SPHEROID ORNATE was observed, instead, stomata were present. The predominant morphotypes were PUZZLE (RE: 66%; CR: 67%) and trichomes (25% in both environments), showing relative similarity in the morphotypes and frequencies between the environments. PUZZLE presented a slightly longer length in RE than in CR. Results show that despite being from different families, the studied groups presented a large amount of phytoliths, with a predominance of PUZZLE. There are still many questions to be elucidated concerning the relationship between populations and different environmental variables with phytolith production.

5 PHYTOLITH PRESERVATIONS IN MODERN AND FOSSIL DEPOSITS FROM PERMAFROST IN THE KOLYMA LOWLAND

Abstract author(s): Zanina, Oksana (Institute of Physicochemical and Biological Problems in Soil Science RAS)

Abstract format: Oral

Rocks formed at Earth's surface are under the influence of external processes, as a result, they lose their initial physical and chemical stability and are destroyed. In permafrost area at low temperatures and multiple phase transitions "water - ice", these processes acquire a special specificity. Probably, cryogenic processes "erase" information about the existing biocoenoses, leading to the destruction of mineral and organic new formations (including phytoliths) in the material of the seasonally thawed layer.

Phytoliths are important microfossils used for paleoecological reconstructions of past plant communities. The latter studies have shown that phytolith assemblages are relatively unstable in soils and sediments. Given the vulnerability and ability of phytolith assemblages to partial destruction at low temperatures after sedimentation and its effect on paleoecological interpretation, it is surprising but this process poorly understood.

We investigated characteristics and preservation of phytoliths from about 25 modern and 10 paleosols at 30 sites in northeast Russia, Lower Kolyma area (68° c.ш., 161° в.д.). Studies have shown that strongly corroded phytoliths are constantly present in the permafrost. The assemblages of phytoliths within soils in the study area are similar. There are dominated by elongate and lanceolate phytoliths, followed by blocky, tabular and trapezoid phytoliths. On the surface of phytoliths from modern soils, there are individual caverns, numerous cracks, often the surface has scales, which indicates intensive weathering. The most common are corroded elongated, lanceolate, and trapezoidal forms. Quantitative and qualitative analysis of the phytolith in the Late Pleistocene Ice Complex showed their best preservation and diversity in the paleosols organogenic layers, peat bogs and lake sediments.

Cryogenic destruction of phytoliths is confirmed. The results can be used to clarify the genesis of the permafrost deposits and to reconstruct the paleogeographic conditions of their formation.

The study is supported by the RFBR grant №20-05-00559.

6 SILICON STABLE ISOTOPES IN PHYTOLITHS: A TOOL TO ASSESS WATER AVAILABILITY? PRELIMINARY RESULTS OF LASER ABLATION ANALYSIS OF EXPERIMENTAL CROPS

Abstract author(s): Lancelotti, Carla (CaSEs Research Group, Department of Humanities, Universitat Pompeu Fabra; ICREA) - Frick, Daniel (GFZ German Research Centre for Geosciences, Earth Surface Geochemistry) - D'Agostini, Francesca (CaSEs Research Group, Department of Humanities, Universitat Pompeu Fabra; CERES team. DIADE - Diversity and Adaptation and Development of plant Group, Université de Montpellier) - Varalli, Alessandra - Ruiz-Pérez, Javier (CaSEs Research Group, Department of Humanities, Universitat Pompeu Fabra) - Madella, Marco (CaSEs Research Group, Department of Humanities, Universitat Pompeu Fabra; ICREA) - Vadez, Vincent (IRD - Institut de Recherche pour le Développement. Université de Montpellier, UMR DIADE, BP; ICRISAT - International Crops Research Institute for Semi-Arid Tropics. Patancheru) - Kholova, Jana (ICRISAT - International Crops Research Institute for Semi-Arid Tropics. Patancheru)

Abstract format: Oral

Identifying plant water availability from archaeobotanical remains is one of the open challenges of the discipline. Several methods have been developed with different degrees of success, especially for C3 plants. Amongst these, phytoliths silicon stable isotope analysis has been suggested as a possible proxy for the environmental conditions in which plant developed. In this paper we present preliminary results on the analysis of silicon stable isotope on phytoliths extracted from leaves of selected C4 species.

Landraces of *Sorghum bicolor* (L.) Moench, *Pennisetum glaucum* (L.) R.Br. and *Eleusine coracana* (L.) Gaertn. were grown in lysimeters under different water regimes at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). The plants were watered according to their transpiration rate to simulate different conditions: from water abundance to extreme water stress. Phytoliths were extracted from the leaves of these plants and analysed by femtosecond laser ablation multi-collector inductively coupled plasma-mass spectrometry (fsLA-MC-ICP-MS). This method allows the measurement of individual phytoliths thus increasing the interpretation potential.

We have so far conducted 2 sets of analysis: the first on all three species and the second only on sorghum. For the first set we analysed 14 samples, each corresponding to a mixture of mature and young leaves, and we analysed bulk (i.e., clusters of phytoliths) and specific morphotypes within silica skeletons for a total of 239 data points. The initial results suggest no significant differences at large in relation to water treatment but highlighted differences between species and geographic origin. However, stomata reading in sorghum signal a sensibility of these phytoliths to water treatment signal. Thus, for the second set, we analysed 5 landraces of sorghum concentrating on bulliforms, stomata and elongates. The rationale behind this was to reduce noise and concentrate on the morphotypes that are related to the transpiration stream.

7 UNDERSTANDING THE RELATIONSHIP BETWEEN THE PHYSIOLOGY OF WATER TRANSPORT AND PHYTOLITHS PRODUCTION IN SELECTED C4 CROPS: AN EXPERIMENTAL APPROACH

Abstract author(s): D'Agostini, Francesca (CaSEs - Culture and Socio-Ecological Dynamics Research Group. Departament d'Humanitats, Universitat Pompeu Fabra; CERES team. DIADE - Diversity and Adaptation and Development of plant Group, Université de Montpellier) - Vadez, Vincent (CERES team. DIADE - Diversity and Adaptation and Development of plant Group, Université de Montpellier; IRD - Institut de Recherche pour le Développement. Marseille; ICRISAT - International Crops Research Institute for Semi-Arid Tropics. Patancheru) - Kholova, Jana (ICRISAT - International Crops Research Institute for Semi-Arid Tropics. Patancheru) - Ruiz-Pérez, Javier (CaSEs - Culture and Socio-Ecological Dynamics Research Group. Departament d'Humanitats, Universitat Pompeu Fabra) - Madella, Marco (CaSEs - Culture and Socio-Ecological Dynamics Research Group. Departament d'Humanitats, Universitat Pompeu Fabra; ICREA - Catalan Institution for Research and Advanced Studies; Department of Geography, Archaeology and Environmental Studies, University of Witwatersrand) - Lancelotti, Carla (CaSEs - Culture and Socio-Ecological Dynamics Research Group. Departament d'Humanitats, Universitat Pompeu Fabra; ICREA - Catalan Institution for Research and Advanced Studies)

Abstract format: Oral

Phytolith formation is related to the plant's transpiration stream which in turn depends on water availability. As such, phytolith analysis have previously been used to explore past water regimes in archaeobotanical samples. For crops of agricultural interest, like some C4 grasses, the mechanisms of phytolith formation are not yet completely understood and there is debate whether genetically and environmentally controlled morphotypes are informative about water availability.

The aim of our research, conducted within the framework of the project RAINDROPS (ERC-Stg 759800), was to test if phytoliths from C4 crops could be used to identify different water regimes in archaeological contexts. Therefore, we carried out an experimental cultivation of ten traditional landraces each of sorghum (*Sorghum bicolor* L.Moench), pearl millet (*Pennisetum glaucum* L.R.Br.) and finger millet (*Eleusine coracana* L.Gaertn.), simulating irrigated and rain-fed scenarios. Experiments were conducted in lysimeters, which allowed us to keep a tight control on water regimes while plants grew in field-like conditions. Our first set of analysis concentrated on leaf samples, being the site of most transpiration, and consequently were assumed to produce the strongest variability among the different phytolith morphotypes.

In this paper we present the first results of analyses on phytolith concentration and morphotype assemblages. We found that millets presented similar patterns, producing more phytoliths in well-water conditions, whereas sorghum response was independent of the water regime. The ratio between fixed and sensitive morphotypes discriminated water availability only for some landraces. Within the same species, not all landraces responded equally to water treatments, suggesting that silica accumulation and mor-

phenotypes production might also be influenced by genetics. Future steps will include the analysis of stems and chaffs to construct a complete picture of how water availability affects phytolith production and to better assess the potential use of C4 phytoliths for archaeological studies on past agricultural systems.

8 WHAT DO WE KNOW ABOUT HEATED PHYTOLITHS BECOMING AUTO-FLUORESCENT?

Abstract author(s): Hodson, Martin (Oxford Brookes University) - Devos, Yannick - Hermans, Rosalie (MARI, Vrije Universiteit Brussel) - Segato, Tiriana - Delplancke, Marie-Paule (4MAT, Université Libre de Bruxelles) - Chevalier, Alexandre (Royal Belgian Institute of Natural Sciences, Brussels) - Vrydaghs, Luc (MARI, Vrije Universiteit Brussel)

Abstract format: Oral

A number of methods have been used in the past to determine whether phytoliths in archaeological contexts have been fired and/or heated: morphological alterations, coloring and opacity, refractive index, and Raman spectroscopy. However, none of these have satisfactorily discriminated between burned and unburned phytoliths. We will report on a series of investigations into auto-fluorescence in heated phytoliths. We are hopeful that this may become an important proxy complementing the previously developed techniques for tracking evidence of fire and heating within archaeological contexts.

Our work has been in two parts. Firstly, we examined phytoliths found in soil thin sections of well-characterized modern and archaeological contexts from Northern Europe. Secondly, we carried out some experimental work to determine the precise temperatures at which auto-fluorescence occurs.

We have unequivocally shown that auto-fluorescent phytoliths can be found in many archaeological contexts where heating or burning has occurred. Unheated material shows no auto-fluorescent phytoliths, while combustion features and burned material revealed many auto-fluorescent phytoliths. These included both cell wall and lumen phytoliths.

As yet it is unclear precisely what the lowest temperature is where fluorescence can be observed, as lower temperatures often do not remove enough organic material to visualise phytoliths. Phytoliths show morphological alterations and melting as the temperature is raised above 500°C, and when this occurs auto-fluorescence can cease. As yet we are uncertain of the mechanism behind heat-induced auto-fluorescence, and that is an important topic for future research.

9 IT IS ABOUT TIME: FOUR CONSIDERATIONS IN STUDYING PHYTOLITH EVOLUTIONARY HISTORY

Abstract author(s): Katz, Ofir (Dead Sea and Arava Science Center)

Abstract format: Oral

Phytoliths are an important tool for archaeologists, palaeoecologists, and palaeobiologists, which enables interpreting human activities, animal diets, ecosystem structures and evolutionary histories. Nevertheless, its application is hindered by unclarity over the role of phytoliths in plant biology and ecology, environmental variations in phytolith formation, and lack of evolutionary framework. Thus, understanding the ecological roles of phytoliths and their evolutionary history is fundamental for increasing our understanding of this phenomenon, its origins, and its significance for past, present and future ecosystems. Achieving this goal requires acknowledging and incorporating into our thinking four key facts that many of us are prone to overlook. First, there is great taxonomic variance in plant silicon and phytolith contents, forms and roles, in herbivore responses and dietary preferences, and in types of current and fossil/archaeological evidence. Second, species and their traits, as well as whole ecosystems, should be seen in the context of their entire evolutionary history, and may therefore reflect not only adaptations to extant selective forces but be anachronisms. Third, evolutionary history and evolutionary transitions are complex, resulting in true and apparent asynchronisms. Fourth, evolution and ecology are multi-scalar, in which various phenomena and processes act at various scales. These considerations are also relevant to other types of archaeological studies, especially ones that employ evolutionary frameworks. Considering these will bring us closer to gaining a more complete understanding of one of the most exciting and elusive phenomena in plant biology and ecology and how it can be utilized.

A. ASSESSING PHYTOLITH PRODUCTION IN MEDITERRANEAN HERBS

Abstract author(s): García-Granero, Juan José (Spanish National Research Council - IMF-CSIC; University of Oxford) - Patús, Cristina (University of Barcelona)

Abstract format: Poster

Herbs are aromatic plants belonging mostly to the onion subfamily (Allioideae), the mint family (Lamiaceae), the parsley family (Apiaceae) and the tarragon family (Asteraceae), many of which are native to the Mediterranean. The culinary use of herbs has been textually documented in the eastern Mediterranean since the Late Bronze Age (Linear B tablets, Greece, c. 1450-1200 BC). However, due to the nature of the archaeological record, where most macroscopic plant assemblages are preserved through charring, herbs are largely underrepresented and have been seldom considered when assessing past culinary practices. Here we present the results of a modern phytolith reference collection of Mediterranean herbs, which show the great potential of phytoliths to bring 'invisible' plant ingredients into archaeological narratives. Although herbs are relatively poor phytolith producers, certain taxa produce distinctive morphotypes at different taxonomic levels that can be used to identify the culinary uses of Mediterranean herbs in the archaeological record.

B. LEAF PHYTOLITHS PRODUCTION IN PLANTS OF UPPER MONTANE RAIN FOREST (ATLANTIC FOREST BIOME) - BRAZIL

Abstract author(s): Mozer, Jonathan (PPG- Geography, UNIOESTE, Marechal Cândido Rondon) - Calegari, Marcia (Geography Collegiate, UNIOESTE, Marechal Cândido Rondon) - Vidal Torrado, Pablo (Department of Soil Science, ESALQ/USP, Piracicaba) - Madella, Marco (CaSEs Research Group, Department of Humanities, Pompeu Fabra University) - Macedo, Rodrigo (Instituto Nacional do Semiárido, Campina Grande) - de Souza, Erica (PPG- Geography, UNIOESTE, Marechal Cândido Rondon)

Abstract format: Poster

To understand the expansion/retraction dynamics of the Atlantic Forest on the Brazilian coast during the Quaternary, it is necessary to understand the records that it leaves on the ground. Phytolith analysis is a promising tool that provides subsidies for this purpose. This study aimed to know the phytolith production in representative plants of de Cloud forest (Upper Montane Rain Forest) collected in Parque Estadual Carlos Botelho (PECB), a permanent preservation area of the Atlantic Forest Biome, located in São Paulo State (Southeast Brazil). A phytolith reference collection (PRC) of leaves of 82 species, representing 39 families (26 eudicots, 11 monocots, 1 pteridophyta and 1 tracheophyta) was elaborated. For each sample, the phytolith production, redundancy, and the identifications of diagnostic morphotypes were established. The extraction procedure used was the dry ashing adapted from Campos & Labouriau (1969) and Piperno (2006). According to results of the PRC analysis, 53 different morphotypes were identified for this set of studies plants. 73% of the samples (60 species) presented abundant phytolith production, 15% (12 species) good production, 5% (4 species) rare production, and only 7% (6 species) did not produce phytoliths. The families belonging to the Eudicot group showed production of Spheroid psilate and Blocky psilate, which were the most frequent in species, 66% and 46%, respectively, of PRC in general, these are representative of forested environments, as corroborates Piperno (2006) and ICPT (2019). The Conical with acute basal projections morphotype demonstrated taxonomic significance for the Arecaceae family (Hat-shaped ICPN 1.0). The grass species (Monocot) produced short cells diagnostic morphotypes: Bilobate, Saddle, Blocky, and Polylobate; with specific Panicoid and Chloridoid Poaceae subfamilies, and the Conical Cyperus where identified in the samples of Cyperaceae, corroborate the studies that indicate these morphotypes as diagnostic for this family.

259 MOBILE PASTORALISM, SALT AND CHEESE. ETHNOGRAPHIC PERSPECTIVES ON THE SPATIAL CONFIGURATION OF A LONG-TERM MEDITERRANEAN TRIAD

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Attema, Peter (University of Groningen) - Neef, Wieke (University of Ghent)

Format: Regular session

This session is dedicated to a historically fundamental cornerstone of the Mediterranean economy, mobile pastoralism, and to an important precondition for its functioning, salt. Both are indispensable for the production of an easily preserved and traded commodity, hard cheese. Two previous EAA sessions (2011 and 2012) focused on upland pastoral sites, published in the edited volume "Summer Farms: Seasonal exploitation of the uplands from prehistory to the present" (2016, Sheffield Archaeological Monographs 16, edited by John Collis, Mark Pearce and Franco Nicolis). In his contribution "Hard cheese: Upland pastoralism in the Italian Bronze and Iron Ages", Mark Pearce stressed the importance of the production of hard cheese for upland land use in later Italian prehistory, as well as the central role of salt in animal husbandry and cheese-making.

In this session, we aim to look beyond the upland summer farms and focus on the exchange networks in which they were embedded. We welcome papers that explore the spatial configuration of pastoral mobility of all ranges in combination with access to markets where salt could be obtained (if not at the source itself), where dairy products could be traded (if not directly to consumers) and ways in which the triad was organized. We aim at a mix of ethnographic, ethnoarchaeological and archaeological perspectives from around the Mediterranean basin.

ABSTRACTS:

1 WHITE ELEMENTS FROM A MOUNTAINOUS LANDSCAPE: SALT, SNOW, AND LONG-TERM PASTORALISM IN THE MONTI LUCRETILI AREA

Abstract author(s): Bernardi, Martina - Farinetti, Emeri (Dipartimento di Studi Umanistici, Università degli Studi di Roma Tre)

Abstract format: Oral

The mountain landscape of the Lucretili Mountains, a territorial district in the north-east of Rome in the Roman Sabina, has been marked, as still today, by pastoralism: for centuries, forms of mobile pastoralism have been practiced seasonally. However, we refer to a short and medium-range transhumance, since this activity developed mainly at a local level and not at a wide-ranging level, as instead attested in other Apennine areas.

In mountain contexts, it is also easy to find on the modern maps some talking toponyms that recall the presence in the rural landscape of some specific trades linked to the movement of shepherds. Sabina has always been 'renowned' for the salt trade. Like salt, snow was also an essential element in nutrition, a very useful resource for the preservation of foods or for their production. The transport and trade of snow continued, with perhaps a slowdown in the early Middle Ages, until more recent times, governed by

contracts granted by the Papal State. Snow, like salt, had to follow precise routes, both land and river, able to lead it first to small towns and then to the city.

The areas of the Lucretili that best suited this activity were Monte Gennaro, which dominates the south-eastern portion of the area, and Monte Pellecchia, near Monteflavio. Along the 'routes of the snow' it is still possible to find small places of worship dedicated to the Madonna della Neve: the evidence testifies to the strong devotional character that this activity, strongly rooted in the territory, assumed in the perception of the local population.

This paper will try to suggest ideas for a diachronic research on human mobility in the area, linked to pastoralism and to the élitarian trade of the 'white' elements of salt and snow.

2 THE MADONIE MOUNTAIN “UNDE SAL FODITUR”

Abstract author(s): Canale, Alessandra (Dipartimento Culture e Società, Università di Palermo)

Abstract format: Oral

In the north-western Sicily, into the Madonie mountains' heart, a very big rock salt deposit has been known since the republic roman period and used until now. According to the most recent researches, human settlement interested the mountain area since the prehistoric period and we have reason to believe in the important role of salt, right in favour of pastoral economy development in this area of the island, till now.

The study benefits from the long term research carried out since the seventies in the Imera river valley (on the western slope of the mountains) as well as the studies developed about Halaesa roman town (on the east slope of the mountains).

The methodological approach, organized by samples areas, looks at the ancient paths system as a starting point of the analysis in the field. So we tried to understand the way in that natural resources was used in the past; to hypothesize pastoral mobility phenomena; to examine the relationship with the surroundings background (cities and rural settlement); to reconstruct the socio-economic implications over time.

3 “THOSE WHO SPRINKLE SALT PREFER MINERAL SALT” (VARRO R.R., 2.11.3): SHEPHERDS, SALT AND MARKETS IN ROMAN AND MODERN ITALY

Abstract author(s): Pasquinucci, Marinella (University of Pisa)

Abstract format: Oral

Ancient Greek and Roman sources document the use of salt in livestock and cattle breeding, in preserving cheese, meat and hides, in veterinary practices. In the Mediterranean district pastoral mobility, vertical and horizontal, short- and long-distance, small- and large-scale transhumance was and is practiced on various scales in various geographical and historical contexts. This practice, which is strictly connected with salt supplies, has persisted over time with diachronic divergences linked with political, social and economic factors (e.g. subsistence and market economies) varying through time. In Roman and Modern times, in particular, pastoral mobility was regulated and attracted investments in central and south Italy. During the late Roman Republican period and the Empire, the markets of Rome and other cities, as well as the military supplies (which included dairy products, meat, wool and hides) made the practice highly profitable. In Medieval/Modern times large evidence of products of the transhumant breeding and their marketing is provided by the Dogana romana (Roman Customs Duties), the Dogana dei Paschi di Siena (The Customs of the Pastures of Siena) and by the Customs (Dohana Menae Pecudum Apuliae) of Foggia.

4 ON THE TRAIL OF SHEPHERDS AND SALT FROM THE COAST TO THE MOUNTAINS AND VICE VERSA IN NE ITALY

Abstract author(s): Montagnari Kokelj, Manuela (University of Trieste) - Migliavacca, Mara (University of Verona)

Abstract format: Oral

Archaeology of pastoralism and archaeology of salt share research methods based on direct and indirect indicators: geomorphological and environmental characters, sedimentology and soil micromorphology, archaeozoology, ethnography, ethnohistory and material culture. The possibility of investigating only one or more of these elements is conditioned mainly by the results of past field explorations/studies and by the present-day research team (interdisciplinary or not) and available facilities.

On these premises we have compared the multidimensional character of pastoralism in Veneto and Friuli Venezia Giulia (NE Italy). Sedimentology and soil micromorphology have been fundamental to identifying some Karst caves as stables. The revisions of associated artefacts in the sites supported the hypotheses on the (dis)continuity of use, while faunal remains were less indicative. The presence of a relatively high number of exotic materials - whose non-local origin, first proposed on traditional, typological-comparative studies has been confirmed by recent archaeometric analyses - may be related to transhumant pastoralism, but marine salt might have been the main attractiveness. From prehistory to Roman times, and in a different context, a similar integration of methodologies resulted successful once again. Moreover, soil chemistry is giving good results also off-site, as demonstrated by the recent study of the Bronze Age embankment road devoted to the passage of herd localized in the Po lowland. This case study shows that ancient paths and roads and pastoral movements can be overlapping: in the reconstruction of both, physiographic features - particularly in mountain regions - play an undeniable role together with historical and ethnographic data. Our studies used regional ethno-historical data, combined with field ethnographic and ethno-archaeological research: though what is 'traditional' is

not inevitably 'ancient', our experiences indicate that data derived from the studied area - rather than from contemporary primitive societies - are useful to identify general trends and recognize sites and structures.

5 ALONG THE “VIA SALARA” (ABRUZZO – CENTRAL SOUTHERN ITALY). CHASING SALT AND ITS MARGINAL MOUNTAIN ROUTES

Abstract author(s): Del Fattore, Francesca Romana (Università degli Studi Internazionali di Roma)

Abstract format: Oral

This presentation examines in detail a segment of a route (about 20 km) located in Southern Abruzzo (Italy). The work is part of PECUS (www.pecus-project.org), an interdisciplinary project dedicated to the analysis of the drove-roads network in Central-Southern Italy. We are between Anversa degli Abruzzi and the Godi Pass (Province of L'Aquila), along the ancient path known in the local tradition as 'via Salara' (Salt Route). The area is rich in archaeological evidence, documenting, since protohistoric times, the presence of communities dedicated to pastoral activities. These traditions still exist today in residual forms: several local shepherds/breeders produce cheese in traditional ways. The 'Via Salara' connected this mountain district with the routes that, already in the protohistoric age, descended towards the Adriatic Coast, where important settlements flourished between the Final Bronze Age and the Early Iron Age. The area is also at the heart of the historic drove-roads network, along which thousands of animals (and humans, seeds, object, uses, ideas + salt) moved until the last Century. Stratigraphic excavations carried out between 2013 and 2016 along the route ('I Giardini' site), have brought to light a settlement of long duration (Republican/Late Antique period). Data from surveys carried out in the area of the Godi pass, further South, document an intense frequentation linked to the exploitation of summer pastures, from protohistoric times to contemporary times. Here, every year, a family of breeders (and cheese producers) brings their flocks from Apulia, reusing the ancient sheep-pens located exactly along the Via Salara. Archaeology and ethnoarchaeology will be used as tools, if not to physically document the presence of salt in the archaeological record, then certainly to reconstruct, diachronically, the network of routes in which our path was inserted. A model of that interconnected road system typical of the Central-Southern Apennine chain.

6 BUTTER AS CURRENCY: OUTLAND PASTORAL PRACTICES AND EXPORT MARKETS. THE VIEW FROM NORWAY

Abstract author(s): Hill, David (NIKU - Norwegian Institute for Cultural Heritage Research)

Abstract format: Oral

The demographic expansion from the end of the Viking Age and until 1350 put pressure on cultivable land. Mountain pastures and forest areas were taken into use for seasonal grazing. Summer farms became established and cattle, goats and sheep were moved into the outland zone. Established meadows and fields could then be used for crops and producing winter fodder thus expanding a farm's production. Rents and taxation were fixed and paid in naturalia. Most farms were required to pay in butter and grain as well as other products. The church was the largest landowner (44%) and became an exporter of butter from towns. Salt was produced locally from sea water in cauldrons heated by fires. The production of calories in the form of preserved animal fat became therefore a currency. This paper will focus on the economy behind the production of butter and salt and their integration within export markets.

7 CHEESE (AND HONEY?) PRODUCTION AROUND DJEBEL GORRAA IN THE SOUTHERN BAGRADAS VALLEY (AFRICA PROCONSULARIS)

Abstract author(s): Raaijmakers, Mariette (Università di Trento) - Attoui, Redha (Université Badji Mokhtar, Annaba, Algérie) - Pol-la, Silvia (Freie Universitaet Berlin Institut für Klassische Archäologie) - Battisti, Alessandro (independent researcher) - Masrouhi, Amara (King Abdulaziz University: Jeddah)

Abstract format: Oral

Our countryside survey of 660 km² in Africa Proconsularis, around Thugga and Thibursicum Bure, is in the centre of the Northeastern Maghreb salt province, one of the biggest, but also the least known in the world. Modern halotponymy shows the presence of salt outcroppings and mines and saliferous streams: the very frequent hydronym oued Mellah of many streams in this Triassic region corresponds with flumen Salsum mentioned in the geography of ancient NAfrica by Pliny, NH 5.10. The salt outcroppings are on the margins of the surveyed region, so salt was a ubiquitous and cheap resource for the 21 cities and 264 farms. One partially excavated farm at Ain Wassel contained 6 plain ware vessels, some 20cm high, with some holes, used for honey and/or cheese making. Under the faunal remains of this farm sheep and goats are the most important species. The farm is situated at the foot of the Gorraa plateau (cuesta 7x 2,5 km), used for short distance transhumance during the rainless summers by the Pères Blancs since 1911 for their famous breed of black sheep of Thibar. Monchicourt admired in 1905 three herds of 200, 100 and 50 cows on the Gorraa. The Ain Wassel farm at 530 asl is only 2 km from the plateau at 850 asl. The many other farmers around the plateau could bring their sheep and goats there and eventually also their beehives as the many beekeepers did at the beginning of the last century, each summer when the flowering in the valleys ended. In the Bagradas Valley we have to imagine mixed farming, where pastoralism was an important but not exclusive activity, contributing to a sustainable system without (visible) solution of continuity during the first 7 centuries of our era.

8 INTRODUCTION: REFLECTIONS ON THE SPATIAL CONFIGURATION OF MOBILE PASTORALISM

Abstract author(s): Attema, Peter (University of Groningen) - de Neef, Wieke (University of Ghent)

Abstract format: Oral

In the introduction to this session the organisers will discuss the importance of the study of highland exploitation from the perspective of landscape archaeology and ethnography. We draw attention to established practices as well as recent theoretical and methodological advances in the spatial study of the long-term Mediterranean upland and highland triad of mobile pastoralism, salt and cheese. We will emphasize the importance of the study of the functioning of exchange networks in which the economy of mobile pastoralism and upland and highland exploitation was embedded. Our expectation is that the cases presented in this session will help explore the spatial configuration of pastoral mobility of all ranges in combination with access to markets where salt could be obtained (if not at the source itself), where dairy products could be traded (if not directly to consumers) and ways in which the triad of pastoralism, the salt trade and cheese production was organized. We will outline the need for a diachronic, pan-Mediterranean, interdisciplinary approach comprising of ethnographic, ethnoarchaeological, landscape archaeological, environmental and biological approaches to understand such systems.

9 SALT, CHEESE AND HIGHLAND EXPLOITATION. MULTIDISCIPLINARY INVESTIGATIONS OF PASTORAL LANDSCAPES IN THE POLLINO MOUNTAIN RANGE (CALABRIA, ITALY)

Abstract author(s): Attema, Peter (University of Groningen) - de Neef, Wieke (University of Ghent)

Abstract format: Oral

In this paper we discuss the results of the first campaign (summer 2020) of the multidisciplinary Monte Pollino Project landscape archaeological project (MPP) that arose out of the on-going Raganello Archaeological Project (RAP) of the Groningen Institute of Archaeology in northern Calabria (Italy). The project, a collaboration between the Universities of Groningen and Ghent, the local Gruppo Speleologico "Sparviere" and the prospection company Eastern Atlas investigates highland exploitation from the perspective of the longue durée using a combined landscape archaeological and ethnographic approach. The MPP seeks to understand highland exploitation within the context of changing highland and lowland socio-economic and cultural relationships from prehistory up to the present. MPP's premise is that through the study of the 'logic' of sub-recent pastoralist practices and the study of environmental impacts - important topics that are worth of study themselves - we can design a useful framework for the interpretation of past practices and their impacts. In our contribution we will first report on our fieldwork at the Mandra Vecchia site, a summer pastoral camp at 2000 m altitude in the heart of the Pollino park that still functioned in the 1960s. The fieldwork here consisted of artefact and architectural survey, geophysical prospections and ecological research. Then we will look into the role of this camp in local cheese production and its position within a network of transhumance routes - among which the ancient salt route leading up to the Pollino massif from the foothills at Lungro, where a salt mine is located. Finally we will comment on the value of this information for the interpretation of past patterns and practices. Our first field campaign followed upon preliminary 'desktop' work published in Attema et al. 2019 (DOI: 10.5325/jeasmedarcherstu.7.4.0482).

10 SHEPHERDS AND ANIMALS ON MOUNT CORNÓN (TRENTINO – ITALY): LIVESTOCK COUNTS IN THE PASTORAL GRAFFITI OF THE FIEMME VALLEY

Abstract author(s): Bazzanella, Marta - Ciela, Marika - Tavella, Andrea (Museo degli Usi e Costumi della Gente Trentina)

Abstract format: Oral

On the slopes of Mount Cornón in the Fiemme Valley (Northern Italy), at an altitude between 1200 and 2000 meters, more than 47.000 inscriptions were painted during the centuries. These writings are significantly concentrated along the steep trails of the high pastures and date back to a period between 1400 and 1950 AD. The signs made by the shepherds engaged in the local short distance transhumance show: dates, signatures, initials, family symbols, the count of the herds, pictographs, sacred symbols, dedications and greetings.

At the beginning of the summer, the alpine pastures of the valley were crossed by two transhumance flows. An annual one, which arrives in according to usufructs agreed upon in ancient times; and a seasonal one bringing to summer pasture the livestock of local peasants and allowing them the farm work, during the short growing season, without the daily care of livestock.

The shepherds, authors of the writings, often placed after their name's initials and the date of passage also the livestock counts and the species of the animals grazed. The writings have been inserted in a georeferenced database. The livestock counts are 6192, goats and sheep result more attested than young goats (anzole), billy goats (becchi), heifers and cows; the shepherds have been detected by their initials, signatures and family signs.

Analysing the spatial distribution of the counts and shepherds' movements, the land use and the documentary sources, gave us a different view of the exploitation of the mountain, due to community choices or to the morphologic features of the area. Considering the livestock counts on a large time scale in relation to the ethno-historical and environmental information provided new data about pastoral strategies in Fiemme valley during the centuries and allowed new interpretative models for the evolution of the Alpine economy.

260 PROBATIO DIABOLICA: ABSENCE OF EVIDENCE IS NOT EVIDENCE OF ABSENCE

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Stead, Stephen (Paveprime Ltd; University of the Arts London - UAL) - Bruseker, George (Getty) - Velios, Athanasios (University of the Arts London - UAL)

Format: Regular session

The general understanding that Cultural Heritage documentation shows only the things that have been identified leads us to a diabolical proof (Probatio diabolica) that lack of evidence fails to prove the absence of something. Now this is fine where it is likely that our knowledge is incomplete (Romans in Tywi Forest in Wales) but becomes more of an issue where it is either very unlikely (Romans in Venezuela) or where comprehensive research shows no evidence (Blind-tooled decoration on a book with well-preserved covers).

This session is intended to provide an opportunity for practitioners grappling with documenting absence to talk about their approaches. Papers are invited to discuss:

- how researchers establish complete knowledge in specific areas of their domain to argue with certainty that there is absence of a feature,
- how researchers evaluate conclusions in their domain while being uncertain whether lack of documentation means absence of a feature,
- how researchers come up with criteria to help them choose which features to document as absent,
- what is the kind of automatic reasoning that researchers can compute based on knowledge of absence of a feature.

The session will include invited papers about initiatives from the CIDOC Conceptual Reference Model Special Interest Group (CIDOC CRM-SIG) to help make data about documented absence interoperable and reusable.

So if you are wrestling with recording sterile deposits or areas that show no remains after intensive field survey or missing features during finds conservation we want to hear from you!

ABSTRACTS:

1 FROM ABSENCE TO PRESENCE: SURFACING PARTIALLY PRESENT/ABSENT KNOWLEDGE IN FORMAL REPRESENTATIONS OF HISTORICAL KNOWLEDGE

Abstract author(s): Bruseker, George (Takin.solutions; ETH Zurich)

Abstract format: Oral

In the established paradigm for integrating cultural heritage information proposed by the CIDOC CRM, the representation of the temporal boundaries of 'states of affair' favours the use of start and end events against classes representing states, in order to support the general feature of providing a data structure that enables information integration. In the study of archaeological history, however, primary sources (which, when digitized, could be translated into a semantic representation) often do not provide us with knowledge that could be accurately expressed using start and end events, however. Rather, they often give us weaker, reported evidence of witnessed, on-going states (whose causal starts or ends are unknown). Such reports often do not warrant the strong knowledge claims that the suggested start and end event modelling procedures used in the data integration practices recommended by CIDOC CRM base would suggest. Often documentation is absent start or end events but only provides reported and inferential knowledge. This leads to a lack of expressiveness of this partial historical knowledge to cover these typical cases of partial knowledge and partial absence of knowledge available from primary texts. The absence of formal expressiveness threatens to misrepresent an absence of knowledge. In this paper, we will look at ways of extending the CIDOC CRM to represent reported past states of affairs using 'state' like classes. This mode of representation aims to be a compatible extension of CIDOC CRM, respecting but extending its basic logic to apply to the forms of evidence and inquiry typical to archaeological and historical research.

2 METAL, WHEREFORE ART THOU? THE IMPORTANCE OF UNDERSTANDING ABSENT AND INCOMPLETE EVIDENCE WHEN CONDUCTING A HOLISTIC STUDY ON METALS

Abstract author(s): Aulsebrook, Stephanie (University of Warsaw)

Abstract format: Oral

Archaeologists tend to conceptualise metal as a non-perishable material and treat its appearance in the archaeological record as reflective of its abundance. However, taphonomic factors and the retention of bullion value, due to the ease with which it can be recycled, means that metal is often less likely to enter or remain in the archaeological record whilst cultural influence can lead to its over-representation in certain contexts, especially the mortuary sphere. My current project is a holistic study of metal use at the Late Bronze Age site of Mycenae, in modern Greece, and the key to its success relies upon the contextualisation of the available data, taking account of this issue. This paper discusses several strategies I am pursuing to help fill in gaps in the data, which include detailed study of undisturbed 'Pompeii-like' destruction levels and burials of individuals outside of the funerary norms, integrating evidence from indirect methods to identify 'missing' objects (such as tool marks) and assessing continuity in Stone Age (i.e. pre-metal) technologies. The main case study is based upon the 1939 excavation season at Mycenae. Revisiting the original field notes has revealed extensive archaeologically significant variation in metal recording and retention strategies between the trench

supervisors, a comparison of which is being used to assess the likelihood of under-recording. Finally I will explain how my database has been designed to enable the recording of finds with poor data, so that every scrap of evidence can be included in my conclusions.

3 GALATIANS IN ASIA MINOR AND ARCHAEOLOGICAL HIATUS, A PROOF OF HELLENISATION?

Abstract author(s): Parachaud, Kevin (EA 4270 CRIHAM)

Abstract format: Oral

In the modern meaning of the term, Galatians are Late Prehistory European populations that have migrated and settled in Central Anatolia after 278 BC. These Celtic people remained autonomous in the heart of the Hellenistic world until their integration in the Roman Empire in 25 BC. If their presence is well documented in Asia Minor by historic – written as epigraphic – data, we observe a strong lack of archaeological remains from La Tène material culture, characteristic of Temperate Europe between 5th and 1st century BC.

For the moment, latenian material culture in this region is only represented by twenty-eight brooches, three rings and one weapon set. The current consensus considers this absence as an argumentum a silentio of the adoption, by Galatians, of local Hellenistic material culture. But is there not a bias? It is still seducing to suppose the influence of the classical world on Late Prehistory populations.

If we consider the hypothesis that the lack of latenian remains is a consequence of the adoption of Hellenistic material culture by Galatians, archaeological remains should be consistent with a high number of evidences dated to their arrival in the area (278-260 BC) followed by a progressive decline of latenian artefacts progressively replaced by local ones. However, chronological analyse shows on the contrary a random distribution of latenian artefacts all along the period. Furthermore, typological approach reveals some variations, indicating the manufacture of these latenian objects in Anatolia during this period.

In this talk, based on archaeological remains of Galatian migrations in Asia Minor, I would like to propose a reflection about the hypothetico-deductive process considering the interpretation of an absence of proof as a proof of absence.

4 NO DRAGONS HERE: RECORDING THE ABSENCE OF ARCHAEOLOGICAL REMAINS DURING FIELD SURVEY

Abstract author(s): Haas, Tymon (Leiden University) - van Leusen, Martijn (Rijksuniversiteit Groningen)

Abstract format: Oral

One of the more fundamental problems encountered by the authors when designing a CIDOC CRM extension for systematic archaeological field surveying is the seeming inability of an ontology (“a branch of metaphysics that deals with things that exist in the social world”) to handle things that are absent. In the case of systematic field surveys, some part of the surface of the selected landscape or region is investigated to determine the locations and character of any archaeological remains, but the concomitant observation that (within given confidence boundaries) such remains are NOT present is equally important – for both scientific and heritage management reasons. We therefore explicitly record the absence of surface finds in specific spatial units in our geodatabases, but have no ontological concepts to describe this reality. This paper is intended as a contribution to the session discussion about possible solutions to this problem. We also briefly wish to discuss a subsidiary problem that is more directly appropriate to the session abstract, namely, how to handle the provisional nature of any recorded absences of surface archaeology: obviously, a more intensive survey or a resurvey under more favourable visibility circumstances could well result in the recorded presence of archaeological remains.

5 EXPRESSING CERTAIN AND COMPLETE KNOWLEDGE ABOUT ABSENCE USING THE CIDOC-CRM

Abstract author(s): Velios, Athanasios (University of the Arts London)

Abstract format: Oral

In a database two approaches are generally adopted for non-existent records: a) the open world assumption where the lack of a record does not mean non-existence of evidence and b) the closed-world assumption where the lack of a record does mean non-existence of evidence. This paper examines an in-between state for a database of a partially complete world where lack of some types of records can be safely interpreted as lack of evidence, whereas the rest remain under the open world assumption. The paper takes a case study of survey forms for the description of the material and techniques of medieval bookbindings. It begins by examining the types of data entered in a database based on a bookbinding survey form. It considers how this data can be expressed using properties of the CIDOC-CRM. It identifies the data which should be considered under the open world assumption and discusses whether the records about non-existent things fall within this category or belong to context-specific closed worlds. It considers a newly-proposed CIDOC-CRM extension for making negative statements within the open world and partially closed world assumptions. The paper tests this categorisation of bookbinding data against a typical survey methodology and the kind of observations done on bookbindings by conservators and bookbinding historians. It concludes with recommendations on the interpretation of bookbinding survey form structures and bookbinding survey principles.

6 THE LINKED CONSERVATION DATA SEMANTIC TEST DATA SET

Abstract author(s): Stead, Stephen (Paveprime Ltd; University of the Arts, London; Delving BV)

Abstract format: Oral

A proposed new extension of the CIDOC-CRM allows the creation of statements that specific identifiable instances of a class do not have any instances of another class associated with them, providing the opportunity to record negative evidence. For example, it can be used to record that a particular defensive tower had no windows, or a specific archaeological deposit had no pottery in it. In normal databases these absences would appear as a lack of records linking window-like features to the Tower or no pottery records associated with the deposit. The interpretation of this lack of records is then in the hands of the user: if they subscribe to an Open-World view the absence is just an artifact of incomplete knowledge or if they are less “Open” minded it can be taken as anything from lack of knowledge through to an absence of windows or pottery. The ability of the original practitioner to say, with some degree of certainty, that there were no windows or pottery is lost. In addition, the integration of different data sources from, potentially different schools of recording practice, might generate contradictions or new insights.

The challenge is then how to provide tools that can explore the resulting composite data sets, that vary in granularity, complexity and completeness and seek out the extra insights or contradictions. These tools do not exist and are difficult to develop without data sets to trial them on. However, such data sets are resource intensive to compile and typically consist of a few hand-crafted records and there is a lack of impetuous to create them as there are no tools to exploit them: a chicken and egg problem. This data set provides a large body of rich data that such tools can work on with documented examples of contradictions and extra insights.

7 THE APPLICATION OF CRMINF TO DOCUMENTING NEGATIVE CONCLUSIONS

Abstract author(s): Stead, Stephen (Paveprime Ltd; University of the Arts, London; Delving BV)

Abstract format: Oral

The role of the CRMInf argumentation extension of the CIDOC CRM in documenting the inference chains supporting justifiable conclusions is well documented and understood. However, there is less experience with using CRMInf to document the lack of conviction in a conclusion or indeed in refuting a conclusion.

CRMInf allows the documentation of the adoption of beliefs from others on the basis of trust or the assessment of the underlying inference chains (see for example the excavation at Rigny (Buard et al 2018)). It also allows a practitioner to explicitly state that they do not believe in the conclusions made in previous work as well as laying out clearly on what basis such rejection is founded. This ability to refute previous conclusions, whether from others or yourself, also provides a mechanism to demonstrate the range of materials, theories and secondary evidence that have been considered alongside the primary evidence consulted.

The mechanics of implementing such documentation are explained together with examples that show its application to a variety of archaeological situations.

265 SWEET AND SOUR: SUCCESSES AND CHALLENGES OF COLLABORATION IN ENHANCING RESILIENCE AND SUSTAINABLE MANAGEMENT IN ARCHAEOLOGY (PUBLIC ARCHAEOLOGY)

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Benetti, Francesca (Historic Environment Forum) - Westmont, Camille (The University of the South) - Olivier, Adrian (University College London)

Format: Regular session

Collaboration in archaeology can take many forms. It can include public bodies, NGOs, private companies, or any number of other groups; it can be time-limited or ongoing; it can have a specific target or very broad objectives. As the benefits of collaboration are increasingly recognized, many calls for grants -- including European grants -- are requiring projects to form partnerships with community organisations. However, making a partnership successful is often hard work. This session aims to explore if and how collaboration and partnerships can enhance resilience and sustainable management of archaeological assets as well as examine the challenges these groups must overcome. We welcome presentations on practical examples of current, past and forthcoming partnerships to explore the experiences from all angles and learn from our successes and failures. How can partnerships enhance the resilience of organisations working in the archaeology sector? What role can partnerships play in a post-Covid landscape? How can we measure successful collaboration? What are the challenges to face when building a partnership or making it work? How can we overcome these challenges? What kind of elements we must keep in mind when looking for partners?

ABSTRACTS:

1 MOVING FROM RESCUE ARCHAEOLOGY TO SUSTAINABLE CULTURAL NETWORKS - AND GETTING AWAY WITH IT. THE CASE STUDY OF "LA BIAGIOLA"

Abstract author(s): Sola, Giulia (University of Vienna)

Abstract format: Oral

The aim of this paper is to analyse the role that an archaeological site might fulfil in its territory, especially in rural areas. Given the importance of a more direct engagement of the public in communicating archaeological contents and the need of new management approaches in the cultural field, a series of successful good practices will be discussed with a focus on the central role played by archaeologists and local stakeholders.

We will present the case study of the "La Biagiola" archaeological site (Grosseto, Italy), which has been excavated by professional archaeologists under the direction of Italian non-profit ACT - Associazione "Cultura e Territorio" since 2012. The peculiar location of the site has allowed the development of a successful project, at the core of which stands the partnership between the archaeologists and La Biagiola Winery, owner of the land where the site lies on.

This partnership has developed into a series of cultural events blending archaeological guided visits with wine-tasting evenings, during which artistic performances are usually offered. Furthermore, the history of the site has influenced the marketing and production of the winery, as with the revival of the roman cocciopesto technique in winemaking. The result is a multifaceted cultural product capable of involving different audiences, which thereby guarantees mutual visibility to both partners, while also offering a fuller experience of the outstanding resources of the territory.

The successful experiment of La Biagiola is at the centre of a project of integrated cultural networking in the surrounding Area del Tufo. The research, started in 2019 as part of a doctoral project, aims at creating a regional-scale model of cultural networking for rural areas, starting from the investigation of the public of in-situ archaeology and exploiting the spatial interconnections between cultural and natural sites, local businesses and facilities.

2 THE EXPERIENCE OF THE MARINE PROTECTED AREA GAIOLA UNDERWATER PARK (NAPLES, ITALY) - A PUBLIC-PRIVATE PARTNERSHIP

Abstract author(s): De Vivo, Caterina (Centro Studi Interdisciplinari Gaiola Onlus - Progetto Museo)

Abstract format: Oral

The Marine Protected Area Gaiola Underwater Park is an underwater archaeological park located in Naples, Italy. The Park was instituted by the Italian Government in 2002 and it was managed through a public-private partnership with a local NGO that, in 2018, was nominated by the State as Manger Authority on the site. On the basis of this experience, also a nearby onland Park, the Pausilypon Archaeological Park, is managed now through a public-private partnership with the same local NGO.

This presentation is aimed at explaining to what extent this experience can be considered as successful, especially in terms of accessibility and of community awareness creation.

At the same time, the limits and the criticisms of this model of management will be presented. Particularly, the legislative and the financial issues related to this kind of partnership will be presented, considering the general context of Italy, which is a country where the heritage and archaeological sector is mainly public and managed by the State.

3 FAIL EARLY, FAIL OFTEN! - PRACTICAL EXAMPLES FROM THE CURRENT JOINT PROJECT "MUSEUM AS CO-LAB - OPEN THE BLACKBOX OF ARCHAEOLOGY!"

Abstract author(s): Ellwart, Anika (LWL Archaeological Museum)

Abstract format: Oral

It's a paradox: The science which brings find(ing)s to light, lies in the dark. It is left to experts to recover, protect, preserve and to mediate cultural heritage. The public is often left as passive observer without deeper insights into the practices of archaeology. Therefore, the question is, if/how we can curate digital applications that mediate those competences or even give a sensual and interactive archaeological experience? Connected to that, we must also ask which kind of culture of digitality there has to be established in institutions and museums in order to sustainably implement digital applications and curation in exhibition practice?

In the above-mentioned project, three museums in North Rhine-Westphalia, Germany, collaborate in the field of archaeology and work on the development of new digital formats together. The LWL Archaeology Museum in Herne, the LWL Roman Museum in Haltern and the German Mining Museum Bochum aim at making archaeological methods come alive with the help of augmented and virtual reality. The project focusses on users and their experience. Thus, narratives, (serious) games and digital applications are developed in co-creation using innovative formats. In joint workshops, game jams, prototests etc. there is developed, tested and adjusted what is going to be installed in the museums later on. This, though, requires new forms of work on the in- and outside: Experts from digital, marketing and consulting agencies support the process. They do not only bring along technical expertise, but also train the staff in agile and digital methods. Sticking with the motto "Fail early, fail often!", in this session I will talk about best and

worst practices from the project. It is running from 2020 until 2023 and is funded by the Digital Fund within the Programme "Digital Culture" of the German Federal Cultural Foundation with 1.3 Mio Euros.

4 SUPPORTING SUSTAINABLE MANAGEMENT IN ARCHAEOLOGY WHERE 'LONG-TERM' IS NOT ALWAYS AN OPTION

Abstract author(s): Jorayev, Gai (UCL)

Abstract format: Oral

Based on the long history of engagements with Central Asia under different collaborative initiatives, this paper will highlight some of the specific challenges in maintaining institutional collaborations and public outreach work in the region. Most of the past initiatives in the region that the author was part of had a clear agenda of contributing to organisational resilience. All ongoing projects with the author's involvement also have a goal of enabling better management of cultural heritage institutional, building the local capacity, improving participation, and supporting the local development agendas. Implementing those agendas in practice is not easy, partly because of the constraints of the local institutional partners. Similar constraints exist in other regions too, but where Central Asia seems to be truly unique is the diversity and changeability of those challenges. Starting from similar positions 30 years ago, the institutions of research and management now find themselves in very different political and socio-economic environments with direct implications for their day-to-day operations. How to stay committed to collaborations with long-term goals under those circumstances is the main challenge that require flexibility, and some of the first-hand experiences in this area will be presented as part of this paper.

5 BRIDGE OVER TROUBLED WATER: FACILITATING HIGH-LEVEL COLLABORATION IN THE HISTORIC ENVIRONMENT SECTOR IN ENGLAND

Abstract author(s): Benetti, Francesca (Historic Environment Forum) - Olivier, Adrian (ICAHM, Historic Environment Forum)

Abstract format: Oral

The Historic Environment Forum (HEF) has existed for more than 20 years. Its original aim was to produce an influential policy document for the management of the historic environment ('Power of place', 2000). Since then, HEF has brought together senior staff members of non-departmental bodies and NGOs to discuss collectively the priorities for the historic environment sector in England, providing an opportunity to share updates between its members and discuss high-level policies. From 2014-2020, it also hosted the Heritage 2020 programme, which enhanced collaboration in the sector towards an agreed vision. In 2020, HEF has been restructured, thanks to the support provided by Historic England (one of the HEF members). The core of the work is now based on a Strategic Framework for Collaborative Action, and a small number of delivery-focused and time-limited task groups will concentrate on achieving the priority outcomes. This paper will briefly explain the structure of the Forum and its resources, and will then explore its recent challenges and successes, and of course the significant impact of the Covid 19 pandemic on Historic Environment practice and policy.

267 HISTORY OF MEASURING AND CALCULATIONS IN ARCHAEOLOGY

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Plutniak, Sébastien (TRACES Laboratory, Toulouse) - Nakoinz, Oliver - Kerig, Tim (Institute of Pre- and Protohistoric Archaeology, Kiel) - Diachenko, Aleksandr (National Academy of Sciences of Ukraine, Kiev)

Format: Regular session

In archaeology, quantitative approaches have a long tradition and belong to the very core of the discipline. However, the history of quantitative archaeological reasoning might be not as straightforward as suggested by the disciplinary history commonly shared among archaeologists. Taken into account different social interests and traditions we doubt the narrative of linear methodological and technical progress, especially considering to a certain extent alternative developments of quantitative approaches in blocks of countries somewhat separated by language barriers. Different communities assign different roles and functions to quantitative procedures applied in archaeology. The use of a kuhnian "paradigm change" framework might be adequate to describe some parts of this history in large scale, but certainly not the whole picture in details, which also includes other complex socio-epistemic processes such as multiple discoveries, parallel developments, absorption, generational distinctions, etc.

This session aims to explore the multitude of factors that determine the development of quantitative archaeology. We intend to stimulate renewed perspectives on this aspect the history of archaeology, through approaches such as historical sociology, examinations of communication issues, analysis of the relationship between sciences and humanities, and of the friction between theory and method.

This session welcomes presentations addressing, for example :

- technological constraints
- different understandings of the role of archaeology within the poles of sciences and humanities
- research questions behind quantitative approaches
- ignorance of the other ideas due to misunderstandings and different slang
- foci on different questions and theories

- different underlying assumptions
- social conflicts between actors
- influence of other fields of science on the development of measuring and estimations in archaeology.

We assume that a deeper understanding of the history of research will allow us to develop less biased perspectives in archaeology and more coherent applications of quantitative approaches.

ABSTRACTS:

1 THE MULTIPLE BEGINNINGS OF QUANTITATIVE REASONING IN EUROPEAN ARCHAEOLOGY

Abstract author(s): Kerig, Tim (Cluster of Excellence ROOTS, CAU Kiel)

Abstract format: Oral

In archaeology, quantitative reasoning is often seen as being introduced by the New Archaeology of the sixties and seventies. In such a perspective, an interest in numbers is too easily criticised as being a relic of an outdated old-fashioned positivism.

Without doubt, processual archaeology enormously brought forward quantification, statistical analysis and modelling. But looking into the actual beginnings of quantitative reasoning in archaeology leads to a very different and much more differentiated story. In the paper I will present and classify some of the multiple beginnings of archaeological measurements in the field, in quantitative reasoning aiming on chronological questions as well as in regards to past economies and social relations.

I will concentrate on some of the earliest examples of computing in archaeology. Using the term computing in its widest sense, its development starts in the West already at the end of the Renaissance and is obviously still ongoing. The reason for the choice of earliest examples is twofold: Research on historiographical agreed innovators can build on a relatively high standard of research and, within archaeology, the innovation itself can be clearly identified as either an archaeological invention or a borrowing from a neighbouring science.

The social context of the innovators as well as failure or success in transmitting the innovation to the following generation will be taken into consideration. Particular emphasis is placed on whether the social background of the innovators have had a significant influence on the success of the particular innovations.

As a baseline of the analysis, I will 1) concentrate on the specific beginnings and will focus on individual researcher's inventions. Then, 2) these events will be collected in a chronological chart and 3) grouped by multi-dimensional scaling. Finally, 4) I will look into possible connections between those groups and the general history of thought.

2 TAYLOR AND SPAULDING: QUANTIFYING THE PAST

Abstract author(s): Smith, Elizabeth (State University of New York University at Buffalo) - Zubrow, Ezra (State University of New York University at Buffalo; University of Toronto)

Abstract format: Oral

By the middle of the twentieth century, issues of measurement and methods of quantification were becoming increasingly relevant in archaeology. Two critical figures in North America were Walter T. Taylor and Albert Spaulding. Their works present a critical analysis of the issues and the limitations of technology regarding the development of measurement and quantification within the discipline. Taylor's work in the late 1940s provided a platform for Spaulding's work in the 1960s. Together they helped set the stage for what was to be known as 'processual' or 'scientific' archaeology. Taylor's 'A Study of Archaeology' not only showed the importance of correlations between hypotheses and results, but also created what he termed a 'conjunctive' approach to analysis. Unfortunately, a fully-realized form of conjunctive archaeology was not possible due to constraints on calculating power at this point in time. Spaulding developed the concept of archaeology as a science, challenging its practitioners to think quantitatively. He regularly contemplated using correlation techniques to determine the relationships between form, space, and time in archaeological study. We argue that given this use of the nascent computer systems available he was able to actually fulfill what Taylor could not.

3 WAR TECHNOLOGIES IN ARCHAEOLOGY: NUCLEAR PHYSICS AND COMPUTING. A COMPARATIVE HISTORY OF TRANSFERS (1950S-1970S)

Abstract author(s): Plutniak, Sébastien (TRACES Laboratory, Toulouse; Centre Émile Durkheim, Bordeaux) - Delley, Géraldine (Laténium, Neuchâtel; Université de Neuchâtel)

Abstract format: Oral

During the second half of the 20th century, archaeology in Europe featured several intertwined processes including disciplinarianisation, professionalisation, and a global increase in the number of academics practitioners, institutions, and publications. Several factors were at stake, including the introduction and application of new technologies. Two technologies, in particular, had profound effects on the development of the archaeological practice: nuclear technology, leading to radiocarbon chronometers, and automatic computing, leading to computer applications in this field of research. These two technologies originated in the WWII developments and subsequently had crucial roles in the Cold War decades. As a minor scientific domain –compared to domains with direct technological and industrial applications (energy production, medicine, automatic translation, etc.)– the growing archaeological discipline

nevertheless played a prominent role among the humanities, these technologies being used as a mean for collaboration between disciplines. Joining our previous studies on the history of radiocarbon (Delley 2015) and computers in archaeology (Plutniak 2018), drawing on technology transfer studies (Seely 2003), work on the development of science during the Cold War (Dahan&Pestre 2004; Krige2006; Creager2013), this contribution aims to further explore the specificities of these transfers when they concern scientific fields which are not directly related to the "hard" sciences (as in previous work on linguistics (Léon2015) and aerial photography (Reubi2018)). The case of archaeology is particularly interesting because the boundaries between disciplinary fields are not as clearly established as for other disciplines, and also because archaeologists took sometimes an active part in the development of these new instruments. Comparing the cases of nuclear and computing technologies, we compare the social and economic dimensions of their transfers to archaeology (key institutions and actors), their intellectual effects on archaeological knowledge and methods, as well as the ways these technologies were promoted, the resistance they raised, and their consequences on disciplinary boundaries.

4 SAILING THE "BATTLESHIPS": HISTORY AND FUTURE OF THE FREQUENCY SERIATION IN ARCHAEOLOGICAL METHOD AND THEORY

Abstract author(s): Diachenko, Aleksandr (National Academy of Sciences of Ukraine, Institute of Archaeology) - Sobkowiak-Tabaka, Iwona (Adam Mickiewicz University in Poznan)

Abstract format: Oral

This paper analyzes the frequency seriation in archaeology which widely known graphical representation has a shape of the "battleship curve". Initially frequency serration was applied to the construction of relative chronologies, i.e. sequences of artifact groups. Recent Darwinian approaches in the discipline suggest additional application of the statistical tools enabling simultaneous consideration of the chronological and spatial factors shaping the data distributions into the "battleship curves".

Neiman's (1995) neutral model have shown that the variety of factors impacting the artifact frequencies may be reduced to the extreme case of the rate of innovation and random cultural drift being the only factors of the "battleship curve" arrangement. Further developing the logic of this approach, our paper links the properties of the frequency seriation accompanied by empirical observations to the recent debates on cultural transmission. Considering the obtained results, we argue that explanation in archaeology requires crucial reassessment of the system approach.

5 DIGITAL DOCUMENTATION FOR CERAMIC NETWORKS IN THE ARCHAEOLOGICAL CONTEXT: THE CASE OF ROMAN PATRAS, GREECE

Abstract author(s): Kougia, Nickoula (Department of Geology, University of Patras; ERAAUB, Departament d'Història i Arqueologia, Facultat de Geografia i Història, Universitat de Barcelona) - Simoni, Heleni (Department of Geology, University of Patras; Institute of Local History, Patras) - Iliopoulos, Ioannis (Department of Geology, University of Patras; ERAAUB, Departament d'Història i Arqueologia, Facultat de Geografia i Història, Universitat de Barcelona)

Abstract format: Oral

The necessity has emerged for enriched approaches of interacting research datasets in order to support and reinforce our insight of past societies and their technologies. In an attempt to reconstruct the evolution of ceramic production and its networks in the territory of Roman Patras, Greece, a large corpus of excavated pottery kilns was recorded. Unfortunately, though basic documentation of these excavations survives in some cases, these sites (urban and rural) are superimposed by the modern city, inhibiting in-situ research with further inferences. In an attempt to overcome this paucity a question arose. How could the archaeological knowledge be shaped, reproduced, disseminated and further preserved in a digital age? Our approach moves towards intra-site documentation, data management, digital cartography and spatial analysis, utilizing different types of data for the evaluation of possible patterns indicative of the former urban and rural space. We endeavored to incorporate the archaeological knowledge that emerged in a digital database along with the subsequently acquired geodata of kilns and workshops for pottery production. In the context of their spatial representation, we embraced an alternative configuration for mapping, encompassed with GIS applications and web-based mapping platforms (Google Maps). The synopsis of the Roman ceramic workshops of Patras and their production repertoire, the interpretation of their spatial distribution, as well as the degree of clustering among them, reveal some conspicuous patterns with respect to what we know of the contemporary Roman urban plan worthy to be elaborated. Further assumptions emerged about their domestic or industrial use, whilst their spatial allocation pointed out their organization into discrete areas.

6 COUNTING STONES. FROM MARBLE FRAGMENTS TO UNDERSTANDING ROMAN BUILDING SURFACES

Abstract author(s): Galán Palomares, Laura (Institut Català d'Arqueologia Clàssica - ICAC) - Soler Huertas, Begoña (Universidad de Murcia - UM; Institut Català d'Arqueologia Clàssica - ICAC) - Gutiérrez García-M., Anna (Institut Català d'Arqueologia Clàssica - ICAC) - Garcia-Entero, Virginia (Universidad Nacional de Educación a Distancia - UNED)

Abstract format: Oral

In the last decades, the studies of stone materials have experienced an important boom and within them, the identification and examination of the coverings in marmora (marbles and other ornamental rocks) used in all kind of sites (rural villages, public and private urban contexts) have multiplied. However, unlike ceramic research, for example, this proliferation in studies has not been accompanied by the development of a specific methodology aimed at the quantification of this type of materials.

This implies the existence of an interpretive problem, at multiple levels. On the one hand, depending on the type of counting performed, the representation of some stone typologies can vary significantly with respect to others (eg, individuals vs. weight vs. m²). On the other hand, the aforementioned absence of a common methodological approach makes it difficult to carry out comparative studies between the various case studies / sites.

The aim of this contribution is to present the problems we have been faced with in the development of this type of study and to propose new possible quantification methodologies. The analysis of specific cases of various kinds of sites and buildings, located mainly in Roman Hispania, and studied by different research teams are the basis of this contribution. This analysis have made it possible to test the suitability of our proposal of quantification methodologies that would allow us to obtain more useful data that can provide better information on the buildings and surfaces where those materials were used.

A. APPLYING RANSAC ALGORITHM TO ANALYSE ARCHAEOLOGICAL AND ARCHITECTURAL MATERIALS FROM OSTIA ANTICA

Abstract author(s): Ogawa, Takuro (Faculty of Human-Environment Studies, Kyushu University) - Hori, Yoshiki (Dept. of Architecture and Urban Design, Kyushu University)

Abstract format: Poster

Since 2008, Japanese team has surveyed the whole of the city of Ostia Antica applying terrestrial laser scanners, which supply the reliable three-dimensional data for the shape and surface of buildings. Furthermore, that data allowing the detail shape of each material to be calculated, can provide the new analysis about archaeological finds, such as columns, capitals, coffins, and reliefs. The shape of these finds usually has circles or free curves, other than lines. However, it is difficult to accurately measure shape which has curvature, in archaeological and architectural analysis. So far, such materials had no choice but to be recorded on drawings with approximated to "circle" or "line" by extracting more clear sections of materials, or with freehand. Therefore, we could not objectively discuss about circle-like and sphere-like shapes of materials in analysis. In this paper, we will create reference geometrical shapes to three-dimensional data of original materials by using point cloud and RANSAC (random sample consensus) algorithm which is one of the robust estimation methods, and we also will evaluate object's shapes based on deviation in a normal direction between reference geometrical shapes and object's shapes. Moreover, validities of reference shapes will be evaluated based on histograms of these deviations. In analysis, five Mensae Ponderariae from Ostia Antica, which were measured in 2015, will be dealt with. Mensae Ponderariae are counter for measuring volumes of liquid and solid goods such as oils and cereals, and they have hemisphere-like cavities which would have held bronze vessels.

B. STANDARD MEASURES OF CAPACITY IN POMPEII AND HERCULANEUM

Abstract author(s): Ogawa, Takuro (Faculty of Human-Environment Studies, Kyushu University) - Hori, Yoshiki (Dept. of Architecture and Urban Design, Kyushu University) - Ayatsuka, Ikuhiro (Obayashi Corporation)

Abstract format: Poster

In a small room beside the western perimeter wall of the Sanctuary of Apollo, a copy of the Mensa Ponderaria, the original of which is kept at the National Archaeological Museum of Naples, is displayed. It is a counter used to check the exact capacity measures used for liquid and solid goods in trade, such as oils and cereals, could be trans-measured between Roman and Oscan capacity feet (OCF and RCF). This counter has already existed in the Oscan period, as proved by the epigraph on carved into the face of the marble counter. When the colony was founded, the Romans upgraded to the system of Roman weights and measures, but traditional Oscan foot has been survived for a long while. Using 5 cavities on this counter Pompeians could easily convert measures by OCF into those by RCF, for example 20 OCF into 16 RCF, as the result of three-dimensionally measuring this copy of counter applying OPT scanner in 2015, where each main cavity was modeled in mesh data and its volume was exactly provided. Of course, we believed that the copy has been produced carefully and exactly into the same shape. This counter appears to have functioned as a standard measure of capacity in trade between the Oscan and the Roman. However, it is not unclear whether the standard measure had been given for vessels or container in daily use at Pompeii and Herculaneum. In the later part of this paper, the capacities of a lead bucket coming from House of Mosaic atrium and a bronze bathtub from House of the Stags are measured by OCF and RCF. Conclusively standard measures of capacity both in Oscan and Roman system could be applied into the containers in daily use at Pompeii and also Herculaneum.

268 AT THE EDGE: LIMINAL ARCHITECTURE DURING THE MEDIEVAL PERIOD OR LIMINAL ARCHITECTURE: RESISTING THE STEREOTYPE

Theme: 6. Material culture studies and societies

Organisers: Patrick, Laura (Queen's University Belfast) - Kerr, Sarah (Department of Archaeology, University of Sheffield) - Berryman, Duncan (Queen's University Belfast) - Huggon, Martin (Bishop Grosseteste University) - Bouwmeester, Jeroen (Cultural Heritage Agency of the Netherlands)

Format: Regular session

In looking at the development of medieval buildings within cultural systems, researchers often focus on those within urban contexts, those focused on centres of power, such as castles and monastic estates, and those which show development and connec-

tions across networks and regions. However, often communities and buildings removed from such areas do not appear to conform to the contemporary styles of the period. Some buildings may have been formed in timber rather than stone for example, and as a result, are no longer visible on the landscape. They appear to be 'missing'.

But what drove this deviation from the perceived norm? Was it the need to use materials more readily accessible? Or, was it a form of resistance against external cultural, political and socio-economic influences and influencers? Why were certain buildings located in liminal areas and did they serve specific functions? Were there liminal spaces within buildings and, if so, why?

This session seeks to explore:

- Communities on the fringe, socially or territorially, and how their architecture reinforced their identity in the face of modernisation, invasion or suppression.
- How medieval communities adapted to external pressures? Did they incorporate new building forms, creating architectural hybrids?
- For those forced to relocate to marginal landscapes, is architecture used as a vehicle to reinforce their identity?
- How have our modern typologies created an artificial sense of 'liminal' or 'other'? And would communities in question have also viewed themselves in this manner?
- Liminal spaces – use of spaces between buildings or space within buildings that is marginalised or avoided.
- Does a lack of evidence necessarily mean a lack of existence? If not, how can this be examined?

ABSTRACTS:

1 LIFE IN THE MARGINS – BUILDINGS AND LIVING ENVIRONMENTS IN THE EARLY MODERN URBAN CENTRE AND PERIPHERY

Abstract author(s): Nilsen, Andrine (Dep. of Historical Studies)

Abstract format: Oral

Early modern Swedish urban- and liminal building practices were less divided through building technique, materials or form than their location in ideal- or non-ideal spaces. The regulated town plans created central or peripheral spaces through inclusion or exclusion in the street grid, or inside/outside urban enclosures. The urban building stock was almost entirely wooden in log timber, timber-framing- or post and plank constructions and often in a mix of these techniques. Stone architecture remained rare in Sweden until the late 19th century. Thus, the wooden architecture reflect all levels of society seen in both manor houses and the backyard privy. The Swedes have had a love-hate relationship with wooden buildings i.e. adaptable, movable, fire hazards yet warm and comfortable as well as relatively cheap. The suburban marginal landscapes were midway between the urban and the rural, which might reflect the most crucial difference between the settings. However, stereotypes were created through viewing these houses in the margins (which in fact looked the same as the rest of the building stock) as disorderly, chaotic and shanty for not being included in the formal street grid.

Swedish archaeologists rarely gets to investigate suburban archaeological deposits due to cultural heritage laws limiting the scope to within the urban confine this study is thus developed from historical sources i.e. probate inventories and fire insurance records.

2 LIMINAL BUILDINGS OR LIMINAL TOWNS? IN SEARCH OF THE (EXTRA)ORDINARY IN FORM, FUNCTION AND MATERIALITY

Abstract author(s): Bouwmeester, Jeroen (Cultural Heritage Agency of the Netherlands)

Abstract format: Oral

When we imagine ourselves a typical medieval Dutch town, we mostly think of streets with beautiful robust stone gables, brick town walls and gothic churches. This 'romantic' vision is in fact an idealized view of a successful 16th - 17th century town in the Netherlands. In reality - especially in the Middle Ages - there was a great variety of towns, from very successful Hanseatic trading towns like Kampen - at the end of the Middle Ages replaced by Amsterdam - to 'failed towns' with an agrarian character like Terborg.

But even the idealized view we might have of for example Amsterdam doesn't quite fit. At the end of the Middle Ages, the urbanized towns struggled with the wooden buildings within their borders. Especially because of safety (city fires) and the expanding upper floors above public space. Furthermore even these trade oriented towns still had an agrarian component. On the other hand, many smaller towns like Terborg could be considered as agrarian villages with town rights. The architecture of the buildings within these towns was therefore mostly adapted to farming. But what happens when a successful trade town - Enkhuizen - declines and becomes far more agrarian?

In my paper I will explore the relation between the main agrarian or non-agrarian 'function' of towns and the architecture and materiality of its buildings.

3 SPACE EXPLORATION IN MEDIEVAL VILLAGES: RELATIONSHIPS BETWEEN VILLAGES AND MANORIAL CURIAE

Abstract author(s): Berryman, Duncan (Queen's University Belfast)

Abstract format: Oral

The built environment shapes the experiences of communities and individuals. Buildings were as important in the medieval countryside as they were in towns. Villages contained a range of buildings, from small peasant houses to the lords' halls and barns. Interactions between peasants and the lord's buildings occurred every day, and their appearance impacted those viewing them. The farm was the centre of village life, tenants entered to carry out labour services, and the hall hosted the manor court. The buildings of the farm and the hall must have imposed on the villagers a sense of the lord's authority over them.

This paper examines the use of space within the manorial farm and village, indicating the relationship between the lord and peasants. It will suggest new ways of viewing the complex and understanding the buildings. Differences between farms set within villages and those set within parks will also be considered. The isolation of buildings may or may not be indicative of their importance or social interaction. The geographic focus is Britain and the temporal focus is the later Middle Ages.

4 MOVING THROUGH A LANDSCAPE OF WOOD AND STONE: LOOKING AT THE BUILDING PRACTICES OF SOCIETY IN ULSTER 1400-1650 AD

Abstract author(s): Patrick, Laura (Queen's University Belfast)

Abstract format: Oral

In Ireland, the medieval period saw a shift from Anglo-Norman control to a Gaelic resurgence. In Ulster, the lineage to benefit most from this transitional period is undoubtedly the Ó Neill's of Tyrone. Rising to the pinnacle of the Irish dynastic system, such as it was, The Ó Neill claimed over-lordship for many of the Ulster families, including the O Donnelly's, O Devlins and the O Hagans: families of their Lucht Tighe or household. Anglo-Norman lords of comparable stature have left an indelible mark upon the Irish landscape, one thinks immediately of Carrickfergus or Trim castle, however, the Ó Neill's and their household families appear largely untraceable, with the notable exception of Tullach Óg Fort. Partly explained by 'Scorched Earth' tactics employed during the Nine Years War, 1594-1603, further investigation shows, however, that this military strategy is all the more effective if the buildings are composed of flammable materials, for example timber, dried sods and thatch. In Ulster, while stone could be used for tower houses and churches, timber was utilised for the construction of range of building types, and the post-and-wattle or sod-walled structures with cruck-roofs would also have been common. While other plantation provinces in Ireland, for example Munster, contain a plethora of stone tower houses, why does Ulster have so few?

This paper looks to investigate why the peasantry and elite alike choose to build their homes with organic materials? Is it a case of practicality, or are there underlying cultural nuances? And ultimately can we place these buildings within the landscape?

5 BRINGING LIMINAL TO LIGHT: FINDING MEDIEVAL PEASANT SETTLEMENT WITH DRONE IMAGERY

Abstract author(s): McAlister, Vicky (Southeast Missouri State University) - Immich, Jennifer (Unaffiliated)

Abstract format: Oral

The liminal nature of deserted medieval rural settlement in Ireland lies in their elusiveness in the archaeological record. In stark contrast to the wider British and European evidence, earthworks formed by nucleated settlement tend not to survive above ground in Ireland. The lack of visible earthworks has resulted in the survey of only spectacular sites -- such as Lisronagh Co. Tipperary -- and a paucity of research seeking to decisively identify medieval rural settlements. The "What Lies Beneath: Identifying 'Lost' Medieval Landscapes" project has concluded phase one of study, which successfully identified three nucleated rural settlements in Cos. Limerick and Tipperary using photogrammetry data collected by drone flights. This paper will present results of this study and, Covid-19 restrictions permitting, compare these Anglo-Norman controlled landscapes with the initial analysis from Digital Elevation Models generated by drone-based survey of a Gaelic Irish rural settlement site. Initial conclusions from the project show that lack of visibility does not mean lack of existence, and instead suggests that we are only now starting to scratch the surface of our understanding of medieval settlement desertion, a situation that will hopefully be rectified by the increasing availability of digital interrogation methods like those employed in the project. Furthermore, the paper will argue that the peasant settlement identified to date in Ireland reflects the hybrid nature of peasant communities in the wake of the Anglo-Norman Conquest. Instead of the standard trope of manorialism dominating the landscape, our results show a landscape where agricultural efficiency was key. The liminality of agricultural landscapes in the past disappears, leaving the call-to-arms to draw on technology to remove the hidden, inconspicuous characteristics of rural medieval settlement in Ireland and shine a light on these elusive landscapes.

6 WATCHERS IN THE WASTELAND: REINTERPRETING HALLMUNDARHELLIR, A FORTIFIED CAVE ON THE MARGINS OF ICELAND'S INTERIOR

Abstract author(s): Smith, Kevin (Brown University, Haffenreffer Museum of Anthropology)

Abstract format: Oral

Hallmundarhellir, a fortified cave site located beneath the surface of a massive 10th century lava flow on the edge of Iceland's desolate interior highland desert, was discovered in 1956 and investigated in 1958. Almost immediately, it was interpreted as a Viking

Age outlaw shelter and its architectural features and location were used not only as evidence of the Icelandic sagas' historicity but also to suggest that 13th century authors knew of such sites and used them both to set their scenes and to gain acceptance for their stories on the basis of their audiences' familiarity with them. While the site quickly became a touchstone for understanding outlaws, the most marginal of all Icelanders, and for linking archaeology with saga studies, these interpretations were made without any independent evidence for the site's age.

In 2017, we revisited Hallmundarhellir to confirm the accuracy of the mapping done in 1958, assess the site's current condition, gain a better understanding of its zooarchaeological record, and obtain samples for dating. The results of our investigations clearly indicate that Hallmundarhellir is not a Viking Age site, at all, but dates to the Sturlung period (1150-1275), when contemporary medieval sources document the rapid consolidation of regionally defined polities across Iceland in the context of nearly constant civil war, the short-lived formation of an independent, unified Icelandic state, and its rapid absorption into the expanding Norwegian maritime empire.

This paper will integrate archaeological, geographic, and documentary sources to examine this marginal site at the distant edge of Europe in order to reevaluate its role within the Sturlung period and the process of Icelandic secondary state formation. In particular, it will consider whether Hallmundarhellir played a role in guarding the vulnerable highland margins of an emerging regional polity's borders in western Iceland.

7 FEATURES OF THE CHURCHES PLANNING IN FORTIFIED SETTLEMENTS ON THE DANUBE LIMES

Abstract author(s): Voronova, Ariadna (St Tikhon Orthodox university)

Abstract format: Oral

This article considers the principles of the placement of churches of the IV-VI centuries in fortresses on the right bank of the Danube (territory of Serbia), the spatial organization and architecture of these churches. Examples are presented in four types of fortified settlements: 1) a fortress on the Danube Limes with a military garrison (Lederata, Diana, Novae, Smorna, Taliata, Bassiana), 2) a city on the Danube Limes (Sirmium), 3) transformation of the imperial residence into a Christian settlement near Danube Limes (Romuliana), 4) a re-emerged Christian settlement away from the Danube Limes (Gradina on Elitsa, Balainac, Bregovina, Arsa).

There are two main types of churches: a one-nave church with a narthex and annexes and a three-nave basilica with an apse, a narthex and annexes, rarely with an atrium. Sometimes the first type of basilicas, through development and extensions, turns into the second, forming the so-called complex basilicas, they are characteristic of the interior regions of Dalmatia. Basilicas of both types often contain a syntron, an altar barrier, an ambo, and a baptistery, which indicates an intensive Christianization of the population. In terms of style, most of the three-aisled basilicas can be attributed to the so-called Hellenistic type. The discovery of Latin inscriptions demonstrates the western jurisdiction of this region, while many architectural and sculptural features of the churches indicate their eastern sources, implemented mostly in a crude way, far from the leading artistic trends.

As a result of the barbarian invasions, the fortified settlements of Illyricum take over the functions of economic centers from the once existing rustic villas, as a result of gradual ruralization, or become refuges for the local population. The burials indicate the presence of the Germanic federates in the population (possibly Arians) and representatives of other peoples, but the predominance of the Romanesque population is clear.

8 RETHINKING SPACE IN THE 'OTHER MONASTICISM': SIGNIFYING RELIGIOUS LIMINALITY THROUGH ARCHITECTURAL LAYOUTS IN ENGLAND AND WIDER

Abstract author(s): Huggon, Martin (Bishop Grosseteste University)

Abstract format: Oral

When discussing the use of space and buildings in medieval religious institutions the focus is usually on ecclesiastical or monastic norms. In contrast, this paper will focus on what Roberta Gilchrist referred to as the 'Other Monasticism', in particular friaries, hospitals, and the military orders. This 'Other Monasticism' includes a range of religious practices that can be argued to fall into the liminal position between ecclesiastic and monastic practice, often clearly mixing greater engagement with the secular world whilst still including elements of monastic organisation to daily life. Examples of these sites will be discussed in relation to current research examining the organisation of buildings and the creation of hierarchies of space in the medieval hospitals of England and Wales, which suggests that buildings were orientated around the concept that certain portions of the main site, usually to the east and south, were more often associated with high status areas compared to the north and west. This frequently seems to result in northern cloisters or claustral buildings in relation to chapels, an architectural form possibly associated with the melding of elements of out-dated Anglo-Saxon monasticism with institutions considered to not fit the more rigorous and strict definitions of monasticism introduced by Norman church leaders.

This paper aims to initiate discussion on the wider application of the hospital model, as well as begin to frame a more geographically extensive utilisation. Preliminary investigation has suggested this approach may only be applicable to institutions in the British Isles and Ireland, suggesting there is a possible early medieval antecedent to this utilisation of space that does not necessarily follow wider European trends. Both the functional and underlying conceptual implications of this use of space will be explored, tying architectural layouts to the physical signifying of religious liminality between the secular and religious worlds.

BETWEEN VARIABILITY AND SINGULARITY: CROSSING THEORETICAL, QUALITATIVE AND COMPUTER-BASED APPROACHES TO TYPES AND TYPOLOGIES IN ARCHAEOLOGY (PAM)

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Hussain, Shumon (Aarhus University) - Plutniak, Sébastien (TRACES Laboratory, University of Toulouse) - Riede, Felix (Aarhus University)

Format: Regular session

While the notion of the “type” and the integration of such types into typological systems played a vital role in the development of archaeology as a discipline, there has been a recent loss of innocence. Either deemed boring or practically fetishized, types and typologies continue to form important cornerstones of many culture-historical schemes and practices; they are used vicariously for inference-based dating, are often attributed cultural, historical or even quasi-ethnic meaning and typological change is read to imply societal transformation. Promoting the type concept and mobilising typologies is undoubtedly value-laden as well as theory-laden, even if only implicitly so. For many, the very term “typology” has thus become a battleground of seemingly incompatible archaeological research epistemologies, for instance reflected in a persistent rhetoric pitching so-called “typologists” against “technologists” in lithic studies and beyond. There is good reason to believe, however, that such inflammations have clouded our view of the utility and diversity of types in archaeology. A similar rhetoric also undermines any true community effort of developing and refining type concepts and type-based approaches to the past. Yet, recent developments both in computational archaeology and archaeological theory have begun to challenge some of these premises, opening up promising avenues of reflection, inquiry and interdisciplinary research.

This session seeks to identify, review and discuss these emerging perspectives. It is based on the ambition to revisit the “type” as an analytical and theoretical concept in order to re-activate type-sensitive archaeological research or to develop genuine alternatives. We invite scholars from varying backgrounds to interrogate our apprehension of types, and to re-consider the basic explanatory value of types and typologies, especially so vis-à-vis computer-based methods, emerging theoretical frameworks and, more generally, the consequences of such approaches and research frameworks for our understanding of types and typological thinking as core concepts of archaeological practice.

ABSTRACTS:

1 TOOL TYPES AND THE ESTABLISHMENT OF THE LATER PREHISTORY TAXONOMIC SYSTEM IN THE NILE VALLEY AND THE HORN OF AFRICA

Abstract author(s): Leplongeon, Alice (Department of Archaeology, KU Leuven; UMR HNHP 7194, Muséum national d'Histoire naturelle, CNRS, UPVD, Paris) - Ménard, Clément (Centre Français des Etudes Ethiopiennes, Addis Abeba)

Abstract format: Oral

Research on the prehistory of the Nile Valley and the Horn of Africa has a long history dating back to the late 19th century. Although research in these two regions is autonomous from a historiographical point of view, it followed similar global pathways. During the 20th century, the same ‘schools’ and at times the same people have worked in the two regions, but with limited comparisons of their archaeological records. Between the 1940s and 1980s, in each region, numerous cultural entities were defined based on tool and core typologies; this habit stopped after the 1980s when both regions saw a slowdown of research on the later prehistoric periods. Many of the cultural entities identified in the Nile Valley for the Late Palaeolithic (LP) and in the Horn of Africa for the Later Stone Age (LSA), are based on different types of backed pieces and truncations. These types often rely on subjective shape criteria, using a non-standardised vocabulary, making comparisons with new material or recent reanalysis of older assemblages difficult. Only recently in the Horn of Africa, LSA research has been reactivated with new fieldwork projects. Old terminology is no longer used or discussed, which is a major obstacle to integrating data from old collections. In the Nile Valley, some LP assemblages have been recently re-analysed but factors of lithic variability remain poorly understood and may be clouded by the use of a too rigid taxonomic cultural system. This study aims to explore the consistency and influence of the definitions of cultural entities on current research, in order to maximise comparability between previous and recent research data. We will particularly discuss tool types, with a focus on backed pieces and truncations, and further investigate their role in the construction of taxonomic systems by conducting comparative 2D outline analyses of published illustrations.

2 TYPOLOGY AND SOCIAL SIGNATURES – EXPLORING THE RELATIONSHIP BETWEEN ARTEFACT VARIABILITY AND PREHISTORIC INDIVIDUALS IN THE LATE UPPER PALAEO-LITHIC

Abstract author(s): Pedersen, Jesper (Department of Archaeology and Heritage Studies, Aarhus University Moesgård)

Abstract format: Oral

One of the most basic elements to archaeological practice is the methodological framework of typology. It represents a top-down approach to relatively date objects and place them and their presumed cultural context, reflecting a culture-historical vision of chronologically ordered phases. The method has proven particularly effective when studying material culture that is made using specific templates (i.e. moulds for metal casting) or the material culture of societies that are strongly normative. Yet, even within relatively normative artefact production it is possible to observe varying degrees of internal variability within particular object cate-

gories. Traditionally, such variability is interpreted as chronological trends and developments towards successive temporal phases with these artefacts serving as diagnostics. Recent studies indicate, however, that rather than reflecting temporal developments with production norms such variability may in many cases reflect the choices of prehistoric individuals. This paper uses a case-study from the Upper Palaeolithic in Europe – the Hamburgian phenomenon – to explore the potential ‘social signature’ (Harush et al. 2020) of individuals or of very small, closely related flintknappers. Using a mixed-method approach by employing a combination of qualitative technological and quantitative geometric morphometric analysis, I argue that parts of the Hamburgian archaeological record reflect a prehistoric learning environment that was exclusive to few people and that diagnostic projectile points instead of indicating chronological phases may be much closer related to the stylistic choices of individual flintknappers. Convincingly identifying individual flintknappers in the deep past remains challenging, yet viewing Hamburgian projectile points as the products of only few individuals has important implications for our understanding of this cultural phenomenon, its chronology and dispersal dynamic.

References:

- Harush, Ortal, Valentine Roux, Avshalom Karasik, and Leore Grosman. 2020. ‘Social Signatures in Standardized Ceramic Production – A 3-D Approach to Ethnographic Data’. *Journal of Anthropological Archaeology* 60 (December): 101208. <https://doi.org/10.1016/j.jaa.2020.101208>.

3 PRELIMINARY RESULTS OF 3D GEOMETRIC MORPHOMETRIC ASSESSMENT OF GRAVETTIAN SHOULDERED POINTS FROM KOSTENKI, RUSSIA

Abstract author(s): Lada, Anton (Institute for the History of Material Culture Russian Academy of Sciences; Saint-Petersburg State University) - Pugacheva, Ekaterina (European University at Saint-Petersburg) - Bessudnov, Alexander (Institute for the History of Material Culture Russian Academy of Sciences)

Abstract format: Oral

From the beginning of its study shouldered points from the Kostenki-Avdeev culture were considered to be a highly variable type of artifacts. Several researchers have faced difficulties working out a valid typology for these pieces. So, we decided to take on a different approach and classify Kostenki-Avdeev shouldered points using the newly emerging method – 3D geometric morphometrics. For the study, we selected 66 complete artifacts from 3 sites of Kostenki-Avdeev culture from Kostenki (Kostenki 1/I, Kostenki 13, Kostenki 14/I). As a control dataset for the study, we have chosen shouldered pieces from another Gravettian site – Kostenki 21/III. All of the analyzed artifacts are stored in the Institute for the History of Material Culture Russian Academy of Sciences. The analysis consisted of two phases. Firstly, using the structured-light scanner we created 3D models of shouldered points. Then, all artifacts were analyzed in Geomorph package of R software. For landmark placement, we used the configuration of 3 landmarks and 200 semilandmarks. All artifacts were orientated tip to the top and shoulder to the right. After, all analyzed artifacts went through Procrustes fit. Then principal component analysis, allometric and symmetry tests were run. According to the results of PCA, two groups can be distinguished: gracile points from Kostenki 21/III and small ones also referred to as atypical points of Kostenki-Avdeev culture, and large or typical points of Kostenki-Avdeev culture. Allometry and symmetry tests showed differences between typical and atypical points, which could be interpreted as functional differences. Overall, 3D geometric morphometric assessment of the shouldered points from Kostenki seems to be a powerful tool in distinguishing types of shouldered points, also it supports the hypothesis which considers large typical points to be knives than weapon tips. This work was funded by RSF grant №20-78-10151 and State assignment №0160-2019-0044.

4 STYLE, FUNCTION AND VARIABILITY IN THE FINAL PALAEO-LITHIC LARGE TANGED POINTS IN EUROPE REVISITED

Abstract author(s): Riede, Felix - Matzig, David - Hussain, Shumon (Department of Archaeology and Heritage Studies Aarhus University)

Abstract format: Oral

Large tanged points are cherished cultural index fossil artefacts in European prehistory. In different research traditions and different regions, they are known by different labels – Lyngby points, Bromme points, Teyjat points, etc. – and they are mobilised in interpretations of culture-historical processes such as migration, territoriality, contact and even identity. Yet, some studies, including recent ones employing computational methods, highlight that (a) the size and weight of such points are suggestive of their use as dart-tips rather than arrowheads, and (b) they are so variable that regional or chronological groups are difficult to clearly demarcate. Large tanged points can therefore not be given the same status as culture-historical marker without due reflection about functional differences. In this paper, we review the research-historical roots of the notion of large tanged points as cultural index fossils and discuss the implications of novel analyses. In concluding, we suggest that there likely was a functional difference between the backed points that otherwise characterise the Late and Final Palaeolithic but that this does not necessarily preclude their status as culture-historical marker. We do, however, urge caution when it comes to using large tanged points as chronological or geographic indicators of different groups via typological labels.

5 THE TYPOLOGY OF TECHNIQUES – LATE PALAEO-LITHIC INDUSTRIES UNDER REVIEW

Abstract author(s): Reuter, Tobias (Centre for Baltic and Scandinavian Archaeology - ZBSA)

Abstract format: Oral

Typology and technology are often considered different methodologies in archaeological research. Traditional typological studies are employed to classify and group archaeological material such as ceramic vessels or arrowheads. As defined types are assumed to bear distinct social information, these types serve as cultural markers for grouping archaeological cultures in time and space. In practice, however, several factors complicate the classification of archaeological material. Often distinctive types are missing or different types occur in the same context. Moreover, the static concept of idealised types leaves little room for variation and distinctions appear arbitrary. In contrast, the study of technology focuses more on detailed aspects of the archaeological material. In the chaîne opératoire approach, all steps of artefact production are analysed, taking into account information from often the entire inventory. However, technological studies mostly rely on typological classification to fit their findings into the bigger picture. I argue that the shortcomings of both methods could be mitigated by combining typological and technological studies. By considering typology as an integral part of technology, additional information from technological studies can be used to review and evaluate existing classifications. This will be illustrated by examining technological characteristics of typologically classified Late Palaeolithic lithic industries from northern Germany. Using statistical methods, technological information on lithic artefact production from the Hamburgian, the Federmesser-Gruppen and the Bromme culture were analysed for their respective typological assignments. The results indicate that technological studies - due to a substantial requirement for interpretation - are prone to subjective evaluations and are thus not easy to compare. Therefore, before using technological studies to evaluate typological classifications, more objective research criteria must be established so that the results of typo-technological studies become more transparent and comparable.

6 TYPOLOGY AND CERAMIC TECHNOLOGY: CASES STUDIES FROM CARIBBEAN ARCHAEOLOGY AND EUROPEAN BRONZE AGE WITH COMPUTER-BASED APPROACH

Abstract author(s): Manem, Sebastien (CNRS, UMR 7055 - Préhistoire et Technologie)

Abstract format: Oral

The 1938 Ceramic Technology Conference in USA was organized – among other things – to encourage interaction between the general archaeologist and the technologist. Decades later, typological and technological works do not tend enough towards the desired symbiosis and are often studied separately.

Typological approach focuses on the visible part of material culture – vessel shape and decoration – to define chronologies or stylistic provinces that can identify cultural boundaries, presuming a universal correlation between type and identity. If this is seen in archaeological and ethnological contexts, numerous studies show the absence of regularity between social groups and stylistic provinces because morphology and/or decoration may depend on the production as well as consumption contexts. Therefore, the visible “type” gives information on the expression of demand, which may be similar to several neighboring cultures, while the technical tradition is related to producers and the expression of a social group because of transmission process.

Anthropological interpretation of chaînes opératoires fully integrates the type in their diachronic and synchronic variability. A synchronic technical variability can be explained if certain sequences correspond to particular vessels, thus inducing that the presence of several technical traditions is above all linked to functional variability and demand. Conversely, if several technical traditions produce the same vessel, their variability will induce social factors.

While a synchronic context can be “easily” interpreted, the question remains complex from a diachronic perspective to determine whether the type/demand or the technique is at the origin of the innovation when thousands of data have to be combined to express transmission processes between generations over several centuries.

In this paper, cases studies from Caribbean archaeology and European Bronze Age will be discussed in order to illustrate the interaction between typology and technology and the contribution of modelling to resolve diachronic variability.

7 RECONFIGURING LITHIC STUDIES THROUGH DESIGN THEORY

Abstract author(s): Hussain, Shumon - Matzig, David (Aarhus University)

Abstract format: Oral

Ever since Bleed’s seminal work on the optimal design of forager hunting weapons, the concept of ‘design’ has become an integral part of paleoarchaeological theory. At least one would think so. In reality, design – both understood with regards to technological systems and individual artefacts or tools – remains a poorly developed and surprisingly undertheorized concept. When it comes to stone tools, design is effectively deployed as a synonym of other, more intuitive and widely used notions to describe formal object qualities such as ‘morphology’, ‘type’, ‘style’ or ‘function’.

It might be argued that any serious attempt to develop a proper design theory for lithic studies has in part been undermined by the dominant discourse on style-vs-function in the early days of processual and Darwinian archaeologies. Another reason for the notable neglect of design considerations has likely to do with Bleed’s original grounding of the concept in the configuration of larger weapon systems of which lithic implements form only one component, making it difficult to study design principles when only the latter are commonly preserved.

We here suggest that although Bleed’s seminal work on design is widely cited and acknowledged among archaeologists, it has rarely been exploited to its full potential. We maintain that design ought to become a more central concept for lithic studies and that recent advances in lithic analysis and interdisciplinary design theory now offer new resources to reignite the study of design in lithic tools. We show that a careful triangulation of quantitative approaches to shape and geometry with qualitative UTF-type analyses and basic considerations of hafting modalities can not only rejuvenate Bleed’s influential distinction between ‘reliability’ and ‘maintainability’ but may also push the study of lithic variability beyond long-standing and ultimately mute dichotomies, thereby also enabling new ways of classifying and ordering the lithic material.

8 THE COMMON-SENSE TRAP IN ARTIFACT CATEGORIZATION

Abstract author(s): Iovita, Radu (New York University; University of Tübingen)

Abstract format: Oral

Complex tool use is one of the defining characteristics of our species, and, because of the good preservation of stone tools (lithics), one of the few which can be studied on the evolutionary time scale. For this reason, it is tempting to quantify lithics and use them as the dependent variable in evolutionary analyses. However, in this paper, I argue based on the psychological literature that current typologies frequently used in such analyses conform to folk biases (common-sense explanations or assumptions) in artifact categorization that may be peculiar to how contemporary humans classify ordinary objects. Conceiving of artifacts made by pre-modern hominins using such folk categorizations severely limits our ability to study them on their own terms and compare them to those made by modern humans. As an alternative, I propose an analytic-functional, pragmatist model for artifact categorization based on a combination of the causality of the tool’s physical properties, the user’s biological system, and the recorded use history. These can be objectively defined independent of species, but also gleaned from archaeological specimens through the study of wear traces. I conclude by mentioning the modern computational methods that will play a crucial part in making such a methodology feasible.

9 GRAPH HEURISTICS. CONTEXT-BASED TYPOLOGY OF ICONOGRAPHIC CONTENT WITH THE R PACKAGE ICONR

Abstract author(s): Huet, Thomas (LabEx ARCHIMEDE, ANR-11-LABX-0032-01) - Pozo, Jose - Alexander, Craig (Independent researcher)

Abstract format: Oral

By definition, elements within a defined type share more commonalities amongst themselves than they share with elements from any other type. This can be modeled by a (dis)similarity metric defining a measure of distance/proximity between elements. Assigning manufactured archaeological remains – such as pottery, lithics or settlements – to different types without precise measurements of these (dis)similarities will likely lead to non-robust typologies and lack of agreement about cultural definitions. Among manufactured remains, iconographic ones are probably those that have led to the most complicated typologies, whether these typologies are too idiosyncratic (e.g. the so-called Warrior stelae) or too general (e.g. an anthropomorphic figure). In the former case, the studies will be regional- and chronology-dependent, leading to tedious descriptions and overly numerous categories, most probably represented by only a handful of examples, making meaningful comparisons difficult. In the latter case, comparisons will necessarily suffer from a drastic loss of precision.

Our purpose is to present the insights achievable with the new R package iconr (<https://cran.r-project.org/web/packages/iconr/index.html>) which implements concepts and functions for modeling prehistoric iconographic compositions using graph theory and spatial analysis. To undertake modeling of a specific type of iconographic content (pottery decorations, cave painting, stelae, etc.), the a priori definitions required are minimal and only concern the graph elements: graphical units (i.e., vertices) and types of relations they share (edges). The iconographic composition (i.e. the semantic content) can be recovered a posteriori, by graph and spatial analysis. Graph theory also allows us to group these data into tree-like structures, introducing a hierarchy of typologies with controlled vocabularies, allowing generalization processes (up, the parent level) and specification processes (down, the child level) to facilitate comparisons and (dis)similarity measurements. Our paper will focus on the theoretical background of the R package iconr and present cases of application on selected corpora.

10 SAME THING, DIFFERENT TYPOLOGIES: A TYPOCHRONOLOGICAL MODULE FOR THE ARCHAEOLOGICAL TYPES IN THE CRFB DATABASE

Abstract author(s): Auth, Frederic - Domscheit, Wenke - Rösler, Katja - Hofmann, Kerstin (RGK - Romano-Germanic Commission DAI)

Abstract format: Oral

The digital transformation of one of the longstanding editorial projects of the RGK onto the <https://idai.world>, the Corpus der römischen Funde im europäischen Barbaricum (CRFB), challenges archaeological typologies. By utilizing the possibilities of digitization and software, we are developing a tyPOCHRONOLOGICAL module, a service for bringing together different typologies and thus provide a chronological addressing of objects.

The CRFB is a joint European publication project, originally established in the 1980s at the Central Institute for Ancient History and Archaeology of the German Academy of Sciences at Berlin (ZIAGA) in the GDR. It registers roman artefacts found outside the Roman Empire together with accompanying finds of regional origin.

In the last years, the data of the underlying databases, and the published catalogues have been transferred into a new database to make the data accessible online, to link it with the latest research data and to provide mapping. Since for most finds, the archaeological context does not provide chronological information, so the chronological addressing of the objects is tied to the type. To realise the digital CRFB it was necessary to find a solution for the different typologies used between the volumes as well as to find a way to add a standardized chronology to the data. The typo-chronological module, which is a stand-alone service, records every type in a tree-structure with its chronology as off the most recent research. This service is also including concordances and ties into the CRFB, making it possible to use different typologies to reference the same thing. With our project-based digital solution we aim to address general aspects of the archaeological concept of type: the vagueness in the determination of types and the lasting chronological significance of types. With this module we hope to make a meaningful contribution to the discussion on computer-based approaches to typologies.

11 ARCHITECTURAL DESIGN METHODS IN RESPONSE TO TYPOLOGICAL SYSTEMS IN ARCHAEOLOGY

Abstract author(s): Toulouse, Catherine - Lengyel, Dominik (BTU Brandenburg University of Technology Cottbus-Senftenberg)

Abstract format: Oral

Typological systems are equally controversial in architecture. However, architecture's use of typologies allows decisive contributions to the visual communication of archaeology, namely to give a type an appearance both identifiable and universal, e. g. an antique capital, the type of which is unambiguous due to the otherwise certainly reconstructible building, but the individual appearance of which is unknown and will in all probability remain unknown forever due to the findings. To visualise such a building in order to develop further questions requires a representation of the type itself e. g. by the way of interference-based modelling. Linguistically, the problem does not arise, but visually it does as individual finds are incompatible to typology at the first glance. And here it is the discipline of architecture that is able to design substitutes that as a basic explanatory value translate the linguistic uncertainty into visible forms. The emerging perspective is that the type becomes a utility and visual perception consequently becomes a part of the research process, taking into account any degree of certainty of knowledge. The authors have developed a method that takes this into account when creating spatial visions based on digital models.

The presentation aims to demonstrate and illustrate this method by several projects developed by the authors in cooperation with archaeological research institutions:

- Cologne Cathedral and its Predecessors (by order of and exhibited in Cologne Cathedral),
- Bern Minster – its first century (by order of and published by Bern Minster Foundation)
- The Metropolis of Pergamon (within the German Research Fund Excellence Cluster TOPOI),
- The Palatine Palaces in Rome (by order of the German Archaeological Institute, both latter exhibited in the Pergamon Museum Berlin),
- The Ideal Church of Julius Echter (by order of the Martin von Wagner Museum in the Würzburg Residence).

12 IT-BASED METHODS AND MACHINE LEARNING METHODS OF CLASSIFICATION: THE COOPERATIVE PROJECT CLARENET – CLASSIFICATION AND REPRESENTATION FOR NETWORKS

Abstract author(s): Hofmann, Kerstin - Wigg-Wolf, David - von Nicolai, Caroline - Möller, Markus - Tietz, Julia - Rösler, Katja (RGK - Romano-Germanic Commission DAI) - Tolle, Karsten - Krause, Robin - Deligio, Chrisowalandis (Frankfurt Big Data Lab - Goethe University Frankfurt)

Abstract format: Oral

The classification of archaeological finds and their representation are shaped by various object epistemological approaches and changes of medium. With ever increasing digitisation, there are now new possibilities of classification, e.g. using methods of automatic image recognition, as well as the representation of finds on the web with linked open data.

ClareNet, a BMBF funded cooperative project of the Römisch-Germanische Kommission (German Archaeological Institute) and the Big Data Lab, (Goethe University Frankfurt) tests the possibilities and limits of new methods of classification and representation. To this end, traditional approaches of typification and the recording of attributes in numismatics and archaeology are compared with IT-based methods of classification, including deep learning, using the examples of three Celtic coin series that were each chosen to address particular research questions and problems.

The work processes are accompanied by a science and technology study that documents the production and circulation of knowledge, as well as instigating reflection on changes in cognitive processes resulting from the use of digital tools and algorithms. ClareNet promotes an interdisciplinary dialogue to sound out the potential and limits of systematic automation for methods of classification and representation in numismatics and archaeology.

Starting out from the coinage of Armorica (Britanny), one of the Celtic coin series selected as an example for the project, we will present how deep learning classifies the coinage, how this may differ from classifications by numismatists, and the lessons to be learned from the exercise.

13 BEYOND SHAPE, TOWARDS IBERIAN CRAFTWORK: APPLYING AN AUTOMATIC CLASSIFICATION MODEL TO IBERIAN POTTERY (SPAIN)

Abstract author(s): Moreno Padilla, María Isabel (Grupo Patrimonio Arqueológico en Jaén - HUM-357; Departamento de Geografía, Historia y Humanidades. Universidad de Almería) - Molinos Molinos, Manuel - Fuertes García, José Manuel - García Fernández, Ángel Luis - Lucena López, Manuel José (Instituto Universitario de Investigación en Arqueología Ibérica de la Universidad de Jaén) - Navarro, Pablo (Instituto Patagónico de Ciencias Sociales y Humanas. Centro Nacional Patagónico, CONICET; Departamento de Informática, Facultad de Ingeniería, Universidad Nacional de la Patagonia) - Segura Sánchez, Rafael (Instituto Universitario de Investigación en Arqueología Ibérica de la Universidad de Jaén)

Abstract format: Oral

In the last years, the development of new theoretical and methodological approaches to the study of archaeological ceramics has demanded a constant and progressive renewal of typological studies. However, the potential of ceramics has been subordinated to watertight departments (the ceramic typological classes), which do not incorporate specific aspects of the containers or other general aspects associated with ceramics as a handmade product.

Our proposal is linked to the development of a groundbreaking typological proposal that overcomes, paradoxically, the concepts of typology, series and variant. Focused on the ceramics associated with the Iberian societies of the western Mediterranean during the Iron Age (VI c. B.C.- I c. A.D.), we try to break with the traditional "archeology of objects" to rethink them beyond their own materiality. This approach is closely linked to the new perspectives open from ceramic sociology, the Actor-Network Theory and the archeology of the senses. Our contribution deals with a common problem in the study of Iberian ceramics: the establishment of innumerable typologies based on subjective criteria established by archaeologists. To address this problem, and based on previous work published by the authors of this work, we have established a classification system of ceramic vessels using geometric matching learning techniques, which allows the automatic learning of ceramic sets through an architecture based on deep neural networks. This system individualizes each of the specific features of the container to later compare them with the rest of the artifacts of the same context. This exercise -the comparison between large groups of ceramics- results in a classification based on the specific variables of ceramics. The final goal of our methodological proposal is to understand the technology of Iberian pottery incorporating the inherent variability of handmade production, and removing at the same time subjective factors from the classification process.

273 TOWARDS AN INTERNATIONAL ARCHAEOLOGY OF FORTIFICATIONS: METHODOLOGIES AND INTERPRETATIONS (COMFORT)

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Schneeweiss, Jens (University of Kiel, ROOTS Cluster of Excellence; Centre for Baltic and Scandinavian Archaeology; University of Göttingen) - Ibsen, Timo (Centre for Baltic and Scandinavian Archaeology) - Ballmer, Ariane (University of Bern, Institute of Archaeological Sciences and Oeschger Centre for Climate Change Research - OCCR) - Maixner, Birgit (NTNU University Museum Trondheim, Department of Archaeology and Cultural History) - Fernández-Götz, Manuel (University of Edinburgh, School of History, Classics and Archaeology)

Format: Regular session

Prehistoric and early historic fortifications are outstanding archaeological sites, which in many cases are still visible in the terrain and therefore represent significant focal points in the landscape. However, numerous fortification works have also been lost due to construction activity and changing landscape uses during the 19th and 20th centuries. Today, there is a significant geographical and chronological diversity of countless monuments featuring different architectures and functionalities, as well as a large number of hillfort researchers across Europe. For a long time, the archaeology of fortified sites has pursued a culture-historical approach, mostly focussing on locating historical events and evidence for warfare. Newer research has expanded the focus to other aspects, such as the symbolic meanings of fortifications, construction labour, or their relationship with the wider natural and cultural landscape. In addition, fortification-specific research methods and techniques have been established, both in fieldwork and in further analysis. There are, however, barriers in scholarship related to political and linguistic boundaries, as well as period-related research traditions, which often make supra-regional and diachronic discussions difficult.

This session aims to explore the current state of research approaches on fortifications in prehistoric and early historic Europe. Individual investigations shall be located and critically reflected within the international research landscape. It is our explicit goal to outline the diversity but also commonalities in strategies and approaches, in order to contribute to the building of larger international networks that go beyond traditional divides. We invite speakers to focus on the concepts, theories and methods relevant to their own fortification research and to contextualise their approaches within the wider disciplinary framework.

ABSTRACTS:

1 COMPARATIVE TRIALS IN FINDING THE BLUEPRINTS FOR EARLY AEGEAN FORTIFICATIONS

Abstract author(s): Turner, Daniel (Leiden University) - Prent, Mieke (Vrije Universiteit Amsterdam) - Thorne, Stuart (Netherlands Institute at Athens) - Brysbaert, Ann (Leiden University)

Abstract format: Oral

In comparing Final Neolithic (FN) and Early Bronze Age (EBA) fortifications in the Aegean (ca. 4000 – 2000 BC), very little of the walls remain, few have been recorded systematically, and fewer still are easily accessed in published reports. What we attempt here is a correspondence analysis of wall features mentioned in publications to see if any strong patterns emerge for a building guide or 'blueprint' in early Aegean fortifications. FN and EBA walls were highly visible, logical targets for mimicry and innovation as exchange intensified and competition encouraged security. They were also investments not lightly undertaken where scarcity loomed behind misfortunes such as consecutive poor harvests. Since wall construction was a high-stakes communal effort, planning and design had to navigate effectively through expectations (what a strong wall looks like) and constraints (how far to stretch local resources and labour). Expectations at least may have formed around the observations (and exaggerations) of travellers. Several recurring features like herringbone masonry and rounded bastions might have led to canonical forms through durable building traditions and experimentation, possibly stemming from one or more archetypes. Older walls certainly influenced community planning as sites developed over time, but they also imposed the burden of precedence on later design choices. Case studies discussed here will include Geraki (Laconia), Kiapha Thiti (Attica), and Strofilas (Andros).

Piecing together incomplete information allows for speculative reconstructions of early walls, provided the limitations of these augmented realities are made clear. The strength of correspondence among recurring wall features remains more dependent on definitive presence/absence variables than rigorous field measurements. Although always a work-in-progress, systematic catalogues of wall features benefit future comparative research even if patterns in prehistoric building practices remain hypothetical.

2 MEASURING AND RECONSTRUCTING IRON AGE AND EARLY MEDIEVAL HILLFORTS ON THE MOSKVA RIVER

Abstract author(s): Chaukin, Sergey (Institute of Archaeology Russian Academy of Sciences)

Abstract format: Oral

Most of the Iron Age and Early Medieval hillforts in the forest zone of Eastern Europe are not well preserved, but significantly affected by erosion processes. Today, after a long period since their habitation, it is often difficult to imagine the past appearance and shaping of the hillforts (landscape and topographic characteristics). At the same time, there are also a sufficient number of well-preserved hillforts. In my previous research, I have revealed a correlation between specific shapes of the platform and specific structures of ramparts and ditches. This interrelation can also be noticed on other elements of fortified settlements. Comparing entire fortified settlements as well as their individual parts allow reconstructing the original appearance of ruined structures. For this purpose, it is suggested to apply precise measurements of individual components of the investigated hillforts. The paper focuses on methodological aspects of the measurements related to the reconstruction of the shaping of fortifications.

At the first stage the database is filled with individual hillfort parameters (measurements), such as: length, width and area of the platform, height and distance between the ramparts, etc. For this purpose, 3D models are created based on topographic plans or, in some cases, on lidar data. The outcome is a table of parameters that is examined by cluster analysis to group the most similar types. The resulting typology forms the basis for a hierarchical classification of the hillforts as well as for social and functional interpretations.

Tens of thousands measurements are expected to be made. The formation of detailed databases will make it possible to apply methods of Big Data analysis in the future.

3 BEYOND THE MILLENNIUM RESEARCH PROJECT. EARLY MEDIEVAL HILLFORTS IN EAST CENTRAL POLAND - CURRENT STATE OF RESEARCH APPROACHES

Abstract author(s): Dzienkowski, Tomasz (Institute of Archaeology Maria Curie-Skłodowska University in Lublin) - Wołoszyn, Marcin (Institute of Archaeology University of Rzeszów; Leibniz Institute for the History and Culture of Eastern Europe - GWZO) - Florkiewicz, Iwona (Institute of Archaeology University of Rzeszów)

Abstract format: Oral

Medieval archaeology in Poland started in earnest after 1945. A key stimulus was the "Millennium" research project investigating the formation of the Polish state (Piast realm). Medieval strongholds were the main focus of the project, as they were understood to reflect the emergence of an central power.

Despite initial declarations archaeological excavation concentrated mostly in Great Poland, Silesia and Pomerania. Lesser Poland, and particularly, eastern Poland, were much less well studied.

However, eastern Poland has no lack of fascinating archaeological features, also because it has few cities and less industry. Many strongholds and their hinterlands are better preserved than in the more urbanized western parts of Poland.

A major attraction of eastern Poland is its peripheral status of a Polish-Rus' and (in the north) Polish-Balt borderlands, complete with the question of ethnic affiliation of its strongholds (Baltic, Polish or Rus'?).

Our paper reports on findings from strongholds investigated in eastern Poland (notably, Czeremo, Gródek, Chełm). Made in a close cooperation with palaeogeographers, these studies present these sites freed from "tyranny of the historical record" (T. C. Champion) and highlight their relationship to their natural and cultural setting.

Eighty hillforts recorded in the border zone between Drohiczyń and Przemyśl offer major potential for research. Most have been excavated, but only on a limited scale. The recent research focuses on the region on the middle Bug River which is particularly "rich in hillforts". The Czeremo hillfort – historical Cherven' (10th–13th c.) and the royal residence in Chełm (13th-14th c.) were excavated over several seasons. Archival and environmental studies were made of the Gródek hillfort – historical Volyn' (10th-13th c.), and on a smaller scale at Szaśiadka (10th-13th c.) and Jurów (12th-13th c.). Archaeological and paleoenvironmental findings have been supplemented by a series of absolute dates from dendrochronology and C14 dating.

4 THE HILLFORT BROBORG NEAR UPPSALA IN SWEDEN – A TIME CAPSULE UNVEILING HOW IT BECAME VITRIFIED

Abstract author(s): Sjöblom, Rolf (Tekedo AB; Luleå University of Technology) - Ogenhall, Erik - Hjärthner-Holdar, Eva (The Archaeologists in Uppsala) - Pearce, Carolyn (Pacific Northwest National Laboratory, Richland) - Schweiger, Michael (Contractor with U. S. Department of Energy, Richland) - Marcial, José (Pacific Northwest National Laboratory, Richland) - Weaver, Jamie (National Institute of Standards and Technology, Gaithersburg) - McCloy, John (Washington State University, Pullman) - Vicenzi, Edward (Museum Conservation Institute, Smithsonian Institute, Suitland) - Kruger, Albert (U.S. Department of Energy, Office of River Protection, Richland)

Abstract format: Oral

The hillfort Broborg is located on top of a solitary hill surrounded by flatlands, and overlooking a river and its ford, as well as an ancient road. The river was once a part of a major waterway connecting the powerful Uppsala region with the Baltic Sea. The construction of the fort dates back to around 400-550 CE. However, and over several centuries, the hillfort gradually lost its importance as a result of the land rise in combination with the unification of Sweden, and has since been abandoned.

About three fourths of the upper part of the present inner wall has been vitrified to a high bearing strength assessed to be sufficient for carrying e. g. a timber-laced wall on top. Two excavations have been carried out, one in the 1980's and another one in 2017. The latter served the dual purpose of adding to the cultural heritage and providing a reference material (an anthropogenic analogue) to nuclear waste glass. Accordingly, the glass and the reasons for its vitrification have been the subject of comprehensive studies which have included cultural (incentives and competence) as well as natural sciences aspects.

It is concluded that each hillfort should be analysed individually, since the prerequisites may be quite different, even for similar types of rock and perhaps even with similar elemental compositions but different oxidation states for the constituent iron. It is also concluded, based on several factors identified, that the vitrification at Broborg was likely carried out intentionally, and for the purpose of constructing the fort. However, this does not seem to be the case for other hillforts in Sweden with vitrified wall material. Nonetheless, and considering the variations in the prerequisites together with the communication internationally at the time, Broborg may have siblings elsewhere awaiting (re)assessment.

5 REVISION OF KNOWLEDGE ABOUT THE CENTRAL FORTIFICATION AT STARÁ KOUŘIM

Abstract author(s): Dvoraček, Daniel (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic)

Abstract format: Oral

Archaeological excavations of the early medieval fortified stronghold at Stará Kouřim, conducted by M. Šolle in the 1940s–1950s in the period which marked the beginning of extensive excavations of Slavic hillforts in the Czechoslovakia, revealed that this stronghold represented one of the most important fortified centres in Bohemia before the rise of the Přemyslids in the first half of the 10th century. More than 60 years have passed since the excavations were finished and the original interpretations have to be verified. The main results were published not long after the completion of the research, in a profusely cited monograph from 1966. Moreover, a great deal of knowledge still needs to be analysed and evaluated. This contribution is dealing with excavation of the central defensive wall, one of the three main fortification lines of Stará Kouřim. This structure was uncovered at multiple places but it did not always earn proper attention. The contribution presents the main results of a new revision of knowledge about this significant fortification.

6 WHO INVENTED RUSSIAN WOODEN FORTRESSES?

Abstract author(s): Koval, Vladimir (Institute of Archaeology RAS)

Abstract format: Oral

Russian medieval city fortifications were a chain of rectangular sections built of oak logs. Each such section, as well as the gaps between them, were filled with earth. As a result, a wooden-earthen wall was obtained, which could not be destroyed with a battering ram and it was very difficult to damage it with stone-throwing artillery. True, such a wall could have been burned.

The earliest fortresses of this type appeared in Russia in the 9th century in Kiev and Novgorod (Rurikovo hillfort). From the end of the 10th century town's walls began to be erected in the rost- (or hook-) constructions (Germanic and Polish names), which copied the fortification of Slavic Moravia, Poland and those Slavic territories that later became part of Germany. In this case, the wall was created from layers of tree trunks, covered with earth (in each next layer, the trunks were laid perpendicular to the previous layer). However, in Russian towns such a construction system was used very rarely. Consequently, the West Slavic experience was accepted, but did not gain popularity in the Russian lands.

How the "East Slavic" (Russian) system of building fortress walls (a chain of rectangular sections with earth) arose remains unclear. The genesis of such a system in the lands of Eastern Europe is not traced. Such a method of fortification is not known in Western Europe either. It remains a mystery who and when developed such a simple and effective system of fortification, which was successfully used in Russia until the end of the 16th century.

7 FORTIFY TO DEVELOP CONTACTS? ZOOMING INTO THE LATE BRONZE AGE ECONOMIC LANDSCAPES OF FORTIFIED SETTLEMENTS IN THE EASTERN BALTIC

Abstract author(s): Podenas, Vytenis - Minkevičius, Karolis - Piličiauskienė, Giedrė - Micelicaite, Viktorija - Čivilytė, Agnė (Lithuanian Institute of History)

Abstract format: Oral

Eastern Baltic region was commonly portrayed as a passive agent of Northern and Central European Bronze Age worlds limited to using metal artefacts as a proxy for the inflow of foreign ideas. However, recent studies of the fortified settlements suggest this process also permeated various other aspects of everyday life. Different data sources indicate that local communities developed different approaches to their economic subsistence which coincide with varying degrees of interregional communication. Zooarchaeological research revealed intraregional variation in animal husbandry alongside some cases of hunting. Archaeobotanical studies unveiled the presence of diverse crop package and allowed the identification of cases of intensive agriculture on nutrient-deficient soils. In addition, the examination of stylistic elements in various artefact groups illustrated the decrease in stylistic elaboration between the coastal and the inland sites. Finally, even differences in architectural tendencies and preferred settlement locations were observed. This is illustrated by the contrasting economic landscapes of the earliest fortified settlements. Sites established in the vicinities of larger rivers relied on active riverine communication, granting access to major economic routes. Whereas settlements located near isolated lakes or small rivulets suggest more nuanced networks in the Baltic Uplands. In this light, Eastern Baltic Bronze Age could be perceived as a distinctive, but economically unstable case. Susceptible and dependent on the import and ideas transmitted by visiting parties.

In this paper, we present findings from the 2020 excavations in Mineikiškės fortified settlement alongside the initial results of the BronzEko project, focused on the exploration of the Late Bronze Age economy of the Eastern Baltic region. By discussing differences among economic landscapes this paper aims to address the role of fortifications in the development and facilitation of interregional contacts. It also seeks to challenge the idea of economic and technological isolation of the local communities.

8 LABOUR COST OF THE HALLSTATTIAN HEUNEURG FORTIFICATIONS

Abstract author(s): Remise, François (EPHE)

Abstract format: Oral

Many studies have been conducted about the architecture choice of fortifications, especially about their defensive capacity or their conspicuous objective. But only few labour cost analyses of these fortifications have been undertaken.

In this paper I present labour cost estimations of the three different successive types of fortifications built to surround the Heuneurg upper town between 620 BC and 540 BC using the Architectural energetics method: the log-cabin-style wood and earth system, the mudbrick on stone foundation wall and the more traditional Pfostenschlitz rampart.

The Architectural energetics method consists in identifying the raw materials used, then calculate their volumes, and estimate the labour cost for each task of the manufacturing, installation and maintenance process, using adequate work rate values which take into account the work site conditions.

The labour cost estimations of the three successive fortification allow to think these costs may have been taken into account in the choice of the building methods.

9 DIFFERENT SOLUTIONS FOR DIFFERENT NEEDS: EXAMINING SIMILARITIES AND DIFFERENCES IN THE FORTIFICATIONS OF NORTH-EASTERN IBERIA (4TH-3RD CENTURIES BC)

Abstract author(s): Cuscó Badia, Oriol (Institut Català d'Arqueologia Clàssica)

Abstract format: Oral

This paper aims to present the state of research of an ongoing PhD thesis which focuses on the study of Iron Age fortifications in the north-eastern Iberian Peninsula (roughly present-day Catalonia). During the Middle Iberian period (4th-3rd centuries BC), this area was inhabited by several ethnic groups. Despite sharing a lot of cultural features, each of these groups had its own territory, political organisation and settlement hierarchy. Long before the beginning of the Roman conquest in 218 BC, war and conflict already

had an important role for these societies and especially for the aristocratic elites who ruled them, as evidenced by the weapons in their burials and by the defensive systems that protected most of their settlements.

Although these fortifications shared many common features and traits, they usually show significant differences in their degree of sophistication, their design, or even in the shape of specific elements. On the basis of an in-depth analysis of these fortifications, we intend to evaluate the causes behind their differences, showing that they are heavily linked with the typology and political importance of the settlements, but also with the regional peculiarities that characterised the aforementioned ethnic entities.

10 UNDERSTANDING A MOUNTAIN SOCIETY THROUGH HILLFORTS: THE SAMNITE CASE

Abstract author(s): Fontana, Giacomo (University College London)

Abstract format: Oral

The Samnites are people without their own history. They most famously survive in Roman accounts that position them as formidable rivals in central Italy during a formative period of the Roman Republic, and indeed as iconic local alter-egos to Rome with quite different ways of organising themselves. It has long been clear archaeologically that the approximate territory of the Samnites was distinctive: full of hillforts, but with few, if any, obvious cities of a type familiar in neighbouring territories and so central to modern narratives of Iron Age Italian state formation. Still, the study of Samnite hillforts has focused on these narratives and the search for hypothetical Samnite cities. This endeavour stagnated research on these sites and neglected wider debates on non-urban societies and advances in the analysis of similar sites elsewhere. This project instead builds on recent research to understand Samnite hillforts according to concepts such as construction labour, state resistance and refusal, mobility, and guerrilla warfare. Different theoretical scenarios are tested using spatial and statistical analyses to highlight the function of hillforts within Samnite society and trace the past modalities of occupation across the challenging mountainous landscape of Samnium. This paper presents the first results of this research.

11 A FORTIFICATION IS SELDOM FOUND ALONE. COMPLEX APPROACH TO FORTIFIED SITES AS PARTS OF A SYSTEM

Abstract author(s): Schneeweiss, Jens (University of Kiel, Centre for Baltic and Scandinavian Archaeology; Cluster of Excellence ROOTS; University of Göttingen)

Abstract format: Oral

Archaeological fortification research often concentrates on typological order and functional interpretation of individual sites. Typological thinking tends to focus on technical and constructive details, while the attribution of possible functions often remains bound to the dichotomy of Herrenburg – Fluchtburg (refuge). In early historical times, written sources can help creating attractive interpretations because they come up with names, dates and stories. At the same time, the zeitgeist has a non-negligible impact on researchers and research questions as well as on chosen methods and interpretations. Both factors contribute to the temptation to overestimate certain findings, as will be illustrated by case studies of Ottonian fortifications.

The paper intends to show the importance of recognising and scrutinising inconsistencies in the findings, as they can point the way to a deeper understanding and help to avoid conclusions being jumped to. The complex history of many fortifications can only be deciphered if the methods of investigation are adequate to the task. Micromorphological analyses, for example, can help to identify specific activities. Moreover, fortifications are never built by chance, but are the expression of a specific intention, usually as part of a superior and subordinate system. Unravelling the social context as well as the concrete relations to contemporaneous sites and cultural landscape elements enables a comprehensive insight into the functional levels of a particular fortification. Dating as precisely as possible is of fundamental significance. In doing so, it is necessary to analyse exactly what is being dated in each individual case: a local repair to the rampart, for example, can easily be misunderstood as a complete construction phase, and a fortified site can be inhabited before or after a fortification was built and in use. Attempting to identify the system a fortification belongs to is as important to its understanding as reconstructing the site itself.

12 HILLFORTS AND SPATIAL ORDER: LEARNING TO LIVE WELL TOGETHER

Abstract author(s): Davis, Oliver (Cardiff University)

Abstract format: Oral

Over the last few decades, the role and function of later prehistoric hillforts has been much debated. In a British context, Prof. Barry Cunliffe (2006) has argued that once the enclosing boundary had been erected, their uses varied according to local need. The implication is that there may be no such thing as a typical hillfort. However, while a few hillforts appear 'empty', a common function shared by most is that they were places of settlement, either permanent or temporary. Indeed, in many parts of the world the development of the hillfort represents a significant point, where for the first time, large numbers of people, beyond merely the extended family, lived together in a centralised location. This has a range of important implications. For instance, once persuaded to move within the confines of a hillfort's boundaries, how did these new 'hillfort communities' deal with the various social challenges? Groups who were used to living in dispersed, rural, settlements were now faced with dwelling in close proximity with neighbours. To some, this transition must have been difficult – the limitations on access to private space for instance may have accentuated one's social condition, highlighting status distinctions and triggering petty differences and disputes. This paper will think through some of these issues by examining the arrangement of settlement within the interiors of hillforts and other fortified settlements throughout Europe. I will

argue that in many cases the layout of occupation areas, and use of particular architectural features, were deliberately manipulated by hillfort communities in an attempt to 'learn to live well together'.

13 EARLY AND MIDDLE BRONZE AGE FORTIFICATIONS IN THE SUB-CARPATHIAN AREA OF MOLDAVIA (EASTERN ROMANIA)

Abstract author(s): Vasile, Diaconu (Neamț County Complex Museum)

Abstract format: Oral

After the decline of the famous Cucuteni culture, in the eastern area of the Carpathian Mountains, there were major cultural changes, amid influxes of people from the northern part of the Black Sea. In this context, the beginning of the Bronze Age meant a decline compared to the previous chronological stage, a fact supported by the modest settlements, the reduced territorial dynamics and a poor archaeological inventory.

For the sub-Carpathian area of Moldova, at the beginning of the Early Bronze Age, the foundations of some fortified settlements were laid, the existence of which has been linked to the control of some communication routes or to natural resources (salt). Although the number of their sites is reduced, they are of particular importance for the reconstruction of territorial control strategies. Based on recent research, important information has been obtained about the fortification system, but multidisciplinary studies should also be performed.

The same model of territorial distribution is followed by the fortifications of the Middle Bronze Age, which are reduced in number, but which benefit from stronger defensive systems.

An important detail is related to the fact that most of the fortifications are in forested massifs, which allowed a good conservation of the defense ditches. In fact, the defensive systems are made up of one, two or three ditches, and the related waves are not visible.

The location of the fortifications specific to the Middle and Late Bronze Age illustrates their arrangement on the eastern edge of the sub-Carpathian depressions, thus being a regional defense system.

14 BORDERS AND CONFLUENCES: SEEING THE BIG PICTURE AT A SMALL SCALE

Abstract author(s): Belford, Paul (Clwyd-Powys Archaeological Trust)

Abstract format: Oral

The border between England and Wales was fixed in 1536, but it is a line on a map that only approximately relates to a much wider cultural and linguistic border zone on either side of it. In contrast, the character of the borderland through which this line runs was shaped much earlier. This has always been a place where the high ground to the west gives way to lowland to the east; where rivers merge and flow onto the fertile plain. Hundreds of Iron Age hillforts and other enclosures dominate valleys and ridgeways, controlling movement and access along them. This was a borderland in the early medieval period too: linear earthworks were constructed to mark boundaries between kingdoms. The most famous of these was perhaps Offa's Dyke, built in the 8th century; in places anchored by earlier hillforts, but running north-south across the grain of the landscape. Later, in the 11th and 12th centuries, French lords fought Welsh princes, and a network of earthen and stone castles – some again on or close to earlier sites – marked out their claims on the landscape. However, wider patterns of territoriality, land use, meaning and identity have since been obscured by barriers both in scholarship and administration. Archaeological scholarship has tended to emphasise the 'defensive' nature of these earthworks; it also creates period divisions for research: prehistory versus historical archaeology. Similarly, heritage management takes place within administrative silos – in this case the separate government heritage agencies of England and Wales – where the 16th century border removes the wider landscape context. This paper uses the example of the landscape surrounding the confluence of the Rivers Severn and Vyrnwy as a springboard for supra-regional and diachronic discussion about understanding and management of earthen fortifications (whether circular or linear) and their associated landscapes.

15 THE RE-INHABITATION OF THE PREHISTORIC HILLFORTS IN THE PROVINCE OF DARDANIA

Abstract author(s): Rama, Zana (Archaeological Institute of Kosovo)

Abstract format: Oral

During the Late Antiquity Period, as a result of different tribe invasions, in Dardania as well as in many places in the Byzantine Empire, the population started to abandon the field settlements and to relocate and reorganize themselves in the hilly locations. Various reasons affected the above movements of the populations, such as: escaping from the danger of invasions, for a better geostrategic position and natural protection, to control important routes and to create better communication between the settlements. Based on the descriptions of the scholar Procopius of Caesarea, in his work *De Aedificiis* (On buildings), during the rule of emperor Justinian I only, 69 fortifications in Dardania were built, 61 of them rebuilt and 8 of them were built new. The reconstruction of the fortifications took place in the strategic locations, most of which were inhabited also in Prehistory, mainly in the Bronze and Iron Age. This has been proven based on the archaeological excavations conducted so far, that brought to light a large number of prehistoric movable objects. Although the prehistoric architectural structures have not survived, they have left their traces behind to nowadays.

The Late Antiquity period remains the most representative period of the fortification system in Dardania. This paper will present the approach and the treatment of the multilayered hillfort settlements in the Republic of Kosovo, with a more specific focus on the Late Antiquity Period.

16 ARCHAEOLOGICAL TRACES OF THE ASSAULTS OF EAST SLAVIC HILLFORTS OF THE OLD RUSIAN STATE FORMATION EPOCH

Abstract author(s): Plavinski, Mikalai (Belarusian State University)

Abstract format: Oral

The end of the 10th – the first half of the 11th century is the time of the formation and functioning of a relatively unified Old Rusian state. Its borders covered the territory of settlement of all East Slavic and some non-Slavic tribal unions. The few existing written sources describe this process extremely poorly. But there is no doubt that the spread of the power of the Kiev princes in many regions was violent.

In different regions of the settlement area of the Eastern Slavs, a number of archaeological monuments have been identified that can be confidently associated with military conflicts of the era of the formation of the Old Rusian state. Among them, a number of hillforts stand out, usually located on the outskirts of the East Slavic oikumene. The materials revealed as a result of the excavations of these hillforts suggest that during the period of their functioning they could have played the role of regional trade, craft and administrative centers. In the 10th – the first half of the 11th century all of them were destroyed as a result of fires, in the layer of which numerous arrowheads and single finds of close combat weapons of the Northern European and early Old Rusian types were revealed.

Despite the fact that the materials of excavations of such hillforts are mostly published, their special analysis from the point of view of the history of early medieval fortification and warfare has never been carried out. At the same time, it is obvious that the study of this group of monuments makes it possible to highlight a number of important issues in the development of fortification and warfare in the Eastern European region.

17 FORTIFICATIONS AND MILITARY THEORETICAL APPROACHES. OR: HOW CARL VON CLAUSEWITZ MAY HELP WITH THE INTERPRETATION OF EARLY MEDIEVAL FORTRESSES

Abstract author(s): Lemm, Thorsten (Centre for Baltic and Scandinavian Archaeology)

Abstract format: Oral

The position of a fortress in a particular region is never random. Fortresses have always been placed at certain locations based on strategic and tactical considerations. On a micro level it was essential to find the locality best suited for an effective defence of the respective fortress in a specific area. The decision for the specific area, however, was dictated by strategic considerations on the macro level very often relating to communication routes. Although several purposes (including administrative, economic etc.) must always be considered for fortresses, such strategic and tactical considerations are primarily relevant to their military functions.

Hence, it seems worthwhile to incorporate military theoretical approaches into the interpretation of fortresses – something that has been severely neglected in the past. However, military manuals of the early Middle Ages – the period considered in this paper – refer to fortifications only to a very limited extent. Far more productive approaches can be found in the famous work "On War" by the Prussian general and philosopher Carl von Clausewitz, written in the early 19th century. It is true that in it he refers to contemporary warfare; however, it is intended to show that his basic considerations on modern fortresses, which are quite theoretical in nature, can to a large extent be very well applied to early medieval conditions.

This paper will focus on Nordalbingia – the Saxon territory north of the river Elbe. Against a historical background characterised by socio-political changes I will use Clausewitz's approaches to discuss overarching strategic concepts and a range of military functions of fortresses. The insights gained on the Nordalbingian fortresses – e.g. as fortresses used offensively in the course of a conquest or as fortifications to control communication routes – should also offer approaches for interpreting fortifications in other regions and from different periods.

18 THE FIRST MEDIEVAL FORTIFICATION IN COPENHAGEN? NEW INFORMATION ABOUT OLD QUESTIONS REVEALED AT GAMMELTORV 24

Abstract author(s): Borgius, Andréa (Museum of Copenhagen)

Abstract format: Oral

A recent excavation of a medieval moat in Copenhagen has raised questions about its function and its place in history. The moat and its rampart, which is completely covered by the modern city, is believed to be the oldest fortification which surrounded the location of the earliest part of the city and has previously been dated to the 12th century.

In 2019-2021, The Museum of Copenhagen had the opportunity to excavate a part of the feature, which had previously only been sparingly investigated. The aim of the excavation was to uncover as much as possible about the structure, how it was constructed, the period it was in use, as well as its connection to the surrounding area.

The excavation revealed new and interesting information about the construction of the moat, and of its immediate surroundings. The results raise questions of the military capacity of the feature, and suggests that other functions, such as administrative and representative, might have been equally important.

The paper will discuss what the results from the excavation may reveal about the functions of the moat and rampart, in the light of the recent decade's archaeological discoveries about the early town history. It is proposed that the construction of the moat and rampart was a move to consolidate power by the king or a local lord to control the town and its surrounding landscape.

19 FORTRESS RESEARCH AT KIEL FJORD. AN ARCHAEOLOGICAL APPROACH TOWARDS FORTIFICATIONS OF THE MODERN AGE

Abstract author(s): Pohl, Per-Ole (University of Kiel, ROOTS Cluster of Excellence)

Abstract format: Oral

During the post medieval period, new technical, political and social ideas and transformations altered dramatically the European societies and landscapes. In the 16th century, the bastionary fortification type, as an efficient response to the European firearm evolution, was developed and introduced as a privilege of the high nobility. Post Medieval fortifications were not only strong military sites originated from military engineering and warfare. Instead, they were complex facilities with agglomerated inhabitants from different social and professional groups, which created a socio-economic entity, separated by the surrounding landscape through a social and cultural borderland, highly constricted and regulated by the sovereign. Beside military, political and economical aspects, these fortifications had also an important symbolic and representative meaning.

Within my presentation I will report the results of my PhD research project at University of Kiel's Graduate School Human Development in Landscapes and Young Academy of the Cluster of Excellence ROOTS - Social, Environmental, and Cultural Connectivity in Past Societies. Within this project, my aim is to analyse the fortified landscapes of Scandinavia, by means of selected examples. The empirical base of the project is dedicated to the former Danish fortress Christianspries / Friedrichsort, which is located on the western shore of the Kiel Fjord. It is the only remaining, and largely preserved naval fortress in Germany and counts as an outstanding architectural, historical and cultural monument. Furthermore the fortress is considered as an important heritage sight and shares commonalities in Danish, Swedish and German history between the 17th and 20th century. According the CfP, I will present and discuss the current state of research approaches on post medieval fortifications, together with concepts, theories and methods of my own research at Kiel Fjords fortifications.

20 HISTORY OF HILLFORT RESEARCH IN LATVIA: DEVELOPMENT OF METHODS AND INTERPRETATIONS

Abstract author(s): Visocka, Vanda (University of Latvia)

Abstract format: Oral

Research of the settlements, especially hillforts, can provide us with a large amount of information regarding the everyday life and activities carried out in the past. These aspects, along with the easy identification of hillforts, have raised quite a large interest among researchers in the study of these types of settlements.

The research of hillforts in the territory of Latvia has a long and diverse history whose roots can be found in the 19th Century. Over this long period of time not only the methodology of archaeological research, but also the questions asked have developed quite significantly.

The aim of this paper is to characterize the development of hillfort research in Latvia, as well as the role of the hillforts in this region presented in the academic literature.

In this paper the history of archaeological surveys and excavations and their characteristics will be analysed through the excavation reports and published excavation and survey summaries. In turn, the change of the questions asked and role of the hillforts and their typology will be analysed through academic literature.

Due to a large amount of the material, the author will only focus on the most representative surveys and excavations in the territory of Latvia.

21 DATING HILLFORTS THROUGHOUT TIME – CASE STUDIES FROM EASTERN PRUSSIA

Abstract author(s): Ibsen, Timo (Zentrum für Baltische und Skandinavische Archäologie)

Abstract format: Oral

As in all Baltic regions, the hillforts in former German province East Prussia (today divided between the modern states of Russia, Poland and Lithuania) are extremely numerous. Over an area of almost 40,000 square kilometres, nearly 500 monuments have been documented until today. In several specific phases in the last almost 200 years, hillforts have been registered, mapped and described. However, detailed investigations have taken place to very different extents, depending on the questions pursued by the excavators. The least is known about the chronology of the monuments. The few finds from excavations usually provided little information about the time of origin and occupation phases. The majority of the monuments was dated to the period between the Migration Period and the Teutonic Order, only a few seemed to exist already in earlier times.

Shortly before the end of the World War II and thus before the end of German research in the region, several scholars formulated dating as the most urgent concern of hillfort research and suggested different strategies.

In the following decades, the number of hillfort investigations increased, now in the responsibility of the respective national states of Lithuania, Poland and Russia. However, especially in the northern part (nowadays Kaliningrad Region of Russia), dating until recently was based mainly on pottery finds, which are difficult to classify typologically. It is only in recent years that radiocarbon dating has been used in larger series for chronological classification by the author. The results draw a completely new picture of the development of hillforts in the Region and prove a continuous use from late Bronze Age up to the Middle Ages.

The paper leads through the history of research on hillforts in former East Prussia, discusses the different methodological approaches and finally puts new dating results into the broader context.

22 EARLY IRON AGE FORTIFICATIONS IN CENTRAL EUROPE: NEW RESEARCH TRENDS AND RESULTS

Abstract author(s): Ballmer, Ariane (University of Bern, Institute of Archaeological Sciences & Oeschger Centre for Climate Change Research) - Fernández-Götz, Manuel (University of Edinburgh, School of History, Classics and Archaeology)

Abstract format: Oral

The study of fortifications occupies a prominent position in Central European Iron Age research and looks back on a long research tradition. While initial investigations focused predominantly on defensive considerations from a military perspective, research of the last few decades has paid increasing attention to the social and symbolic role of the fortifications. Despite (or because of) the intense research, fortifications are still highly significant for Early Iron Age archaeology and offer great research potential. The authors will define and evaluate the current status quo of Early Iron Age fortification research in terms of questions, technical procedures, analytical methods, and interpretive frameworks, in order to then propose a set of prospective research approaches. This includes, among other aspects, going beyond the rigid typologies that were established to define certain fortification types, thus acknowledging the existence of 'hybrid' works that escape traditional classifications. In addition, the paper will explore the potential of fieldwork techniques that go beyond the traditional excavation of a wall section in order to gain knowledge about chronology and typology. Examples from Germany and France will illustrate the discussion and build a basis for a future research agenda.

23 ALL AT SEA: WHAT IF PROTOHISTORICAL HILLFORTS FROM THE CHANNEL-ATLANTIC SEABOARD WERE OVER-INTERPRETED AT THE EXPENSE OF THE HINTERLAND?

Abstract author(s): Duval, Hervé (CReAAH)

Abstract format: Oral

The French Channel-Atlantic seaboard occupies an important place in the archaeology of the northwest part of France. From the thousands archaeological sites discovered on its coastal and insular environments, several dozen are fortified sites of the protohistoric period. For reasons still closely linked to historiography, most of the archaeological interventions (surveys and excavations) have focused on documenting this geographical context, until now. On the contrary, the hinterland has not benefited from such a great enthusiasm, which contributes to a very imbalance situation for the scientific data currently available. In fact, archaeological theories have often focused on the best documented sites, putting the hinterland in the background. Some major fortified sites are therefore unexploited or remain unknown, despite their great archaeological and cultural value

This communication seeks to question our ability to reverse our research paradigms through a critical and updated reading of the results obtained on the French Channel-Atlantic seaboard. Far from a historiographical assessment, it aims to highlight this imbalance which marked an oriented the reading of archaeological results concerning the protohistoric fortified sites. Solutions are also proposed, considering what is currently being done on a larger scale, in order to discuss future researches and the methodology that wish to be systematized.

24 MEDIEVAL FORTRESSES IN UKRAINE: DIRECTIONS OF STUDY

Abstract author(s): Manigda, Olga (National Academy of Sciences of Ukraine)

Abstract format: Oral

Studies of fortified settlements in Ukraine in last 10-15 years have moved from the definition of land ownership markers to comprehensive researches related to the exploration of landscapes, ethnic identification, the strategy of defense on the frontiers. All these directions are common to investigations of fortified settlements in different epochs. However, as a specialist in medieval settlement systems, I will talk about the fortresses of the 10th-13th centuries from the territory river Dniester pool.

One of the most common directions of study is the archaeological mapping of region. This direction allows to reveal the degree of archaeological research, areas of traditional settling, agglomeration, and ways of communications. It also allows to create a prognostic models for poorly researched territories. As an example, we could say about the archeological map of the Galician Princedom created by the author, which counts about two thousand archeological sites (settlements, fortresses, cemeteries of 10-13 centuries).

The second direction is the study of settlement structures, which organically arises from a huge array of accumulated information about the sites that we received from the archaeological mapping. This direction allows us to understand how life has changed in a certain area, the stages of growth and decay. After that we get the opportunity to reconstruct landscapes in the areas of study.

The third direction is a comprehensive study of a particular site (complex of sites) which is aimed at reflecting all aspects of life of the inhabitants of the fortress/ Such as from the diet to clothing preferences and features of material and spiritual culture. As an example it could be the citadels of the capitals of princedoms - Zvenyhorod, Halych, Terebovlya, and other center fortresses.

25 EARLY MEDIEVAL HILLFORTS IN CENTRAL POLAND. THE STATE OF RESEARCH AND WHAT NEXT?

Abstract author(s): Sikora, Jerzy (Institute of Archaeology University of Lodz)

Abstract format: Oral

Between 2013 and 2016, researchers from SNAP branch Łódź and from the University of Lodz conducted four programs of comprehensive integrated multi-disciplinary non-invasive research of early medieval strongholds/hillforts in central Poland (medieval lands of Łęczyca and Sieradz). Their aim was to recognise the spatial structure of not only the stronghold but also of the surrounding rural settlement, its environmental background, and preservation conditions. During these programs, twelve strongholds with their vicinity were surveyed. In 2017, a monograph summarising the research was published. Just a few years earlier, in 2014, a three-volume monograph of a multi-year program of multidisciplinary research of the stronghold in Tum was published. In the near future, we expect the same team from the Museum of Archaeology and Ethnography to publish another monograph on the recently finished research of the stronghold in Czerchów. The state of our knowledge seems to have grown considerably over the last decade. But could we really use it to build a comprehensive narrative of changes in the stronghold network and its role in the settlement transformation and development of tribal and state organisations in the Early Middle Ages? What are the prospects for future research? What should be done in the fields of academic archaeology, heritage protection, and public archaeology? And how this quite local, peripheral archaeology of fortification could be relevant in a wider European context?

276 CROSSED APPROACHES TO TRANSITIONS IN THE NEOLITHIC: UNDERSTANDING SOCIAL MECHANISMS UNDERLYING MATERIAL CULTURE TRANSFORMATION USING THE CONCEPT OF CHAÎNE OPÉRATOIRE

Theme: 6. Material culture studies and societies

Organisers: Denis, Solène (Masaryk University; PaTHs Unamur; UMR 7055) - Gomart, Louise (CNRS, UMR 8215) - Tóth, Peter (Masaryk University)

Format: Regular session

The processes underlying change in European Neolithic material cultures are the subject of long-lasting debates, revolving around questions on human group identities, mobility and interactions. In this framework, the sequences of production and use (i.e. the chaînes opératoires) of material goods can act as powerful proxies to grasp the anthropological conditions leading to these critical shifts, as they reveal habits transmitted over generations. Identifying raw material supply territories and processing, as well as the manufacturing processes and uses of the artefacts produced by a given human groups provides information on its sociological nature, as well as evidence on its spatio-temporal trajectories and interactions with other communities (e.g. shared supply territories, exchanges, technical borrowing, stylistic imitation...). A systemic perspective, combining data, appears however pivotal to untangle the social dynamics of the identified communities and eventually assess their role in complex transition phenomena.

The session proposes to discuss the social mechanisms leading to Neolithic material culture transformation, using the concept of chaîne opératoire. By focusing on material culture stability versus transformation in a technological perspective, we wish to investigate the diversity of economic and social patterns at the basis of changes in production and consumption of material goods: who are the groups engaged in material culture change? What kind of interactions can lead to transformation in material culture? As part of these interactions, what is transmitted? What is reinterpreted? What is rejected? Do the different technical spheres display the same rhythms and processes of change and how can these differences be interpreted? Our goal is ultimately to apprehend the different historical scenarios at the root of the turning points identified in the archaeological record.

The session welcomes research on all kinds of artefacts and analytical methods (petrography, technology, use-wear analyses, bio-archaeology...), with an emphasis on integrated approaches combining different types of data.

ABSTRACTS:

1 DYNAMICS OF CULTURAL CHANGES IN THE NEOLITHIC OF THE FOREST-STEPPE VOLGA REGION (EASTERN EUROPE)

Abstract author(s): Andreev, Konstantin (Samara State University of Social Sciences and Education)

Abstract format: Oral

Goal of the presentation - to show the dynamics of cultural changes in the Neolithic of the forest-steppe Volga region. The materials of the research are the complexes of the sites of the Mesolithic and Neolithic eras of the region. When considering the indicated problem, a set of methods was used: typological, palynological, radiocarbon and others.

Neolithization (the appearance of ceramic dishes) in the forest-steppe Volga region is associated with the carriers of the Elshanskaya culture. The first groups of the early Neolithic population appeared in the region at the beginning of the VII millennium BC as a

result of migration from the territory of Central Asia. In the first half of the VII millennium BC the incoming groups coexisted with the indigenous Mesolithic population.

In about 8,200 BC certain groups of the population from the south (steppe Lower Volga region) began to penetrate into the forest-steppe Volga region under the influence of increasing aridization. They interacted with representatives of the Elshanskaya culture and, as a result, the process of forming a new, syncretic tradition began (the Srednevolzhskaya culture). At the same time part of the Elshan collectives migrated from the forest-steppe Volga region to the west and northwest.

By the end of the VI millennium BC, the Elshanskaya cultural tradition was dying out, becoming the basis for the formation of the Srednevolzhskaya culture, which consisted of three elements: Elshanskaya (aboriginal), southern (ceramics, ornamented with pricks - Lower Volga) and western or northern (ceramics, ornamented with a comb stamp - Don and Dnieper or Kama region). During the end of the VI - the middle of the V millennium BC the Srednevolzhskaya culture was developing on the territory of the forest-steppe Volga region which coexisted with the early Eneolithic newcomers in the V millennium BC.

Russian Science Foundation (19-78-10001).

2 TRACING THE NEOLITHIC TRANSITION THROUGH THE FIRST POTTERY (NEOPOT)

Abstract author(s): Tóth, Peter - Petřík, Jan (Masaryk University) - Bickle, Penny (University of York) - Petr, Libor - Slaviček, Karel - Adameková, Katarína (Masaryk University) - Pokutta, Dalia (Masaryk University; University of Stockholm)

Abstract format: Oral

In this paper we will use the most common archaeological find – pottery – to reveal new perspectives of the spread of farming in the Pannonian region. How did pottery first appear in this area? Was it moved by people or was it a local innovation, learned from farming cultures to the south? By application of ground-breaking analytical methods we approach this research question through four inter-related topics: a high resolution mathematical model of radiocarbon dates, technological traditions of pottery, cooking practices (such as the first appearance of dairy products) and provenance of the pottery. Together this forms the basis of the NeoPot project.

In this paper, we will focus on presenting a method of treating the samples for 14C dating, which produced highly precise absolute data. Preliminary results show the earliest pottery appeared in SW Slovakia around 5600 BC, which corresponds with the formative phase of the LBK in Transdanubia (Szentgyörgyvölgy-Pittyerdomb) and Lower Austria (Brunn am Gebirge). Preliminary results of the ceramic technology study of the earliest pottery show the use of grass instead of chaff, which contrasts with Starčevo and Körö/Criș traditions in terms of firing temperature and tempering practices. The work is supported by Grant Agency of the Czech Republic under the contract No. GA20-19542S.

3 CULTURAL TRANSITION OR RUPTURE WITHIN EARLY NEOLITHIC TOOLKITS: THE CASE OF LBK GRINDING TOOLS

Abstract author(s): Hamon, Caroline (CNRS)

Abstract format: Oral

The spread of the Neolithic throughout Europe is accompanied by major technological innovations, among which ceramic productions, polishing tools and grinding tools take a major part. Though often considered poorly indicative from a cultural perspective, neolithic grinding tools offer a wide range of technical and functional characteristics that contribute to differentiate specific regional and chronological patterns. The close study of the distribution of these different grinding tools technologies design diffusion roads and frontier effects that can be interpreted in terms of adoption and innovations through time and space. In the frame of this communication, we will discuss the possible mechanisms related to the adoption or abandonment of grinding tools systems within early neolithic contexts in Western Europe. As but an example, we will discuss the reasons explaining the wide diffusion of emblematic grinding tools types during 5 centuries throughout the European Lbk, and the final abandonment of one of this emblematic implement at the end of the sequence at the arrival of Lbk people on the western margin of the Lbk diffusion between Meuse and Seine. The respective and combined role of possible internal technological innovations related to the evolution of cereal processing and food habits, as well as external cultural influences with a margin effect, will be discussed.

4 TRANSFORMATION OF A NEOLITHIC SETTLEMENT ON THE EXAMPLE OF THE RECONSTRUCTION OF POSSIBLE HOUSEHOLDS ON THE SITE OF HULÍN-PRAVČICE

Abstract author(s): Kalabková, Pavlína (Palacký University Olomouc)

Abstract format: Oral

The multi-cultural Neolithic settlement on the site of Hulín-Pravčice (Czech Republic) has been explored in 2007–2010. The settlement is dated back to the period of the LBK, STK and LgK. Archaeologists uncovered here more than fifty Neolithic house plans and over eight hundred sunken Neolithic settlement features of various shapes and functions (storage pits, clay pits, ovens, building pits). Movable finds are represented by fragments of ceramic vessels, stone artefacts and clay daub. The research outputs also include results of various types of environmental analyses (petrography, archaeozoology, archaeobotany) and a series of absolute dates. The site is located in a region whose natural conditions are ideal for agriculture and permanent settlement. It also lies on the long-distance routes in the basic north-southern communication corridor in Moravia. This is indirectly evidenced by raw materials for lithic industry imported from the Carpathian Basin, Lesser Poland and Bohemia. We suppose that the Neolithic settlement on

this site existed continuously from the end of the 6th millennium until the mid-5th millennium BC. The settlement continuity is also verified by on-site detections – mutual respecting of individual settlement features (houses, households), joint (long-term) use of clay pits, backfilling of the settlement pits with common garbage. An evidence might also be the frequent reutilization of stone tools – for example, the transformation of LBK shoe-last celts (adzes) into the LgK tools, or the production of ceramic spatulas of the LgK from fragments of handled vessels of the LBK. Petrographic analyses of pottery proved that all three Neolithic cultures in this settlement used the same sources of potting clay. The contribution will thus try to use the model example of Hulín-Pravčice to verify the thesis that Neolithic communities intentionally created long-term settlement areas.

5 ATH “ LES HALEURS “, TWO VILLAGES LBK AND BLICQUY/VILLENEUVE-SAINT-GERMAIN: SEARCH FOR TRANSITION MECHANISMS THROUGH THE INTEGRATED STUDY OF PRODUCTIONS

Abstract author(s): Denis, Solène (Masaryk University; UMR 7055) - Deramaix, Isabelle (Agence wallonne du Patrimoine) - Cayol, Nicolas (INRAP; UMR 8215) - Gehres, Benjamin (UMR 6566 CReAAH) - Goemaere, Éric (Royal Belgian Institute of Natural Sciences) - Gomart, Louise - Hamon, Caroline (CNRS, UMR 8215) - Jadin, Ivan (Royal Belgian Institute of Natural Sciences) - Teetaert, Dimitri (Ghent University, Department of Archaeology, Pre-and Protohistory of Europe) - Zeebroek, Martin (RPA)

Abstract format: Oral

At the turn of the sixth to the fifth millennium BC, a historical turning point occurred in continental neolithization of Europe as the Linear Pottery culture broke up into a mosaic of cultural entities. The northern half of France and Belgium were occupied by the Blicquy/Villeneuve-Saint-Germain culture (BQY/VSG). The recently discovered site of Ath “Les Haleurs” in the west of Belgium (Hainaut Province) represents a key site for exploring in detail the mechanisms of the cultural transition between these two cultural spheres. Indeed, established along the eastern branch of the Dender river, the “Les Haleurs” site has the particularity of offering the remains of the two successive Early Neolithic cultures, i.e. Linear Pottery Culture (LBK) and Blicquy/Villeneuve-Saint-Germain. This proximity is exceptional: sites with houses of the two cultures are rare (three sites in Hainaut and two in Hesbaye, the Belgian Liège province) especially when they show such a high closeness (less than 3 meters). Thus, this communication will present the first results of the technological and integrated study of all the artifacts found at the site of Ath “Les Haleurs”. We propose to cross-reference the origin of raw materials, typo-technology, and use-wear analysis of ceramic productions, lithic industry, macrolithic tools, and stone ornaments. The rhythms of change in the different technical sub-systems will then be compared and questioned.

6 EXPLORING THE SOCIAL CONDITIONS OF THE LBK/POST-LBK TRANSITION IN EASTERN BELGIUM THROUGH THE INTERGENERATIONAL TRANSMISSION OF CERAMIC AND LITHIC KNOW-HOWS

Abstract author(s): Gomart, Louise (French National Centre for Scientific Research) - Denis, Solène (Masaryk University, Department of Archaeology and Museology; Université de Namur, Laboratoire Interuniversitaire d’Anthropologie des TECHniques LIATEC)

Abstract format: Oral

In this communication, we will present the results of an integrated technological analysis performed on the ceramic and lithic assemblages from the early Neolithic villages of Verlaine and Vaux-et-Borset (Hesbaye, Belgium), both characterised by a double LBK and post-LBK (i.e. Blicquy/Villeneuve-Saint-Germain, abbreviated BQY/VSG) occupation. Our study, centred on the reconstruction of the manufacturing chaînes opératoires, aims to identify technical traditions, revealing learning networks that are specific to producer groups. Tracking these technical traditions in time and space at the larger scale of Belgium and north-eastern France enables us to assess (1) continuity and ruptures in know-hows in Hesbaye during the transition from LBK to BQY/VSG; (2) the mobility patterns of producers; (3) possible processes of interaction between producer groups. The detailed reconstruction of lithic and ceramic technical know-hows during the transition between LBK and BQY/VSG in Hesbaye reveals distinct producer groups whose spatial trajectories and socio-economic behaviours seem to have changed profoundly at the turning point of the 6th and 5th millennia BC. Our systemic study shows the potential of the chaîne opératoire approach to apprehend the sociological relationships between these two cultural entities and to propose a scenario of historical transition, taking into account the cultural, social and economic dynamics that led to the fragmentation and disintegration of the LBK system.

7 FARMER-FORAGER INTERACTIONS AND THE NEOLITHIC TRANSITION IN NORTHERN BELGIUM: RESULTS OF AN INTEGRATED STUDY OF HUNTER-GATHERER POTTERY AND LITHIC MATERIAL

Abstract author(s): Teetaert, Dimitri - Messiaen, Liesbeth - Halbrucker, Éva - Crombé, Philippe (Ghent University, Department of Archaeology)

Abstract format: Oral

During the 5th millennium BC, the last hunter-gatherers (Swifterbant Culture) of northern Belgium and the Netherlands gradually adopted the knowledge of pottery production, animal husbandry and crop cultivation from farmers of the NW European loess areas. The social mechanisms behind this transition are still poorly understood. So far, there was no clear indication as to which farming populations were responsible for these knowledge transfers. Recently, all pottery and lithic remains from five transitional sites in the Scheldt river valley were studied in detail. The pottery technology and changes in the lithic industry of the hunter-gatherers in northern Belgium indicate that they had strong social relations with farmers of the Blicquy/Villeneuve-Saint-Germain Culture in central Belgium and northern France. This paper presents the main results of these studies. It combines information on pottery/

lithic technology, raw materials and use with archaeobotanical/-zoological data and radiocarbon dates. It is suggested that the hunter-gatherers of the Scheldt river valley adopted the knowledge of pottery production from BVSG potters, and possibly had their first direct contact with domestic animals as well as cereals through interactions with the BVSG Culture, between c. 4800 – 4600 cal BC.

8 NEOLITHIC TRANSITION IN THE EASTERN ADRIATIC: NETWORKS, CULTURAL TRADITIONS AND TECHNOLOGICAL TRANSMISSIONS

Abstract author(s): Kacar, Sonja (TRACES, UMR-5608 University of Toulouse)

Abstract format: Oral

This presentation focuses on the Eastern Adriatic, where beginning of the Neolithic dates back to ca. 6000 cal BC and is associated with the Impressed Ware Culture. However, this cultural uniformity seems to be only apparent, i.e. limited to the same ceramic style. Indeed, the lithic assemblages show obvious regional differences in the organisation of lithic production systems and variable chaîne opératoires, clearly distinguishing two different cultural zones: Dalmatia and Istria. The Impressed Ware lithic assemblages from Dalmatia are characterized by the complex pressure blade production techniques on exogenous south Italian (Gargano) cherts reflecting important socio-economic and technical mutations that are specific to the Neolithic. The technical systems from Istria, however, can be described as local since the locally available cherts were used in on-site expedient production. The bladelets and bladelet-like flakes were obtained by direct and indirect percussion, possibly reflecting some Late Mesolithic (Castelnovian) features.

This difference in technical systems probably reveals different technological traditions in the production of stone tools.

Besides, while the Gargano cherts continue to be used in Dalmatia during the Middle and Late Neolithic, it seems that Istria and Northern Adriatic were excluded from this south Italian chert distribution network. In these regions, from the Early/Middle Neolithic (Danilo culture; after ca. 5500 cal BC), finished products (blank or retouched blades, pressure-flaked arrowheads) on the high-quality exogenous cherts were recorded, but it seems that they were originating from the Northern Italy (Alpine foothills).

In this presentation we aim to understand social mechanisms behind the Neolithic transition by combining different types of data (lithics, ceramics, past subsistence, paleoenvironment...).

The results suggest that during the 6th millennium BC several human groups of different origins and cultural traditions, integrated into different technological networks, were co-existing in the Eastern Adriatic.

9 TOWARDS A MULTI-PROXIES ANALYSIS OF TECHNICAL BEHAVIOUR IN THE EARLY NEOLITHIC PERIOD IN THE RHÔNE VALLEY

Abstract author(s): Caro, Joséphine - Defranould, Elsa (UMR 5608 Traces) - Convertini, Fabien (UMR 5140 ASM; INRAP) - Manen, Claire - Perrin, Thomas (UMR 5608 Traces; CNRS) - Beeching, Alain (UMR 5133 Archéorient)

Abstract format: Oral

During the 6th millennium BCE, the neolithisation of the north-western Mediterranean is marked by the development of the Impresso-Cardial Complex, which gathers several facies. The renewal of the chronometric framework and recent works of synthesis underline the complexity of the spatio-temporal dynamics and allow varied scenarios to interpret this polymorphism. The aim of our paper is to characterise the evolution of lithic and ceramic material productions through the prism of ‘chaîne opératoires’ in order to approach these facies as techno-complexes and to question their cultural reality.

Our investigation concerns the second half of the 6th millennium BCE in the lower Rhone valley. This region is an ideal study area for this type of combined approach: it corresponds to a Neolithic penetration way inland and offers contrasting landscapes, conducive to the diversity of human settlements. In this context, the sites of the Baume de Montclus (Gard Department) and the Baume de Ronze (Ardèche Department) appear as key sites of Holocene prehistory in the south of France. In the Early Neolithic, the stratigraphies of these two sites record a succession of occupations over several centuries (ca. 5600-4800 BCE), attributed to two main ceramic facies: Cardial and Epicardial. Their chrono-stratigraphic articulation offers the conditions for addressing the ruptures or continuities which characterise the evolution of material productions and hence the mechanisms of change.

Thus, this presentation provides an opportunity to introduce a comparative analysis of the origin of raw materials and the ‘chaînes opératoires’, both lithic and ceramic. Several neighbouring and contemporaneous sites can be used for comparison purposes. We try to interpret the different rhythms of evolution of the production sub-systems, to question their relationships with ceramic styles, but also with the development of networks for the circulation of materials or products able to transcend (or not) “cultural” particularisms.

LIVING IN THE MOUNTAINS: SETTLEMENT STRATEGIES FROM THE BEGINNING OF THE HOLOCENE TO MODERN TIMES IN SOUTHERN EUROPE. PART 1

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Alliot, Pascal (Department of Antiquity and Middle Age Studies, Autonomous University of Barcelona - UAB) - Stagno, Anna (Laboratory of Environmental Archaeology and History - DAFIST-DISTAV, University of Genoa) - Olesti, Oriol (Department of Antiquity and Middle Age Studies, Autonomous University of Barcelona - UAB) - Gassiot Ballbè, Ermengol (Department of Prehistory, Autonomous University of Barcelona - UAB) - Portillo, Marta (Institutió Milà i Fontanals, Spanish National Research Council - CSIC)

Format: Regular session

Over the last few decades, our understanding of human occupations in mountain areas of Southern Europe from the Pleistocene-Holocene transition onward has increased notably. Interdisciplinary attempts and the integration of geosciences and natural sciences has become and extension to conventional archaeological approaches. There is a range of evidence for subsistence practices from key moments tracking the emergence of early farming, the domestication of plants and animals, the relationship between socio-economic changes and environmental resources management, and the impact on the environment.

This session will place together recent research exploring settlement patterns from the early/middle Holocene to modern times, through a wide diversity of approaches, such as bioarchaeology, geoarchaeology, archaeometry, technology, landscape archaeology, and ethnoarchaeology. We suggest participants particularly explore human-environment interactions in mountain areas in different regions across Southern Europe through time, and in key episodes of cultural change. Interdisciplinary studies to delineate the complex environmental and social contexts in mountain occupations from all archaeological records and historic periods are most welcome.

ABSTRACTS:

1 THE CERRETANI (ORIENTAL PYRENEES): SETTLEMENT AND PRODUCTIVE PATTERNS FROM THE IRON AGE TO THE ROMAN CONQUEST (4TH-1ST C. BC)

Abstract author(s): Vila, Oriol (Universitat Autònoma de Barcelona)

Abstract format: Oral

The archaeological research developed in the Cerdanya region (Oriental Pyrenees) in the last 20 years has allowed to identify the main settlement, social and productive patterns of the Cerretani, the Iberian community living in the Pyrenees. Considered as a mountain –and marginal– society, not urbanised, the research has showed his complex territorial system (based on several hill-forts), an agro-pastoral productive system (with also complex livestock strategies), and an important development of literacy.

The paper analyses also the process of conquest and integration of the Cerretani to the Roman empire, a process started in an early chronology (mid 2nd c. BC), and well documented thanks to the urbanistic and economic changes identified in most of the cerretanian sites. The continuity of some economic indigenous traditions, can be balanced with the presence of some new requirements (specially about metals) and the influence of the Roman Army occupation. The final abandonment of the Iberian hill-forts, and the foundation of the city of Iulia Libica about the augustean period, show the end of this historical process.

2 INTEGRATED LANDSCAPE RESEARCH IN TER HIGH MOUNTAIN VALLEYS (EASTERN PYRENEES, SPAIN): LIVESTOCK, SETTLEMENT DYNAMICS AND LAND-USE IN A LONG-TERM PERSPECTIVE

Abstract author(s): Palet, Josep Maria - Pescini, Valentina - Colominas, Lúdia - Garcia-Molsosa, Arnau - Euba, Itxaso (Catalan Institute of Classical Archaeology. Landscape Archaeology Research Group - GIAP-ICAC)

Abstract format: Oral

Since 2010, an integrated archaeological and palaeoenvironmental research programme has been developed in the Ter High Mountain Valleys (Eastern Pyrenees), with the aim of studying the long-term landscape shaping of these Mediterranean high-mountain environments. This programme integrated archaeological extensive survey, GIS, excavation and radiocarbon dating of archaeological structures, palaeoenvironmental research, as well as archaeobiological and micromorphological analysis.

Settlements dynamics discontinuities, since the Middle Neolithic-Late Neolithic transition (~3600 cal BC) until modern and contemporary periods, will be characterized together with changes in landscape and in environmental resources management practices.

Results allow drawing a densely exploited landscape, and showing the deep and ancient occupation activities shaping the Pyrenean high mountain spaces. Some of the analysed sites will be discussed. Open-air Neolithic settlements show a strong presence of alpine and subalpine vegetation communities (mountain pine, birch, willow) while an increase in juniper has been highlighted in sites of Roman times and Early Middle Ages. Actually, Antiquity reports an important period in livestock expansion, with an especial intensity from the 2nd – 3rd centuries and during Late Antiquity. Settlement dynamics show a new expansion from the Early Middle Ages (9th 10th c.), with the reuse of roman structures and the construction of new ones clearly more specialized (cheese production). The importance of livestock management practices (including fire-driven forest openings and grazing activities) together with forest exploitation in these areas especially during medieval and post-medieval periods are among the main causes of the timberline low-

ering. Finally, archaeological data attest a new phase of pastoralism expansion from the 14th-15th c. to modern and contemporary periods.

3 ARCHAEOLOGICAL SURVEY IN A HIGH-MOUNTAIN ENVIRONMENT: LIVESTOCK SETTLEMENTS, LAND-USE AND LANDSCAPE DYNAMICS IN PUIGPEDRÓS MASSIF AND DURAN VALLEY (EASTERN PYRENEES, SPAIN)

Abstract author(s): Carbonell, Arnau - Palet, Josep - Colominas, Lúdia - Martínez, Jesús - Pescini, Valentina - Gallego-Valle, Abel - Aliende, Paloma (Catalan Institute of Classical Archaeology. Landscape Archaeology Research Group - ICAC-GIAP)

Abstract format: Oral

Since 2018, GIAP-ICAC has been carrying out an archaeological survey in high-altitude areas in the Puigpedrós mountain range, at the high Segre valley in La Cerdanya (Catalonia). The survey has been guided by previous photointerpretation work in order to carry out a pre-inventory of archaeological structures. A total of 119 structures grouped in a total of 20 sites have been documented. Until now, the research has comprised the excavation of test pits in a total of 5 sites and 16 structures located between 2300 and 2500m. The sites are areas of livestock occupation, dry-stone huts, and enclosures, but also settlements surrounded by dry stone walls, with differentiated occupation phases. The survey has provided an accurate inventory of archaeological structures and has made it possible to study their functionality and chronology, essential features in order to characterize occupation dynamics and land-use in these high mountain areas. The results show a very important occupation sequence with a structurally very important first phase during the late Neolithic, a second period at the beginning of the Iron Age, very rare in High Pyrenean contexts, a Roman occupation, and an expansion of livestock activities in Late Antiquity. Finally, occupation during the Middle Ages (12th-14th centuries) has been also attested. The reutilization of some sites over time explains the excellent state of conservation of many structures and their high heritage value.

4 FLYING OVER THE PASTURES. TOWARDS NEW PROCEDURES FOR ARCHAEOLOGICAL SURVEYS IN HIGH ALTITUDE AREAS

Abstract author(s): Calastrenc, Carine - Baleux, François - Poirier, Nicolas - Antoine, Laurent - Philippe, Magali - Rendu, Christine (CNRS)

Abstract format: Oral

The interest of archaeologists and the dialogue between the human and natural sciences allow us to understand the dynamics of mountain territories. Subjected today to integrated interdisciplinary questioning, they reveal long and complex histories.

The different research teams involved in this work are confronted with the problem of primary data acquisition. As an essential prerequisite for any archaeological research, high-mountain survey has its own specificity and particular challenges.

- How to go beyond the visible threshold, enrich information (subsurface and diversification of sensors)
- How to systematize acquisition to ultimately deal with larger territories.

Accessing the most complete archaeological information in a relatively short period of time is the challenge of the

The new technological advances, the diversification and miniaturisation of sensors, the democratisation and development of aerial drones and the progress in the computer ergonomics of data processing software make it possible to think about the implementation of new procedures for primary information acquisition, data processing and fusion to optimize the detection of archaeological remains in high-altitude environments.

This is what the TAHMM (Télédétection Archéologique en Haute et Moyenne Montagne) research program proposes to do since 2018 (<https://www.tahmm.fr/>). It focuses on four workshop areas located in the Pyrenees.

Its objective is to cross several sources with highspatial, spectral, radiometric and temporal resolution: satellite and UAV remote sensing, geophysics and chemical soil analysis are used for exploratory purposes.

This communication will present the first results of this research.

5 PEOPLING THE ITALIAN MOUNTAINS, 9500-2000 BC: ANSWERING OLD AND NEW QUESTIONS

Abstract author(s): Skeates, Robin (Department of Archaeology, Durham University)

Abstract format: Oral

This paper reviews the current archaeological evidence for the peopling of the Italian mountains over multiple scales of time and space: initially during the Early Holocene by Mesolithic hunter-gatherers, then extending across the mixed-farming societies of the Neolithic, Copper Age and Early Bronze Age (c. 7500-2000 BC). In the process, it provides answers to a series of old and new questions:

How were mountain zones colonised, over time and space? What routes did mobile human groups take within them? What impact did climatic change and fluctuations have on faunal and human territories and subsistence strategies in the mountains? How extensive were human territories within and around the mountains over time and space? How were these territories ordered and marked? In what kinds of mountain habitat did human groups concentrate their activities and related sites? How variable were these sites and activities over space and time? How frequently were these sites abandoned and reoccupied? To what extent were human mobility,

subsistence and settlement practices in the mountains scheduled seasonally? What food and other material resources did people exploit in the mountains? How specialised were these practices? Over what distances were mountain resources transported, and to what extent were these material flows connected to wider networks of production, interaction and exchange? How did these networks vary over space and time? Did human actions have any negative impacts on soil, woodland or wild animals in the mountains? What kinds of social groupings and relations did humans maintain in the mountains? How strongly defined were gender- and age-based activities, identities and relations? How and to what extent did prominent social groups control mountain zones? What kinds of symbolic acts, ceremonies and rituals did human groups perform in the mountains? To what extent did these performances complement socio-economic strategies?

6 CHALLENGES FOR PREHISTORIC ALPINE FOREST SUBSISTENCE ECONOMIES: STRATEGIES OF DIVERSIFICATION, FOOD STORAGE AND PRESERVATION – THE LEVENTINA (TICINO) CASE STUDY

Abstract author(s): Della Casa, Philippe (University of Zurich)

Abstract format: Oral

From around 3500 BCE, all-year inhabited dwellings emerged in the inner valleys of the Alps, to the north and south of the watershed. It is believed that these settlements lived on a simple subsistence economy, not dissimilar to sub-recent ethnographic models in the Alps and other mountain regions. The term "forest subsistence economy" has been coined for such mixed economies relying on farming, breeding and forest products.

Biological macrorests from settlement situations are the most important source of knowledge on early mountain economies, along with archaeological features relating to subsistence activities, and palynological data on vegetation history. A conceptual framework is always needed in order to interpret the data, and propose cultural activity models.

The settlement of Airolo-Madrano TI was excavated in the years 2004–08 (cf. Della Casa ed., Zurich Studies in Archaeology 12, 2018). It is situated at an altitude of 1150 masl, above the Leventina valley floor, in an area situated at the climatic limits of crop cultivation. The excavations yielded abundant material finds and biological macrorests. Charcoal analysis attests for a human-impacted forest environment and an extensive use of ligneous resources, which is also reflected in the local vegetation history. In the archaeological record, a number of stone-lined firing pits bordered by rows of pales stand out as conspicuous features of subsistence activities. These always contain cracked stones and charcoal, various plant remains, burnt animal bones and ceramic shards, and are thus interpreted as pit ovens and drying kilns.

An all-year local subsistence economy can be postulated for the site, completed by the use of the abundant forests and (sub) alpine pastures in the valley. A possible site catchment Airolo-Madrano has been modeled using environmental parameters in GIS. The observed features and phenomena are discussed against the background of seasonal cycles, agricultural produce, and food preservation techniques.

7 THE "MASSIF DU FOSSARD", BETWEEN MOUNTAIN AND FOREST : A WINDOW OPENED ON THE ANTHROPIISATION OF THE VOSGES MOUNTAINS

Abstract author(s): Kraemer, Charles (HisCant-MA - Université de Lorraine)

Abstract format: Oral

For some time now, the mountain has been the object of particular attention. The Vosges massif is no exception. Echoing the work already carried out on the high stubble and the Alsatian hillside, a multidisciplinary team is looking for the dynamics of a forest area on the Lorraine side over the long term. The choice of the "Fossard", which dominates the western foothills of the massif and extends over nearly 150 km² between Epinal and Remiremont, results from the close link with the latter born of a medieval alto abbey founded in a perched late-antique castrum.

In this sector of medium mountains where superficial sandstones rub shoulders with crystalline outcrops, the question arose as to whether the forest that developed after the disappearance of the glaciers, around the tenth millennium before present, has undergone, since the Neolithic period, the same alternation of clearings and recoveries as others. During the first millennium, did it remain a space reserved for the hunting activities of the powerful or, on the contrary, was it only impacted from the 7th century onwards by the monks who cleared the land, as the account of the lives of the holy founders of Remiremont Abbey suggests? Did the abbey develop new models of land management there? Did it encourage the settlement of the massif by clearing the land, as the name "Fossard" evokes, long before its conquest in the 16th century? These are all questions which, thanks to a LiDAR carried out for the occasion and a multi-disciplinary approach, should provide some answers to better understand the phases of anthropisation of this "mountain forest".

This paper will review the results of a first phase of research from a window of about ten km²; it will compare the first field observations with the usual geohistorical sources.

8 THE CHANGING LANDSCAPES OF MONTE PRIMO (CENTRAL APENNINES, ITALY): NEW PERSPECTIVES ON A MONUMENTAL MOUNTAIN TOP SITE

Abstract author(s): de Neef, Wieke (Ghent University)

Abstract format: Oral

This paper presents new research of the monumental mountaintop site Monte Primo near Pioraco (Marche, Italy) and the changing landscape in which it is situated. Monte Primo was in use between the Late Bronze Age and the Roman Republic period and is characterized by a series of large enclosures of uncertain date which cover an area of ca. 2 hectares. The earliest occupation of this 1300 m high summit is often interpreted as a fire offering place ('Brandopferplatz') related to pastoral land use. Iron Age and Roman activity is attested by various bronze figurines found by metal detectorists and/or looting. Geophysical prospection, aerial photography, and surface modelling allowed to analyze the spatial organization of the large enclosures and natural features on the mountain, and to model the ritualized access to the summit. By placing Monte Primo in a longue durée context of increasing social complexity and landscape formation processes, this presentation proposes how this site was embedded in its cultural and natural surroundings, and how its role changed during its 1000-year occupation history.

9 THE BRONZE AGE DEPOSIT OF EL MIRADOR CAVE: A HIGH-RESOLUTION INVESTIGATION OF ANIMAL HERDING USING MICROMORPHOLOGY AND PHYTOLITH ANALYSES

Abstract author(s): Polo-Diaz, Ana (Department of Archaeology, University of Sheffield) - Burguet-Coca, Aitor (IPHES-Institut Català de Paleoeologia Humana i Evolució Social) - Vergès-Bosch, Josep Maria (IPHES- Institut Català de Paleoeologia Humana i Evolució Social; Universitat Rovira i Virgili - URV)

Abstract format: Oral

Mountain areas are key for the investigation of the introduction and expansion of early farming in the SW Mediterranean. During the Late Prehistory caves and rock-shelters were used for herding of domestic herbivores, entailing the formation of deposits commonly referred to as fumiers. These sites, although displaying variable thickness and preservation degree depending on location and time period, commonly consist of a mixture of weathered and burnt organic matter which investigation requires microscopic analytical approaches to fully unravel their composition and formation processes.

El Mirador Cave, is a fundamental site for the study of herding practices in the Iberian Peninsula with an extensive fumier deposit dating back to the Neolithic period. In this presentation we focus on the Bronze Age section of this fumier deposit (2nd millennium cal BC) to explore questions regarding some stratigraphic particularities of the sequence observed in the field.

Integrated data of micromorphological and phytolith analyses allowed us to improve our understanding of the human activities and natural dynamics involved in the accumulation and alteration of the deposit and clarify aspects concerning the taphonomy of the archaeological record.

10 ABOUT A RITUAL DAMAGE OF A ROMAN ARMOR IN A SANCTUARY GURZUFSSKOE SEDLO

Abstract author(s): Novichenkova, Maria (Institute of Archaeology of National academy of Science of Ukraine)

Abstract format: Oral

A paper will deal with the peculiarities of ritual rites hold in a barbarian sanctuary near the pass Gurzufskoe Sedlo, situated in the Mountain Taurica on a height 1434 m under a sea-level – the ritual damage of a Roman armor used as votive offerings. The sanctuary began its functioning not later than the 4th century BC with the use of numerous animal sacrifices. In the last quarter of 1st century BC, there was constructed a new ritual complex with the arch system of ritual pits and the use of fire rituals in rites.

During the investigations, a sanctuary hold in 1981-1993 (the archaeological expedition of Yalta Historical and Literary Museum, the head of an expedition – N.G. Novichenkova) along with the other votive objects there were revealed more than 2600 items, details, and fragments of the Roman military equipment of the 2nd cent BC – 3rd century AD – an offensive, defensive weapons, details of a military suite and camp life. The majority of items date by the Early Principate period. Most part of Roman armor – e.g., the helmets, chain-mail Lorica Hamata, gladii were cut on pieces and dispersed on a vast territory of a sanctuary.

A. HUTS, ENCLOSURES, AND OTHER DRY-STONE STRUCTURES: TOWARDS AN UNDERSTANDING OF THE ARCHAEOLOGICAL RECORD IN HIGH MOUNTAIN ZONES OF SOUTHEASTERN EUROPE

Abstract author(s): Garcia Casas, David (Institute of Heritage Sciences Incipit - CSIC)

Abstract format: Poster

In the last two decades numerous research programs have been carried out in different high mountain zones of Europe. Consequently, new data and a large amount of new archaeological sites are available for areas that had been overlooked in previous research. There are some common problems that researchers in mountain archaeology must face. The first one is the methodology to record and classify an archaeological record that appears sparse in the landscape. Another common problem is the chronological and functional identifications of the remains in a zone without previous archaeological studies and consequently no references to interpret the archaeological sites.

In this poster, I have focus on two case studies located in alpine environments. I have examine the archeological record of the Parc Nacional d'Aigüestortes i Estany de Sant Maurici (Southern Central Pyrenees) and the archaeological record of Ubaye Valley (French Alps). Moreover I have analysed the features of open-air structures in these zones in order to explore if it is possible to build types of pastoral settlements. Finally, in this work I discuss similarities and differences in all zones in two ways: in the features of empirical record and in terms of the evolution of subsistence practices and long-term sociohistorical dynamics.

278 SYSTEMIC APPROACHES TO AGRICULTURAL AND LAND USE CHANGE IN PREHISTORIC SOCIETIES. PART 1

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Antolin, Ferran (Integrative Prehistory and Archaeological Science - IPNA/IPAS, University of Basel; Department of Natural Sciences, German Archaeological Institute) - Whitehouse, Nicki (Archaeology, School of Humanities, University of Glasgow; School of Geography, Earth and Environmental Sciences, Plymouth University)

Format: Regular session

Farming practices are embedded within a complex and inter-dependant system that involves crops and livestock and their management, soils, the environment and climate, as well as social and land-use dynamics. Changes in agricultural practices are therefore never simple or easy to track, but archaeobotanical and archaeozoological data generated over the past few decades informs us that they took place, sometimes at a very broad scale. The question we would like to address in this session is: what drove agricultural changes and innovations in prehistory, when farming practices were mostly locally rooted and depended largely on household level decision-making and what were their social and ecological consequences?

Archaeology has the ability to tackle this complex network of processes and consequences by interlinking multiple proxies that can be evaluated independently, combined and contrasted with multiple sources of information. This session welcomes papers that deal with all types of archaeological proxies that are combined with data on agricultural dynamics at the local, regional or supra-regional scale to understand the scale of agricultural change, innovation and productivity, as well as the effects on social and ecological systems, including land cover and land use change. We particularly welcome multi-proxy and systemic approaches to the understanding of agricultural decision-making in the past.

This session is supported by the AgriChange Project (<https://agrichange.duw.unibas.ch>), funded by the Swiss National Science Foundation (PP00P1_170515) and the LandUse6k working group of PAGES (<https://landuse.sas.upenn.edu/>).

ABSTRACTS:

1 DEVELOPMENTS IN EARLY NEOLITHIC PLANT MANAGEMENT PRACTICES DURING THE EMERGENCE OF HOUSEHOLD-BASED FARMING COMMUNITIES IN SOUTHWEST ASIA

Abstract author(s): Weide, Alexander (School of Archaeology, University of Oxford) - Hodgson, John (Department of Archaeology, University of Sheffield) - Dovrat, Guy (Department of Natural Resources, Agricultural Research Organization, Israel) - Bogaard, Amy (School of Archaeology, University of Oxford)

Abstract format: Oral

This paper discusses a recently developed functional ecological model and its ability to discriminate between different plant management regimes. The model focusses on functional traits positively related to mechanical disturbance (e.g. soil tillage and weeding) and is based on modern vegetation survey data from non-arable wild cereal communities and 'traditionally' cultivated arable fields (=no herbicides and minimal mechanisation) in Israel and Palestine. It is able to correctly reclassify between 83-89 % of arable and non-arable habitats, depending on the combination of functional traits used in the discriminant analysis. This differentiation is primarily based on the absence of tillage and other disturbances related to cultivation in the wild cereal communities. We applied the ecological model to Early Neolithic archaeobotanical datasets, spanning the development from early wild cereal exploitation to established farming communities with domesticated crops. All earlier datasets, which have been claimed to represent systematic cultivation, match the untilled wild cereal communities in our model. Weed floras from unequivocal Neolithic farming contexts match the modern arable fields, indicating that cultivation practices, including soil tillage, intensified during the Neolithic transition. We attribute this to the emergence of increasingly independent households, which had the ability to mobilise more labour than earlier communities, reflecting a change from communally-organised to household-centred subsistence strategies.

2 NEW INSIGHTS ON THE IDENTITY AND DOMESTICATION-STATUS OF 'NEW GLUME WHEAT' IN THE CONTEXT OF BROAD-SPECTRUM SUBSISTENCE AT NEOLITHIC ÇATALHÖYÜK

Abstract author(s): Roushannafas, Tina - Bogaard, Amy - Charles, Michael (University of Oxford)

Abstract format: Oral

Decades of archaeobotanical work have established that the inhabitants of Neolithic Çatalhöyük (central Anatolia) utilised a broad subsistence base which included a diverse range of crops and other food plants. Such a strategy naturally buffers the risk of any one food source failing, and thereby creates a resilient environment conducive to experimentation in cropping. The adoption of so-called

'new glume wheat' (NGW) represents such an innovation, cultivated first by inhabitants of the North area of the settlement, and later replacing emmer wheat as a staple crop across the community.

'NGW' is an archaeobotanical type first identified from Neolithic and Bronze Age sites in northern Greece and subsequently recognised at a wide range of sites across Europe and western Asia. Morphological analyses along with newly-published aDNA evidence, strongly links NGW and the *Triticum timopheevii* wheat group, now restricted to western Georgia. The large NGW assemblage from Çatalhöyük represents a significant source of data regarding this once widespread, but subsequently neglected, crop.

We present new morphological/geometric morphometric analyses of 'NGW' chaff and grain from the eastern mound at Çatalhöyük which use modern timopheevii wheats as reference. By comparing with wild and domesticated timopheevii wheats, it is argued that NGW was actively undergoing processes of domestication during the thousand-year settlement sequence. This local domestication sequence occurred in the context of an established agricultural regime incorporating a range of domesticated crops. Associated arable weed flora suggest that cereals and pulses were grown under relatively fertile and disturbed growing conditions at Çatalhöyük, providing a rare opportunity to assess domestication processes in terms of selection pressures arising in a well characterised agro-ecological context.

3 LANDUSE AND AGRO-PASTORAL PRACTICES FROM A HOUSEHOLD PERSPECTIVE: A MULTI-PROXY BIOARCHAEOLOGICAL STUDY OF AN EARLY NEOLITHIC ASSEMBLAGE FROM SLATINA (BULGARIA)

Abstract author(s): Ivanova, Maria (University of Vienna) - Takorova, Desislava (National Institute of Archaeology, Bulgarian Academy of Sciences) - Gorczyk, John (Cornell University) - Blanz, Magdalena (University of Vienna) - Casanova, Emmanuelle - Evershed, Richard (University of Bristol) - Marinova, Elena (State Office for Cultural Heritage Baden-Württemberg) - Nikolov, Vassil (National Institute of Archaeology, Bulgarian Academy of Sciences)

Abstract format: Oral

Studies of plant and animal remains, combining a range of traditional zooarchaeological and archaeobotanical proxies with novel developments in isotopic and biomolecular archaeology, allow in-depth understanding of prehistoric agro-pastoral systems. Although this approach is equally well suited to uncover inter-regional trends as well as household level decision-making, it is most often employed in broad-scale comparative studies. In contrast, we focus on the bioarchaeological assemblage from one well-preserved Early Neolithic (c. 6100-5850 cal BC) building at the site of Slatina, to uncover the agronomic decisions of an individual household at the scale of the annual farming cycle. The site of Slatina dates to the period of initial establishment of sedentary farming villages. The bioarchaeological assemblage, including a large number of charred annual crops and gathered fruits in storage bins as well as animal bones, originates from a fully excavated burnt house, covering an area of 147 m². Destroyed in a single event of intense conflagration, this large assemblage reflects just one or a few consecutive annual cycles, and thus provides a rare snapshot view of a number of agricultural decisions made during the same short time period. We integrate the results of archaeobotanical and faunal studies with isotope analyses of crops, domestic animals and absorbed lipids in pottery, to reconstruct the household's agro-pastoral decisions regarding crop choices, soil management, animal diet and dairy exploitation within a mixed farming system. This work thus provides detailed insights into past decision-making on a short-term household scale, which are required to understand broader changes in land use.

4 A CHANGE IS GONNA COME: TOWARDS A MULTIPROXY APPROACH TO AGRICULTURAL PRACTICES IN THE NORTHWEST MEDITERRANEAN REGION AROUND 4000 BC

Abstract author(s): Antolin, Ferran (Deutsches Archäologisches Institut; IPAS, University of Basel) - Häberle, Simone - Jesus, Ana - Martínez-Grau, Héctor (IPAS, University of Basel) - Prats, Georgina (Universitat de Lleida) - Schäfer, Marguerita - Steiner, Bigna (IPAS, University of Basel) - Hajdas, Irka (Laboratory of Ion Beam Physics, ETH) - Jaggi, Madalina - Bernasconi, Stefano (Department of Earth Sciences, ETH)

Abstract format: Oral

The diffusion of agriculture from SW Asia to the Southern Balkans was based on a large crop diversity including a wide range of cereals and pulses. A progressive reduction of this suite of crops is observed as farming practices expanded towards the West. In the NW Mediterranean, a rapid focus towards naked wheat and naked barley took place at the end of the 6th millennium cal. BC. Both crops dominated the plant spectrum, together with some legumes such as pea and common vetch, until the end of the 5th millennium cal. BC. For unknown reasons, an increase in glume wheats (either einkorn or emmer or both) is observed in many sites around 4000 cal. BC.

In order to discuss potential explaining factors for this change, a robust archaeobotanical dataset (including new sites with good preservation of plant remains) has been built, along with interdisciplinary analyses of potential crop pests, storage techniques as proxy for household-scale productivity and isotopic analyses of cereal grain that reveal crop growing conditions. These have been combined with a radiocarbon dating programme to secure the necessary temporal accuracy. The main underlying question is whether crop change was a cultural decision or an adaptive response to climatic or other natural hazards and whether any proxies anticipate the change or if it took place suddenly. This work is carried out within the SNF Professorship project AgriChange (PP00P1_170515).

5 PER CAPITA LAND USE AND GLOBAL CLIMATE CHANGE MODELS: TRACKING HISTORIC ANTHROPOGENIC LAND USE THROUGH TIME AND SPACE

Abstract author(s): Madella, Marco (ICREA - CaSEs Research Group - Universitat Pompeu Fabra) - Hill, Chad - Morrison, Kathleen (University of Pennsylvania) - Whitehouse, Nicki (University of Glasgow) - Jiménez-Arteaga, Carolina (CaSEs Research Group - Universitat Pompeu Fabra) - Hilpert, Johanna (University of Köln) - Welton, Lyn (University of Toronto) - Biagetti, Stefano (CaSEs Research Group - Universitat Pompeu Fabra) - Bates, Jennifer (University of Pennsylvania) - Kolár, Jan (Czech Academy of Sciences)

Abstract format: Oral

Humans have been important drivers of environmental change for millennia. Changing human land use drove changes in land cover, with the most dramatic changes resulting from the agricultural revolution and the domestication of plants and animals. Tracking this anthropogenic land cover change (ALCC), through models of historical per capita land use (PCLU) combined with historic population models, is crucial for climate modeling as well as global climate change studies. However, until now, ALCC models have been limited by the relative lack of historical data on per capita land use. There has not been an investigation of how per capita land use is related to climate and the type of biomes where people settled, or how climatic settings influence land use. To address this, we have been building a global database of historic per capita land use. In this presentation we explore this land use data, comparing temporal, environmental, and technological variables in order to understand the archaeological significance of per capita historical land use and, potentially, provide much needed nuance for land cover change models.

6 EUROPEAN LAND-USE AT 6000 CAL BP

Abstract author(s): Whitehouse, Nicki (Archaeology, School of Humanities, University of Glasgow; University of Plymouth) - Vander Linden, Marc (IMSET, University of Bournemouth) - Madella, Marco (ICREA - CaSEs Research Group, Department of Humanities, Universitat Pompeu Fabra) - Antolin, Ferran (Department of Natural Sciences, German Archaeological Institute, Berlin; Integrative Prehistory and Archaeological Science, University of Basel) - Dreslerová, Dagmar (Dept of Archaeology, University of Prague) - Filipovic, Dragana (Institute for Pre- and Protohistory, Kiel University) - Kolar, Jan (Department of Vegetation Ecology, Institute of Botany of the Czech Academy of Sciences; Institute of Archaeology and Museology, Masaryk University) - Marinova, Elena (Baden-Württemberg State Office for Cultural Heritage, Laboratory for Archaeobotany) - Nowak, Marek (Institute of Archaeology, Jagiellonian University) - Out, Welmoed (Dept of Archaeological Science and Conservation, Moesgaard Museum, Højbjerg)

Abstract format: Oral

The PAGES LandCover6K group is concerned with prehistoric human impacts on land cover and if these impacts were sufficiently large to have affected regional climates. This is usually done via modelling land cover using different scenarios. However, there are major differences between the current available land use scenarios, between these scenarios, and reconstructions based on pollen analysis. A promising way to achieve a more realistic assessment of the land use changes needed to affect past climate is to input land use models with more accurate land cover and land use changes inferred directly from both palaeo-vegetation (land cover) and archaeological records (land use).

We present a top-level land use map for Europe at 6000 cal BP and summarise key land use activities for selected regions, derived primarily from radiocarbon dates, compared with site-based distribution maps and records of animals and plants used by people as proxies for the past economy, alongside contextual data. By 6000 cal BP, large areas of Europe were already subjected to land use change, although the intensity of land usage at this time varied significantly between regions, likely the consequence of both gaps in archaeological knowledge and differences in land use practice (e.g. the degree of reliance on agriculture, if any) and population dynamics. Incorporating this variability in land use intensity will produce a considerable improvement in existing land-use scenarios and improve understanding of how past land use may have impacted past climates.

*The European Land use work represents the efforts of many scholars, not all of whom are listed here for reasons of space; a full list of Europe participants is here: <https://landuse.sas.upenn.edu>.

**The PAGES LandCover6K project is co-ordinated by Marie-Jose Gaillard; global land use co-ordinators are Kathy Morrison, Marco Madella and Nicki Whitehouse. The full leadership group may be found here: <http://pastglobalchanges.org/science/wg/landcover6k/intro>.

7 COMBINING SETTLEMENT DYNAMICS AND BIOARCHAEOLOGICAL EVIDENCE FOR INFERRING THE IMPACT OF LANDUSE ON THE NEOLITHIC LANDSCAPES IN SOUTHEASTERN EUROPE

Abstract author(s): Marinova, Elena (Laboratory for Archaeobotany, Baden-Württemberg State Office for Cultural Heritage) - Filipović, Dragana (Institute for Pre- and Protohistory, Christian Albrecht University Kiel) - Gorczyk, John (Dept. Anthropology, Cornell University) - Bulatović, Jelena (Laboratory for Bioarchaeology, University of Belgrade) - Vander Linden, Marc (Institute for the Modelling of Socio-Environmental Transitions, Bournemouth University)

Abstract format: Oral

Bioarchaeological studies of past subsistence are essential for understanding how human societies have shaped their environment. However, those studies only provide an indirect measure of land use and this measure considered on its own has a qualitative

character. A possible way to obtain quantitative estimates for given subsistence pattern and land use lies in the combination of bioarchaeological (i.e. archaeobotany and zooarchaeology) and settlement data (as inferred from 14C-dated sites). Here we test this approach with evidence from the Balkans covering the time span between 8000 and 6000 cal BP and discuss it in view of its implications for reconstructing anthropogenically induced land cover change.

The extent and nature of settlement patterns will be inferred from the analysis of archaeological sites, privileging those with direct 14C information. Diachronic trends in crop and weed diversity will be used to estimate organisation of crop field growing. Human impact on vegetation cover will be further estimated based on wood charcoal data from settlements and the wild/gathered plants component of the archaeobotanical assemblages. Zooarchaeological data will provide a measure of the reliance upon both domesticates and wild animals and their informative value for the land use and landscape development.

8 AGRICULTURAL AND LAND-USE MODELS IN SOUTHERN POLAND: NEW ARCHAEOBOTANICAL DATA FROM EARLY AND MIDDLE NEOLITHIC CASE-STUDIES

Abstract author(s): Moskal-del Hoyo, Magdalena - Korczyńska, Marta - Kapcia, Magda (W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków) - Nowak, Marek (Institute of Archaeology, Jagiellonian University, Kraków) - Kenig, Robert (W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków; Institute of Archaeology, Jagiellonian University, Kraków)

Abstract format: Oral

Loess-mantled areas of southern Poland belong to the first regions occupied by the Neolithic groups. The first communities that were responsible for bringing a new type of economy based on food production appeared in the second half of the sixth millennium BC (the Linear Pottery Culture). Their patterns of farming and spatial arrangements were close to those of the Balkan-Danubian Neolithic cultures. During the first half of the fourth millennium BC these patterns changed considerably, following the appearance and spread of the Funnel Beaker Culture. A relatively intensive agriculture and enclave-type settlement were replaced by extensive, environmentally universal agriculture and more evenly distributed settlement. In this presentation we will focus on plant economy and its implications for the potential land-use models, based not only on farming practices associated with domesticated plants, but also on the use of wild plants. In order to track the evolution of plant-based agriculture in southern Poland, we will present the analysis of charred plant remains coming from recently excavated and thoroughly sampled archaeological sites of the Linear Pottery culture (Biskupice site 18), the Lengyel-Polgar culture (Spytkowice site 26) and the Funnel Beaker culture (Mozgwa site 1-3). These sites were studied in light of all available regional archaeobotanical records and other multi-proxy data. The research was conducted in the context of local palaeoenvironmental conditions since the sites, although located in loess areas, represent different regions, including the foothills, the upland zones and alluvial environments. Also, our study took into account various types of settlements as the data came from relatively small settlements based on a few contemporary households and from large settlements extending over 20-30 hectares.

9 NEOLITHIC LAND-USE IN THE DUTCH WETLANDS: ESTIMATING LAND-USE IMPLICATIONS OF RESOURCE EXPLOITATION STRATEGIES IN THE MIDDLE SWIFTERBANT CULTURE (4600-3900 BCE)

Abstract author(s): Dusseldorp, Gerrit (Faculty of Archaeology, Leiden University; Palaeo-Research Institute, University of Johannesburg) - Out, Welmoed (Moesgaard Museum, Department of Archaeological Science and Conservation)

Abstract format: Oral

The Dutch wetlands witness the gradual adoption of Neolithic novelties by foraging societies during the Swifterbant period. Recent analyses provide new insights into the subsistence palette of Middle Swifterbant societies. Small-scale livestock herding and cultivation are in evidence at this time, but their importance is unclear. Within the framework of PAGES Land-use at 6000BP project, we aim to translate the information on resource exploitation into information on land-use that can be incorporated into global climate modelling efforts, with attention for the importance of agriculture.

A reconstruction of patterns of resource exploitation and their land-use dimensions is complicated by methodological issues in comparing the results of varied recent investigations. Analyses of organic residues in ceramics have attested to the cooking of aquatic foods, ruminant meat, porcine meat, as well as rare cases of dairy. In terms of vegetative matter, some ceramics exclusively yielded evidence of wild plants, while others preserve cereal remains. Elevated $\delta^{15}N$ values of human were interpreted as demonstrating an important aquatic component of the diet well into the 4th millennium BC. Yet recent assays on livestock remains suggest grazing on salt marshes partly accounts for the human values. Finally, renewed archaeozoological investigations have shown the early presence of domestic animals to be more limited than previously thought.

We discuss the relative importance of exploited resources to produce a best-fit interpretation of changing patterns of land-use during the Middle Swifterbant phase. Our review combines recent archaeological data with wider data on anthropogenic influence on the landscape. Combining the results of plant macroremains, information from pollen cores about vegetation development, the structure of faunal assemblages, and finds of arable fields and dairy residue, we suggest the most parsimonious interpretation is one of a limited land-use footprint of cultivation and livestock keeping in Dutch wetlands between 4600 and 3900 BCE.

SOCIAL AND ECOLOGICAL CONSEQUENCES OF LAND-USE CHANGE IN NEOLITHIC IRELAND

Abstract author(s): McClatchie, Meriel (University College Dublin) - Whitehouse, Nicki (University of Glasgow)

Abstract format: Oral

Farming began in Ireland during the early centuries of the Neolithic period (4000-2500 BC). There is widespread evidence for engagement with agricultural activities – both plant and animal – soon after 4000 BC, as well as new ways of shaping local and wider landscapes through the construction of substantial settlements and burial monuments. Although we can detect changing practices in land use during the preceding Mesolithic period, human impacts on landscapes take place on a very different scale during the Neolithic period in Ireland. These new practices do not persist, however. From the Middle Neolithic (starting c. 3600 BC), both arable agriculture and settlement become increasingly difficult to detect in the archaeological record. What were the social and ecological consequences of these shifts in behaviour? This paper will explore dynamic practices in agriculture and land use during the Neolithic period in Ireland, drawing upon a variety of archaeological evidence and proxies, including archaeobotany, zooarchaeology, palynology, palaeolimnology and organic residue analyses. The evidence from Ireland will be considered in the wider context of Europe, drawing upon findings by the LandUse6k working group of PAGES.

BIODIVERSITY AND LAND-USE CHANGE IN THE BRITISH ISLES - A MULTI-PROXY APPROACH TO INTERPRETING HUMAN-ENVIRONMENT INTERACTIONS

Abstract author(s): de Vareilles, Anne (Historic England, Fort Cumberland, Portsmouth) - Woodbridge, Jessie (School of Geography, Earth and Environmental Sciences, University of Plymouth) - Smith, David (Department of Classics, Ancient History & Archaeology, University of Birmingham) - Pelling, Ruth (Historic England, Fort Cumberland, Portsmouth) - Fyfe, Ralph (School of Geography, Earth and Environmental Sciences, University of Plymouth)

Abstract format: Oral

The Biodiversity and Land-Use Change in the British Isles project brings together fossil pollen, plant macrofossils and ancient insect remains to explore past changes in land-use and land-cover in Britain. We have chosen the south-east of England as a case study area where we use the three different lines of evidence to generate a multi-proxy approach to identifying land-use and land-cover changes from the Neolithic to the Roman period. The three sources of evidence enable us to define landscapes at different spatial and temporal scales, offering a novel way by which to investigate past human-environment interactions and long-term changes in biodiversity. Climatic records and population “boom and busts” inferred from summed radiocarbon dates are integrated into our analysis, to better understand the causes and effects of land-cover changes. Initial results have demonstrated complex relationships between land-cover and population density (Woodbridge et al. 2020). This paper will present the methodology and results of our ongoing analyses, which offer new insights into the inter-relationship between land-cover (reconstructed from the palynological data), land-use (from the archaeobotanical data) and biodiversity (from pollen and insect data), and reflects on how these may be integrated to understand ecological change in the past.

Woodbridge et al. 2020. What drives biodiversity patterns? Using long-term multidisciplinary data to discern centennial-scale change. *Journal of Ecology*. DOI: 10.1111/1365-2745.13565

LIVING IN THE MOUNTAINS: SETTLEMENT STRATEGIES FROM THE BEGINNING OF THE HOLOCENE TO MODERN TIMES IN SOUTHERN EUROPE. PART 2

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Alliot, Pascal (Department of Antiquity and Middle Age Studies, Autonomous University of Barcelona - UAB) - Stagno, Anna (Laboratory of Environmental Archaeology and History - DAFIST-DISTAV, University of Genoa) - Olesi, Oriol (Department of Antiquity and Middle Age Studies, Autonomous University of Barcelona - UAB) - Gassiot Ballbè, Ermengol (Department of Prehistory, Autonomous University of Barcelona - UAB) - Portillo, Marta (Institutió Milà i Fontanals, Spanish National Research Council - CSIC)

Format: Regular session

Over the last few decades, our understanding of human occupations in mountain areas of Southern Europe from the Pleistocene-Holocene transition onward has increased notably. Interdisciplinary attempts and the integration of geosciences and natural sciences has become and extension to conventional archaeological approaches. There is a range of evidence for subsistence practices from key moments tracking the emergence of early farming, the domestication of plants and animals, the relationship between socio-economic changes and environmental resources management, and the impact on the environment.

This session will place together recent research exploring settlement patterns from the early/middle Holocene to modern times, through a wide diversity of approaches, such as bioarchaeology, geoarchaeology, archaeometry, technology, landscape archaeology, and ethnoarchaeology. We suggest participants particularly explore human-environment interactions in mountain areas in different regions across Southern Europe through time, and in key episodes of cultural change. Interdisciplinary studies to delineate the complex environmental and social contexts in mountain occupations from all archaeological records and historic periods are most welcome.

ABSTRACTS:

MOUNTAIN LANDSCAPE ECONOMY. CHARACTERIZATION OF ANCIENT AGRARIAN SPACES IN THE UPPER SEGURA RIVER BASIN

Abstract author(s): González Reyero, Susana - Sánchez-Palencia Ramos, Francisco-Javier (Spanish National Research Council)

Abstract format: Oral

Our study of a landscape of prebetic and subbetic mountain ranges in the southeast of the Iberian Peninsula, structured by the upper basin of the Segura River, has led us to the analysis of the productive practices developed in these landscapes. We consider these economic activities as practices integrated into the rest of social activity and as a central aspect to address the processes of continuity and social change in ancient societies.

We have prioritized working on several scales and in a multidisciplinary way. In this presentation we will address the identification and characterization of agricultural production spaces located in the vicinity of the habitats of the 1st millennium BC. In Jutia, the integration of photointerpretation, geophysics, palaeoenvironmental studies and surveys allows us to hypothesize the agrarian use of the valley in a long diachrony, which begins in the 1st millennium BC and includes Iberian and Roman Republican times. In Morra de los Castillejos we have combined photointerpretation and prospecting, identifying possible agricultural structures and a registry compatible with subscriber practices. With this, we seek to analyze the production models of these landscapes, taking into account the mixed models that integrate pastoralism or livestock and taking care of the possible identification of specific solutions of these mountain landscapes.

JURISDICTION, LOCAL SOCIETIES AND PRACTICES. A METHODOLOGICAL PERSPECTIVE ON THE ARCHAEOLOGY OF COMMONS IN THE BASQUE COUNTRY

Abstract author(s): Stagno, Anna Maria (University of Genova - DAFIST- Laboratory of Environmental Archaeology and History) - Narbarte, Josu (University of the Basque Country) - Portillo, Marta (CSIC - IMF, Archaeology of Social Dynamics, Barcelona) - Santeramo, Riccardo (University of Genova - DAFIST) - Tejerizo García, Carlos (University of the Basque Country)

Abstract format: Oral

This papers aims at discussing the theoretical and methodological background of an investigation conducted in different mountainous areas of the Basque Country, focused on the archaeological analysis of the common-lands. This investigation forms part of a wider project (ARCHIMEDE) which tested the possibility to archaeological investigate the jurisdictional dimension of common-lands, through case studies located in different mountains of southern Europe.

Investigations crossed archival research, archaeological surveys and excavation, integrated with geochemical and archaeobotanical analyses, including wood charcoal, pollen, non pollen palynomorphs, phytoliths and other calcitic microfossils and radiocarbon dating. We will focus in particular on the results of the investigation of medieval and post-medieval seasonal settlements (Malla and Beorlatza), where the investigation linked in-site and extra-sites contexts. The aim was to reconstruct changes in the environmental resources management practices and in the way to occupy and inhabit the mountain space, considering practices in their double meaning of ways to product primary products and possession acts to claim jurisdiction and access rights. The methodological question are referred to the relationship between of site and off-site and between synchronicity and diachronicity in the archaeological record and at a micro-analytical level.

IMPACT OF PASTORALISM ON THE OPENING UP OF THE LANDSCAPES OF THE MERCANTOUR AND CRITICISM OF STRUCTURALIST AND PALEOENVIRONMENTAL PARADIGMS

Abstract author(s): Suméra, Franck (Ministère de la Culture France)

Abstract format: Oral

For several decades, two paradigms have organised archaeological research in the Southern French Alps. The first one is linked to a structuralist discourse that refers to the notion of mountain «affordance» and gives a timeless dimension to pastoral practices in the management and organisation of southern Alpine terroirs. The second is linked to the numerous paleoenvironmental studies that have demonstrated the existence of persistent pastoral practices since the Neolithic period and that of an opening of the landscape that has been progressing since the Subboreal, and which speculate on the importance of the causal link between these two facts.

The study presented here reconsiders these paradigms in the light of the signals returned by recent archaeological research and the analysis of archaeological, historical and palaeoenvironmental documentation. It points out the weaknesses of the dominant discourse and shows, through archaeological examples, the non-linear character of the historical processes linked to pastoralism in the Mercantour mountains from protohistory to modern times.

4 ARCHAEOLOGICAL AND PALAEOENVIRONMENTAL SURVEYS IN JURA MOUNTAIN WOODLANDS: METHODOLOGY AND FIRST RESULTS

Abstract author(s): Chevassu, Valentin - Bichet, Vincent - Richard, Hervé - Gauthier, Emilie (UMR 6249 Chrono-Environnement / Université de Bourgogne-Franche-Comte)

Abstract format: Oral

Jura mountains are characterized by a landscape of plateaux and high valleys between 600 and 1700 m high, on the French/Swiss border. This region is nowadays mainly covered by pastures and wooded areas.

Numerous high resolution and well dated paleoenvironmental analyses performed on peat deposits and lakes are available in the studied area. These information items are completed by a large collection of medieval and modern archives, still underused. More recently, facing the lack of archaeological data, a survey program has been launched on this area since 2015 by Chrono-Environnement Laboratory. This program is based upon the analysis of LiDAR data and seeks to bring chronological data about the spotted archaeological structures, often located in mountain spruce forests. Several field approaches have been tried to characterize as well as possible these different types of sites, from pedestrian surveys to test pits. The main results are concerning the numerous remains of medieval and modern forest exploitation - such as tar kilns, lime kilns and charcoal-making platforms - and pastoral activities - modern deserted hamlets and dairy huts, drystone field boundaries -, that were never studied or surveyed before.

A systematic crossing between these different approaches has been done thanks to a database linked to a Geographical Information System. It may be possible then to describe and understand more precisely the evolution of land-use, beyond the usual prejudices about marginality and late land clearing in mountain territories. On another side, the crossing of written sources with statistical analyses of palynological data may enable us to estimate more precisely the impact of various historical phenomenon on the evolution of land-use.

5 BIOSTRATIGRAPHIC ANALYSIS FOR THE HISTORY AND CHRONOLOGY OF ENVIRONMENTAL RESOURCES MANAGEMENT. NEW RESULTS FROM LIGURIAN APENNINES (BORZONASCA, GENOVA, N-ITALY)

Abstract author(s): Attolini, Davide - Montanari, Carlo - Stagno, Anna Maria (Laboratory of Environmental Archaeology and History - DAFIST-DISTAV, University of Genova)

Abstract format: Oral

Based on previous rural archaeology investigations carried out by the Laboratory of Environmental Archaeology and History of the University of Genova in Valle Sturla (Western Ligurian Apennines), the paper aims to discuss possibilities and difficulties to gain a good chronological definition of land management events that can be read in pollen assemblages. The aim is to make it possible to compare and contrast archaeobotanical results with archaeological and archival research in post-medieval contexts. The focus is on the micro-analytical characterization of agro-forestry-pastoral activities as a key element to reconstruct changes in the organization of the local societies and to understand the differences in the population dynamics of settlements. The selected case study concerns Perlezzi, a small hamlet of the municipality of Borzonasca (Genoa, Italy), where pastures, irrigation aqueducts, and terraces are still in use, as opposed to what happens in most of the Ligurian Apennines, characterized by a widespread abandonment of agro-silvo-pastoral activities. Previous research showed a visible change in the relationship between the management of environmental resources (in particular water resources and grazing activities) and the transformations related to access rights to commons, which took place in the last three centuries. Research suggested that between eighteenth and nineteenth centuries, short-distance transhumance ("monticazione") finally established in Perlezzi, leading to important changes in the management of grazing resources, which still wait to be analytically investigated. The study's goal is to verify whether it is possible to observe these changes and better characterise them by means of biostratigraphic sources, i.e. micro and macro-remains preserved in wetlands sediments. For this purpose, we have selected two peat-bogs, "Pian delle Moglie" and "Moglia del Fango", from which samples were extracted for pollen analysis. Multi-proxy analyses have been carried out, including pollen, NPPs, microcharcoal, sediment texture and micromorphology.

6 HISTORICAL PERSPECTIVES ON ALPINE IRRIGATION FARMING AND ENVIRONMENTAL RESOURCE MANAGEMENT

Abstract author(s): de Jong, Carmen (University of Strasbourg) - Meier, Thomas (University of Heidelberg)

Abstract format: Oral

Few studies relate irrigation farming in the European Alps with climate, hydrology and environmental resource management over history. Under current threats of climate change and anthropogenic impacts understanding how alpine irrigation agriculture survived droughts and dry summers in the past is essential. Considerable potential exists for reconstructing hydro-climatological conditions as well as agricultural characteristics such as irrigation canals, fields and meadows. This requires an interdisciplinary approach across geography, hydrology, climatology, history and archaeology ranging from excavations to the study of archives and interpretation of topographic, imagery and lidar maps. Across the southern Alps and inner alpine dry valleys, the beginning of irrigation is not well known but archaeological evidence from the Bronze Age exists in Vinschgau, South Tyrol. Nevertheless, the first written records date from the 12th century AD. In regions with a rainfall deficit, strong winds and southward exposure, irrigation was essential to

increase the biodiversity and yield of hay meadows during the summer at altitudes as high as 2000m a.s.l. Benefits included gravitational water flow from torrents or glaciers that gradually warmed and infiltrated into the soil, bringing water and nutrients directly to the plant roots and reducing evapotranspiration losses. Settlement patterns developed together with irrigation systems, often consisting of multiple parallel irrigation channels. Scattered hamlets appeared at major canal distribution points. Irrigation infrastructure was planned, built and maintained by village councils. Elected officials enforced an equitable allocation of precious water resources especially during droughts. During the 20th century, irrigation canals and participative water management were replaced by larger autonomous farming ventures with individual energy-consuming water pumps and sprinklers causing high evaporation losses. There is no real accountability and sustainability mechanism to prevent water overuse and conflicts especially with growing water pollution and abstractions for tourism. Nevertheless, existing irrigation canals are increasingly restored for tourism and ecological conservation.

7 MOUNTAINS BC/AD. MOUNTAINOUS LANDSCAPES AND ECONOMIC STRATEGIES IN THE CENTRAL-SOUTHERN APENNINES (1000 BC-2021 AD): THE JOVANA VALLEY (ABRUZZO, IT)

Abstract author(s): Del Fattore, Francesca Romana (Università degli Studi Internazionali di Roma)

Abstract format: Oral

The presentation is part of "PECUS", a multidisciplinary research focused on the sheep-tracks network in Central-Southern Italy (www.pecus-project.eu). The field-data (2010- 2016) comes from the "Fluturnum project", conducted in collaboration with the University of Bologna. The aim is to reconstruct diachronically the human landscapes and the occupation/exploitation strategies of a sample territory located in southern Abruzzo - the valley of the Jovana stream (1,200 - 1,600 m a.s.l.) - between the 1st millennium BC and the contemporary age. Archaeology, Ethnoarchaeology and Cultural Anthropology will guide the analysis. The results of surveys and stratigraphic excavations, the testimonies of memory carriers, the study of recent rural architectural evidence and the relationship with the shepherds still active in the area will be used as tools. A representative pattern of the complexity that has characterised the Apennine chain over the last two thousand years. From South to North, along the Jovana stream, three sample areas are taken into consideration: 1) the Godi pass, where traces of seasonal settlements (Late Bronze Age/Early Iron Age) linked to the exploitation of high-altitude pastures have been documented. The area is still used by a family of transhumant breeders, the heart of the PECUS project; 2) the 'I Giardini' complex, where surveys have documented terracing works and considerable quantities of surface materials (8th century BC - 6th / 7th century AD). Excavations here have brought to light a necropolis (1st-2nd centuries BC) and a settlement (3rd-6th centuries AD), probably abandoned following seismic events; 3) Jovana, where remains of a fortified structure from the late Middle Ages and traces of the nearby village are still visible. Ancient landscapes, where recent traces survive, linked to the activities carried out by the local communities until the 1960s and in some cases - in a residual form - still alive today.

8 ARCHAEOLOGY OF MOUNTAINS VERNACULAR ARCHITECTURE. AN EXAMPLE IN MASSIF CENTRAL, FRANCE: THE FARMHOUSE OF CLASTRE

Abstract author(s): Laffont, Pierre-Yves (Université Rennes 2; UMR 6566 CReAAH)

Abstract format: Oral

The farmhouse of Clastre is located in the small village of Sainte-Eulalie (Ardèche) in the south of Massif central, 1230 m high near the Loire river spring. This building, very well preserved today, is the last farmhouse in the heart of a village in France with a roof covered with broom, a very usual kind of covering in this area before WW2.

Until the end of the 1970s, the farmhouse of Clastre was a small classical farm as many others in this mountainous area, specialized since the Late Middle Ages in cattle breeding due to very high quality natural pastures. In the 1980s, the building was bought by a local association in the aim to valorise the local architectural and rural heritage. It became a small open-air museum, presented as a typical example of vernacular architecture dated between the 16th to the 19th century. During this decade, the building was one of the rare farmhouses in France to benefit from the "Monuments historiques" protection programme and during the 1990s it also benefited from some dendrochronological analyses, a very rare experience for this kind of building in France during the 20th century.

A large programme of restoration works in the middle of the 2010s allowed us to engage important studies (archaeological excavations, archaeology of buildings, archeometric analysis, archives analysis) on the building which was in reality not well known and not exactly dated.

The studies have shown that the present building is the result of a very long time history that dates back to Carolingian times, closely linked to the history of the Saint-Eulalie church and presbytery located immediately next to it. The farmhouse plan and appearance changed regularly throughout the centuries until the last important modifications made in the 1930s.

9 SETTLEMENT IN WESTERN MASSIF CENTRAL (FRANCE): THE CASE OF NORTHERN CORRÈZE

Abstract author(s): Pichon, Blaise (Université Clermont Auvergne)

Abstract format: Oral

I will present the results of the research conducted by the Programme Collectif de Recherche «Habitat antique de la moyenne montagne corrézienne» team since 2014 in the East of the territory of Lémovices. We made first a critical review of all of archaeological and paleo-environmental data available for the area. Concurrently, the team defined a protocol for new research on previously

known antique sites. We carried out geophysical prospecting, using several methods (electrical prospecting, magnetic prospecting, georadar), in order to be able to obtain plan on large surfaces, before carrying out excavations on small surfaces in order to have stratigraphical and chronological data. Secondly, we carried out paleo-environmental analyses in wetlands near antique sites.

This work made it possible to better understand the organization of the sites, their architectural characteristics, their functions and their dynamics, from the beginning of the Roman period to Late Antiquity. Now, it makes possible to propose new schemes of development of these territories. The forms of ancient rural settlements are various and adapted to the topographical constraints of the sites where they are located. Other forms of settlement (small towns, public buildings) are now attested on the plateaus in northern Corrèze, making it possible to call the idea of little-developed and sparsely populated spaces into question.

10 SHEPHERDS' LIFE THROUGH PASTORAL GRAFFITI ON MOUNT CORNÓN IN THE FIEMME VALLEY (TRENTINO – ITALY)

Abstract author(s): Bazzanella, Marta - Ciela, Marika - Tavella, Andrea (Museo degli Usi e Costumi della Gente Trentina)

Abstract format: Oral

The writings left by the shepherds on the slopes of the summer pastures of Mount Cornón in the Fiemme Valley (Northern Italy) are more than 47.000 and represent a significant ethnographic heritage of the pastoral culture in the Alpine region between XIV to XIX centuries. The writings record data in order to fix it in memory through the use of support (in this case a rock face) and a medium (a local red hematite pigment known as bó) for the benefit of others (shepherd, passers-by).

The messages, called 'historiolae', contained in the writings consist of a text of variable length, linked to "practical" or "intimate" aspects, usually located after the initials, signature, or family sign of the author. The 'historiolae' count is 2005. Each of them was classified by content: summarized in diary or greeting forms, warnings, exclamations, exhortations, prayers, the shepherds' origin village, pieces of information on working in the mountains, social status, and the mood of the shepherds. Depictions, in association with the 'historiolae', can provide useful information to characterize the author, its political sphere, and in some cases the historical period.

The systematic study of the messages left by the shepherds on the rocky walls of Mount Cornón allowed us to highlight an evolution in the economic exploitation of sheep and goat farming, and also a cultural change. Since the nineteenth century, we can also remark a progressive process of secularization of writings, increasingly characterized by a social affirmation of the shepherds.

11 LIVING IN THE MOUNTAINS: SETTLEMENT STRATEGIES FROM THE BEGINNING OF THE HOLOCENE TO MODERN TIMES IN SICILY

Abstract author(s): Forgia, Vincenza (Dipartimento Culture e Società, Università di Palermo) - Ollé, Andreu - Messana, Chiara - Allué, Ethel - Expósito, Isabel (Institut Català de Paleoeologia Humana i Evolució Social - IPHES-CERCA; Universitat Rovira i Virgili - URV, Dept. d'Història i Història de l'Art) - Martín, Patricia (Institut Català de Paleoeologia Humana i Evolució Social - IPHES-CERCA; Universitat Rovira i Virgili - URV, Dept. d'Història i Història de l'Art; SERP, Departament d'Història i Arqueologia, Facultat de Geografia i Història, Universitat de Barcelona) - Di Simone, Giovanni (Scuola di Specializzazione in Beni Archeologici "Dinu Adamesteanu" - Università del Salento) - Arnone, Massimo (Geologo) - López-García, Juan Manuel (Institut Català de Paleoeologia Humana i Evolució Social - IPHES-CERCA) - Vergès, Josep Maria (Institut Català de Paleoeologia Humana i Evolució Social - IPHES-CERCA; Universitat Rovira i Virgili - URV, Dept. d'Història i Història de l'Art)

Abstract format: Oral

In this contribution, we explore human-environment interactions in the Madonie mountain range, in northwestern Sicily, in a diachronic perspective, analyzing and interpreting the new results of our ongoing research project HUMAnS (Human Upland Mobility in Ancient Sicily). In particular, we present the archaeological evidence recorded with the surface survey of sample areas and the archaeological excavation of a key-site (Vallone Inferno, Scillato – Palermo); then we discuss the results of a spatial analysis aimed to the interpretation of the settlement strategies in their palaeoenvironmental context. In particular, we will highlight the interest for the mountainous environment by prehistoric pastoral communities, mainly during the Middle Neolithic and the transition between the last phase of the local Copper Age and the beginning of the Early Bronze Age, but also during the more recent times. Moreover, we discuss the contribution of the pastoral mobility as one of the main factors for the spread of cultural elements on the island.

12 IGIŁIZ, THE MOUNTAIN OF THE ONE GOD. THE LIVING CONDITIONS OF A MEDIEVAL MOUNTAIN SOCIETY IN THE ANTI-ATLAS RANGE (MOROCCO)

Abstract author(s): Van Staevel, Jean-Pierre (University Paris 1 Sorbonne; UMR 8167) - Fili, Abdallah (El Jadida University) - Et-tahiri, Ahmed S. (INSAP Rabat)

Abstract format: Oral

The archaeological research carried out at Igiłiz in the Moroccan Anti-Atlas range, at once a rural fortress, a place of devotion, a tribal gathering spot, an eagle's nest and the shelter, at the beginning of the 12th century, of a charismatic community led by a Berber religious leader, allows to reconstruct, for the first time in the Maghreb, the history of a mountain society of medieval times in the pre-Saharan area, grasped in its material and symbolic components. The Igiłiz mountain is the birthplace of a religious movement that would lead to the constitution of the most powerful empire – the Almohad Empire (1147-1269) – that had ruled the Muslim West during the Middle Ages. Such a site, as peripheral as it may be, provides a valuable object of reflection on how the state comes to the

tribe and on the endogenous process of the emergence of the state in tribal and rural areas. The paper will focus on the multifaceted main features of this key place in the history of medieval Morocco, with a specific emphasis on material culture and modes of production and consumption in the context of an agro-sylvo-pastoral economy that can be precisely defined by the bioarchaeological approach.

281 RESOURCE USE AND RECYCLING IN URBAN ECOLOGIES

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Fitton, Tom (Department of Archaeology, University of York) - Bobou, Olympia (Centre for Urban Network Evolutions, Institute for Culture and Society, Aarhus University) - Lisowski, Mik (Department of Archaeology, University of York) - Raja, Rubina (Centre for Urban Network Evolutions, Institute for Culture and Society, Aarhus University) - Wynne-Jones, Stephanie (Department of Archaeology, University of York)

Format: Regular session

In this session we invite papers on resource use and recycling in urban settlements from any geographic region, to encourage a broad discussion of urban ecologies from Antiquity to the Early Modern period.

Towns and cities rely on a complex web of resources, woven into the infrastructure and the practices of urban society. Archaeology is increasingly able to characterise such resource use using high-resolution methodologies to investigate human-centred stories about the urban past. These approaches have also begun to recover evidence for 'circular economies' of recycling and reuse in past urban settings, which contribute to contemporary discussions on sustainability and resource depletion.

Archaeological studies of urban ecology rely on combining multiple scales of analysis from domestic production to landscape use, and draw on landscape archaeology, environmental archaeology, and archaeometric studies of craft production among others. This array of methodological avenues also creates a challenge, in that having set out to study environmental resource use, ecological impact, and networked relationships from a wide variety of data sources, it is easy to focus on the results of a single mode of analysis rather than a holistic narrative.

What we offer in this session is the opportunity for researchers from diverse methodological backgrounds to present the results of empirical studies with an emphasis on humanist narratives of resource use and recycling. This might include macro- or micro-scale studies utilising settlement and landscape archaeology, zooarchaeology or archaeobotany, stable isotope or other archaeometric analysis, as well as more traditional archaeological and historic studies, provided the emphasis is on the themes of resource use or circular economies in urban contexts, supported by evidence of practice.

We hope thereby to stimulate discussion on the anthropological narratives of urban dynamics and ways of life which bind archaeological studies of urban ecology, rather than contrasting methodological procedure alone.

ABSTRACTS:

1 WHO CONTROLLED RECYCLING? NEW DATA FROM LATE ANTIQUE ROME

Abstract author(s): Bison, Giulia (University of Leicester)

Abstract format: Oral

In very recent decades, archaeological evidence for recycling in late antique urban centres emerged as a striking feature all across the former territories of the Western Roman Empire. Rome is no exception, with new excavations revealing a widespread pattern of spoliation of classical public and private complexes for recycling.

This phenomenon can be considered a direct reflection of changed political, economic and social life with diverse demands and a different concept of the city and its decorum. Indeed, recycling involved not only urban economics and craft production, but also social practices: in particular, close analysis of the reuse of decayed buildings for recycling offers an important tool to explore the relationship between city-dwellers and site resources and, consequently, social dynamics and power relations within the urban society. Understanding WHO may have controlled and thus could access such spaces and their materials would shed light on how the City was managed, and the new priorities set.

Within this context, metallurgy likely played a significant role in late antique Rome. Metals were vital to city life from multiple points of view (tools, roofing, dress fittings, money, etc) and as a result were a core economic resource and subject to extensive recycling. This paper will frame this process through the analysis of three different case studies, in which prestigious sites located within the former city centre were turned into large-scale metalworking facilities; I will propose a multi-faceted approach that exploits archaeology, texts (including laws) and archaeological science.

Analysis of these metalworking processes and practices through the lens of resource use helps properly question late antique urban systems, economics, authorities and lifeways.

2 THE USE OF RECYCLED MATERIALS IN ROMAN VERNACULAR ARCHITECTURE(S): A CASE STUDY FROM THE PORTA STABIA, POMPEII

Abstract author(s): Poehler, Eric (University of Massachusetts Amherst) - Ellis, Steven (University of Cincinnati)

Abstract format: Oral

The durability of architectural materials makes them a prime candidate for recycling and reuse in urban environments. This is especially true in the context of Roman cities, where stone was a ubiquitous building material and vernacular architecture evolved to require very few specialized forms. This paper explores the recycling of architectural materials through an architectural survey and associated excavation in two complete city blocks in Pompeii's Porta Stabia neighborhood. In general, some ten independent ground-floor properties, constituting more than 400m of standing architecture, document a history of increasing heterogeneity of building materials, revealing the trendline for recycling between the mid-second century BCE and the late first century CE. This trend toward recycled architectural material can be shown to have been punctuated - indeed motivated - by episodic, city-wide growth spurts. More specifically, these architectures provide an opportunity to explore some archaeological approaches to reuse and recycling in stone-built architectures. These methods include qualitative assessments of stone shapes and types, quantitative assessments of material volumes (especially leveling fills), and metrological analyses of cut stones used in framing other materials. Finally, we approach the question of material procurement through the construct of an archetypal, individual builder, in order to set these piecemeal and vernacular construction activities within a broader urban and socio-economic framework.

3 USE AND RE-USE OF ORGANIC RESOURCES IN LIMITED SPACES - MEDIEVAL WASTE MANAGEMENT IN COPENHAGEN

Abstract author(s): Mayer, Simone - Topcagic, Zenon (Museum of Copenhagen)

Abstract format: Oral

The archaeological excavations of 2019/20 at Købmagergade in the inner city of Copenhagen have revealed structures from the 12th to 19th c. AD. The area changed from a peripheral location in the early settlement to workshops and housing for the local nobility. Especially wooden latrines, trenches filled with manure from cattle and horse stables and pits from the 16th century have clearly been filled and recut several times indicating limited space available, but also that the laws not to build latrines, cesspits etc. too close to the city's streets and people's houses were upheld. Perhaps due to these laws we also have an example of a well, being reused as either a latrine or cesspit filled with faeces. Written sources describe that waste and manure was collected and sold to regional farmers as fertilizer for their fields. This suggests regulations from the authorities. Several on-going scientific analyses, such as archaeobiology and ITRAX-scanning, shall help further our knowledge of the workings of medieval waste management. First results show that sorting of waste clearly took place, as latrines and waste pits include almost no archaeological finds such as pottery or bones but were used for human faeces as well as organic household and workshop waste. Earlier excavations in Copenhagen suggested that animal bones and larger scoriae were used as pavement for the medieval town's streets. The medieval recycling and management of waste seem to be more complex than previously thought.

4 PEACEFUL USE OF DEFENSIVE STRUCTURES - SPACE RECYCLING AND ITS SOCIAL AND ECOLOGICAL ASPECTS ON THE EXAMPLE OF WROCŁAW, POLAND

Abstract author(s): Legut-Pintal, Maria (Institute of Archaeology - University of Wrocław)

Abstract format: Oral

A system of walls and moats around the locational city of Wrocław, Silesia, was built relatively early (from around 1240 to 1291). At the same time, the city expanded to the south and east and new external defensive walls and moats were built. From around the half of the 14th century, internal strengthening lost its military function and became a desirable investment area for City Council and townspeople. Until the beginning of the early modern period, a large part of the old fortifications gained new functions and blended into the building structure of the city. Analysis of historical and iconographic sources along with archaeological research conducted from the second half of the 20th century made it possible to trace the forms of land development in place of the former fortifications. A variety of transformations of the use of space from becoming prestigious to degradation has been identified. A defensive wall could be used as parts of new buildings or demolished and used as a building material. Interwalls (Zwinger) were places of craft production, gardens or were built up. The moat transformed into a source of water, a place for removing impurities and a source of energy. The development of the space after the former fortifications has become an opportunity to correct the city's spatial arrangement by, among other things, creating closed settlements for groups of people engaged in onerous activities, unwanted in the very center of the city. Despite the physical and legal unification, a mental boundary between the area inside and outside the inner walls has remained. With this article, we want to discuss the spatial and social aspects of these transformations as well as their impact on the urban environment.

5 FOOD, FODDER AND... CONSTRUCTION MATERIAL! A CONSIDERATION OF RYE (SECALE CEREALE L.) AS A RESOURCE IN TRADITIONAL HALF-TIMBERED HOUSE CONSTRUCTION

Abstract author(s): Filatova, Sofia - Kirleis, Wiebke (Institute for Prehistoric and Protohistoric Archaeology, Kiel University) - Holtgrewe Stukenbrock, Eva (Max Planck Institute for Evolutionary Biology, Plön; Botanical institute, Kiel University) - Krause-Kyora, Ben (Institute of Clinical Molecular Biology, Kiel University) - Claaßen, Benjamin (Max Planck Institute for Evolutionary Biology, Plön) - Torres, Guillermo (Institute of Clinical Molecular Biology, Kiel University)

Abstract format: Oral

The tradition of the construction of half-timbered houses goes back to the Middle Ages and Early Modern period and today these houses are praised as symbols of cultural heritage within many cities in Germany. Hidden behind walls, between floors, and under the rooftops of these historical buildings, are numerous remains of plants that were once used for the purpose of temper of construction materials and isolation of the houses. For our project, "Genetic variation in ancestral crops" within the ROOTS Cluster of Excellence (Kiel University), we focus on the study of plant remains from so-called Wellerhölzer. These parts of half-timbered houses were originally located between floors and consisted of wooden planks wrapped by cereal straw and covered by clay/loam. In many cases the assemblages of straw represent harvests of single crops, typically those of rye (*Secale cereale* L.), and thus form excellent archives for the reconstruction of past agricultural practice and ecology of cultivated fields. In addition, Wellerhölzer provide an important insight into the use of so-called by-products, or threshing remains, of harvests within traditional construction of buildings and thus exemplify the use of the entire harvest (i.e. grains, chaff, culms and weeds) as a resource.

In this contribution, we present the results of archaeobotanical analyses of plant remains that were retrieved from Wellerhölzer from various towns in Germany, dating between the Middle Ages and Early Modern period. We aim to define the types of assemblages that are represented in the Wellerhölzer and to compare them across the different towns and time periods. The results will be used to reconstruct important characteristics of rye cultivation and to shed light on the value of rye straw as a resource in house construction.

6 NEO-ASSYRIAN AGROPASTORAL AND FUEL RESOURCE USE AND REUSE AT ZIYARET TEPE, SOUTHEASTERN ANATOLIA

Abstract author(s): Proctor, Lucas (University of Connecticut) - Rosenzweig, Melissa (Northwestern University) - Greenfield, Tina (St. Thomas More College, University of Saskatchewan) - Matney, Timothy (University of Akron)

Abstract format: Oral

As a multiregional hegemonic state, the Neo-Assyrian Empire mobilized and redistributed commodities throughout its territory, often by extracting resources from its margins, through tax or tribute, and transferring them to the imperial core. However, at the local scale, inhabitants of these provincial areas would have had to balance these requirements against local subsistence needs and sustainable maintenance of the local resource-scape. In this study, we consider how local agropastoral production and fuel harvesting formed a circular economy embedded in the wider land use practices of Assyrian urban centers by combining evidence from excavation with archaeobotanical and zooarchaeological specialist analyses at Ziyaret Tepe (Upper Tigris Valley, southeastern Anatolia). Ziyaret Tepe, identified as ancient Tušhan, was an important urban center and provincial capital on the northern frontier of the empire. Textual accounts have suggested that the region controlled by Tušhan was an important source of timber and surplus grain and livestock for the Assyrian heartland.

Previous work has documented a mixed agropastoral economy at Ziyaret that included large, imperial-managed herds and grain agriculture. Evidence suggests that several products and byproducts of these activities were recycled and transformed for reuse within the subsistence economy, including the use of grain and/or straw as fodder to support herds, and animal dung used as fertilizer and/or fuel. However, analyses of fuel remain from the site also indicate that the Assyrians may have been increasingly degrading the local vegetation surrounding the site through tree clearance and overgrazing at the same time. Together, the data from Ziyaret Tepe paint a complex picture of resource exploitation and management in which agropastoral activities are linked and reused at the local and landscape scale.

7 DUCKS AND GEESE IN ROMAN BRITAIN: A CASE STUDY FROM LONDON DISCUSSING THE USE OF WILD RESOURCES IN URBAN SETTINGS

Abstract author(s): Poland, Ged (Independent)

Abstract format: Oral

The use of wild animal food resources in urban centres is often assumed to be the result of elites procuring speciality food, is often not discussed at all, or cannot be discussed because of methodological constraints in identification. However, wild animal food resources may have presented a seasonal, and perhaps vital, opportunity for all members of society to add variety to the diet, vital protein, and fat.

One aspect of the use of wild meat in urban centres that is particularly rarely discussed is the use of wild ducks and geese. This is despite the frequent recovery of their bones from archaeological sites in Europe. This is largely because until recently there were few options for identifying whether a bone belonged to a wild individual or not, not to say what wild species the bone came from. Following the development of reliable identification criteria using traditional morphometrics and multivariate statistics it is now pos-

sible to reliably identify most duck and goose species in north-west Europe. This paper will discuss the use of wild ducks and geese within an urban setting using sites from Roman London as a case study, comparing the results with sites in other parts of Britain, namely Fishbourne Palace, Caister-on-Sea, and York. It will be discussed whether the assumption that wild meat usually means the actions of elites acquiring speciality food is reasonable, or if it is possible that other groups in urban societies had food procurement networks that mean they can acquire seasonally available sources of meat to augment diets.

8 URBAN STRATEGIES AND RESOURCE USE: MARINE AND TERRESTRIAL FOOD RESOURCES IN THE SETTLEMENTS OF MEDIEVAL ZANZIBAR

Abstract author(s): Lisowski, Mik - Alexander, Michelle (BioArCh, University of York) - Fitton, Tom - Wynne-Jones, Stephanie (Department of Archaeology, University of York)

Abstract format: Oral

The Swahili coast of East Africa is known for its monumental stone towns that developed during the peak of Swahili culture in the second millennium CE. Research interest in the growth of Swahili urban centres has increased in recent decades, but much has to be done to investigate the use of local resources underpinning that urban development. In this paper, we focus on the exploitation of food resources at two Swahili coastal settlements from the Zanzibar archipelago: Unguja Ukuu and Tumbatu. Previous studies suggest that reliance on marine, and domestic and wild land animals at Swahili settlements might have varied; and that strategies often changed over time. To explore this across sites of two chronological periods, we use conventional and – previously scarcely used in this region – biomolecular zooarchaeology, including carbon and nitrogen stable isotope analysis. Results at Unguja Ukuu indicate that during the peak of occupation (7th-10th centuries) the exploitation of marine fauna was extensive, and domesticated and wild mammals seemed to play a smaller role. Excavations across the settlement revealed spatial and chronological changes in the patterns of marine resource use. The town at Tumbatu (11th-15th centuries), in the north of the Zanzibar archipelago, displays a different pattern, much more dependent on land resources. Data on economy, diet, and resource use at those two settlements broadens our understanding of the development of Swahili urbanism.

9 CRAFT NETWORKS AND SCALAR ECONOMIES IN THE SOUTHERN AFRICAN REGION (900-1600 CE)

Abstract author(s): Moffett, Abigail (University of East Anglia)

Abstract format: Oral

Studies of crafting within past societies, that assess interrelated aspects of the craft production system such as the identity of artisans, the organisational and social relations of their production and the distribution and consumption of crafts, provide important an avenue for developing critical, multi-scalar perspectives on past economies and societies. Research conducted at the site of Shankare (900-1300 CE), located near Lolwe mine, the earliest dated copper mine in southern Africa, aimed to explore the ways in which crafters were embedded within regional economic networks and processes. Crafting at Shankare was characterised by a dynamic domestic economy, with copper production taking place in domestic contexts alongside ceramic production and textile spinning indicative of time and labour scheduling and multi-crafting. Exchange and consumption patterns reveal that crafters were networked into a regional economy that facilitated access to locally produced and imported items and technologies. Together with evidence of crafting practices at urban centres such as Mapungubwe (1200-1300 CE) and Great Zimbabwe (1000-1700 CE), this research highlights the variable ways in which craft processes were embedded within the political economy.

282 SYSTEMIC APPROACHES TO AGRICULTURAL AND LAND USE CHANGE IN PREHISTORIC SOCIETIES. PART 2

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Antolin, Ferran (Integrative Prehistory and Archaeological Science - IPNA/IPAS, University of Basel; Department of Natural Sciences, German Archaeological Institute) - Whitehouse, Nicki (Archaeology, School of Humanities, University of Glasgow; School of Geography, Earth and Environmental Sciences, Plymouth University)

Format: Regular session

Farming practices are embedded within a complex and inter-dependant system that involves crops and livestock and their management, soils, the environment and climate, as well as social and land-use dynamics. Changes in agricultural practices are therefore never simple or easy to track, but archaeobotanical and archaeozoological data generated over the past few decades informs us that they took place, sometimes at a very broad scale. The question we would like to address in this session is: what drove agricultural changes and innovations in prehistory, when farming practices were mostly locally rooted and depended largely on household level decision-making and what were their social and ecological consequences?

Archaeology has the ability to tackle this complex network of processes and consequences by interlinking multiple proxies that can be evaluated independently, combined and contrasted with multiple sources of information. This session welcomes papers that deal with all types of archaeological proxies that are combined with data on agricultural dynamics at the local, regional or supra-regional scale to understand the scale of agricultural change, innovation and productivity, as well as the effects on social and ecological systems, including land cover and land use change. We particularly welcome multi-proxy and systemic approaches to the understanding of agricultural decision-making in the past.

This session is supported by the AgriChange Project (<https://agrichange.duw.unibas.ch>), funded by the Swiss National Science Foundation (PP00P1_170515) and the LandUse6k working group of PAGES (<https://landuse.sas.upenn.edu/>).

ABSTRACTS:

1 MODELLING HUMAN-ENVIRONMENT INTERACTION PATTERN(S) OF BRONZE AGE COMMUNITIES OF THE ADRIATIC SIDE OF CENTRAL-SOUTHERN ITALY

Abstract author(s): Lucci, Enrico (Department of Antiquities, Sapienza - University of Rome)

Abstract format: Oral

The Adriatic side of Central-Southern Italy embraces a significant ecosystem variability. During the 2nd millennium BC, this area witnessed the emergence of more complex settlement patterns and demographic growth, as well as new economic and socio-political patterns. Long-lived settlements, characterized by a steady subsistence economy and engaged in exchange networks with the Aegean and Balkans, arose mainly along the south-eastern coastal area. At the same time, inland settlements, which appear to have a less permanent nature, show great capacity of exploiting diverse environmental niches, resulting in a surplus and enabling them to fully participate in the exchange network. Thus, the interplay of structural (demographic growth, environmental productivity and increasing technologies - e.g., arboriculture), sociocultural and geopolitical factors produced multiple trajectories of human-environment interactions over the area under scrutiny.

In this presentation I will propose GIS land use models focused on specific case studies, notably, Bronze Age settlements of highly surveyed inland (e.g. Fucino Lake, Tavoliere plain and Murge) and coastal territories (notably of Molise and Apulia regions) of the Adriatic side of Central-Southern Italy. Discussion will be focused on the integrated approach for synthesizing and analysing economic, sociocultural and environmental data in order to visualise how diverse environmental niches were selected and exploited by the various communities and how these choices transformed in relation to changing socio-political patterns. The analysis will consider both a macro-scale perspective based on regional settlement strategies, palaeoenvironmental proxies and geomorphological aspects and a micro-scale perspective based on land use analysis of the territory surrounding each settlement, possibly used for farming activities and procurement of natural resources (e.g. wood). Pastoral activities and potential mobility strategies will be integrated in the analysis. This study represents one of the first efforts to produce an overarching model of human-environment interaction for this wide area of the Italian peninsula.

2 AN INTEGRATIVE MULTIVARIATE APPROACH TO RECONSTRUCT SUBSISTENCE FROM THE BRONZE TO IRON AGE IN THE SOUTHERN AND CENTRAL LEVANT

Abstract author(s): Vermeersch, Shyama (Institute for Archaeological Sciences at University of Tübingen; Collaborative Research Centre 1070 at University of Tübingen) - Riehl, Simone - Starkovich, Britt (Institute for Archaeological Sciences at University of Tübingen; Collaborative Research Centre 1070 at University of Tübingen; Senckenberg Centre for Human Evolution and Palaeoenvironment at the University of Tübingen) - Kamlah, Jens (Collaborative Research Centre 1070 at University of Tübingen; Institute of Biblical Archaeology at University of Tübingen)

Abstract format: Oral

Faunal and botanical studies are at the heart of reconstructing subsistence strategies and agriculture in past societies. Understanding these practices helps us place social and political developments in their wider contexts. Additionally, we know that animal husbandry and crop cultivation are commonly interlinked in recent and historical agricultural systems. However, the results of faunal and botanical analyses in archaeology are often treated separately, depriving us of a holistic understanding of past subsistence practices. In this talk, we present a customised method to integrate faunal and botanical remains for understanding both components in mixed (pre)historic farming economies. We use multivariate statistics – specifically correspondence analysis – combined with independent variables such as chronology, mean annual precipitation, and elevation. We apply this method to investigate developments in farming systems from the Bronze through Iron Age in the southern and central Levant (3,600 – 586 BCE). We see diachronic developments in animal husbandry and crop cultivation, a distinction between sites in lower and higher mean annual precipitation zones, and a difference between sites at different elevations. As such, this method allows us to not only identify human but also environmental components related to shifts in farming systems and diet. We advocate for making such integrative analyses common practice in bioarchaeology, because only then will we be able to obtain a more holistic picture of the economic basis of past societies.

3 AGRICULTURAL DYNAMICS OF IMPERIAL “PAUSES”: A CASE STUDY FROM IRON AGE ANATOLIA

Abstract author(s): Marston, John (Boston University) - Çakırlar, Canan (University of Groningen) - Meiggs, David (Rochester Institute of Technology)

Abstract format: Oral

Distinct agricultural regimes have been documented to accompany the rise of empires and their expansion into new territories. Agricultural systems in imperial peripheries are often aimed at intensive, extractive production, eroding the autonomy of local authorities and individual farmers and herders, with distinct environmental consequences. Such agricultural systems are often substantively

different from those in place prior to imperial expansion. In contrast, agricultural regimes during imperial “pauses”—archaeologically identifiable moments of autonomy and local decision making—such as those that follow imperial collapse are less well understood. This paper argues that such periods are critical for understanding both imperial agricultural dynamics and agricultural decision-making processes among small-scale, independent communities.

A long-term record of both plant and animal use from the site of Gordion in ancient Anatolia renders it a valuable case study of agriculture during both imperial and inter-imperial periods. The Early Iron Age (c. 1100-900 BCE) is a key period of autonomy, falling between the collapse of the Late Bronze Age Hittite Empire and the rise of the indigenous Iron Age Phrygian state. In this paper I reconstruct agricultural practices from archaeobotanical and zooarchaeological remains, drawing on nascent isotopic research to help identify agricultural strategies and their ensuing environmental implications. The “peak” imperial period before and the “nascent” imperial period following the Early Iron Age help to bookend that period of local autonomy and decision making, highlighting how practices differed during a period of small-scale settlement with a local economic orientation. The implications of this case study for the broader question of imperial environmental legacies in agricultural landscapes are considered.

4 ANTHROPOGENIC LANDSCAPES OF THE LATE BRONZE AGE IN THE SOUTHERN URALS: THE IMPACT OF PASTORALISM ON THE ECOSYSTEM

Abstract author(s): Shcherbakov, Nikolai (Laboratory of method and methodology research, Bashkir State Pedagogical University) - Golyeva, Alexandra (Institute of Geography, Russian Academy of Sciences) - Shuteleva, lia (Laboratory of method and methodology research, Bashkir State Pedagogical University)

Abstract format: Oral

A group of sites belonging to the Late Bronze Age was studied on the territory of the Southern Urals. Geographic location of the studied area - between the European part of Eurasia and Central Asia - makes it possible to trace the movement dynamics of people and technologies. The object of the study was a group of sites united by the middle course of the Urshak river. This area has a high concentration of sites belonging to the late Bronze Age and subsequent periods (early Iron Age and early Middle Ages). The Southern Urals became a contact zone between the Srubnaya archaeological culture and the Andronovskaya archaeological culture (1770 and 1630 CalBCE). This array of sites showed the trend in the development of pastoralism. The population of the Andronovskaya archaeological culture moved from arid climate of the Central Asia to humid climate of the Southern Urals. Multi-proxy analysis including paleosoil analysis, archaeobotany, archaeozoology, isotope analysis, ADNA analysis of settlements and burial mounds made it possible to assess the consequences of the ancient people’s activities on the environment. Representatives of the Andronovskaya culture brought traditions of pastoralism and the building tradition of using simple mud bricks from the Central Asia. In the Southern Urals, this population used gypsum to build houses. Artificial layers of gypsum reached one meter. Accumulation of large amounts of gypsum rocks within the ancient settlement site resulted in contamination of the environment with gypsum. In some cases, the human impact on ancient landscapes has been so profound that local soils still remain significantly affected even after hundreds and thousands of years after ending impact. The properties of the modern soil inside the cultural layer were directly affected by the Late Bronze Age human activities, with 3.5 thousand years being an insufficient timescale to restore the natural soils.

5 MOUNTAIN AGRICULTURE IN THE NORTH CAUCASUS: POLLEN SIGNALS IN PEAT PALEOARCHIVES, ARCHAEOLOGICAL DATA AND SIGNS OF SLOPE TERRACING

Abstract author(s): Ryabogina, Natalia (Tyumen Scientific Centre SB RAS; Institute of Physicochemical and Biological Problems of Soil Science RAS) - Yuzhanina, Eleanora (Tyumen Scientific Centre SB RAS) - Troshina, Alla (Institute of Archeology RAS) - Borisov, Aleksandr (Institute of Physicochemical and Biological Problems of Soil Science RAS)

Abstract format: Oral

Agriculture development in the North Caucasus (Russia) has a few archaeobotanical and archaeological sources, often poorly dated. Therefore, we tried to find alternative data and traced the appearance of agricultural signals from profiles of four mountain peatlands. The presence of cereal pollen, weeds and specific NPP associated with agriculture have been compared with archaeological data.

The earliest pollen markers were found in the 7th millennium BC simultaneously in mountain peat from the Eastern, Central and Western Caucasus. It is crucial that in the Eastern Caucasus this is consistent with the presence of Neolithic settlements in the mountainous zone, while in the Western and Central Caucasus until now there has been no convincing archaeological data confirming the agriculture.

The next interval with agricultural signs appears at different times. In the Eastern Caucasus at the end of the 5th - the middle of the 3rd millennium BC during the existence of the Ginchi settlements. In the Central Caucasus (the end of the 4th millennium BC) and the Western Caucasus (in the first half of the 4th millennium BC), it is associated with the Maikop population and the late Kuro-Araxes.

Later, in the Central Caucasus from the middle of 2nd to the middle of the 1st millennium BC pollen signal associated with the emergence of Koban agro-terraces. Intensive agricultural markers consistent with the construction of mountain terraces are also identified in the Eastern Caucasus in the early Iron Age from the 5th century BC and reaches its maximum 9-12 centuries AD. In the Western Caucasus, terracing has not been detected, and cereal pollen dated of 10th-3rd centuries BC and later.

Such data raise new questions about the age of the first appearance of mountain agriculture and paleoeconomy activity in different parts of the North Caucasus.

Supported by the Russian Science Foundation, project 19-18-00406.

6 PRE-HISPANIC URBAN AGRICULTURE ON VOLCANIC ASH SOILS: GEOARCHAEOLOGICAL COMPARISON OF TWO SITES FROM CENTRAL AND WESTERN MEXICO USING LIDAR

Abstract author(s): Dorison, Antoine (CNRS - UMR7041 ArScAn Archaeology and Sciences of the Antiquity, team Environmental Archaeologies) - Elliott, Michelle (CNRS - UMR7041 ArScAn Archaeology and Sciences of the Antiquity, team Environmental Archaeologies; University Paris 1 - Panthéon Sorbonne) - Clayton, Sarah (Department of Anthropology, University of Wisconsin-Madison) - Pereira, Grégory (CNRS – UMR8096 ArchAm Archaeology of the Americas)

Abstract format: Oral

The Central Mexican Highlands have concentrated human occupations since pre-Hispanic times. Their lake basins with volcanic ash soils constituted good farmlands in an economy without beasts of burden, though subtropical seasonality (humid/dry) – which constrains plants growing cycle – required the implementation of water management techniques. Agriculture was a major structuring principle in the settlement and urbanization processes and pre-Hispanic cities have even been qualified as “sustainable” (Isendahl and Smith 2013). However, research on pre-Hispanic settlement agriculture still presents gaps, beginning with the fact that current knowledge remains chiefly based on post-Conquest 16th century texts written by the Spanish settlers. In the latter and subsequent research, advanced wetland cultivation systems (i.e. raised fields) have received significant attention while simpler rainfed techniques, albeit providing the major part of the subsistence, have received much less notice. In parallel, archaeological works focusing on agrarian features remain rare, even though examples of such features are proliferating across Mesoamerica with the multiplication of Airborne Laser Scanning (ALS or LiDAR) surveys.

To tackle these issues, we present an investigation that addresses the place of agriculture in the urbanization process focusing on rainfed cultivation practices at two sites of the Central Mexican Highlands: Infiernillo (Basin of Zacapu, West Mexico) and Chicolapan (Basin of Mexico). We aim to compare the different intra-site and local agricultural strategies in these two sites, both area having experienced a population increase, an urban agglomeration process and ensuing economic changes between the 7th and the 14th century AD. We focus here on the first step of a novel methodology based on LiDAR-derived data consisting in the mapping of not only archaeological features, but also landforms and soils. Fieldwork (i.e. archaeological and pedological test-pits and analysis) will only be presented here as perspectives as it remains uncertain in 2021 pandemic context.

7 UNDERSTANDING COMMUNITIES THROUGH THEIR FARMLAND. CASE STUDIES FROM SOUTHERN ETRURIA (ITALY) BETWEEN FINAL BRONZE AGE AND FIRST IRON AGE

Abstract author(s): Sotgia, Agostino (Sapienza - University of Rome; RUG - University of Groningen)

Abstract format: Oral

Thanks to a specific GIS model, developed combining agricultural knowledge with information from landscape survey, excavations, palynological and archeozoological data, it is possible to define the land use of human communities.

The idea is that the reconstruction of the primary economy of communities not only allows us to better understand the relation between human and landscape but it also informs us about the very essence of these groups. It is well known, as Marxist theories have taught, that economic production refers not only to an economic configuration but also to a complex arrangement of different social and anthropological patterns within community life. In other words, the economic organization is the backbone of the social one. Since subsistence economies are the basis of economics in prehistoric times, it is necessary to understand them as much as possible. Moreover, as the ancient agricultural production in most cases is an exploitation of common and shared resources (commons), we must conceptualize it in terms of a communal production with its social implications.

The case study presented here shows how it is possible to better understand important historical phenomena through this “agro-economist” approach. In fact, it is precisely the changes in the strategies of primary economies that occurred during the end of the Bronze Age in southern Etruria that are at the basis of the revolutionary phenomenon of social development of the “proto-urban turning point” of the Iron Age, with the transition from villages to the first forms of (proto) cities. It is thanks to the reconstruction of the agro-pastoral production dynamics between 1150 and 850 BC. (different organization between sites, production specialization, gradual transition from collective ownership to private property) that it is possible to better understand this historical phenomenon of great importance for the development of all the communities of the Italian peninsula.

8 MOBILE MANAGEMENT OVER THE LONGUE-DURÉE: ISOTOPIC ($\delta^{7}\text{SR}/\delta^{6}\text{SR}$, $\delta^{18}\text{O}$) AND ZOOARCHAEOLOGICAL EVIDENCE FOR HERDING STRATEGIES IN PREHISTORIC AND ROMAN NORTH ITALY

Abstract author(s): Trentacoste, Angela (University of Oxford) - Nieto-Espinet, Ariadna (IMF-CSIC) - Guimarães-Chiarelli, Silvia (IMF-CSIC; CIBIO/InBIO) - Valenzuela-Lamas, Silvia (IMF-CSIC)

Abstract format: Oral

Livestock mobility, in the form of mobile pastoral strategies and seasonal movements, has long been considered a central part of animal management in the ancient Mediterranean. It is now increasingly recognised, however, that animal husbandry - including the nature and scale of herd mobility - was shaped by its social and economic context, as well as by the natural environment. Alongside

terrain, land use, and the organisation of arable production, political and economic connectivity also presented incentives and obstacles to animal movement. This paper takes a long-term view of livestock management and mobility from the Bronze Age to the Roman period, integrating zooarchaeological, isotopic, and environmental data to investigate changes in animal management and mobility through time. Analysis of strontium ($^{87}\text{Sr}/^{86}\text{Sr}$) and oxygen ($\delta^{18}\text{O}$) isotopes from tooth enamel of sheep/goat and cattle provide new evidence for herd mobility, and information on the localisation of herding strategies and the 'animal catchment' of sites, as well as an indication of animals imported from further afield. Through integration with published zooarchaeological studies and environmental proxies, we aim to assess the changing dynamics of herd mobility and the role of economic connectivity – compared to local ecology – on production strategies.

9 IRON AGE AND ARCHAIC AGRICULTURE IN CENTRAL ITALY: INTEGRATING ARCHAEOBOTANY, ZOOARCHAEOLOGY AND STABLE ISOTOPES ANALYSIS

Abstract author(s): Gaveriaux, Fanny (Department of Earth Sciences, Sapienza University of Rome; Department of Environmental Biology, Sapienza University of Rome) - Motta, Laura (Kelsey Museum of Archaeology, University of Michigan) - Moses, Victoria (University of Arizona, School of Anthropology)

Abstract format: Oral

From the 10th to the 6th century BCE the populations of the Tyrrhenian region in central Italy underwent social, political and economic transformations, including nucleation and urbanization processes which led to the rise of the first city-states. These changes were associated with a demographic growth as well as a significant shift in settlement patterns and size that dramatically restructured life across the region. Previous scholarship postulated that, therefore, the population would have intensified and modified their agricultural practices. However, little is known about agriculture during this period, and only very recently new datasets became available. Here we propose a multi-proxy approach that integrates zooarchaeological and archaeobotanical data with carbon and nitrogen stable isotope analysis ($\Delta^{13}\text{C}$ and $\delta^{15}\text{N}$) on charred cereal grains (barley and emmer). While the first method allows us to have an overview of crop productions and livestock husbandry, the second one permits to better characterize the farming practices used in the fields. This study compares the results from three sites, Tarquinia, Rome and Gabii that underwent this phase of proto-urbanisation and have provided archaeobotanical and zoological remains spanning the whole period.

10 AGRICULTURAL SYSTEMS, FORMS OF SOCIAL ORGANISATION AND LANDUSE IN THE VALENCIAN COUNTRY BETWEEN THE 6TH AND 1ST MILLENNIA BC

Abstract author(s): Jorda, Guillem (Dept. of Prehistory, Archaeology and Ancient History, University of Valencia) - Gordó, Salvador (Departamento de Geografía e Historia, University of La Laguna)

Abstract format: Oral

From the establishment of the first farming communities in the Valencian Country (Eastern Iberia) in the middle of the 6th millennium BC, until the beginning of the Roman presence, changes have taken place that firstly affect the forms of social organisation, with processes of aggregation and disintegration of the population, as well as phases with greater and lesser social complexity. At the same time, the agricultural system has undergone changes, moving from an intensive to an extensive model, with innovations that have also affected the appearance of new crops or the introduction of technological improvements such as the use of animals as draught power or the appearance of metal implements.

In this paper we have selected a series of sites that cover this chronological span and contrast different variables.

- Size of settlements/population volume
- Agricultural system
- Soil quality

Based on these data, it can be seen that intensive models only work when the population is dispersed, given the impossibility of maintaining it over large areas of land. On the other hand, when there are processes of aggregation of the population, a mainly extensive model is chosen, without ruling out the possibility of coexistence with small-scale horticultural production.

At the same time, it can be seen how the selection of crops is conditioned by the quality of the surrounding soils, and in this way, it can be observed how the introduction of metal tools and undemanding crops such as fruit trees made it possible to exploit areas that had not been previously occupied. In short, the study shows how there is a close relationship between the possibilities offered by the environment, technology, social organisation and the use made of the territory by the different farming communities.

11 NICE RICE, CAN I HAVE IT?: MODELLING PRODUCTIVITY AND SUITABILITY OF RICE FARMING DURING THE YAYOI PERIOD IN JAPAN

Abstract author(s): Brainerd, Leah - Crema, Enrico (University of Cambridge) - Madella, Marco (ICREA - CaSEs, Department of Humanities, Universitat Pompeu Fabra) - Yoshida, Akihiro (Kagoshima University)

Abstract format: Oral

The introduction of rice and millet farming to Japan during the Yayoi period (2,800-1,750/1,700 BP) was a significant turning point in Japanese history that subsequently led to the emergence of early states in the archipelago. Rice and millet agriculture were proliferated by migrant communities from mainland Asia; these communities spread into the Japanese islands interacting with the

incumbent population of complex hunter-gatherers, the Jomon people. The introduction of wet-rice farming, in particular, brought major changes in settlement patterns and demography but its adoption was not uniform across Japan, with some areas showing limited to no reliance on the new subsistence strategy and others, after an initial adoption, even reverting to a predominantly hunting and gathering economy. The geographically diverse response to the continental subsistence economy is generally assumed to be reflecting the underlying variation in the environmental and climatic settings of the Japanese islands. However, this assumption remains untested and further exploration of the relationship between environmental and social factors are required to elucidate the diversity of local responses. This paper contributes to this research agenda by modelling the geographic variation in the suitability and productivity of wet and dry rice farming in the Japanese archipelago using ecological thermal niche modelling and retrodictions based on spatial autoregressive models. The latter are based on historic agricultural yield census data from mid-late 19th century Japan and extrapolated to the climatic conditions of the Yayoi period. We assess the limitations and the potential of the two approaches by comparing the two models against each other and their relative fit to the archaeobotanical fossil record.

12 CHANGING FARMING PRACTICES OF A LATE ANTIQUE RIVERSIDE RURAL SETTLEMENT IN THE GREAT HUNGARIAN PLAIN

Abstract author(s): Masek, Zsófia (Institute of Archaeology, Research Centre for the Humanities, Budapest) - Daróczy-Szabó, Márta - Daróczy-Szabó, László (Budapest History Museum) - Kenéz, Árpád (Independent researcher) - Pető, Ákos (Hungarian University of Agriculture and Life Sciences, Institute for Wildlife Management and Nature Conservation) - Rácz, Zsófia (Institute of Archaeological Sciences, Eötvös Loránd University)

Abstract format: Oral

The economic strategies of past communities are especially difficult to assess in a complex way, when the environmental and climatic reconstructions of the investigated landscapes are also in progress. New considerations may be raised when one site could be examined in several consecutive time periods and a comparison of each datasets is also possible.

Time and time again, new waves of eastern communities entered the Carpathian Basin over the millennia. Instead of pastoral practices, these communities mostly tended to settle down, interacting with new neighbouring societies that transformed them as a result, providing various responses to the environmental and social challenges.

In this local study, we would like to present the agricultural dynamics through a site, where a continuous habitation with strong cultural transformations can be traced. The examined time period is the late 4th – early 6th. c. AD. These horizons are referred to different ethnic groups (Sarmatians, Gepids), but today's research uses these terminologies more as chronological concepts. Instead of a large number of Hun-period samples at the site, the results of the transformation processes of the 5th century can be grasped with a contrast of the previous and the following settlement horizons.

We would like to combine the studying of animal and plant resources, livestock management, as well as systematic archaeological evaluation. In the vicinity of the site which lies on the bank of the Tisza river, a mosaic-like landscape structure is determinant. In spite of limited opportunities of re-defining land use, changing dynamics and farming structures are revealed in both agriculture and animal husbandry. These processes coincide with the results of the archaeological assessment; however, there are several explanations for the agricultural changes, the possible causes of which are also discussed.

A. THE VILLAGE AFTER THE CITADEL: THE AGROPASTORAL ECONOMY OF THE MEDIEVAL OCCUPATION OF NIĞDE-KINIK HÖYÜK (CENTRAL ANATOLIA)

Abstract author(s): Castellano, Lorenzo (New York University, Institute for the Study of the Ancient World) - Campana, Douglas (US National Park Service - retired) - Crabtree, Pam (New York University, Department of Anthropology)

Abstract format: Poster

The multi-period mound of Niğde-Kinik Höyük (N-KH) lies in the northern fringes of the Bor-Ereğli plain, an agricultural rich region of southern Cappadocia (Central Anatolia), strategically located on the main routes connecting the Central Anatolian plateau with Cilicia and the Levant. Since 2011 the site of N-KH is under investigation by a joined NYU and Pavia University project. Within this framework, extensive archaeobotanical (wood charcoal and seed/fruit remains) and zooarchaeological research allowed to diachronically reconstruct the agropastoral economy orbiting around the site, throughout its long occupation history spanning from the Bronze Age to the Medieval period.

As part of this broader research project, the aim of this contribution is to communicate the zooarchaeological and archaeobotanical evidence from the latest occupation of N-KH, dating to the Seljuk/Early Ottoman period (ca. 1200-1450 CE). This evidence will be discussed within a broader diachronic framework, providing insights into the degree of continuity and discontinuity in the local and regional agropastoral system.

The changes detected in the archaeobotanical and zooarchaeological record during the Seljuk/Early Ottoman are interpreted as chiefly resulting from changes in the nature of the occupation and to the cultural proclivities brought by new populations settling the area. The latter instance might be suggested by the almost complete disappearance of pig (*Sus scrofa*) from the zooarchaeological assemblage. On the other hand, other aspects of the local agricultural landscape appear in continuum with the earlier tradition, as exemplified by the continuous attestation of botanical macro-remains of grapevine (*Vitis vinifera*), reflecting the long-standing importance of viticulture in the region.

BIOARCHAEOLOGICAL APPROACHES TO FARMING PRACTICES AND PALAEOENVIRONMENT IN THE LATE NEOLITHIC SETTLEMENT OF VINČA CULTURE FROM ȘOIMUȘ-TELEGI (HUNEDOARA COUNTY, ROMANIA)

Abstract author(s): Malaxa, Daniel - Stanc, Simina - Danu, Mihaela (Alexandru Ioan Cuza University of Iasi) - Marc, Antoniu (Museum of Dacian and Roman Civilisation, Deva) - Bejenaru, Luminița (Alexandru Ioan Cuza University of Iasi)

Abstract format: Poster

Archaeological research conducted in 2011 on the Șoimuș-Telegi site (Hunedoara County, Romania) revealed many discoveries (i.e., houses, pits with different destinations, ovens, ditches, ritual deposits, graves), belonging to the Neolithic, Bronze Age, Iron Age and Antiquity.

The present study tries to answer questions related to farming practices and palaeoenvironment in the southwest of Transylvania during Late Neolithic, from interdisciplinary perspective, valuing archaeozoologically and archaeobotanically the Vinča site of Șoimuș-Telegi (5300-4500/4450 cal BC).

The archaeozoological sample comprises 1523 faunal remains which belong to mammals (85.82%), bird (0.06%), and mollusks (14.06%). Almost 86% of the identified mammal remains are of domestic species: cattle (*Bos taurus*), sheep (*Ovis aries*), goat (*Capra hircus*), pig (*Sus domesticus*) and dog (*Canis familiaris*). Slaughter ages suggest the management of cattle and sheep/goat for both secondary products (e.g., milk, traction) and primary ones (e.g., meat), while pig mostly for primary products (meat, fat).

The wild mammals represent about 14% of the identified remains belonging to this class. Some species, especially of large mammals, were hunted for meat: red deer (*Cervus elaphus*), wild boar (*Sus scrofa*), roe deer (*Capreolus capreolus*), wild horse (*Equus ferus*); others provided also leather or fur, such as hare (*Lepus europaeus*), beaver (*Castor fiber*), bear (*Ursus arctos*).

The skeletal frequency indicates that both domestic and wild animals were slaughtered in or near the settlement, as remains from all body regions were identified (excepting wild species with small number of remains: wild horse, wild donkey, aurochs, etc.). The presence of the freshwater mussel (*Unio* sp.) is an indicator that the Vinča community from Șoimuș-Telegi practiced also the mollusk gathering for an additional source of food.

In our research, phytolith analysis represents another way to interpretation the cultural layers and makes possible the reconstruction of the settlement palaeoeconomy. Phytolith assemblages also offers information on the palaeoenvironment.

INNOVATIONS, IDEOLOGY AND INTERACTIONS - THE NARRATIVES OF EARLY MODERN DECORATED EARTHENWARE

Theme: 6. Material culture studies and societies

Organisers: Witte, Frauke (Museum of Southern Denmark) - Wennberg, Tom (Gothenburg City Museum)

Format: Regular session

Material culture has a symbolic value and can be used actively in social and economic relations. The time of the Reformation put focus on the relationship between the individual and Christianity, and the Renaissance challenged the medieval perception of art. These changes often demanded that each person should take a stand in the community as an individual. This position was communicated to the community through material culture.

One medium was pottery. In the 15th and 16th centuries potteries in various regions of Northern and Central Europe started to produce new forms, which can be decorated using new technologies, such as coloured glaze, slip-painting and Scraffito. The interaction between producer and customer after 1500 for a while came under the influence of the big religious and political questions of the time. This allowed expressing certain signals and values and a kind of personal choice of decoration. As the motifs used were quite similar all over Europe, they can be interpreted as well-known symbols – both in connection with the bible and with rather profane aspects of life. Later, in the 18th century, also written statements appear on pottery. We must ask ourselves, if the material also was perceived as a kind of “everyday art”, being displayed and placing the owner in a social and cultural group.

This session aims to compare the motifs in a wider European perspective to discuss the question of understanding the decorations as symbols and the objects as art and representative pieces besides its function. Also chronology of the objects is relevant as it reflects the delay of adapting new fashion from south to north, which can shade light to the transport and implementation of ideas. We welcome papers presenting decorated early modern earthenware from all European regions with an emphasis on the motives and their meanings.

ABSTRACTS:

1 NEW DATA ON 13TH-15TH CENTURY CERAMIC PRODUCTION IN BENEVENTO (CAMPANIA, ITALY): THE EXCAVATION OF THE MONASTERY OF SANT'ILARIO

Abstract author(s): Rapuano, Silvana - Rotili, Marcello (Università della Campania Luigi Vanvitelli)

Abstract format: Oral

The present paper is focused on the preliminary results from the study of pottery coming from the site of the church of Sant'Ilario a Port'Aurea, located in the north-eastern area of the historic center of Benevento, in the southern Italy. The church was built in between the end of the 7th and the beginning of the 8th centuries and owes its name to the close Arch of Trajan, which was also known as “Porta Aurea” (i.e. Golden Gate) being, at that time, incorporated into the town walls. The first cenobitic nucleus was added to the cult hall soon after the construction. In particular, the fictile finds here analyzed and belonging to several ceramic classes, with strong technological differences, come from 13th-15th century strata formed in the area in front of the church and in the coenobium. Those finds and many other artefacts were dug up during the years 2001-2002 by the Archaeological Superintendency of Benevento, during a campaign financed with public funds allocated for the construction of the so-called Trajan Arch's Park. However, since at that time the finds were not analyzed in depth and even the documentation on the excavations is still unpublished, the group of medieval archaeologists of DILBEC, at the University of Campania “Luigi Vanvitelli”, is currently working on it. The research is conducted under the scientific direction of Marcello Rotili, who carried out long-term research in Benevento, in agreement with the Superintendence of Archeology, Fine Arts and Landscape for the provinces of Caserta and Benevento, and aims to shed light on the production, dissemination and use of this kind of pottery in the Benevento area. In this framework, the preliminary results we present here are the first of a promising sequence.

2 MODERN DECORATED EARTHENWARE IN THE NORTH OF FRANCE BETWEEN THE 16TH AND 18TH CENTURIES

Abstract author(s): Vincent, Vaiana (INRAP)

Abstract format: Oral

This paper proposes to question the modern decorated earthenware discovered in the North of France. The 16th century shows a profusion of ceramics decorated with sgraffito, notably the Beauvaisis productions. In the region, no other potter's workshop is known to have attempted the same type of decoration. Their reputation and success was such that they were later widely distributed in Northern Europe. Slip decorations succeeded them. At first dominated by the German workshops at Werra, several local workshops then tried their hand at this technique, creating their own decorative field with their subtlety. It will also be interesting, through certain consumption sites, to see the choices made for decorated stoneware. The decorations take up both religious and secular themes and the choice of consumers, according to the nature of the site observed, may reveal important information. If the 17th century in the North of France was largely dominated by the arrival of majolica and earthenware from the Netherlands, the first regional earthenware factories (notably that of Lille) appeared at the beginning of the 18th century. The study of several production sherds from waster pits allows us to characterize for the first time as closely as possible this production from Lille, whose decorative repertoires were inspired both by the great center of Delft and by the productions of Rouen (in Normandy), from which many workers came. This paper will be based on the study of ceramics from both production centers and consumption sites, dealing with the motifs created/chosen, their possible symbolism, the chronology in the North of France and the adaptability of local pottery centers to compete with the large “international” productions with a wide distribution.

3 PORTUGUESE CERAMICS AS A VEHICLE FOR EUROPEAN AESTHETIC SYMBOLIC MESSAGES (1550-1800)

Abstract author(s): Casimiro, Tania (HTC NOVA University of Lisbon)

Abstract format: Oral

Portuguese ceramics were widely distributed in Europe from late 16th to early 18th century. These objects correspond to a large variety of wares mostly destined to the transportation of goods or used as table ware. Although blue on white tin glaze wares are the most abundant, red wares were also highly demanded. These presented decorations which enriched the aesthetic portfolio of European houses in a perfect balanced relation with Spanish, Italian, Dutch and English wares, all in circulation at the same time. These were high quality productions and destined to a wealthy market with many on-demand peculiar objects.

This paper discusses styles and decorations, their influences and originality and how can they help to build a historical narrative. Most importantly it aims to understand the symbolic demands that European populations made of tableware, through mythological, biblical, historical, and political representations and how Portuguese pottery workshops and artists responded to that demand.

4 LEAVES, CIRCLES, WAVES AND MORE - DECORATED LEAD-GLAZED EARTHENWARES FROM THE GOTHENBURG AREA IN THE EARLY MODERN TIMES

Abstract author(s): Wennberg, Tom (Museum of Gothenburg) - Gustavsson, Jeanette (Rio Göteborg) - Forsblom Ljungdahl, Veronica (Arkeologerna)

Abstract format: Oral

The production of slip-decorated lead glazed earthenwares on the west coast of Sweden from Early modern times is still a largely unresearched area. We are at this point not sure exactly what was produced locally and what was imported. We do have a general idea of what that could be though, and ICP-analysis has been done that starts to shed light on this subject. Much of the decorated pottery is likely to have been imported, possibly from present day Germany and Holland. This paper will suggest a general chronology of slip-decorated lead glazed earthenware in the urban contexts of Nya Lödöse and Gothenburg as we understand it today.

Introduction of slip-decoration on pottery in Nya Lödöse (1473-1624) is closely associated with the increased use of plates and bowls in the later period of the town during the second half of the 16th century. Before that time, decorated pottery is rare. The main motifs seem to be simple geometric and floral patterns. There are a few examples of birds and one or two examples of fish motifs. So far, no examples of other animals or human figures have been identified.

Gothenburg is the urban continuation of Nya Lödöse (1619-present). In general, the use of decorated larger plates and bowls continues in Gothenburg, but the motifs become more varied. There are primarily flowers and other vegetative motifs but other motifs like geometrical forms, animals and people are to be found. During the late 17th century, the tulip seems to be very popular but other motifs are used. In the late 17th and early 18th century there are two traditions emerging. One with simpler motifs for everyday use vessels and one with more elaborate motifs that depict cultural traits.

5 THE PAINTED EARTHENWARE OF THE LOWER RHINE REGION - A CERAMIC MEDIUM AND ITS CULTURAL CONNECTIONS

Abstract author(s): Röser, Christian (LVR-LandesMuseum Bonn; Rheinische Friedrich-Wilhelms-Universität Bonn)

Abstract format: Oral

For a long time, the painted earthenware of the Lower Rhine Region was regarded primarily as an autonomous phenomenon that reflected local everyday culture. In addition the misleading term 'peasant pottery' ("Bauernkeramik"), which was sometimes chosen for this ware, placed it in the context of lower social classes. However, these attributions did not do justice to the Lower Rhenish Earthenware, for the realities of its creation, production and distribution were far more complex. Its motifs and stylistics certainly show unique and characteristic features, but these can only be understood in an analysis that is trans-regional and also goes beyond the material of ceramics. Technical and stylistic traditions going back further in time place the Lower Rhenish Earthenware in a broad European perspective. The emergence of the production of polychrome painted earthenware in the Lower Rhine Region at the end of the 17th century and the establishment of a putting-out system through which this ware was exported, especially to the Dutch Republic, has to be seen as a consequence of economic changes and the shifting of trade routes for ceramics in Northwest Europe.

This contribution attempts to present these versatile connections and contexts and to incorporate the latest insights resulting from the BMBF project 'Medium:Keramik – Produktion, Verwendung und kulturelle Bedeutung rheinischer Keramik mit Bildsprache und Symbolik in der frühen Neuzeit', thus providing an overview of the current state of research and future perspectives.

6 A NEW DISCOVERED POTTERY PRODUCTION SITE OF HORN-PAINTED SLIP WARE FROM DESSAU AT THE ELBE RIVER (SAXONY-ANHALT/GERMANY)

Abstract author(s): Petzschmann, Ulf (Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt)

Abstract format: Oral

Recently finished excavations in the Early-modern suburb outside the town wall of Dessau investigated around 2000 sqms. of a densely built-up urban area. Wasters and other pottery production related finds give strong evidence for a long tradition of pottery production on the site from the 16th to 19th century, albeit no pottery kiln was found. One of the main products from Dessau was obviously horn-painted slip ware, which was found overall the place in almost every layer and every context. There are several well-dated closed find contexts like an earth cellar and several backfills in wells and cesspits which shed light on the development of the painted slipwares from around 1600, around 1750 and the first half of 19th century.

The paper presents plates, dishes and miniature vessels from each of these periods in chronological order. The various decoration techniques like chattered- and sgraffito-decoration, inscriptions and different ways of horn-painting give a good impression of pottery traditions in a minor town at a major river in central North-Eastern Germany. The geographical placement of Dessau connects this region to the North Sea and the southern Baltic. The presentation of these regional slipwares can give a basis to discuss the general development of horn-painted slipware throughout Northern and Central Europe.

7 ADAPTATION OF NOVELTIES IN POTTERY PRODUCTION AND DECORATION IN POMERELIAN TOWNS IN POST-MEDIEVAL PERIOD

Abstract author(s): Starski, Michal (Faculty of Archaeology University of Warsaw)

Abstract format: Oral

The paper aims to describe the changes in pottery production and the range of ceramic vessels used in the Pomerelian towns from the 16th to the 18th century (Gdańsk Pomerania). The main area of considerations will be the issue of introducing new production trends, new forms of vessels and their ornamentation, as well as the associated symbolism. The impact of the Reformation will also be the background for the observed changes, as well as local production trends and regional trade influences. This problem will be presented based on an analysis of selected collections from the principal city of the region, i.e. Gdańsk, and several smaller urban centres (such as Człuchów, Chojnice, Debrzno, Łębork, Puck and Skarszewy). As a result of this presentation, the similarities and differences in the adaptation of new products in post-medieval pottery, including the share of foreign products in the range of used vessels, will be outlined.

8 FORGING IDENTITIES IN EARLY MODERN CARNIOLA: THE CASE OF LOKA PAINTED WARE

Abstract author(s): Predovnik, Katarina (University of Ljubljana, Faculty of Arts, Department of Archaeology)

Abstract format: Oral

In central Slovenia, the former Duchy of Carniola, the production of decorated earthenware first began in the mid-sixteenth century. This so-called Loka Painted Ware (LPW) is characterized by polychrome painted and in some cases incised (sgraffito) decoration on white slip coating covered with transparent glaze. Large bowls and plates predominate, clearly intended for display. The decoration includes combinations of geometric and floral motifs as well as depictions of animals (birds, fish, deer) and people, both portrait busts and full-figure representations. Some vessels also bear inscriptions and dates. Production of LPW lasted at least until the early years of the seventeenth century, when it was replaced by various, more austere productions of slip-painted and monochrome-glazed pottery.

While the decorative techniques and motifs of LPW are undoubtedly derived from earlier and contemporary Italian ceramic wares, the vessel forms, stylistic execution, and preference for particular motifs, as well as the colour palette, are quite distinctive and original. LPW can therefore best be understood as a cultural hybrid that emerged under the conditions of increasing literacy, education, and both physical and social mobility of people during the Reformation and Renaissance. As an affordable local alternative to imported Italian majolica and sgraffito wares, LPW has been interpreted as a resource for the emulation of polite behaviour by the middle classes in the processes of cultural change and social differentiation of early modern Carniolan society. The presumed symbolic meanings of the painted motifs and year numbers will be discussed in terms of identity formation, using a relational approach to material culture that interprets artefacts as social agents forming networks of relationships with people, places, and other objects.

9 FEASTING & DANCING - PURE JOY OR GUILTY PLEASURE? FESTIVITY MOTIFS ON VESSELS AND TILES FROM EARLY MODERN TIMES

Abstract author(s): Krukowska, Olga (Archaeological Museum in Gdansk)

Abstract format: Oral

The article presents selected ceramic artefacts as stoneware jugs, Werra ware, stove tiles decorated with everyday scenes coming from early modern times. The artefacts have origins in Gdansk and they have got their analogies amongst the artefacts coming from Europe. Decorative motifs that are going to be presented are scenes with dancers, feasts and weddings. These scenes often imply some symbolic, hidden meaning we cannot always understand. One character I would like to draw the attention to is the seemingly unconcerned jester. A jester, so called a fool was often associated with joy, fun and jokes. Although feasting and dancing were portrayed in art for centuries and as decorative motifs they had various meanings depending on the epoch, a jester was always omnipresent in many fields of art and his symbolic meaning remained unchanged for centuries. Only the thorough knowledge of the epoch may enable us to understand the hidden messages.

10 FOR ONE KNIGHT ONLY? SYMBOLISM AND MEANING IN THE DECORATION OF STENHOUSE REDWARE CERAMICS

Abstract author(s): Hall, Derek (Independent Contractor)

Abstract format: Oral

Amongst the limited number of pottery kilns and workshops so far discovered in Scotland is the Scottish Redware production centre at Stenhouse near Falkirk in the Forth Valley. First discovered in the 1950's during sand quarrying by the Carron Iron Company the site and pottery assemblage were finally written up by the author twenty years ago and a further adjacent part of the pottery was excavated by him in the early 2000's. This example of a late 15th/16th century Scottish Redware production was distinguished by the use of a distinctive group of symbols and decorations on the pottery that have been linked to the site's ownership or patronage by the Knights of St John of Jerusalem at their preceptory of Torphichen which lies 14 and a half Kilometres to the South of the site. This paper will discuss the use and meaning of these decorative styles from the perspective of Scottish pottery studies.

11 A FORGOTTEN ART HISTORY?

Abstract author(s): Johansen, Iben (Museum Sønderjylland)

Abstract format: Oral

This presentation will start with the simple question: Is decorated Danish pottery from 1500-1800 art? The question is interesting because pottery, and decorated household items in general, have been written out of western art history. In recent years it has gotten a revival as a beloved medium in contemporary art.

To answer this question, there is a multitude of other questions that needs to be answered first. How has the definition of art changed over the centuries, and how does the decorated pottery fit into that concept in different periods? Do we have sources, which can inform us on the perception of pottery?

At the same time, we must also look at the Danish term "Folkekunst" (Folk Art), which was first used in the latter part of the 19th century. Under this term decorated pottery is hobbled together with furniture and other decorated everyday items, which at the time were characterized as folksy and implicitly uncouth in style. In the Western art historical canon, it is a rule that these everyday art mediums are excluded for unsaid reasons. From the earliest times art historians view all mediums as important in understanding art history – everyday objects as well as ceremonial. Up until the ancient Greeks the art of the decorated vase or plate was an important part of art history. But from about the Middle Ages up until about a hundred years, ago decorated pottery was hardly mentioned at all. It returns into art historical writing around the start of the 20th century, where the new avantgarde movements expanded the then very narrow definition of art (painting, sculpture, architecture). From then on everything could be art. In that light we would now define decorated pottery as art, but would it have been, when it was created?

12 EVERDAY ART? EXPRESSION BY SYMBOLISM ON EARLY MODERN EARTHENWARE IN SOUTHERN SCANDINAVIA

Abstract author(s): Witte, Frauke (Museum of Southern Jutland)

Abstract format: Oral

During many periods of human history, common people's art was dominated by decorated pottery.

Compared to the preceding period, dramatic changes in the ceramic tradition in Southern Scandinavia become apparent from the beginning of the 16th century: potters - under influence from further south - introduced new vessel forms and started decorating the wares completely different. In this way, the earthenware acquired a completely alternate appearance and aspects of the ornamentation took on the hitherto unknown function of expressing certain signals and values (i.e. knowing the bible).

These changes in the ceramic tradition took place at the same time as the Reformation put focus on the relationship between the individual and Christianity, and the Renaissance challenged the medieval perception of art. The new vessel forms and ornamentation which characterise locally produced earthenware through most of the 16th and into the 17th centuries reflect the need of the owners to either distinguish themselves visually from their surroundings or to be part of a bigger group. These changes in forms and especially ornamentation reflect a new development towards the use of meaningful symbolism.

In the past Southern Scandinavia societies ways of visually expressing personal beliefs and statements were limited. One such way was art. In contrast, pottery has over a very long period brought art into all homes, from the rural farm to the castle. Only few were able to represent status and decorate through the choice of books, tapestries, and paintings, whereas all levels of society used ornamented pottery whose different motives and forms developed into "everyday art" which was displayed, e.g. hanging on the wall.

287 ECONOMIC AND TECHNOLOGICAL NETWORKS OF THE EURASIAN STEPPES

Theme: 4. Globalisation and archaeology

Organisers: Gleba, Margarita (Ludwig Maximilian University of Munich; University College London) - Daragan, Marina (Institute of Archaeology, Ukrainian National Academy of Science)

Format: Regular session

The Eurasian Steppe region was fundamental in the development of multiple technologies and transregional networks of economic exchange long before the establishment of the Silk Roads. Far from being a periphery, the Eurasian Steppe region was the crucible in which fundamental technologies, languages, ideas and even pathogens originated and spread. Recent studies highlighting the exceptional scale and volume of Eurasian metallurgy and the emergence and spread wool textile technology in Eastern Europe, the Urals, Western Siberia and Kazakhstan are demonstrating that the Eurasian Steppe societies were at the heart of these technological development since the Bronze Age. Yet, although large-scale historical narratives spanning Europe and Asia have recently been gaining momentum, research dealing with specific technologies across this vast region remains disjointed, making it difficult to understand the broader patterns. The long-standing focus on headline-generating 'shiny' objects found in burials has led to the neglect of the necessities and realities of the complex economic systems, that required large-scale infrastructures to access raw materials and finished goods.

The session will consider sources of materials and objects (food, wool, leather, metals, wood etc.) and their production technologies (metallurgy, animal husbandry, textile production) with the aim of reconstructing economic and technological networks which developed across the Eurasian Steppe region in its broadest geographical expansion from the Bronze Age until the end of the 1st

millennium BCE. We are particularly keen to see submissions which explore innovative scientific approaches to explore developments across time and space.

ABSTRACTS:

1 SHEEP AND WOOL: EURASIAN STEPPE PASTORAL CULTURE INPUT IN WOOL INDUSTRY DEVELOPMENT

Abstract author(s): Shishlina, Natalia (State Historical museum) - Orfinskaya, Olga (Centre of Egyptological investigation, RAS) - Roslyakova, Natalia (Samara State University of Social Sciences and Education)

Abstract format: Oral

The Bronze Age of northern Eurasia is characterised by major socio-economic changes. A secondary products revolution defined an overall trajectory in these global economic transformations. Innovative changes in fibre technologies led to appearance of woven wool textiles and production and consumption of new types of clothing.

The transmission of wool technology was a result of contact between communities in the steppe and their southern neighbours in early 3000 BC. In subsequent periods wool textiles 'travelled' from south to north with migrating population groups, where they were rapidly assimilated into local technical systems. This assimilation and the emergence of secondary products economy based on wool textiles was, most likely, facilitated by widespread of mobile sheep/goat herding, which became a dominant economic model in mid-3000 BC. In the last quarter of 3000 BC a wider preference for wool textile gradually spread, stretching north into the forest-steppe and forest zone and then from west to east. The production of wool textiles was fully integrated into the social economy of Eurasian pastoralists and wool textiles became increasingly widespread across northern Eurasia, spreading east towards the Urals and across Siberia and Kazakhstan.

2 PRACTICE NOT CULTURE: ON THE UTILITY OF THE COMMUNITY OF PRACTICE CONCEPT FOR CERAMIC TECHNOLOGY ON THE EURASIAN STEPPE

Abstract author(s): Rose, Nicole (Independent Researcher)

Abstract format: Oral

The Eurasian Steppe has been characterized by such terms as "highway" (Andersson 1929) or "spread zone" (Nichols 1998; Malory 2014) throughout its history of study. Though our understanding of the mechanism by which such a corridor developed has transformed over time from long-distance migration to overlapping seasonal cycles of pasture exploitation (Shishlina 2001; 2008; Frachetti 2008), scholars have consistently identified the role of mobile pastoralism in spreading languages, genes, materials, and technologies across Inner Eurasia. Yet mobility is implicated in not just the spread of technologies but in the construction and maintenance of tradition. Here I propose the application of an increasingly popular concept in archaeology to Eurasian steppe contexts: "community of practice" (Lave and Wenger 1991). Such a concept allows us to discuss what Frachetti (2012) termed "nonuniform institutional complexity" within and between distinct societies as developing in social networks unfolding at various scales dependent on the form of technological practice. For everyday technologies such as ceramics, on the Sal-Manych steppe, for example, a widespread community of practice whereby low investment technology was produced and curated in remarkably consistent ways persisted from the fifth millennium BCE through second millennium BCE as long as the "region" (de Certeau 1984, 126) of pastoral movements was maintained. With the social and economic transformations of the first millennium BCE, communities of practice would diversify in terms of ceramic technologies as steppe societies transitioned to historically-recognized pastoral nomadism, becoming more localized even as some social networks grew increasingly global.

3 NOMADLAND: EXPLORING BRONZE AGE POTTING TRADITIONS OF SOUTHEAST KAZAKHSTAN

Abstract author(s): Dupuy, Paula (Department of Sociology and Anthropology, Nazarbayev University) - Amicone, Silvia (Competence Center Archaeometry Baden-Wuerttemberg, Eberhard-Karls-Universität Tübingen; UCL Institute of Archaeology, University College London) - Mathur, Arvin (Department of Anthropology, University of Wisconsin-Madison)

Abstract format: Oral

Through regular interactions with their neighbors, the diverse groups of the Bronze Age Eurasian steppe (2500-800 BCE) formed dynamic interregional networks that saw the proliferation and persistence of shared material cultures over a vast geographic area. Some amount of cultural signaling related to these connections is demonstrated through handmade ceramics that repeat a narrow range of forms and finishes across the Eurasian steppe. Historically, such stylistic uniformity in regional potteries led scholars to posit that the people may have been similar too. However, recent archaeometric studies contradict this idea by revealing considerable diversity in both genetics and subsistence practices throughout the region. These data have therefore brought into question the utility of pottery studies to achieve anything but a gross description of Bronze Age communities. This talk stresses the need for a holistic approach to studies of material culture, combining both macro- and micro-scale technological studies, in order not to lose sight of the actual people who drove defining transformations in the Bronze Age. We provide a combined petrographic and formal analysis of pottery from the Semirech'ye region of southeastern Kazakhstan to examine diachronic technological traditions with a special focus on routines of selection and raw material processing. Our results demonstrate site-specific technology as well as

traits that permeate both time and space. This microcosm of unity and diversity in crafting practices shows the potential of pottery as a proxy for studying deep-histories of human-environment interactions among different communities of practice. Results illuminate how and to which level technological adaptations connect people in the Bronze Age beyond the social signals as seen from stylistic-typological studies.

4 SAKA-SCYTHIAN GOLDSMITHING: EVIDENCE FROM ELEKE SAZY AND SHILIKTY BURIAL COMPLEXES (KAZAKHSTAN)

Abstract author(s): Amirova, Saltanat - Martín-Torres, Marcos (University of Cambridge)

Abstract format: Oral

Gold is a prominent component in the material culture of the nomadic cultures that inhabited the Eurasian Steppe in the Bronze and Iron Ages. However, the scarcity of studies of contextualised finds from modern archaeological excavations has constrained our ability to discuss the development of technological traditions, the provision and value of raw materials, cross-craft interactions, or the role of gold in funerary rituals. Here we present an initial contribution to these topics through the analysis of gold assemblages recovered from two kurgan complexes, constructed by the Saka-Scythian cultures in Eastern Kazakhstan around 800 - 400 BCE. Recent excavations revealed a few kurgans with rich goldwork assemblages, some left intact or only partially looted. We employed two portable, non-invasive analytical techniques: digital microscopy to identify technological features and usewear, and portable X-ray fluorescence (pXRF) for elemental analysis. The results show remarkably different goldworking techniques, ranging from the application of wrought sheets on organic substrates through to solid casting, granulation and inlaying. Correlations between technology, composition and usewear are suggestive of different modes of sourcing, crafting and using gold. In addition, thousands of gold microbeads, barely visible to the naked eye, highlight the value of skill and labour in addition to that of the material. These initial results give useful pointers for future research, which we plan to pursue as the project expands.

5 TECHNIQUE AND TECHNOLOGY OF SCYTHIAN BRONZE ARROWHEAD CASTING

Abstract author(s): Daragan, Marina (Institute of Archaeology of Ukrainian National Academy of Sciences)

Abstract format: Oral

The most ubiquitous category of Scythian material culture – the bronze arrowheads – is paradoxically the least studied to date. First and foremost, this concerns one question: how were they cast? No definitive conclusions regarding the technology of arrowhead casting have been reached. Some sources suggest the use of a metal mould for these purposes, while others propose the use of lost-wax casting technology. Our understanding of the casting technology is fundamental, since it affected the organisation of the manufacturing process of such a numerous category of material and,

as a consequence, the supply of Scythian warriors with necessary weapons. In order to solve this problem, more than 12,000 arrowheads from 455 quiver sets from burials and layers of settlements found in the steppe and forest-steppe zone of the Northern Black Sea region were studied, and several experiments were carried out casting the arrowheads in a metal mould, using metal moulds to obtain wax models, and lost wax casting. Comparative metallographic analyses were carried out for some of the original Scythian arrowheads and their analogues, cast in different ways. The results of the experiments indicate the casting of arrowheads using the lost wax technique. These data were confirmed by the results of metallographic analyses: the difference in the cooling rate of the crystallisation of arrowheads obtained by different casting methods affected the parameters of the crystal structure of their alloy. The dendritic structures of the analysed original Scythian arrowheads have a great similarity. Uniformity of the dendritic parameter (thickness of dendritic branches) is observed when moving from the surface into the depth of the arrowhead. This indicates the casting of the arrowhead most likely using the lost wax model, and probably in a disposable ceramic rather than a metal mould.

6 USING ARCHAEOLOGICAL MATERIALS SCIENCE TO TRACE ECONOMIC AND TECHNOLOGICAL NETWORKS OF THE EUROPEAN SCYTHIANS

Abstract author(s): Gleba, Margarita (Ludwig Maximilian University of Munich)

Abstract format: Oral

Scythian material culture is first and foremost associated with shiny gold objects, yet it is the perishable materials such as leather, textiles, wood and bone that constituted its bulk, as demonstrated by the spectacular Scytho-Siberian burials preserved by the permafrost in the Altai region of Russia. The preservation conditions are not as favourable in the Ukrainian steppe, but a large number of fragmentary organic remains does survive, for example in kurgan burials at Bulgakovo, Ilyinka and Vodoslavka. Recent developments in archaeological materials science allow using various scientific analytical techniques to trace economic and technological networks of the European Scythians. This paper will provide an overview of the recent and ongoing research into characterisation and provenance of archaeological textile, leather, wood and bone artefacts from the Scythian burials excavated in Ukraine. The multi-analytical approach includes technological analysis, fibre and dye identification of textiles (using SEM and HPLC-DAD); species identification of wood (using microscopic techniques); species identification of leather (using ZooMS and SEM); and characterisation of pigments (using SEM, FTIR, RAMAN, multispectral imaging). The new data provide a rich source of information about the mate-

rials and techniques used for the production of Scythian tools, weapons and elements of clothing. In some cases, their provenance reflects complex networks of their acquisition, thereby expanding our understanding of Scythian economy.

7 USING ZOOMS TO IDENTIFY LEATHER SPECIES FROM THE 1ST MILLENNIUM BC BURIALS OF THE EURASIAN STEPPES

Abstract author(s): Brandt, Luise (GLOBE Institute) - Daragan, Marina (Institute of Archaeology of the National Academy of Sciences of Ukraine, Kiev) - Pankova, Svetlana - Chugunov, Konstantin (The State Hermitage, St. Petersburg) - Gleba, Margarita (Ludwig Maximilian University of Munich)

Abstract format: Oral

Excavations of kurgans across the Eurasian steppes yielded extremely well preserved burials of various Scythic cultures of the first millennium BC. While the magnificent golden decorative objects found in many of these burials have received much attention, other, particularly organic artefacts made of leather, have rarely been investigated, despite their importance to the everyday life of their nomadic owners. These objects provide a unique opportunity to gain insights into the animal exploitation, leather technology and use, and perhaps also the beliefs attached to the animals so frequently depicted in the Scythian Animal Style art. Until recently, identifying species of the leather has been difficult since morphological methods for identifying skin materials are complicated by interspecies variation and, particularly in archaeological environments, frequent degradation of the diagnostic surfaces. Using the protein-based species identification method ZooMS (Zooarchaeology by Mass Spectrometry), we analysed 63 leather samples from quivers and articles of clothing from the seventh century BC Arzhan-2 kurgan in Tuva, Russia and 13 different Scythian kurgan sites in Ukraine, primarily of the fourth century BC. Also articles from the southern Siberian Oglakhty cemetery, Burial 4, were sampled. This site belonged to the Post Scythian group (1–4 c.AD) that inherited many traditions of the previous period. The different geographical locations of the finds allowed testing for the variable degree of leather preservation in different environments. Most species identified are domesticates such as equids, bovids and ovicaprids, demonstrating that people in the steppe primarily relied on herded animals for their raw materials. At least two samples, however, belong to wild carnivorous species and one is human, confirming for the first time the claim of the Greek historian Herodotus that Scythians used the flayed skin of their enemies to make quiver covers.

8 PIGMENTS OF EUROPEAN SCYTHIANS LOCATED IN THE PONTIC STEPPE: PRELIMINARY RESULTS

Abstract author(s): Leighton, Chloe (UCL) - Gleba, Margarita (LMU) - Radivojevic, Miljana (UCL) - Daragan, Marina (Institute of Archaeology of the National Academy of Sciences of Ukraine) - O'Grady, Caitlin - Phillipson, Ines (UCL)

Abstract format: Oral

Recent studies on the technologies and economic exchanges that occurred along the Eurasian Steppes have begun to address the prejudices of the conventionally accepted historiography of 'East-West' exchange. Archaeologists, by expanding research to include raw materials as well as finished goods, have started to expose a mature and complex economic web between nomadic and sedentary societies extending as far back as the Bronze Age. Science has also played a major part in this discovery by unveiling a new wealth of information on a microscopic level.

This talk presents the preliminary results of analysis of thirty pigment samples from Scythian burials located in the Pontic Steppe of modern Ukraine (5th – 4th centuries BC), using FTIR and pXRF techniques. The results allowed for the identification of certain synthetic blue and natural earth pigments used by the European Scythians. These findings are then placed in the wider context of pigment use and exploitation in Eurasia and Europe, revealing potential new source locations and trade networks utilised by pastoral nomads. The samples in this study are some of the first Scythian pigments to be analysed by means of non-destructive scientific techniques. Therefore, this study sets out to create the foundations of a much broader database of pigments found in kurgans across the Eurasian Steppes.

9 SCYTHIAN FUNERAL FEAST AS A REFLECTION OF SCYTHIAN ECONOMICS: THE CASE OF ROYAL SCYTHIAN ALEXANDROPOL KURGAN

Abstract author(s): Daragan, Marina - Polin, Sergei (Institute of Archaeology of Ukrainian National Academy of Sciences)

Abstract format: Oral

The Royal Scythian Alexandropol kurgan, dated to the last third of the 4th century BC, was 24 m high and 85 m in diameter. The funeral feast (trizna), discovered in the course of the recent re-excavation of the Alexandropol kurgan, contained the remains of no less than 457 Greek transport amphorae. These amphorae had been produced in 13 different centers and had 14 different shapes. Combining these with the amphorae, which were found inside the kurgan's burial chambers, the total number of amphorae discovered in Alexandropol kurgan amounts to 479 units. Using the standard amphora volume, we estimate that the participants of the feast consumed between 5663 and 7242 litres of imported Greek wine, in addition to the beverages of local origin which are indicated by the presence of Scythian moulded vessels. The transport of such a quantity of wine to the distant steppe raises the question of economic supply logistics. Where did this wine come from and how was it delivered to the burial site? It is important to consider not only the weight of 6000 liters of wine itself, but also the weight of the amphorae, which based on our calculations, would have totaled 10–11 tons. In addition to the wine, the participants of the funeral feast at Alexandropol consumed 16 cattle, 71 horses, 7 sheep/goats, 2 domestic pigs and 1 red deer, amounting to no less than 17,240 kg of meat. Based on these data, we estimate that

the number of participants was between 3500 and 5780 persons. Whilst approximate, these numbers allow us to consider some aspects of Scythian economic and political organization, including the high social status of the deceased buried in the Alexandropol and the networks of supply allowing organization of a large number of people and logistics of their food supply.

10 “ALL MY PRETTY ONES?”— CHEMICAL ANALYSES OF SOME GLASS BEADS FROM EARLY SARMATIAN BURIALS

Abstract author(s): Hall, Mark E. (Black Rock Field Office, Bureau of Land Management)

Abstract format: Oral

While a variety glass objects are often found in the high status burials of the Eurasian Scythians and Sarmatians, glass beads are commonly found in a variety of female and child burials of varying status belonging to the Sarmatian culture. The purpose of this paper is to present some new, and re-examine some previously published, chemical analyses of glass beads from ten Early Sarmatian (3rd-1st century BC) burials excavated at Pokrovka, Russia. The chemical analyses are classified according to the chemical typologies developed by Lankton and Dussubieux (2006).

Oxide ratio plots indicate 4 groups in the data set; while principal component analysis indicates 4 to 5 groups in the data set. One high lead bearing glass bead is clearly of Chinese origin and does not fit into any of these chemical typologies. There is one bead conforming to a potash glass with moderate lime (mKCA) that has possible origins in Southeast Asia. Eight beads are a soda-lime silica glass made with plant ash (vNC). These types of beads have a wide distribution, and numerous production sites, throughout the East Mediterranean and Central Asia. The largest group of beads correspond to a “Mediterranean” composition. Thirteen of these beads have similar compositions to other Hellenistic glasses from Greece and Anatolia. The remaining six have a composition similar to the Group 2 glasses recovered from Yahorlyk, Ukraine.

The results of the chemical analyses, and the lack of any glass furnaces at Early Sarmatian sites on the steppes, are clear evidence of the economic networks of the Sarmatians. At a minimum, these beads illustrate indirect ties of the Early Sarmatians with the Hellenistic city states and the Maruyun empire.

Reference

- JW Lankton and L Dussubieux (2006) Journal of Glass Studies 48:121-144

11 FALCONRY: FROM THE EURASIAN STEPPE IT CAME AND FROM THERE IT SPREAD

Abstract author(s): Grimm, Oliver (Centre for Baltic and Scandinavian Archaeology - ZBSA)

Abstract format: Oral

There are good reasons to suggest that falconry, the hunt with trained birds of prey, originally belonged to the Eurasian steppe. The open landscape demanded hunting assistants: dog and golden eagle. Falconry had practical value: acquisition of fur (fox) and protection of the flock (against wolves). This kind of hunting might be as old as the steppe itself. However, the earliest pieces of evidence – archaeological and written – are c. 2500 years old, for the more eastern part of the steppe.

Much more solid is the source situation for the Chinese Han dynasty; falconry is around 1.900 years old, on the base of archaeological and written testimonies. Somewhat surprisingly, the earliest falconry in Korea and Japan in the east, the Arabian Peninsula and Persia to the south, and Europe and northern Africa to the west is more or less 1500 years old, as indicated, again, by archaeology and written records – how did the knowledge of falconry, once invented in the Eurasian Steppe, travel that far?

294 WIDENING HORIZONS – CONTRIBUTING TO COMMUNITIES IN A POST-COVID-19 WORLD THROUGH INCREASING ACCESS TO ARCHAEOLOGY AND HERITAGE

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Richardson, Philip (Archaeology Scotland) - Doyle, Ian (The Heritage Council)

Format: Regular session

We believe that archaeology and heritage is for everyone and that it can have a positive impact on people’s lives and help to develop better communities. With the increasing social-economic impact of the Covid-19 Pandemic bringing into sharp focus the inequalities between many people and communities across the continent there is clear need for fairer, more sustainable and more resilient communities to emerge once the pandemic is over. Community focused archaeology and heritage projects will be one way that we as practitioners can help and contribute to this urgent need.

In this session we will explore the ways in which archaeology and heritage can widen its horizons to help contribute to making our communities fairer, more sustainable and more resilient.

We welcome contributions from members that are engaging in archaeology and heritage practices that are contributing to wider community engagement and development and especially those that are seeking to widen participation to include working with and within communities (communities of place, interest or socio-economic situation) that do not normally have access to archaeology and heritage. We are keen to hear about innovative ways in which different audiences can be engaged in archaeology and heritage, and of new methodologies for widening participation and positively contributing to different communities. We would also welcome

contributions from those members whose projects or initiatives did not work as envisaged or planned as well as contributions that critically assess the roles in which archaeology and heritage can contribute to wider socio-economic problems.

ABSTRACTS:

1 RECHARGING PUBLIC PARTICIPATION IN ARCHAEOLOGY: THE CBA'S RESPONSE TO COVID-19

Abstract author(s): Corkill, Claire - Redfern, Neil (Council for British Archaeology)

Abstract format: Oral

The impact of Covid-19 on local archaeology groups and societies has been profound, with activities restricted and many groups lacking the skills and confidence to engage with their members successfully online. The potential long-term impact of this remains to be seen but we know that many groups are concerned about their lack of income, ability to rebound and the effect that their limited engagement is having on their members. While the focus of these groups is the delivery of archaeology-based activities, many of them also play a significant role in people’s lives creating wellbeing opportunities.

During 2020 the CBA undertook a range of activities to support local archaeology societies through the pandemic as part of our Historic England funded Recharging British Archaeology project. This allowed us to provide some immediate assistance and look at opportunities to help groups become more resilient for the future through new methods of engagement.

The Festival of Archaeology also provided valuable learning opportunities. Moving from on the ground to digital resulted in a significant drop in participation from local groups but also highlighted the potential digital events offer to reach new audiences and engage people in different ways.

Moving beyond the pandemic our paper will set out how we are looking to take these experiences and continue to work with groups and societies to develop creative, engaging ways to use archaeology to help people explore the stories of their local place and feel more connected to their communities.

2 A ROMAN VISITOR CENTRE FOR MENTAL WELLBEING

Abstract author(s): van den Dries, Monique (Faculty of Archaeology, Leiden University) - Hazenberg, Tom (Hazenberg Archeologie)

Abstract format: Oral

In this paper we will talk about a care centre for (around 500) people with mental disorders (like Down Syndrome, dementia etc.) in the Netherlands (Ipse de Bruggen). During its construction in the 1970’s, a Roman fort and harbour was discovered, including six ‘Zwammerdam ships’. This Roman history inspired the organisation to open a Roman visitor centre (in 2016). The care centre aimed to use its heritage to achieve a ‘reversed integration’ of clients with ordinary citizens, by encouraging local villagers and tourists to visit the Roman exhibition. Clients of the care centre helped making the visitor centre and some of their day time activities are still inspired by the heritage and the tasks needed to run the visitor centre. As this is a unique use of Dutch heritage, the authors conducted a study among the clients (and staff members) to learn about the effects of the visitor centre on their wellbeing. This paper will discuss the results of this evaluation.

3 COMMUNITY-LED SURVEYS OF IRISH HISTORIC GRAVEYARDS DURING THE COVID-19 PANDEMIC

Abstract author(s): Tierney, John (Eachtra)

Abstract format: Oral

Archaeological fieldwork since March 2020 has presented some interesting challenges and responses by our own team and by our community group partners.

Due to Covid-19 restrictions;

1. we seem to have ended up with more rapid data capture, albeit with some impacts on quality in the initial phase of data entry.
2. An older cohort has taken part in the rural fieldwork ie. anecdotally our usual cohort are mid 50-60s but last Summer (2020) our main drivers were in their 70s? This has resulted in challenges in digital data entry.
3. Our own philosophy has shifted somewhat, probably due to the maturity of the project (10 years old in 2021) to increasing storytelling components rather than the previous emphasis on data gathering.
4. It hasn’t happened just yet but we feel like we’re going to have more global elements to the storytelling than strictly Irish. Should know by time of the conference if that has materialised ie. you tell the story of Ireland by talking about Irish communities of the diaspora.

4 SOFORTHILFEPROGRAMM HEIMATMUSEEN – SMALL SCALE INVESTITION IN RURAL COMMUNITIES

Abstract author(s): Civis, Greta (DVA - Deutscher Verband für Archäologie)

Abstract format: Oral

The national investment programme „Soforthilfeprogramm Heimatmuseen“ started in spring 2020 during the first lockdown in Germany. Due to this context it was often mixed with programmes meant to limit the harm caused by Covid 19, but it never was: The programme is framed in a national attempt to strengthen rural communities in respects of culture and heritage from pre-covid-times. Small museums, archaeological parks, archaeological sites and similar places were granted up to 25.000€ for investments to maintain and accompany their work in and with rural communities. The small sums, accompanying guidance by the Deutscher Verband für Archäologie and the option for civil initiatives and volunteers to apply were new for a programme financed by a national ministry. The massive responses showed a grand need for investments in cultural institutions in rural areas, as well as much appreciation of the national interest and engagement. The presentation will address outcomes and learnings from the first year as well as some perspectives on cultural work in small communities.

5 INTERACTING WITH COMMUNITY ARCHAEOLOGY IN A TIME OF PANDEMIC THROUGH VIRTUAL LEARNING ENVIRONMENTS (VLE)

Abstract author(s): Donnelly, Colm (School of Geography, Archaeology and Palaeoecology,) - McDermott, Siobhán - Murphy, Eileen (Queen's University Belfast)

Abstract format: Oral

The Centre for Community Archaeology at Queen's University Belfast has been developing a series of online learning resources to facilitate increase participation in local heritage across Northern Ireland. Initiated in response to the Covid-19 pandemic and its impact on society, these online learning resources have proven to be highly effective tools to help communities engage with their local archaeological resource, and the current paper outlines the results from two programmes of online learning. The first of these was the Community Archaeology Toolkit (CAT), developed during the Spring 2020 "lock-down" as a means of signposting participants towards a range of freely available online resources while guiding them through archaeological desktop assessment. The paper outlines the results obtained during this initiative and how the CAT enabled individuals in "lock-down" to still engage actively and productively with their heritage using accessible online resources to research their localities. The success of the programme was measured through personal testimonials, anonymous questionnaires and online user analytics. Participants reported increased confidence when engaging with the research process, while their demographic profile proved markedly younger than for a traditional community-based archaeological project. The success of the CAT has now led to the development of a second VLE project, designed for the Lough Erne Landscape Partnership (LELP) in County Fermanagh, and with a wider curriculum that includes oral history collection, building survey, remote sensing and archaeological excavation. With an opening up of social interactions, digital learning was blended with place-based fieldwork experiences.

6 CREATION OF AN ARCHAEOLOGICAL EXHIBITION IN PANDEMIC TIMES. THE EXAMPLE OF AMAIUR ARCHAEOLOGICAL CENTRE (NAVARRA, SPAIN)

Abstract author(s): Matelo Mitxelena, Suberri - Errarte Zurutuza, Maite (Aranzadi Science Society)

Abstract format: Oral

The archaeological site of Amaiur Castle is located in the homonymous town (Baztan Valley, Navarra, Spain) and it began to be excavated in 2006, owing to the locals initiative. From the first moment, they turned to the Aranzadi Science Society for scientific support. Since then until 2020, excavations have been carried out with volunteers and archaeologists from that Society.

The structures found were musealized in 2014, and the traces found have contributed to strengthen the identity of the town, seeing the site as an indispensable part of the community and a driver in the promotion of tourism. Thanks to this, the town has encouraged a new project that seemed unthinkable in these times of pandemic: an Archaeological Centre with a permanent exhibition where the archaeological items founded in the castle and other historical material are displayed. These pieces are the proof of the battle that took place in the castle in 1512 and the speech and imagery that have been created subsequently about that historical event. Due to the difficulties caused by the epidemic, all this project has been done in a record time of two months.

In this paper the museum designers will explain the process, its strengths and weaknesses, as well as the work that the locals carried out to open this centre in pandemic context.

7 COMMUNITY ARCHEOLOGY AND OTHER PARTICIPATORY STRATEGIES DURING PANDEMIC. ADAPTATION AND FUTURE OF THE TERRA LEVIS-MASAV PROJECT, ÁVILA (SPAIN)

Abstract author(s): López García, Juan Pablo (MASAV)

Abstract format: Oral

In 2017 AC Abulaga was created and linked to it was the Terra Levis Arqueología en Comunidad project. Work processes based on citizen participation in its management, made the project become an action in the territory with the name MASAV -Museo Abierto de las Sierras de Ávila y el Valle Amblés-. A regional management strategy that included research, didactic strategies, culture and communication in a wide territory -Sierra de Ávila and Valle Amblés, Spain-, which was joined by both small town councils, as well

as the provincial and regional government. The expectations in 2020 were extraordinary as they would mean the consolidation of the project in the territory. The last big event before the closure of the country due to the Coronavirus was the Archaeological Carnestolendas held on February 29 in Solana de Rioalmar, Ávila, Spain. The attending public was able to enjoy an action-packed day with workshops on experimental archeology, cinema, talks, concerts, and craft markets. COVID-19 was a cloud that was observed on the horizon, but had not yet begun to discharge. On March 14 they confined the country. At stake, a Community Archeology project that had to adapt to survive without the proximity of the community. Without those affections, without that close contact so necessary for a project of this type. The creativity, the desire for action of the countrymen, associates and technicians adapted the strategy to the situation. First with online talks when confinement was more difficult, then with controlled actions in the territory: archaeological excavations, guided tours, artistic interventions ..., which allowed us to achieve the objectives set at the beginning of 2020 and which guarantees, with the support of citizenship and public administration, the survival of this project, at least one more year.

8 ARCHAEOLOGY AT THE TRAIN STATION – MAKING A MUSEUM FOR EVERYONE

Abstract author(s): Host-Madsen, Lene (Museum Skanderborg)

Abstract format: Oral

It will be a completely different experience to wait for a train or bus in the future at Skanderborg Station, Denmark. In 2019, the museum moved into the former post office building at the station with an ambition to create a different museum very close to people's everyday lives.

The ambition is for the museum to become a natural part of the station environment and thus as natural and straightforward to use as public transport.

Imagine that you enter the waiting room on Platform 1, and here you meet the Dead Warriors from Iron Age "Alken Enge", the Viking and his horse from Fregerslev or maybe Princess Anna, who became Queen of England. Or that you follow the archaeologists' fascinating work very closely as they process the material from the excavations in the workshop. You can also take a cup of coffee in the café and experience a pop-up exhibit while you wait.

We put the new museum right where people are. In the middle of the vibrant everyday life. With the location at the station, the museum becomes both a place where you learn about the past and a living meeting place. The ambition is that the physical setting will change the way we think and use museum experiences.

9 SUSTAINABLE INVESTMENTS FOR MUSEUMS, GALLERIES, AND HERITAGE SITES DUE TO THE CORONA CRISIS

Abstract author(s): Nitzschke, Diana (Deutscher Verband für Archäologie e.V.)

Abstract format: Oral

As of september 2020 the Deutscher Verband für Archäologie grants funds to museums, galleries und cultural or archaeological heritage sites within the funding program „Pandemiebedingte Investitionen in Kultureinrichtungen zur Erhaltung und Stärkung der bundesweit bedeutenden Kulturlandschaft“. The program is part of the larger funding program „Neustart Kultur“, brought to life by the BKM, the Representative für culture and media in Germany, due to the Covid-19 pandemic and its impact on cultural institutions.

The cultural institutions can apply for a project between 5000€ and 100.000€. The projects must focus on activities, that strengthen their hygienic conditions compliant with the new normal in living with the Coronavirus and that build up their digital settings and nourish their long-term attractiveness for visitors. Massive responses showed a grand need for invests in cultural institutions, grand or small. The presentation will address outcomes and learnings from the first year as well as some perspectives on cultural work influenced by the Covid-19 pandemic crisis and in times of lockdowns.

10 PURSUING TRANSCULTURAL HERITAGE IN THE TIME OF COVID: TOWARDS A MORE ACCESSIBLE ARCHAEOLOGY OF EURASIA IN THE PAST AND PRESENT

Abstract author(s): Knutson, Sara Ann (University of California Berkeley; University of Cologne; University of Warsaw)

Abstract format: Oral

In this paper, I explore the possibilities for traditional pieces of archaeological evidence, such as coinage, to contribute to timely discussions in Archaeology and cultural heritage work, especially in light of the COVID-19 pandemic. In particular, the pandemic has demonstrated the importance and relevance of non-invasive, digital methods in Archaeology for examining cultural heritage materials and for using such tools to make these materials more accessible to different communities around the world. My own research uses digital archaeological tools including ArcGIS and Social Network Analysis software to make trans-Eurasian materials such as Abbasid coinage, housed in European museum collections, more accessible to source communities who are the recipients of this heritage. My research in museum collections seeks to understand these archaeological materials as evidence of multicultural networks in the Eurasian past as well as part of contemporary material networks in the 21st century that continue to inform cultural heritage in a variety of ways. In conducting this work, I hope to demonstrate the need for greater sensitivity among researchers to traces of power and inequalities in the past and their entanglement in contemporary public debates and cultural heritage.

(DIS)CONNECTING THROUGH HERITAGE - PERSPECTIVES UPON PRACTICES AIMING FOR SOCIAL COHESION IN NORDIC AND BALTIC MUSEUMS

Abstract author(s): Wollentz, Gustav (The Nordic Centre of Heritage Learning and Creativity)

Abstract format: Oral

The paper looks at how heritage can be approached as a process of connecting to diverse communities through focusing upon the concepts of care and belonging. We have also been examining reasons why and when heritage institutions fail in connecting to a diverse audience. We have studied practices and attitudes in museums in Nordic and Baltic countries, through a method of both a widespread questionnaire sent to ca 750 museums in Sweden, Norway, Finland and Estonia, as well as through qualitative semi-structured interviews with a selection of key-individuals. The study was carried out within a larger project called "Heritage, Identity and Social Cohesion", which was collaboration between several museums and other heritage institutions that aimed to develop and pilot activities increasing social cohesion in society. The paper identifies that the current speed of the museum tends to hinder the process of reaching and connecting to a diverse audience, where a relationship based on mutual trust can be sustained over a long period of time. Care is an on-going temporal practice, and there is a danger in placing demarcated beginnings or endings upon it. Furthermore, it identifies the need for a shared understanding within the sector as to what concepts such as diversity mean and how it can be approached through practices in the museum. Finally, the paper recognises that the sector itself has to become more diverse in order to reach out to a plural society.

A. PARTICIPATORY MUSEUMS: THE STATE OF THE ART OF ITALIAN ARCHAEOLOGICAL MUSEUMS

Abstract author(s): Frascella, Selene (Università Cattolica del Sacro Cuore, Milano)

Abstract format: Poster

The COVID-19 pandemic has had its effects on both individuals and museums. While scientific studies have shown the psychological disturbances produced by isolation, research by leading museum associations shows that museums have been quick and proactive in responding to the pandemic and the obligation to close, strengthening their digital activities. These have demonstrated their value, bringing together and comforting people at home, sharing experiences, offering a virtual space to build ideas together.

Now it is important to plan the construction of a new normal, making the new working methods triggered by this crisis systematic. It is important to translate this new digital involvement, which has also made it possible to reach new audiences, into physical and participatory involvement within museums, in anticipation of their reopening. It is time to make the transition to participatory museums, not centred "on" something or designed "for" someone, but created and managed "with" visitors, who can create, share and connect with each other through content offered. More relevant and interested in people's needs and interests, they will be able to leverage the high digital engagement achieved during the pandemic, help combat the psychological effects of lockdown isolation, and compensate for the drastic loss of revenue due to forced closure.

In view of this change, it is first necessary to understand what the starting point of museums is in the field of participatory programs in order to be able to design and develop effective strategies. This work fits into this context and will illustrate the state of the art of Italian archaeological museums through a quantitative and qualitative analysis of the participatory projects they have implemented. The goal of the contribution is to analyse, through significant case studies, to what extent Italian archaeological museums have reached the standards of public participation and through which forms.

BEYOND THE FAR HORIZON: EVALUATING REGIONAL SURVEY IN THE WESTERN IBERIAN PENINSULA. THE STATE-OF-THE-ART AND FUTURE PROSPECTS (FIDO; ARCHAEOLOGICAL PROSPECTION)

Theme: 1. Widening horizons through human-environment interconnections

Organisers: García Sánchez, Jesús (CSIC-Instituto de Arqueología, Mérida) - Devi, Taelman (Ghent University) - Paul S., Johnson (University of Nottingham)

Format: Regular session

Regional landscape surveys in the Mediterranean have been widely employed since the 1980s, with the seminal article by John Bintliff and Anthony Snodgrass (1988) continuing to provide a methodological and conceptual underpinning to many current projects. Despite this prevalence, projects have often focussed on historically important sites, or otherwise easily accessible landscapes; marginal landscapes and those on the periphery of historically attested polities remain understudied.

This session aims to address some of these lacunae through a focus on one such liminal zone, the western Iberian Peninsula. Despite a strong tradition of recording rural archaeological sites, often resulting in municipal site-catalogues, and in studies centred on the hinterlands of ancient cities, there is little current engagement in western Iberia with emerging trends in survey methodologies. We therefore aim to address the following specific questions: how can challenging landscapes such as the dehesa and mountainous regions be approached archaeologically; how might industrial agricultural landscapes be harnessed for their archaeological potential, and how can archaeological resources be understood and preserved; what are the current links between western Iberian surveys and projects elsewhere in the Mediterranean, and how have survey methodologies in these marginal landscapes been tailored to specific archaeological and historical goals and aims?

From this focus, we aim to widen the horizons of discourse on landscape studies, relying on methodological and theoretical insights from this, and other regions, to develop a discussion around how to engage with key socio-cultural questions about identity, the exploitation of landscape and its sustainability.

Since different national research traditions encourage a variety of theoretical and methodological approaches, we welcome proposals from colleagues which apply a landscape archaeology perspective to surveys dealing with Western Iberia, and also papers concerning other Mediterranean zones.

Bintliff, J., Snodgrass, A., 1988. Mediterranean survey and the city. *Antiquity* 62, 57–71.

ABSTRACTS:

1 BEYOND THE FAR HORIZON: EVALUATING REGIONAL SURVEY IN THE WESTERN IBERIAN PENINSULA

Abstract author(s): Johnson, Paul (University of Nottingham) - Taelman, Devi (Ghent University)

Abstract format: Oral

Regional landscape surveys in the Mediterranean have been widely employed since the 1980s, with the seminal article by John Bintliff and Anthony Snodgrass (1988) and the volume by Johnson and Millett (2013) continuing to provide a methodological and conceptual underpinning to many current projects. Archaeological survey projects, however, generally still focus on historically important sites and/or easily accessible landscapes.

In this introductory paper, we present ongoing research of a rural and landscape survey in the north-western Alentejo region in Portugal and western Extremadura region in Spain that aims to address questions about the impact and causes of ecological change over the long durée, alongside changes in political authority, through a study of settlement dynamics and the conceptual geographies which they signify, in a remote part of the Roman Empire and in a particular survey-challenging dehesa landscape.

Through this case study, we wish to introduce some critical issues around the selection of survey areas, the development of survey strategies and methodologies, and the need for well-defined and clearly articulated research questions when investigating so-called 'hidden' landscapes and/or landscapes on the periphery of historically attested polities. These issues form the conceptual core of this session raising questions which will be explored through a set of papers which combine assessments of the latest developments in Mediterranean survey archaeology (methodologically, strategically and analytically), with case-studies of landscape surveys in different parts of the western Iberian Peninsula, that articulate these developments to go beyond the established archaeological traditions of the region.

- Bintliff, J., Snodgrass, A., 1988. Mediterranean survey and the city. *Antiquity* 62, 57–71.
- Johnson P.S. & Millett, M. (ed's) 2013. *Archaeological Survey and the City*. Oxford: Oxbow.

2 BEYOND THE PLOUGHED SURFACE: DEALING WITH VISIBILITY AND ACCESSIBILITY BIASES

Abstract author(s): van Leusen, Martijn (Groningen Institute of Archaeology)

Abstract format: Oral

Survey archaeologists have long been aware of the dangers inherent in the selection of 'best' areas to survey, i.e. those that are most easily accessible and present little or no obstructions to the documentation of surface archaeology. They have attempted to counteract the resulting biases by paying attention to the regional sampling design and by adapting the field protocols, but have achieved only partial success in this. More recently, some projects have taken to specific targeting of 'difficult' landscape types – mountainous, marshy, uncultivated, buried. This paper examines what we can learn in this respect from the 'Hidden Landscapes' surveys conducted between 2005 and 2013 by the Groningen Institute of Archaeology in central and southern Italy, and looks at potential future developments. Where possible and relevant, the discussion will refer to the recently published multi-authored "Guide to good practice in Mediterranean surface survey projects" (*Journal of Greek Archaeology* vol. 5, 2020).

3 THINKING THROUGH "MARGINAL" LANDSCAPES IN THE MEDITERRANEAN: A CASE STUDY FROM SW TURKEY

Abstract author(s): Vandam, Ralf (KU Leuven; Vrije Universiteit Brussel)

Abstract format: Oral

This paper focuses on several themes with regard to marginal landscapes in the Mediterranean such as connectivity, vulnerability and resilience and applies it to the case study of the Dereköy Highlands in SW Turkey. Previous archaeological research in the area and generally in Western Turkey has until now mainly focused on the larger fertile lowland areas (e.g. Burdur Plain). This research revealed numerous farming settlements from the Neolithic (6500 BC) onwards and illustrated clear distinctive periods of continuity and collapse in human occupation in these areas. Next to nothing was known about sites in other landscape units such as remote, high altitude locations, which in contrast to plain areas, are traditionally considered to be 'marginal', as they are not particularly favorable for permanent habitation. The Sagalassos Archaeological Research Project started a new archaeological survey research in the Western extent of the Taurus mountainous which aims to fill the gap in knowledge by documenting all human activity in the so-called 'marginal' landscapes. With this research we aim to investigate how communities operated in these landscapes in terms of subsistence, resource exploitation and mobility and to assess how different/similar they were in comparison to the city of Saga-

lassos and the lowland communities. In this paper we will illustrate that marginal landscapes should be considered as integral parts of the cultural landscape. From early onwards (120.000 BCE) until recent times (Late Ottoman period; 18th - 19th century) we have evidence that people were living and exploiting these landscapes and that they formed an explicit element in the different lifeways and economic systems of past communities.

4 AN INTERDISCIPLINARY, COMPARATIVE APPROACH TO NON-INVASIVE ARCHAEOLOGY ON THE TIDAL ZONE AND MARSHLANDS OF LACUS LIGUSTINUS. THEORETICAL APPROACH AND METHODS

Abstract author(s): Lagóstena, Lázaro (Universidad de Cádiz) - Aragón Nuñez, Enrique (Flinders Univesity)

Abstract format: Oral

Over the last few decades, archaeologists have identified patterns and created models of early human migration and mobility based on evidence recovered from sites on land. However growing awareness of past climate change, and sea-level fluctuations have highlighted a critical flaw in these models. Although archaeologists commonly point to the importance of coastal and riverine margins in migration studies, they still not been investigated systematically. Marshlands play a pivotal role in the understanding highly altered landscapes that based on their use and perception from different societies make them be considered marginal. Marshlands archaeology investigations can seem overwhelming, given their extension. Still, the increasing availability of non-invasive technology had opened the opportunity to access archaeological sites in spaces that occupies vast areas. This context has enabled the discipline to blossom, primarily through geoarchaeological and remote sensing methodologies. This paper purports to propose methods applied to marshland site prediction and detection, for an adaptation on a specific case of study, the lower course of the Guadalquivir riverbank (Cadiz, Spain), as representative of the so called lacus Ligustinus, within the incorporation of local and traditional knowledge. Ultimately, this paper's main objective is to introduce the theoretical and practical framework to address research questions surrounding this particular territory of the Southwest of the Iberian Peninsula.

5 WHEN THE GOING GETS TOUGH: RESOURCE PACKAGES AND SUSTAINABLE LANDSCAPE MANAGEMENT IN SPHAKIA, CRETE

Abstract author(s): Nixon, Lucia (Wolfson College, Oxford)

Abstract format: Oral

The Sphakia Survey, co-directed by Nixon and Moody, is an archaeological project investigating human activity in this rugged ('tough') peripheral area, from people's arrival (later 4th millennium BC) to the end of Ottoman rule (1898).

The concept of resource packages was developed (Nixon 2006) to assess land use in Sphakia. A resource package (RP) is a combination of perceived resources in a specific area, which people use in a specific way at a specific time.

People in Sphakia tended to live in more or less sedentary agro-pastoral communities. Each settlement had a minimum local RP including arable, pasturage, water procurement, and connectivities (in/visibility, inter/visibility of specific locations; networks inside/outside Sphakia, by land and sea). People also used other RPs, often some distance from settlements, and sometimes at a significantly different altitude. The clearest example is the high pastures in the White Mountains, several hours' walk from relevant settlements, exploited in particular by herders over the Survey's whole timespan, and into the present. Specific high pasture locations were used repeatedly, though not necessarily continuously, by people living elsewhere. In Venetian-Turkish times, textual evidence confirms that shepherds produced enough cheese to sell outside Sphakia (as today).

Re-use of the same areas does not indicate identical agro-pastoral systems over time. Rather, it suggests that land where something will grow without cultivation is never marginal. Careful use of all Sphakiote RPs is crucial. Modern parallels suggest that people know the consequences of failures in resource management (Forbes 2017). In this case, over-grazing could not be permitted, because its adverse effects on arable were well-known. The details of RP use and the systems of which they are a part will differ from period to period, but any system needed built-in sustainability. Sustainability therefore underlay people's resource strategies, and their tactical use of individual RPs.

6 UNLOCKING THE LEGACY SURVEY DATA OF ROMAN PORTUGAL

Abstract author(s): Casarotto, Anita (Leiden University; Royal Netherlands Institute in Rome - KNIR)

Abstract format: Oral

In this paper I present a data collection initiative and a digital platform that allows scholars and students who conducted regional landscape surveys in the Western Iberian Peninsula to publish online their survey projects and share their data. This initiative is part of a Leiden University project funded by the Dutch Prins Bernhard Cultural Foundation that aims at studying settlement patterns in relation to the Roman expansion in ancient Lusitania (Portugal – western Iberian Peninsula, 3rd c. BC to the 3rd c. AD), and to compare it to other Mediterranean data-sets (esp. in Italy). Activating researchers and students, these legacy survey data can be unlocked and made openly accessible online by means of a digital webGIS platform. In this paper the results of an online internship are presented in which students collected and digitized a good sample of legacy data from regional surveys in Portugal, and assisted the researchers working there with their data publication in the Fasti Online Survey platform. The increased availability of open survey data expected if wider participation in this initiative is achieved will enable comparison of data patterns and survey methodologies on an inter-regional level, which is vital for landscape archaeological analysis and historical reconstruction.

7 RESILIENCE AND ROMANIZATION, UNDERSTANDING THE LATE IRON AGE AND EARLY ROMAN COUNTRYSIDE IN LUSITANIA

Abstract author(s): García Sánchez, Jesús (CSIC-Instituto de Arqueología, Mérida)

Abstract format: Oral

In 2019 a new research project was established to study the Late Iron Age landscape and the transition to the Roman organized territory of Augusta Emerita, capital of Lusitania (present-day Mérida, Badajoz). This paper aims to introduce the main debate about the organization of the western territory of Augusta Emerita with a special interest in the social dynamics occurring in the area from the Late Republican/ Iron Age period to the creation of a Roman organized landscape. These dynamics could be traced in archaeological proxies such as the settlement pattern, the organization of society in new clustered sites rather than fortified hillforts, and other historical information, such as epigraphic formulae.

Methodologically speaking, this paper will discuss the geospatial (site pattern analysis, remote sensing) and fieldwork approaches, namely intensive field survey conducted in early autumn 2020, and will try to frame the discussed topic in a wider Mediterranean and Iberian context in opposition to old-fashion regional approaches which still dominate the local literature.

8 ARCHEOLOGY BETWEEN VINEYARDS. ARCHAEOLOGICAL SURVEYS IN TIERRA DE BARROS (EXTREMADURA, SW OF SPAIN)

Abstract author(s): Pérez-Aguilar, Luis-Gethsemani (Archaeology Institute of Mérida - CSIC) - Gordillo Salguero, David (University of Salamanca)

Abstract format: Oral

The historical importance of the current region of Tierra de Barros is widely acknowledge. This zone, characterized by the fertility of its lands, nowadays oriented towards viticulture, used to be one of the most relevant areas of Colonia Augusta Emerita's territory.

Ancient settlement patterns in Tierra de Barros are known after the datasets provided by the archaeological surveys carried out in the 1980s. These works represented a break through and their advances constitute the starting point for further research. Nevertheless, this data has important downsides.

In June 2020, we started a new campaign of archaeological field survey in this area within the project "Settlements and landscape in Tierra de Barros (Extremadura) between Protohistory and the Early Middle Ages". Our main purpose is to refresh the existing information in the central part of the Tierra de Barros.

The two year duration of the project forced us to adapt methodological approaches and the main goals to the available resources.

Firstly, we do site-oriented macro-scale surveys with a threefold aim. To locate and correctly georeferenced both known and new archaeological sites; to refine the chronological information of such sites based on ceramological criteria, and to determine the functionalities of these archaeological sites. To do so, we apply parameters such as presence/absence of diagnostic artifacts as well as the location and extension of sites.

A second phase consists on intensive micro-scale surveys in selected archaeological sites. This approach combines artifact collection (for chronological and functional information), and spatial data to produce kernel density estimations. This allows us to perform quantitative analyses such as the calculation of settlement's entropy. Eventually, these analyses will provide an insight into the exosomatic metabolism of the community that occupied the studied sites.

9 THE LANDSCAPE AS A LABORATORY. THE CASE OF CIUITAS IGAEDITANORUM IN THE NORTHERN HINTERLAND OF LUSITANIA

Abstract author(s): Lacerda, Sofia (University of Coimbra; Centre of 20th Century Interdisciplinary Studies)

Abstract format: Oral

During the Roman period, the historic village of Idanha-a-Velha was a small but important town called Igaedis. Located in the northern hinterland of Lusitania, at a strategic location within the province, the ciuitas Igaeditanorum included a large territory and an economy based on gold mining and agricultural production. Today, most of this territory belongs, broadly, to the district of Castelo Branco, in the interior of Portugal. Over the last decades, several archaeological surveys and excavations have been done, thus helping us to better understand this ciuitas: the singular contours of its city, the kind of rural settlements who Romans established here or the specificities of its economy. Recently, through various spatial analyses, we tried to represent and connect the data collected during field work. With this in mind, our aim is to spread the results of these spatial analyses, showing how they express the occupation and exploitation of the ciuitas Igaeditanorum during the Roman period.

10 A GIS BASED LANDSCAPE STUDY IN LATE IRON AGE BETWEEN THE BASIN OF RIVER LEÇA AND LOWER AVE (NORTHWEST PORTUGAL)

Abstract author(s): Maciel, Sílvia (Independent researcher) - Blanco-Rotea, Rebeca (University of Santiago de Compostela)

Abstract format: Oral

Martins Sarmento's pioneer work in the nineteenth century in the hillfort of Citânia de Briteiros (Guimarães, Portugal) was the starting point of Iron Age studies in the Northwest of Portugal. Many researchers continued his work alongside theoretical and

methodological advances, focusing on developing site-catalogue studies or on identifying Iron Age settlement patterns in the main hydrographic basins, in relation to the strategies of municipal territory reorganization carried out in the 1980s, but few landscape studies were carried out since then. In the last decade, Geographic Information Systems have been an important tool for noninvasive studies of Iron Age landscape but also for heritage representation and preservation by contributing for the knowledge about these sites that, in some cases, were intervened at that time and by identifying new settlements from the same period completing the settlement structure and improving the settlement patterns. In our opinion, the lack of investment in cultural heritage in Portugal and the difficulty of preserving/maintaining the sites post excavation has led to a certain standstill in this line of research, which has only been recovering in recent years due to various researchers that have been incorporating new technologies.

With this paper, we aim to present the Landscape study of Late Iron Age settlements between de river Leça and the lower Ave through geospatial tools. Our main goal was to understand the relationships between sites and its surroundings and inter-sites, with the oppidum of Citânia of Sanfins (Paços de Ferreira, Portugal) as a focal point. We combined an Information System 2Archls (Unity of Archaeology of University of Minho) with GIS, to obtain important locational information such as mobility, accessibility, and visibility that were validated in the field. Also, we intend to ponder about new lines of work that combine the use of new technologies with surface survey tools.

11 MODELIZATION OF THE ROMAN SETTLEMENT IN NORTH ALENTEJO (PORTUGAL) USING LEGACY DATA, ITINERARIES, SURVEYOR'S LITERATURE AND AGRICULTURAL RESOURCES

Abstract author(s): Trapero Fernández, Pedro (Cádiz University) - Carneiro, André (Évora University)

Abstract format: Oral

Our aim is to use Geographical Informations Systems to propose a method to classify and study the limits and connections between villae and their fundi in Alto Alentejo (Portugal). This territory has scarce urban centers, such as Ammaia and Eborá, being not easy to determine what the association of villa with cities is, but has relevant connections between the main urban centers Emerita Augusta and Olisipo by the XII, XIV, and XV main roads. This territory benefited from some archaeological research, allowing us to develop our methodology, which consists of associating current geographic parameters with recognizable values in the recommendations in the ancient surveyor's and agronomist literature to determine the limits between the different agricultural fundi. Also, we want to use geographical data to try to evaluate the agricultural potentiality in the land use to test and propose a methodological model to analyze the roman settlements combining the existing data.

12 A LIMITED HORIZON IN CENTRAL PORTUGAL: AN OVERVIEW AND FUTURE PROSPECTS FOR REGIONAL ARCHAEOLOGICAL SURVEY IN THE REGION OF AVEIRO

Abstract author(s): Vilarinho, Gil (The University of Edinburgh)

Abstract format: Oral

The region of Aveiro, in central Portugal, could be considered a strange case in archaeological terms, as a relatively small number of sites have been documented hitherto across this territory. When compared to other regions in Portugal, the contrast in the number of sites identified in this littoral area becomes even more evident. For decades, this absence of evidence was frequently associated with the recent formation of this stretch of coastline but a simple spatial analysis reveals that the mountainous areas, which are distant from the shoreline, also lack known archaeological evidence. Why are there fewer sites known in this region then? The answer is simple: Though there is a long tradition of work at known archaeological sites, field surveys and landscape analysis have been frequently overlooked until now.

Building on an on-going research on the Iron Age and Roman settlement of this region and drawing on literary sources, recent publications, LiDAR and geophysical data, this paper aims to present an overview of the data currently available for region of Aveiro and discuss the problematics for regional surveys in this area, as well as future prospects. The geomorphology of this landscape is diverse and includes vast littoral plains with holocene formations and high mountain ranges. This broad case study area offers different perspectives for archaeological prospection and different problems. In this study we argue that, although the lack of archaeological survey is common throughout the whole area, the problematics and the future prospects vary according to topography, demographics and land-use. Ultimately, this paper asserts the need for further archaeological investigation and provides some valuable insights for future research.

296

TRACING PREHISTORIC HUNTER-GATHERERS IN THEIR ENVIRONMENT: CHALLENGES AND PERSPECTIVES FOR PROSPECTING ELUSIVE LIFEWAYS (PAM; ARCHAEOLOGICAL PROSPECTION)

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: De Smedt, Philippe (Department of Environment, Ghent University; Department of Archaeology, Ghent University) - Corradini, Erica (Institute of Geosciences, Applied Geophysics, University of Kiel) - Schneiderhofer, Petra (Department for Cultural Heritage Management, Vestfold and Telemark County Council) - Verhegge, Jeroen (Department of Archaeology, Ghent University; Department of Environment, Ghent University; GATE Archaeology)

Format: Regular session

While advances in survey methods have been a boon for studying past landscapes, mapping traces of hunter-gatherers and their environment remains a long-standing challenge. Information on such lifeways, characterised by ephemeral land-use, is difficult to capture with any survey approach, particularly in stratified environments. This elusiveness is exacerbated when using non-invasive tools (such as geophysics or remote sensing), and strongly restricts identifying and characterising land-use patterns hidden in landscape-scale datasets.

The continually expanding archaeological prospection toolkit does, however, create new opportunities. Recent, well-structured integrated approaches show how accounting for the limitations of complementary survey methods as well as for the intricacies of the prehistoric record supports detailed palaeoenvironmental reconstructions, and can equally provide fine-grained site-specific insight into cultural activities. Still, such advances remain only peripherally integrated into Palaeolithic or Mesolithic archaeology, with particular consequences for development-led applications. While available survey toolkits have promise, their translation into daily practice remains variable, restricting the potential of 'Malta archaeology' for tapping into this archaeological resource. Although in some regions, finetuning prospection strategies has increased the amount of detected stone age sites, in other areas this number has stagnated or – e.g. following intensified farming practices – deteriorated.

In this session, we strive to bridge the gap between fundamental questions related to Palaeolithic and Mesolithic archaeology, and established and novel survey approaches. We consider the contribution of archaeological prospection in its broadest sense: ranging from non-invasive techniques (e.g. remote sensing and geophysics), to minimally (borehole and direct-push) and highly invasive (test pitting) methods, complemented with spatial sampling strategies tailored to Palaeolithic and Mesolithic targets.

We welcome contributions on questions and solutions to the complexities of prospecting hunter-gatherer environments, and equally encourage discussing integrated survey approaches that combine traditional and emerging methods to investigate elusive types of the wider array of prehistoric land-use.

ABSTRACTS:

1 DETECTING MESOLITHIC SITES. A MULTICHANNEL GROUND PENETRATING RADAR (GPR) INVESTIGATION AT ANCIENT LAKE DUVENSEE

Abstract author(s): Corradini, Erica (Institute of Geosciences, Christian-Albrechts-University Kiel) - Groß, Daniel (Centre for Baltic and Scandinavian Archaeology - ZBSA, Schleswig-Holstein State Museums Foundation Schloss Gottorf) - Wunderlich, Tina (Institute of Geosciences, Christian-Albrechts-University Kiel) - Lübke, Harald (Centre for Baltic and Scandinavian Archaeology - ZBSA, Schleswig-Holstein State Museums Foundation Schloss Gottorf) - Wilken, Dennis - Erkul, Ercan (Institute of Geosciences, Christian-Albrechts-University Kiel) - Schmölcke, Ulrich (Centre for Baltic and Scandinavian Archaeology - ZBSA, Schleswig-Holstein State Museums Foundation Schloss Gottorf) - Rabbel, Wolfgang (Institute of Geosciences, Christian-Albrechts-University Kiel)

Abstract format: Oral

A large-scale ground penetrating radar (GPR) survey using a 16 channel MALÅ Imaging Radar Array (MIRA) system was performed at the early Mesolithic hunter-gatherer sites of Duvensee (10000-6500 cal. BCE). The aim was to map the location of former islands possibly hosting Mesolithic camps, for reconstructing the prehistoric landscape and shed light on human-environment interaction in the Early Holocene. The presented study extends the geophysical work done in the past four years investigating the unknown area surrounding the recently excavated site (WP10) and eventually detect new islands which can be a location for yet unknown dwelling sites. Furthermore, a detailed comparison between the archaeological excavation and the GPR record is presented with the purpose to identify hazelnuts roasting facilities, which are the most important findings of the camps. It turned out that the detection of these features is possible, but this demands a very detailed analysis of the different profiles and is partly only possible with prior archaeological identification. Nevertheless, the stratigraphy was imaged with a high degree of resolution (3/5 cm) providing the internal layering of the archaeologically investigated sectors and delivering the possibility to locate the interface between archaeological relevant layers and the sterile ones.

Another striking discovery is the presence of unknown islands, promising more insights into prehistoric life in the area. However, currently no evidence of surface findings that would indicate human occupation is recorded. Integrating non-destructive but high-performance analysis into archaeological landscape reconstruction has proven useful in several cases. However, applying this to elusive archaeological landscapes like ancient Lake Duvensee where hunter-gatherers left little structural evidence of their ac-

tivities is significantly improving our understanding of the past. Apart from being able to cover large areas in a short time, the GPR measurements need adequate post-processing to reach useful results and calibration through in situ investigations.

2 A NEEDLE IN A HAYSTACK. LOOKING FOR TRACES OF PALEOLITHIC HUNTER-GATHERERS IN THE WESTERN TAURUS MOUNTAINS (SW, TURKEY)

Abstract author(s): Vandam, Ralf (KU Leuven; Vrije Universiteit Brussel) - Van Peer, Philip (KU Leuven) - Willett, Patrick (KU Leuven, Belgium; University at Buffalo, SUNY) - Egberts, Ella (The British Museum) - Poblome, Jeroen (KU Leuven)

Abstract format: Oral

In 2016-2017, the Sagalassos Archaeological Research Project initiated an archaeological intensive field walking survey program in the Dereköy Highlands, SW Turkey. This survey investigated the long-term socio-ecological developments in agriculturally "marginal" highlands within our mountainous study region in order to break with the traditional archaeological research focus on ecological zones that are well-suited for crop cultivation, such as valleys and plains. One of the most remarkable outcomes of Dereköy Highlands survey was the discovery of Middle Paleolithic artefacts (120 000-45 000 BCE) which push the evidence of the earliest human activity in the area far back in time. After more than 25 years of archaeological surveying in the research area, we were finally able to detect solid indications of Middle Paleolithic human activity in the form of abundant loose finds, but more importantly in two concentrations on a high plateau within the Bey Dağları as well. This plateau is characterized by an extensive gully system that has been transecting sedimentary (probably aeolian and fluvial) deposits. Although no Middle Paleolithic artefacts were yet identified in-situ, it is most likely that these artefacts have been eroded from buried sedimentary deposits that are being washed out through the active gully system. In 2021, we will initiate invasive test pitting survey research within this plateau to hopefully gain high resolution data on the chronology and nature of the artefact concentrations. The prospect of finding Middle Paleolithic in-situ occupations in what seems to be a large sedimentary trap indicates that this site has major potential for the study of the Paleolithic past of Anatolia. In this paper we will specifically present our survey design along with our first results and compare it to previous survey research which had yielded so very scarce Paleolithic results.

3 DETECTING SEALED FINAL PALEOLITHIC HUNTER-GATHERER SITES IN THE SCHELDT VALLEY (NW BELGIUM) – AN INTEGRATED APPROACH

Abstract author(s): Pincé, Possum (Department of Archaeology, Ghent University) - Vandenberghe, Dimitri - Karimi Moayed, Nasrin - De Grave, Johan (Department of Geology, Ghent University) - Crombé, Philippe (Department of Archaeology, Ghent University)

Abstract format: Oral

During the Late Glacial recolonization of NW Europe, hunter-gatherers preferably settled in sheltered environments and along river valleys and lake edges. In the Scheldt valley of NW Belgium, however, remains of these Late Glacial settlers are scarce. It is at present not clear whether this scarcity is related to specific taphonomic factors and/or corresponds to a prehistoric reality. Moreover, the few known sites in the Scheldt floodplain all seem to belong to the Younger Dryas (final stage of the Late Glacial), which led to the recent hypothesis of a possible population shift from the inland lakes towards the Scheldt River at the abrupt transition from the warm Allerød to the extreme cold Younger Dryas. This hypothesis, however, is significantly hampered by the lack of an in-depth assessment of Final Palaeolithic sites in the Scheldt valley.

To investigate this apparent scarcity, geoarchaeological research is performed on elevated locations (aeolian dunes) along the floodplain of the Scheldt River and its tributaries that have a high potential for sealed Final Palaeolithic sites. The first step of this research is to reconstruct the formation and age of these dunes by using minimally (manual and mechanical coring) and highly (test-pitting) invasive survey techniques that include sampling for sedimentological analyses (e.g. granulometry, soil micromorphology) and Optically Stimulated Luminescence (OSL) dating. Based on these results, systematic archaeological coring surveys are conducted on a selection of these dunes to detect sealed Final Palaeolithic sites and to obtain a better understanding of the hunter-gatherer responses to the changing environment and climate in NW Belgium during the Late Glacial. This paper will present the first results, new insights and challenges of this research project.

4 KOKOŘÍNSKO: ASSESSING PROSPECTION DATA ON HUNTER-GATHERER LIFEWAYS FROM A VARIABLE ENVIRONMENT

Abstract author(s): Kapustka, Katarína (Institute of Archaeology of the Czech Academy of Sciences, Prague, v.v.i.) - Walls, Matthew (University of Calgary) - Pauknerová, Karolína (Center for Theoretical Study, Charles University)

Abstract format: Oral

There are many modes of archaeological prospection, and scrutinizing the character of how spatial data is produced is critical to understanding how past communities disposed themselves on past landscapes. This is particularly the case for highly mobile hunter-gatherers whose lifeways include movement across environments that have variability in terms of preservation conditions. In this paper we present preliminary results of a structured survey project that we conducted in the region of Kokořínsko in order to better understand human-environment relationships during the Pleistocene/Holocene transition of Central Bohemia. An objective was to locate both surface scatters and well-stratified contexts with large assemblages that might offer clear insight on lifeways during the radical environmental changes that took place during the Pleistocene/Holocene transition. Kokořínsko is comprised of deeply incised sandstone valleys that break up high plateaus; this creates a rich and varied environment with a dense distri-

bution of ecological niches and localized contexts where geomorphological conditions support archaeological preservation. Our sampling strategy included a combination of field walking, sub surface boring, and test pits, adapted to local context. We outline the distributions of sites located during this work, and reflect critically on the extent to which these reflect real landuse patterns through the Final Paleolithic and Mesolithic communities can be assessed, or if these are products of the sampling strategy.

5 PRECISE SUBMARINE MEASUREMENT AS BACKBONE FOR THE RECONSTRUCTION OF COASTAL MESOLITHIC LANDSCAPES

Abstract author(s): Enzmann, Jonas (Lower Saxony Institute for Historical Coastal Research)

Abstract format: Oral

Since 2011 the site Strande LA 163, in 6 m depth around 1 km in front of the modern coast, is known as one of the few aceramic Ertebølle sites in Northern Germany. A first excavation campaign in 2012 and a survey in 2014 had very promising results, which led to the current project. Under the title: „Subsistence strategies, settlement structure and communication during the terminal Mesolithic exemplified by a submarine micro region in the Bay of Kiel“ the German Research Foundation (DFG) granted a three years project to the Lower Saxony Institute for Historical Coastal Research (NIhK).

The presentation will show how it was possible to reconstruct the palaeotopography and the complex site formation processes. During the project several small trenches were excavated. These trenches were supplemented by coring transects made with a Pürckhauer and special sampling cores next to the trenches obtained by a vibrocoring device. All coring had to be done by divers due to the exposed position of the site. Special remarks will be made on the innovative measurement system which was crucial for the merging of small-scale excavation data, the mid-level coring data and the large scale seismic and sonar data. By combining Computer Vision Photogrammetry with Total Station measurements, it was possible to get positions of layers, artefacts, coring's and samples with a precision of under 5 cm and even less in height. Obviously such a precise and coherent localization of different datasets and information is necessary to understand the extremely dynamic ancient coastal landscapes in which hunter-gatherers lived.

6 DIRECT PUSH VIDEO IMAGING FOR PREHISTORIC PALEOLANDSCAPE MAPPING

Abstract author(s): Verhegge, Jeroen (Department of Archaeology, Ghent University; Department of Environment, Faculty of Bioscience Engineering, Ghent University) - Delvoie, Simon (Department of Architecture, Geology, Environment and Civil Engineering, University of Liège) - Luong, Hiep (Department of Telecommunications and Information Processing, Faculty of Engineering and Architecture, Ghent University)

Abstract format: Oral

Prospecting prehistoric landscapes relies profoundly on natural paleolandscape surveys. Invasive sampling methods, such as test pitting and coring, are widely used but rely on a direct soil or sediment observations. Non-invasive, sensor based techniques such as remote sensing, marine or near-surface geophysical survey were introduced over the past decades. Direct-push sensing is used less frequently and forms a compromise of both approaches, due to its rapid, in-situ data recording. Since, the sensor is pushed down the soil profile while recording data continuously, the target discrimination potential is independent of the burial depth, contrary to non-invasive survey, but dependent on the horizontal extent instead. Therefore, it is well-suited to map deeply buried, subtly contrasting targets with a large horizontal extent and a complex overburden.

After investigating electrical cone penetration testing in combination with electrical conductivity logging, the potential contribution of direct push, in-situ video imaging was explored over the past years to map prehistoric paleolandscapes of the polder-, sand- and loess region of Belgium. On different locations, 720i videos of the soil passing by a small sapphire glass window were recorded as a cone containing the camera is pushed into the soil. Next, image stitching was employed to convert the recorded video (frames) and time-depth data to a vertical mosaicked overview image of the individual depth soundings. This results in an ca. 1 cm wide RGB image of the penetrated soil profile, which was interpreted in combination with mechanical and electrical soil properties. Results point towards an increased discrimination potential in organic (rich) sediments and subtle paleosol horizons. As such, direct push camera imaging forms a considerable new tool for prehistoric landscape mapping. Nevertheless, independent validation of the interpretations by direct soil observations is still required. Further improvements in camera resolution and color calibration could reduce this dependency.

7 COMPLEX REALITIES OF HUNTER-GATHERER ARCHAEOLOGY: A REVIEW OF PAST ADVANCES AND FUTURE CHALLENGES FOR MAPPING ELUSIVE LIFEWAYS

Abstract author(s): De Smedt, Philippe (Ghent University) - Corradini, Erica (Institute of Geosciences, Applied Geophysics, University of Kiel) - Schneidhofer, Petra (Vestfold and Telemark County Council) - Verhegge, Jeroen (Department of Archaeology, Ghent University; Department of Environment, Ghent University; GATE Archaeology)

Abstract format: Oral

Mapping past hunter-gatherer landscapes remains a long standing challenge in archaeological survey. Over the past decades, many prospection techniques have been developed that try to account for the scale and subtlety of the elusive targets characterising these lifeways. The range of regions in which integrated prospection approaches are applied, is expanding continually. While sub-aqueous, wetland and sedimentation areas pose specific technical complexities, the search for Palaeolithic and Mesolithic occupa-

tion in dryland environments, mountainous regions or even submerged areas is pushed by academic framework and the mitigation responses to land-use and development.

While some techniques, including traditional approaches such as test pitting, are well established, advancement on adaptive sampling strategies or continual scrutiny of deployed field approaches remains limited. The same goes for other methods that have a more regional 'acceptance', such as systematic auger surveying in Belgium and the Netherlands. These provide opportunities beyond local applications, and often hold an untapped potential for developing comprehensive survey approaches that increase the scientific revenue as well as the economic efficacy of field practice. Lastly, the introduction of novel investigative methods such as remote sensing or geophysical prospection has heralded a 'prospection positivism' in some schools. While such approaches can resolve (sub)surface variation at an unrepresented spatial scale and sensitivity, the increased effort towards automated interpretation schemes does raise concern for omitting hunter-gatherers from the 'non-invasive' archaeological record.

In this presentation, we provide an overview of traditional and non-traditional approaches to prospecting hunter-gatherer environments and the material remains that enable us to study them. We will start by delineating the targets that define these from an archaeological and environmental standpoint, and evaluate how common approaches are optimal – or inefficient – in resolving these. Lastly, we will propose future pathways to a more sustainable evaluation and reliable investigation of these elusive lifeways.

A. DUVENSEE PALAEO-DATA IN NEW LIGHT: RE-EVALUATION OF ON- AND NEAR-SITE SEDIMENT SEQUENCES FROM THE MESOLITHIC

Abstract author(s): Wieckowska-Lüth, Magdalena - Dörfler, Walter (Institute of Pre- Protohistoric Archaeology, University of Kiel)

Abstract format: Poster

The intensive archaeological research in the ancient lake Duvensee was accompanied several times by the palynological studies. However, these were mainly restricted to archaeological purposes, that is, dating of hunter-gatherer sites and clarifying questions about the stratigraphy, rather than being regarded as essential for understanding of the temporal evolution of the palaeolake area. This poster presents a re-evaluation of the hitherto results of the palynological research carried out in the Duvensee area, referring to several both published and unpublished on- and near-site early Holocene sediment sequences.

Owing to this holistic view of the paleo-data it was possible to identify common developments. While more or less continuous use of the Duvensee area could be detected in most of the pollen records since the beginning of the Boreal, hydrological changes at the transition from the early to the late Boreal seem to have had an impact on the Mesolithic land-use. During this phase, evidence of open-land indicators decreases, often correlating with a hazel decline. The poster takes up the discussion of whether hazel may have been encouraged either by human activities, or that climatic changes may have temporarily slowed down its spread.

297 MODELLING COMPLEXITY: PAST INTERACTIONS BETWEEN PEOPLE, CLIMATE AND ENVIRONMENT [PAM]

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Burke, Ariane (Universite de Montreal; Oeschger Centre for Climate Change Research) - Riede, Felix (Aarhus University)

Format: Regular session

Conveying a sense of place and measuring the importance of environmental services for people in the past are difficult tasks. Understanding the relationship between prehistoric human populations and the world around them requires the ability to reconstruct key aspects of the palaeoenvironment – from large-scale drivers of environmental conditions, such as climate, to more regional variables such as vegetation cover and faunal communities. Computational archaeology is leading the way in the study of past human-environment interactions across spatial and chronological scales. With the increased availability of high-resolution climate models, palaeoecological proxies and the mature use of GIS-aided ecological modelling, archaeologists working in interdisciplinary settings are well-positioned to explore the intersection of human systems and environmental affordances and constraints. These methodological advancements provide a better understanding of the role humans played in past ecosystems – both in terms of their impact upon the environment and, in return, the impact of environmental conditions on human systems. They may also allow us to infer past ecological knowledge and land-use patterns that are historically contingent, rather than environmentally determined. This session seeks contributions that combine reconstructions of past environments and archaeological data with a view to exploring their complex interactions at different scales and invites scholars from varying disciplines and backgrounds to present, compare and contrast different modelling approaches.

ABSTRACTS:

1 CLIMATE NICHE MODELLING REVEALS THE FATE OF PIONEERING LATE PLEISTOCENE POPULATIONS IN NORTHERN EUROPE

Abstract author(s): Pedersen, Jesper (Department of Archaeology and Heritage Studies, Aarhus University Moesgård; Center for Biodiversity Dynamics in a Changing World - BIOCHANGE, Department of Biology, Aarhus University) - Assmann, Jakob - Normand, Signe (Department of Biology - Ecoinformatics and Biodiversity, Aarhus University; Center for Biodiversity Dynamics in a Changing World - BIOCHANGE, Department of Biology, Aarhus University) - Karger, Dirk (Swiss Federal Institute for Forest, Snow and Landscape Research WSL; Center for Biodiversity Dynamics in a Changing World - BIOCHANGE, Department of Biology, Aarhus University) - Riede, Felix (Department of Archaeology and Heritage Studies, Aarhus University Moesgård; Center for Biodiversity Dynamics in a Changing World - BIOCHANGE, Department of Biology, Aarhus University)

Abstract format: Oral

Following deglaciation during the final stages of the Pleistocene, vast landscapes became increasingly accessible for human dispersal. With no historical analogues, it remains uncertain how people were adapting to these unknown and often unstable environments and whether dispersals were sustained or characterised by local retreat or extinction events. We address these uncertainties by using climate niche modelling to investigate the relationship between climate and the archaeological record of such a dispersal event: the Late Upper Palaeolithic Hamburgian settlement of northern Europe. Our models consider temperature and precipitation from paleo climate models with high temporal (100 yrs) and spatial resolution (c. 1km). They suggest that rising temperatures instead of precipitation changes drove dispersal events by allowing carriers of the Hamburgian tradition to occupy a specific, northward shifting climate space. Similarly, our models suggest a subsequent constriction and fragmentation of this climate space caused by declining temperatures. This climatic downturn and shifting climate space coincides with the disappearance of the Hamburgian tradition from the archaeological record. We argue that this sudden climatic change pushed the social and demographic costs of northward dispersal to become unsustainable, leading to a depopulation of the region.

2 OF HUNTING, GATHERING AND FISHING: EXPLORING SOCIO-ECOLOGICAL DYNAMICS USING AGENT-BASED SIMULATIONS

Abstract author(s): Günther, Gerrit (Department of Geography, Physical Geography, Christian-Albrechts-Universität zu Kiel; CRC 1266: Scales of transformation: Human-environmental interaction in prehistoric and archaic societies - SFB 1266, Christian-Albrechts-Universität zu Kiel) - Groß, Daniel (Centre for Baltic and Scandinavian Archaeology - ZBSA – Schleswig-Holstein State Museums Foundation Schloss Gottorf; CRC 1266: Scales of transformation: Human-environmental interaction in prehistoric and archaic societies - SFB 1266, Christian-Albrechts-Universität zu Kiel) - Knitter, Daniel (Department of Geography, Physical Geography, University of Kiel; CRC 1266: Scales of transformation: Human-environmental interaction in prehistoric and archaic societies - SFB 1266, Christian-Albrechts-Universität zu Kiel) - Strohm, Steffen (Department of Computer Science, Christian-Albrechts-Universität zu Kiel; CRC 1266: Scales of transformation: Human-environmental interaction in prehistoric and archaic societies - SFB 1266, Christian-Albrechts-Universität zu Kiel) - Wieckowska-Lüth, Magdalena (Institute of Prehistoric and Protohistoric Archaeology, Archaeobotanical and Palynological Laboratory, Christian-Albrechts-Universität zu Kiel; CRC 1266: Scales of transformation: Human-environmental interaction in prehistoric and archaic societies - SFB 1266)

Abstract format: Oral

Land use practices and spatial organization are integral to understand past human-environment interactions. Especially in hunter-gatherer societies with their elusive material culture, it becomes important to find ways for interpreting the archaeological data. Agent-based modelling is a method, which provides a bottom-up approach for studying complex systems. In this presentation, we focus on the Mesolithic on the Northern European Plain and provide an abstract, modular simulation tool that allows investigating various aspects and possibilities of socio-ecological dynamics and environmental perception of past societies. In order to test hypotheses regarding different land use patterns and strategies, socio-ecological concepts are combined with advanced computational modelling techniques. Transferring these concepts into a simulation using the Julia programming language we provide first results that showcase agent-based models as useful tools for discussing hypotheses and bridging the gap between archaeological data and socio-ecological dynamics. Our model contributes to understanding hunter-gatherer societies by an integrative perspective of theoretical approaches and empirical data.

3 CHALLENGES IN USING COMPUTATIONAL ARCHAEOLOGY WITH LIMITED DATA: A CASE STUDY FROM FINAL PALAEO-LITHIC SCHLESWIG-HOLSTEIN

Abstract author(s): Grimm, Sonja - Eriksen, Berit (ZBSA - Centre for Baltic and Scandinavian Archaeology; CRC 1266) - Günther, Gerrit - Hamer, Wolfgang - Knitter, Daniel (CAU Kiel; CRC 1266) - Krüger, Sascha (National Museum of Denmark) - Weber, Mara-Julia (ZBSA - Centre for Baltic and Scandinavian Archaeology; CRC 1266) - Wild, Markus (CAU Kiel; Cluster of Excellence "ROOTS")

Abstract format: Oral

Using computational modelling is a promising field in combining palaeoenvironmental and archaeological research. However, a model always represents a simplification and analysing complex connections such as human-environmental interactions requires a solid conceptual fundament and the respective data base. Source criticism is essential to differentiate past patterns from analytical

limits. For instance, the idea of developing an inductive predictive model for finding sites of the different Final Palaeolithic techno-complexes in Schleswig-Holstein could not be developed straightforwardly due to the small number of sites in regard to the size of the region and the timespan. The palaeoenvironmental archives are also limited and reflect shifting ecological zones across Schleswig-Holstein during the Lateglacial. Furthermore, the landscape has changed significantly since the deposition of Final Palaeolithic material with the accumulation of coversands and tidal plains, the development of peat bogs from open water bodies, wind ablation, permafrost development and melting. Hence, modern DEMs do not reflect past landscapes and cannot be adapted by simple equations. We are lacking detailed information about the development in large parts of the landscape what makes geostatistical analyses difficult to impossible.

Yet, advanced computational methods can help evaluating our hypotheses if we can transform these conjectures into spatially explicit data and test them against the available archaeological and palaeoenvironmental sites and material. For instance, the incorporation of fuzzy logic allows us to map our limited knowledge as linguistic variables. The benefit of this rule-based approach is that it reflects our hypotheses and answers questions concerning, for instance, key palaeoenvironmental aspects for Final Palaeolithic humans and traditional choices of placing a camp.

4 THE LAST OF THEM. INVESTIGATING THE PALAEOGEOGRAPHY OF THE LAST NEANDERTHALS IN EUROPE (MARINE ISOTOPIC STAGE 3; 60-27 KY BP)

Abstract author(s): Albouy, Benjamin - Burke, Ariane - Riel-Salvatore, Julien (Université de Montréal)

Abstract format: Oral

Neanderthals (*Homo neanderthalensis*) are the best-documented extinct human species to this day. They are generally associated with the material culture known as the Mousterian. They occupied a large part of Eurasia, starting around 350 ky Before Present (BP) until their disappearance around 40 ky BP. In this context, Marine Isotopic Stage 3 (MIS 3), lasting 60-27 ky BP, constitutes a key period to consider their adaptability and to clarify the reasons behind their extinction. Further, this period was marked by both abrupt climatic change, and the arrival of Anatomically Modern Humans from the East. Hence, it is crucial to investigate the precise impact of each of these elements on Neanderthal behavior.

While much research has focused on the specific conditions of their extinction, we present here a new doctoral research project that aims to assess more precisely the influence of abrupt climatic change on the Neanderthal settlement of Europe during MIS 3. This project, taking place within the Hominin Dispersal Research Group (HDRG), involves a multidisciplinary approach combining a large corpus of archaeological and paleoclimatic data used to develop species and ecological distribution models. We detail here the first step of this project, focusing specifically on the collected archaeological data. The resulting database, built from a comprehensive literature review, is the foundation of our work and will also constitute an open-access resource for further research and collaborative projects. We conclude with an in-depth discussion of our methodology for integrating these data with the paleoclimatic data and how they will be used to build habitat suitability models of unprecedented temporal and spatial resolution.

5 TOWARDS COMPLEX MODELLING: HUMAN-ENVIRONMENT INTERACTION IN EUROPE DURING GLACIAL-INTERGLACIAL CYCLES

Abstract author(s): Schmidt, Isabell - Limberg, Heiko - Klein, Konstantin - Wegener, Christian (University of Cologne) - Weniger, Gerd-Christian (Neanderthal Museum) - Hense, Andreas (University of Bonn) - Rostami, Masoud - Shao, Yaping (University of Cologne)

Abstract format: Oral

Climatic change during glacial-interglacial cycles of the Late Pleistocene have raised intense discussions about its effects on humans' resilience, their survival, socio-cultural and economic adaptations, and dispersal processes. In this study, we use the human-existence potential model to investigate how climate change influenced the distribution and dispersal of humans, taking the expansion of Anatomically Modern Humans into Europe a case study.

A global climate model is used to simulate extreme climate conditions of stadial and interstadial periods. These simulations underlie the human-existence potential model, which combines climate and archaeological data and provides an estimate on the human existence probability at each given location. We find that climate change profoundly influenced human dispersal during the Aurignacian. Several hot-spot areas located in the climate shadows of large topographic features may have played important roles during cold conditions. However, we also observe interesting mismatches which could indicate evidence of specific human adaptation during this time frame. In general, the contrast between the high temporal resolution of the climatic record and low resolution available for the archaeological record requires careful adjustment of the research questions addressed at this scale. However, high potential is identified for its application to long temporal time-series and the integration of additional environmental and socio-cultural factors.

6 LANDFORMS AND HABITATS: A DIACHRONIC PERSPECTIVE ON UPPER PALAEO-LITHIC LAND USE IN EUROPE

Abstract author(s): Schoenenberg, Jonathan - Sauer, Florian (University of Cologne)

Abstract format: Oral

The geomorphology of landscapes influences a variety of different abiotic factors such as precipitation, evapotranspiration or soil formation. Hydrological conditions in the landscape are regulated and directed by valleys and peaks while insolation changes with elevation and exposition of different landforms. Local topography has an indirect effect on biotic factors by defining the framework for plant societies and the accompanying fauna. Therefore, topography and landforms are proxies for the patterning of biocoenoses and its resulting bioeconomic potential. We use the diversity of different landforms in modelled catchments of prehistoric sites to quantify this bioeconomic potential.

In this presentation we show the methodological framework and initial results of the analysis of bioeconomic resource potential for the Upper Palaeolithic (c. 42–10 ka BP) on a continental scale.

First results of the project allow to quantify the difference between generally available landscapes and settled regions. The diachronic comparison throughout different technocomplexes reveals further distinction in the interaction between humans and their surrounding environment. We also identify regional trends by synchronous comparison of different chronological phases and regional units. At this point of research, we can document a strong correlation between the diversity of catchments in different chronological phases and global climatic trends. During warmer periods of the last glaciation a preference for low variance in landform distribution resulting in a lower bioeconomic potential can be observed. In turn, hunter gatherers favoured higher diversity within catchments during colder phases such as the Last Glacial Maximum.

Discussing our modelling results, we will illustrate potential implications on the Upper Palaeolithic land use in Europe and compare these against common mobility theories.

7 THE IMPACT OF MAGDALENIAN HUNTER-GATHERERS ON THEIR ENVIRONMENT

Abstract author(s): Gravel-Miguel, Claudine (Arizona State University)

Abstract format: Oral

Anthropological and ethnographic research has shown the influence of climate and resource distribution on hunter-gatherer lifestyle. As a result, an increasing number of archaeologists have attempted to reconstruct past environments to understand behavior in its context. However, to this day, only a few have considered the possibility that hunter-gatherers themselves impacted the environment and resources on which they relied. This research aims to reconstruct Southwest European Magdalenian environment and evaluate the potential impact that Magdalenian hunter-gatherers had on that environment. It uses the biomization method, focusing on the distribution of 77 plant taxa aggregated into 13 plant functional types (PFT), which are then grouped into biomes. The modern distributions of the PFT are assessed through crowd-sourced data, and a model of their climate requirements is built using MaxEnt. Those requirements are then applied to Magdalenian climate to reconstruct the PFT's probable prehistoric distributions. Magdalenian climate maps are reconstructed using WorldClim and data from the Trace-21ka global climate model. In the scenario without human impact, the PFT distributions are combined to form biomes. In the scenario with human impacts, a MaxEnt model is built using archaeological sites to predict the distribution of Magdalenian hunter-gatherers, which affects the threshold of PFT's presence prior to being combined into biomes. The reconstructed biomes of both scenarios are then compared to the archaeological pollen record to evaluate which scenario (with or without human impact) fits the empirical data best.

8 RETHINKING THE IMPORTANCE OF EUROPEAN RABBIT (*ORYCTOLAGUS CUNICULUS*) IN THE HUMAN DIET DURING THE UPPER PALAEO-LITHIC IN IBERIA

Abstract author(s): Seuru, Samuel (Département d'Anthropologie, Université de Montréal) - Perez, Liliana (Département de Géographie, Université de Montréal) - Burke, Ariane (Département d'Anthropologie, Université de Montréal)

Abstract format: Oral

Understanding interactions between prehistoric human populations and faunal communities requires a combination of theoretical models and computer-based simulations to reconstruct key aspects of cynegetic behaviors such as small game hunting. Today there exists no general consensus as to the causes of the introduction of the European rabbit (*Oryctolagus cuniculus*) into the diet of Palaeolithic hunter-gatherers in Iberia. One hypothesis is that resource stress, caused by an imbalance between human and ungulate populations in Iberia during the Last Glacial Maximum, drove people to expand their diet breadth. Because this hypothesis is grounded in Optimal Foraging Theory, we use this conceptual framework to build an agent-based model (ABM). The goal of the ABM is to evaluate the impact of the resource stress hypothesis on the zooarchaeological record and better understand its implications. The results bring a new perspective to the intense debate surrounding the interpretation of the large number of European rabbit remains in Iberian sites during Upper Palaeolithic.

9 **WHERE THE GRASS IS GREENER: ESTIMATED VEGETATION PERIODS AND THEIR EXPLANATORY POTENTIAL FOR SITE DISTRIBUTION IN THE EAST EUROPEAN PLAIN**

Abstract author(s): Tharandt, Louise - Linsel, Florian - Maier, Andreas (Institute of Prehistoric Archaeology, University of Cologne) - Ludwig, Patrick (Karlsruhe Institute of Technology, Institute of Meteorology and Climate Research, Department Troposphere Research - IMK-TRO)

Abstract format: Oral

Migrating animals often show a behavior that is termed "surfing the green wave", i.e. they move to patches of land where plants just started to sprout. Timing and conduct of such movements likely have been of interest for prehistoric hunter-gatherers. Particularly in areas with a comparatively homogeneous topography, such as the East European Plain, these movements might have been a strong factor influencing the distribution of site and consequently the intensity of contact and interaction between different groups. In this paper, we present estimates on the timing of the vegetation period in the East European Plain between 40 ka (GI-9) and 27 ka (GS-3). We explore the differences and shifts in the start and end of the vegetation periods with regard to Stadial and Interstadial conditions. Evaluating the explanatory potential of the emerging pattern, we compare the results with the site distribution during the different periods as well as the formation of larger taxonomic units. We conclude that differences in the estimated timing of the vegetation period in different parts of the East European Plain are helpful to understand the large-scale structure of the archaeological record between the Vistula River and the Ural Mountains.

10 **ABOUT PEOPLE AND LOESS. MODELLING DUST EMISSION AND IMPLICATIONS FOR THE PEOPLING OF NORTH-WESTERN FRANCE DURING THE LAST GLACIAL MAXIMUM**

Abstract author(s): Boisard, Solène (Hominin Dispersals Research Group, Department of Anthropology, University of Montreal) - King, James - Chaput, Amélie - Gauvin-Bourdon, Philippe (Wind Erosion Laboratory, Department of Geography, University of Montreal) - Burke, Ariane (Hominin Dispersals Research Group, Department of Anthropology, University of Montreal)

Abstract format: Oral

Human settlement dynamics are influenced by ecological and social factors. In North-Western France, the scarcity of archaeological sites dating to the Last Glacial Maximum (LGM) is commonly assigned to periglacial conditions characterized by important loess accumulations. The emission processes, their sources, and the transport of loess as well as its extent in this region are not well defined and explained. It is commonly assumed that loess material comes from a major and distant source: the English Channel/North-Sea, a large exposed periglacial area during the lowering of sea level. However, research on passive (geological and geoarchaeological regional map) and active (global paleoclimatic models with dust production models) geomorphology are rarely confronted, opening issues about the ancient ecosystems and their habitat suitability for ancient populations.

This preliminary study combines two approaches and multiple sets of data. To study passive geomorphology, spatial analysis of loess deposits thickness available in northern France were set against potential sources of emissions from the English Channel. This approach emphasizes on geomorphology patterns (topography and hydrography). The active methods consist of modelling the regional LGM climate in Northern France, via existing global paleoclimate models, driving a Lagrangian trajectory model (FLEXPART) to study various potential dust sources. Modelling results are correlated and contrasted against loess analysis maps, to verify the accuracy of the potential dust sources. Unique or multiple origin dust influence regional soil type, and by extent vegetation, a situation that could lead to more contrasted ecological patchwork and influence movements dynamics of faunas and humans.

11 **REFLOATING THE AEGEAN LOST DRYLAND: AN AFFORDANCE-BASED GIS APPROACH TO EXPLORE THE INTERACTION BETWEEN HOMININS AND THE PALAEO LANDSCAPE**

Abstract author(s): Tsakanikou, Peny (Palaeolithic Lesbos Research Project, University of Crete; Centre for the Archaeology of Human Origins, University of Southampton)

Abstract format: Oral

Recent palaeogeographical reconstructions for the past 400ka provide solid evidence for the occurrence of subaerially exposed landmasses over the northern and central Aegean during the glacial low stands of the Middle Pleistocene (from at least MIS 12). Similar conditions could be extended as far back as the Early Pleistocene or even the Late Pliocene, based on current knowledge of the tectonic evolution of the Aegean.

These former terrestrial environments, which now lie underwater, connected Western Asia to Europe via the Greek mainland, offering opportunities for settlement and dispersal to hominin groups. The Aegean dryland would constitute the extension of the Balkan refugial zone over the NE Mediterranean, hosting variability-rich resources and protected niches during extreme climatic phases. In spatial terms, a whole new arena for the LP research is now revealed at the crossroads between Africa, Europe, and Asia.

Understanding the interaction between hominins and this newly revealed, former terrestrial landscape in the deep past has proven to be quite challenging due to the dynamic nature of the Aegean region. Despite these challenges, through GIS-based suitability analysis and predictive modelling, we can begin to formulate a better understanding on the nature of this interaction.

This paper will present an interdisciplinary approach, integrating archaeology, palaeoenvironments and palaeogeography within an affordance-based GIS framework, to explore further the affording palaeolandscapes and the hominin response to it. Predictive mod-

elling based on suitability and landscape legibility led to the identification of potential trans-Aegean corridors of opportunity for dispersal and occupation zones during the Early and Middle Pleistocene.

This work is hoped to instigate future LP research and renew interest in the Aegean by fostering a new cycle of discussion on the biogeographical importance of the wider NE Mediterranean during the early settlement(s) of the European continent.

12 **GIS-AIDED MODELLING OF NEOLITHIC SOIL EXPLOITATION IN THE SOUTH OF EASTERN EUROPE**

Abstract author(s): Kiosak, Dmytro (Ca' Foscari University of Venice) - Radchenko, Simon (Universita degli Studi di Torino)

Abstract format: Oral

Neolithic farmers had certain patterns of soil exploitation, which were well established in Central Europe. There are particular sedimentary conditions at many Neolithic sites in the south of Eastern Europe (modern-day Ukraine, Moldova and Romania). The remains of Neolithic houses are covered by thick (sometimes over 1 meter) layer of later Holocene deposits. On the one hand this situation makes any large scale excavation of these sites a difficult enterprise, on the other hand it opens the possibility to study the soil sequence looking for trends of change during Holocene.

In this work we study the geographical correspondence between sites of several Neolithic cultures and the modern soil distribution. In order to carry out the comparison we compiled the database, which was designed in PostgreSQL, and digitalized (in QGIS) a dataset of soil maps provided for agricultural purposes. The results indicate a variable patterns of soil exploitation throughout Neolithic. Furthermore, several case-studies (Linear Pottery Culture site Kamyane-Zavallia, Trypillia sites Sabatynivka 1 and Kamyane-Zavallia I) enable us to verify the correspondence of modern soil cover to the soil cover of Neolithic in different geomorphologic contexts. This possibility forms a basis for modelling of the soil distribution in Neolithic in a given microregion. The latter is carried out in a shape of GIS-project.

13 **FROM CELLS TO BEHAVIOURS. MODELLING PASTURES AND CROPS IN A RASTER GIS SYSTEM STARTING FROM LANDSCAPE (PALEO-)DATA**

Abstract author(s): Sotgia, Agostino (Sapienza - University of Rome; RUG - University of Groningen)

Abstract format: Oral

The exploitation of landscape resources has always been the main type of relationship between human communities and the environment where they live. Agriculture and pastoralism represent the first level of rational exploitation of the landscape by man and above all for the prehistoric communities they are the most evident sign of their action.

For this reason, a GIS cell-raster model has been developed that is capable of the identification of the area most suitable for the agro-pastoral exploitation.

Combining information from landscape survey, excavations and palynological and archeozoological analyses, I will propose a land use model, based on these primary data, informed by studies on pre-modern agricultural techniques (as the Latin agronomists Columella or Pliny), as well as on contemporary agricultural requirements (FAO - land evaluation).

Using the Analytic Hierarchy Process method, the system carries out an integrate multi-criteria analysis of various variables such as: soil types, slope and sun exposure of land, area elevation or the distance from water resources, as well as effect of the phenomenon of erosion on the lands or the wetness present in the area.

Once the landscape's areas most suitable for agro-pastoral exploitation have been identified, it will be possible to analyse their relationship with archaeological sites using all the typical tools of the archaeological discipline, whether they are the most typical of space archaeology or the new, more phenomenological approaches.

The paper presented intends to illustrate in detail the structure and functioning of the GIS model developed, as well the different possible applications in archaeological contexts.

14 **POPULATION DENSITY DRIVES FARMER SETTLEMENT AND ABANDONMENT OF MARGINAL ENVIRONMENTS**

Abstract author(s): Yaworsky, Peter (Department of Archaeology and Heritage Studies, Aarhus University; University of Utah Archaeological Center; Department of Anthropology, University of Utah) - Codding, Brian (University of Utah Archaeological Center; Department of Anthropology, University of Utah; Global Change and Sustainability Center, University of Utah)

Abstract format: Oral

While archaeological research throughout the world documents the spread of farming communities following regional domestication events, explaining the variation in their timing and persistence remains contentious. Leveraging insights from behavioural and population ecology, we examine the factors that drive farming populations to occupy and abandon marginal environments. We assess the rise and collapse of farming communities in the West Tavaputs Plateau in the southwestern USA. Early farmers in the region lived at the northern extent of where agriculture was possible. With its high plateaus, deep canyons, and limited perennial water sources, the arid environment resulted in both short growing seasons and a paucity of water. We use the ideal free distribution model to investigate the occupation and abandonment of habitats across the West Tavaputs Plateau. We find that neither occupation nor abandonment is driven by variation in precipitation, but by other factors that affect population size. This finding has

two significant implications. First, it supports the idea that farmers on the West Tavaputs Plateau were not dry farming, but primarily reliant on perennial water sources for crop irrigation. Second, settlement and abandonment events appear to mirror one another, with lower-ranked habitats being occupied last and abandoned first. These results have important implications for understanding the resilience of farming in marginal environments around the world.

298 THE LONG FOURTH CENTURY BC: TRACING THE TRANSFORMATION OF SOUTHERN ITALY IN ITS MEDITERRANEAN CONTEXT

Theme: 4. Globalisation and archaeology

Organisers: Heitz, Christian - Hoernes, Matthias (University of Innsbruck) - Henning, Agnes (Humboldt University, Berlin) - Robinson, Ted (University of Sydney)

Format: Regular session

Thirty years ago, Nicholas Purcell recognised a 'long' fourth century BC, between the late fifth century and the end of the Pyrrhic War, as the "heroic age" of Southern Italy. This period saw significant dynamics in the construction of urban and rural landscapes as settlements transformed into cities, many of them fortified. Hinterlands were scattered with farmsteads, new sanctuaries appeared and new forms of local identity emerged. Tombs increased exponentially in number and lavishness; larger tomb types arose, funerary cult intensified and increased social stratification is strongly implied. Over this period, craftsmanship underwent specialisation and the production of red-figured and glazed pottery grew into an industry that flooded the inland with commodities and led to the establishment of workshops there. Nevertheless, this period has primarily been regarded as a phase of constant turmoil and crisis, into which the so-called 'condottieri' are thought to have thrown the South on the eve of the Roman conquest. Predominantly based on the literary evidence, such narratives fall short of this highly dynamic period, in which longer developments tied in with accelerated change and Mediterranean connectivity and transculturality thrived more than ever before.

Purcell had already voiced the hope that archaeology could construe a new narrative by going "beyond the simple evolutionist perspective of analysing hundreds of local experiences in geographical order" and instead making sense of them within a broader historical process. After three more decades of archaeological work, it is now time to sketch a narrative of the 'mezzogiorno' and to trace transformative dynamics on the basis of the archaeological evidence. We invite papers presenting in-depth studies of manifestations of regional dynamics, surveys with a sensitivity for local particularities, or comparative perspectives from neighbouring regions in the Mediterranean, which focus on, but are not limited to, the topics touched on above.

ABSTRACTS:

1 TRANSFORMATIVE DYNAMICS IN THE 4TH CENTURY BC MESSAPIA

Abstract author(s): Meo, Francesco (University of Salento)

Abstract format: Oral

Messapia corresponds to the southeastern edge of Italy. During the last few decades, extensive archaeological research has been conducted into Messapian settlements. This paper will focus on transformation of the settlements and territory in this area, through social dynamics and material culture.

Despite the fact that most of the evident transformations of this population (the introduction of writing, the construction of a road system, the change of domestic architecture and of funerary practices) occur during the 6th cent. BC, new researches are demonstrating several consistent, even if less evident, changes in some settlements during the second half of the 4th cent. BC.

As in the case of the Archaic period, these transformations are rather internal to societies, led by the local aristocracies.

As for the whole southern Italy, also Messapian settlements build imposing surrounding walls in the 4th cent. BC, whose dimension demonstrate the importance of the centre in a sort of civic competition. In the case of Muro Leccese, they totally redefine the town as they are built destroying some funerary nuclei and outer clusters of dwellings and occupying about 30 hectares of a new area.

Together with walls, changes consist in the construction of larger dwellings (Vaste), sometimes with a mosaic floor (Oria) and of monumental tombs (the 'Ipogeo Palmieri' at Lecce, the 'Ipogeo delle Cariatidi' at Vaste and a new hypogeum found at Muro Leccese) whose decoration reflect the cultural koinè with Macedonia and Epirus, through Taranto.

On the other hand, in daily life Messapian communities became markedly less open to external cultural experiences, reflecting a pronounced conservatism among the local ruling classes. The building techniques replicated those of the Archaic period, while the ceramics used for daily purposes included far fewer imported items, limited almost exclusively to amphorae of wine.

2 VENAFRO PROJECT: THE RISE OF HILLTOP FORTIFICATIONS IN SAMNIUM IN THE 4TH CENTURY BC

Abstract author(s): Hoer, Alexander (Universität Zürich)

Abstract format: Oral

The tribes referred to as "Samnites" by Roman sources were particularly noted for their ferocity. Samnites allegedly posed a threat to Roman hegemony and were subsequently fought in several wars beginning in the 4th century BC.

The image of Samnites conveyed in literary sources has recently been challenged by archaeological research, which has focused especially on sanctuaries and settlement patterns. An important feature, has however, received little attention so far: the rise of hilltop settlements and military outposts surrounded by massive megalithic walls.

The aim of this paper is to provide a reassessment of these hilltop fortifications through fieldwork and new theoretical approaches. Three extensive field survey campaigns of the region around Venafro, carried out in 2017 and 2018, serve to document several hill-forts and their surrounding features in more detail. Therefore, the paper discusses the new results carried out in these field campaigns. They provide a new perspective on the broader territorial and historical context and the nature of hilltop fortifications.

3 THE SPATIAL AND SOCIAL TRANSFORMATION OF THE SETTLEMENTS BY FORTIFICATION WALLS IN THE MOUNTAINOUS INLAND OF SOUTH ITALY

Abstract author(s): Henning, Agnes (Winckelmann-Institut, Humboldt-Universität zu Berlin)

Abstract format: Oral

Due to the geomorphology, the mountainous inland of South Italy was characterized by hill top settlements since the late Bronze Age. Although we have only little evidence for the organisation of the settlements in the first half of the 1st millennium BC which were probably structured as single clusters, a radical transformation and a completely new layout of the settlements is to be observed since the 4th century BC. Older buildings and even necropolises were given up and overbuilt. The most significant change was the construction of fortification walls. The fortifications surrounded and protected the settlements from now on, but they also bounded and defined the settlements towards the external space and made them visible from far away. These enormous building projects - which have been executed not only in the South Italian inland but also in the whole Mediterranean and which coincided with the development of new war techniques - were a novelty and an economical, logistical and technical challenge. New technologies were applied which in this extend have never been used before. This demonstrates that the fortifications had a high value for the single settlements which cannot only be reduced on the defensive function of the walls. Furthermore, they have to be seen in a wider context of the South Italian communities in the 4th and 3rd century BC.

In my paper I will present these transformations and ask their dynamics, which are related to the graduate growth of the Roman influence towards the South.

4 VISUAL CONNECTIVITY AND CONTROL: LUCANIAN FORTIFIED CENTRES

Abstract author(s): Myers, Brett (Australian Archaeological Institute at Athens; University of Sydney)

Abstract format: Oral

This paper will investigate models of fortification systems used during the 4th century BC in ancient Lucania. Over seventy fortified centres are known in Lucania from this period and we will examine how the environment of the uplands of Basilicata could have helped shape Lucanian settlement patterns and how some of these settlement patterns were seemingly tempered by proximity to neighbouring Greek colonies on the Ionian and Tyrrhenian coastlines. Combining GIS and network analysis a number of questions will be examined: Were the positions of Lucanian fortified centres influenced by an ability to remain in visual contact with each other, at least within a number of discreet groups? Were their locations influenced by the amount of visual control their elevated positions afforded over communication and trade routes? Did proximity to Greek coastal colonies modify upland settlement patterns?

The results of this survey on the fortified centres can help construct an understanding of the regions sites and the people who inhabited them.

5 CONTINUITY AND TRANSFORMATION: SOME EXAMPLES OF STOAI AND THESAUROI ORGANIZING THE PUBLIC AND RELIGIOUS SPACE

Abstract author(s): Pollini, Airton (Université de Haute-Alsace) - Montel, Sophie (Université de Franche-Comté, Besançon)

Abstract format: Oral

Recent studies on Greek architecture and topography have increasingly examined the complexity of the determination of specific functions attributed to some monuments. Some monumental structures, mainly stoai and thesauroi, are found in communal spaces (public and religious) such as agorai and sanctuaries scattered almost everywhere in the Greek world, including South Italy. Their architecture was also adopted by several Italic communities. The functions of these monuments are multiple, or rather undetermined, with a very wide range of purposes depending mainly on their contexts and local history: functions may then be linked to politics, economic activities, religious acts or even philosophical debate; stoai and thesauroi may also serve as memorial places for the community and as a privileged space for the disposition of offerings, including weapons and statues, honorific and sacred.

After the publication of a collective work on the organization of space in fourth century BCE (Montel-Pollini ed., *La question de l'espace au IVe siècle avant J.-C. dans les mondes grec et étrusco-italique*, 2018), we propose to pursue our analysis on the layout of some communal spaces (agorai and sanctuaries) taking into consideration the possibility that those vaguely defined structures (stoai and thesauroi) may also be essential in the organization and development of such spaces, during the fourth century BCE, shortly before an intensive building activity in the third century. We propose a synthetic analysis from some meaningful case studies (Metaponto, Poseidonia, Heraion Sele, Locri-Parapezza, Argos, Delphi, Epidavros, Olympia, Knidos, Smyrna) comparing the realities

of both parts of the Greek world, Western and Aegean cities. In order to analyze the particularity of Italiote cities, it is essential to compare them to the Aegean: it's a necessary first step before exploring the links between Greek and Italic experiences.

6 A SYNTHESIS OF THE 'LONG' FOURTH CENTURY: THE BASE FROM UGENTO

Abstract author(s): Lualdi, Carlo (University of Warwick)

Abstract format: Oral

Southern Italy between the fourth century and the early third century BC was a multicultural context: many different ethnic and political identities came in contact with each other and this caused material culture to flourish. Recent archaeological findings and studies provide new information about the Italic people settled in the Salento Peninsula, the Messapians, which are rarely mentioned by ancient literary sources. Before 1933, in the fortified settlement of Ugento, one of the largest Messapian centres located in the south-west area of the Salento Peninsula, a square base decorated by reliefs on four sides was found. The decorative apparatus of the base show fighters on foot and riders with different equipment. Most scholars have defined the monument as a unicum dated to the end of the fourth and the beginning of the third century BC showing the spreading of the Tarentine artistic language and Hellenistic models in Messapia. Additionally, the sculptural programme of the base shows iconographic schemes and details which can be related to subjects and themes belonging to depictions dated to the early fourth century BC, which are linked to the Apulian aristocratic ideology and to models belonging to Greek heroic culture. Hence, the base from Ugento can be considered as a material synthesis of a multi-layered cultural context between the late classical and the early Hellenistic period. The present study aims to provide an updated analysis of this complex monument and its decoration based on a multidisciplinary approach.

7 SOUTHERN ITALIC WARRIORS AND THE DEVELOPMENT OF THE WESTERN MEDITERRANEAN MILITARY KOINE

Abstract author(s): Lumsden, Alastair (University of St Andrews)

Abstract format: Oral

This paper examines the development of the Southern Italic military system during the 'Long Fourth Century' and the profound influence it had on other contemporary military forces in the region. It will demonstrate that southern Italic warriors acted as central agents in the evolution of the western Mediterranean military koine.

Ancient authors attest to southern Italian warriors' importance in Carthaginian and Syracusan forces during their prolonged conflicts in Sicily. Nevertheless, they do not reveal why they were so highly sought after, how they fought, or whether they influenced the armies in which they served.

However, funerary deposits and iconographic depictions found in Southern Italy, Sicily and North Africa illustrate that they fought with equipment which enabled them to fight in a highly flexible and mobile manner. This contrasted with the rigid predominantly Classical Greek/ Hellenistic styled forces fielded by Carthage Syracuse and exposed their deficiencies. Consequently, this paper contends that the large-scale employment of Southern Italic warriors in Sicily resulted in the assimilation of their weaponry and tactics by non-Italic forces, which helped facilitate western Mediterranean armies transition towards a more flexible and mobile style of warfare than was used in the East.

8 ITALIANS, ITALIOTES, AND HERACLES IN THE "LONG" 4TH C. BCE SOUTHERN ITALY

Abstract author(s): Wright, Parrish (University of South Carolina)

Abstract format: Oral

The importance of Heracles to Italic communities across southern Italy in the "long fourth century" is attested through cult sites, ubiquitous bronze statuettes, and can be inferred from his appearance on Bruttian coins in the 3rd century. Later foundation stories for the Bruttians indicate that descent from Heracles formed a central aspect of their identity.

While Italic identities were crystalizing in Southern Italy in the 4th c. BCE, power dynamics were shifting among the Greek city states of Magna Graecia. The Italiote league, an ever-changing alliance of these Greek communities, with Croton at its head, began to modify its own imagery and mythology to include Heracles to recruit Italians as allies.

Heracles as a "pre-foundational" figure has been seen as a justification for Greek presence in Italy, but I show that these myths could be mutually beneficial to both Greeks and the indigenous Italians, giving Italians agency in how they deployed their versions of Heracles and bringing them into a system of alliances based on shared mythology. I argue that a combination of the archaeological evidence for the worship of Heracles in Italic sites with material from Croton to shows how these networks of kinship diplomacy functioned pre-Roman southern Italy.

9 SOME NOTES ABOUT THE CONSUMPTION OF SOUTHERN ITALIAN RED-FIGURE WARE AT METAPONTO AND PISTICCI DURING THE 4TH CENTURY BC

Abstract author(s): Lecce, Lucia (Humboldt-Universität zu Berlin)

Abstract format: Oral

The use of figured vases in the inland Italic contexts of Southern Italy has been interpreted as the clearest sign of acculturation, or Hellenisation from Western Greece for a long time. However, the current debate focuses on the concepts of Middle ground and Hybridity, which frames the discussion in terms of how Italics and Western Greeks influenced and contaminated each other.

The work aims to investigate the complexity of the relationships between Western Greek and Italic populations in a small but relevant area of Southeast Italy, revisiting the debate over pictures as medium of cultural values and social communication. In particular, I will explore the dynamics related to the consumption of Southern Italian Red-figure Ware in the funerary contexts of the Western Greek colony of Metaponto and those of the Italic settlement of Pisticci, both located on the Ionian coast of Southern Italy in the modern Basilicata region, during the 4th century BC. These sites are fundamental to the understanding of the dynamics related to the consumption of figured ware, because at the beginning both communities imported figured vases from Attica. Then, Metaponto is one of the first to produce figured vases in Southern Italy, while Pisticci is the main destination of these products in the first phase of production. Moreover, a glance at the visual and material evidence of the 6th and 5th century BC will provide a broader overview beyond the separation well known in literature between imports (Attic Black and Red-figure) and local productions (Lucanian and Apulian).

In conclusion, the paper will show whether and how the development of visual and material "languages" can shed some light into inter-community relationships in the larger context of the 4th century transformation of Southern Italy.

10 THE LONG FOURTH CENTURY BC AND THE ARCHAEOLOGY OF FOOD: "COOKING UP" SOME HISTORICAL CHANGES IN THE GREEK WORLD

Abstract author(s): Serino, Marco (Università degli Studi di Torino)

Abstract format: Oral

Current research on cooking pottery – a neglected category for a long time, at least from an archaeological perspective – is disclosing a lot of potential in the attempts of reconstructing wider historical processes. For Greece, Magna Graecia and Sicily, the analysis on these vessels through their functional, morphological and technological features allow to explore numerous and different dynamics related to acceptance, resistance, hybridism as well as local workshop's productive strategies.

The transformation that occurred in the cooking pot's manufacturing tradition during the "long fourth century" aims at satisfying both new culinary needs and social customs spread in this crucial period among Greece and South of Italy. Thanks to some preliminary new data provided by current excavations at Lokroi Epizephyrii, as well as information coming from other Greek and indigenous centers in Southern Italy, it is possible to observe some crucial cross-cultural dynamics through the perspective of a renewed "archaeology of food".

11 FUNERARY PRACTICES AND CHANGES IN THE SOCIAL HIERARCHY IN LATE 4TH CENTURY CENTRAL APULIAN COMMUNITIES

Abstract author(s): Peruzzi, Bice (Rutgers State University of New Jersey)

Abstract format: Oral

This paper analyzes the evolution of burial practices in Central Apulia in the second half of the 4th century BCE; this period was characterized by the impressive increase in the number of tombs, a spike in the number of reused burials, the introduction of new shapes in the burial kit, and the growth in the size of the assemblages. Although it is possible that this reflected a demographic growth or external influences, I argue that these changes were caused by a shift in the social hierarchy of Central Apulian communities.

Evidence for the emergence of new social groups comes, for example, from the study of Apulian red figure vases, which in this period had virtually replaced both imports and local matt-painted ceramics. The vast majority of the assemblages contained pots decorated with generic and repetitive imagery; it follows that in this period there was a wider clientele with lower expectations, and potters produced vases that were generally appropriate for burial kits and could be acquired together when necessary. In contrast, the production of very large, labor-intensive, high quality vases with sophisticated iconographies illustrates the existence of a relatively smaller group of consumers who desired to visually set themselves apart from the rest of the population.

Changes were not limited to the funerary sphere. In the second half of the 4th century, Central Apulian sites witnessed also a shift in the settlement pattern, new feasting behaviors, and the establishment of local coin production. Thus, understanding the evolution of funerary practices within this broader context of transformation will help us shed new light on this highly dynamic period in the history of Southeastern Italy.

CRISIS OR DISINTEREST? FUNERARY “AUSTERITY” AND ELITE LEGITIMACY IN SAMNIUM, LATE FIFTH-EARLY THIRD CENTURIES BCE

Abstract author(s): Scopacasa, Rafael (Universidade Federal de Minas Gerais; University of Exeter)

Abstract format: Oral

This paper discusses potential changes in funerary display and elite legitimacy in Samnium between the late fifth and early third centuries BCE. It focuses on a sample of five funerary sites which have been more systematically excavated/published and cover a range of sizes and phases (Alfedena-Campo Consolino, San Vincenzo al Volturno, Gildone-Morgia della Chiusa, Larino-Carpineto, Termoli-Porticone). Beginning c. 400 BCE, a decline in the number of dated tombs can be identified at Alfedena and Termoli, which for centuries had probably been key arenas for local lineages to assert their power through funerary ritual. In addition, an apparent decrease in funerary display can be detected throughout the sampled sites c.400-300/250 BCE, with tombs featuring, on average, fewer grave goods and simple tomb architecture (also in comparison with neighbouring regions of central/southern Italy). Taken in conjunction with contemporaneous trends in non-funerary contexts, I consider how these developments may indicate changes in the definition of Samnite elites' place and role in society vis-a-vis subordinate groups. Ultimately, this discussion can allow us to explore how communities that were removed from major political and economic hubs responded to, and engaged with, the accelerated social, economic and political transformations that swept through the fourth-century BCE Mediterranean.

BURIAL CUSTOMS AND SOCIETY IN PRE-ROMAN BASILICATA: RECONSIDERING THE CAPPUCCINA TOMBS

Abstract author(s): Lorente Sebastián, Paloma (Université Paris1 Panthéon-Sorbonne)

Abstract format: Oral

Among the transformations affecting Southern Italy during the 4th c. B.C., the introduction of cappuccina tombs deserves a renewed attention, showing a greater complexity than expected. A first novelty comes from the taphonomic study of two graves from the indigenous settlement of Monte Torretta di Pietragalla: a structural analysis of cappuccina tombs reveals under their terracotta roof a variability of this funerary practice still to be studied. Moreover, the spread of this burial customs appears to be related to a more general framework of spatial reorganization in Basilicata. Despite the evidence for the Archaic period and the early Classical age, with the burials placed around and inside the housing units, during the 4th c. BC the funerary spaces moved away from the settlement.

In this study, by re-examining the indigenous known contexts from pre-Roman Basilicata, I shall focus on the following topics:

1. The cappuccina tombs represent a new “type” of burial custom, suggesting a new attitude towards the world of the dead.
2. They introduce complexity in the deceased treatment.
3. Mnemata and semata at the same time, these graves indicate a new conception of funerary spaces from a symbolic and topographical point of view.

This may show a shift in the ideology of death by a community, aiming now to be buried in a common space, by marking its presence with the cappuccina “semata-tombs”.

NEW THOUGHTS ON THE LUCANIANS' ETHNOGENESIS: THE CONTRIBUTION OF FUNERARY EVIDENCE

Abstract author(s): Battiloro, Ilaria (Mount Allison University) - Pignataro, Mariangela (Independent researcher)

Abstract format: Oral

Debate has long raged over the historical and cultural dynamics that led to the emergence of the Lucanian ethnos. Influenced by Strabo's account, scholarly literature has long considered the Samnite expansion into the Southern Italian peninsula as the origin of the Lucanian ethnogenesis. More recent scholarship is now reconsidering this invasionist perspective, and, rather than reducing the emergence of the Lucanians to a mere substitution of one people for another, tends to define it as internally driven. However, the concept of “Samnitization” itself has limited, if not obscured, any more nuanced interpretations of the role played by the Archaic groups of the Southern peninsula in the creation and promulgation of a uniquely Lucanian identity.

Archaeological evidence documents the existence of Lucanian burials that show chronological and cultural “outsider elements”, both in the depositional rituals and in the funerary assemblages. They therefore represent a privileged terrain to explore aspects of rupture and continuity in the pre-Lucanian to Lucanian transition. The persistence of typically Archaic funerary customs in many Lucanian sites has been variously interpreted in literature, but no contextual analysis has been made to explain this phenomenon. This paper presents the result of a re-analysis of a sample of Lucanian tombs showing anomalous aspects, which can be referred to a pre-Lucanian culture. The topographic location of the burial, the gender and social status of the deceased, depositional ritual, and grave-good assemblage are all taken into consideration. The ultimate goal of this study is to illuminate whether the inclusion of “outsider elements” in a burial was a way for members of Lucanian communities to express a “mixed” ethnic and cultural identity, or whether it was a way to retain the memory of early encounters.

A TOMB OF ONE'S OWN: GENERIC MODELS AND LOCAL ADAPTATIONS IN ITALIOTE AND ILLYRIAN ICONOGRAPHY (5TH-3RD CENTURY B.C.)

Abstract author(s): Bièvre-Perrin, Fabien (Centre Jean Bérard)

Abstract format: Oral

From the 5th to the 3rd century BC, so-called “tomb scenes” are very frequent in South Italian and Illyrian iconography, especially in red-figure pottery. Although apparently very generic in their composition, these scenes present subtle differences that enlighten the historian about their production and reception contexts, as well as on gender roles. In addition to the fact that the central funerary monument (naiskos, column, stele...) may vary from one region to another, artists have often singled out the protagonists, especially women, according to their ethnicity through their clothing, the objects they're handling and probably their gestures. In this communication, we will look at the ways in which a generic Italiote scheme is recurrently used by adapting it to the commissioners according to their culture and ethnicity.

This research is based on precise quantitative analyses carried out on several hundred representations. Three devices designed within the framework of the European project Feminicon (grant number : 891118) will be used jointly: an Omeka S platform gathering documentation, a TomL language for describing the scenes and a series of R-Markdown scripts.

CONTACT - THE ‘OTHER’ IN EXPERIMENTAL USE-WEAR STUDIES

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Thaler, Ulrich (Römisch-Germanisches Zentralmuseum Mainz, Leibniz Research Institute for Archaeology, KB Scientific & Experimental Archaeology) - Marreiros, João (ICArEHB, Interdisciplinary Center for Archaeology and Evolution of Human Behaviour, FCHS, Universidade do Algarve; Römisch-Germanisches Zentralmuseum, Leibniz Research Institute for Archaeology, MONREPOS Research Centre and Museum, Laboratory for Traceology and Controlled Experiments) - Macdonald, Danielle (University of Tulsa)

Format: Regular session

The concept of alterity, an ‘other’ in contrast to which the (collective or individual) self is defined and constructed, has long been a mainstay of social archaeology. Following the material turn in the social sciences, we may also consider the agency of material objects on one another. This leads us to a fundamental, though in some respects perhaps underdiscussed, principle of use-wear studies: any object under analysis develops its defining characteristics, i.e. use-wear traces, only through contact with an ‘other’, i.e. the contact material.

While welcoming all proposals exploring the epistemology of use-wear analyses either through specific case studies or in more general terms, the session aims to put, for the first time, contact materials centre-stage in traceological discourse and especially invites contributions highlighting the role of contact material choice and treatment in experimental use-wear studies. Topics discussed might include, e.g., issues of both replicability and ethics (as well as legal ones) in the choice of natural contact materials or artificial analogues, e.g. in the study of Palaeolithic hunting or Prehistoric warfare; the diagnostic potential of comparative studies of ‘narrow ranges’ of contact materials, e.g. different plant species such as types of cereals exploited by Neolithic farmers; best practice in the choice and pre-treatment of single contact materials standing in for larger, more varied groups of materials including potential proposals for standard samples, e.g. in the study of Bronze Age axes and forest clearance.

With use-wear study having taken much inspiration from the engineering and natural sciences, e.g. tribology, this session also directly pertains to a fundamental epistemological debate in the ‘hard’ sciences, i.e. the much-cited crisis of reproducibility and the (partly) resultant crisis of confidence in science: careful consideration of the traceological ‘other’ is crucial for ensuring repeatability, replicability and reproducibility in both controlled laboratory and actualistic field trials.

ABSTRACTS:

USE-TRACES AND MATERIAL AFFORDANCES OF MULTIFUNCTIONAL TOOLS

Abstract author(s): Macdonald, Danielle (The University of Tulsa)

Abstract format: Oral

Understanding the behaviors of past peoples is at the core of use-wear analysis studies. Building from the microscale, the identification of traces allows for broader inferences to be made about human intentionality and action. However, to understand the past, we must recreate it in the present through making and using tools ourselves. Experimental design to replicate traces can range from actualistic experiments to highly controlled movements performed by robotic devices. These differing designs each have strengths and limitations, and much can be learned through a broad approach to experimentation. However, these methods of experimentation often overlook the wider interaction networks in which the archaeological tools reside, including the nuances and affordances of the materials they connect with. In this paper, I explore the issue of multifunctionality of tools, exploring how tools exist in broader material networks and may be used for a variety of purposes and tasks.

Starting from the microscale, this paper assesses traces of multifunctional use on experimental tools using confocal microscopy to identify the complexities of multiple contact material traces. Building outwards through the lens of Gibson's theory of affordances,

the material properties of the experimental tools are addressed in concert with the affordances of multiple contact materials to understand the dynamics of their interactions. These ideas are discussed within the framework of material agency to understand how objects are positioned within broader material/human networks. Through the exploration of tools' interactions with multiple contact materials, we can get closer to understanding how people were positioned in past networks and how they may have interacted with the world around them.

2 ROBOTS IN ARCHEOLOGY

Abstract author(s): Calandra, Ivan - Schunk, Lisa (TraCEr, Laboratory for Traceology and Controlled Experiments at MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, RGZM) - Bob, Konstantin (Scientific Computing and Bioinformatics, Institute of Computer Science, Johannes Gutenberg University) - Perske, Josh (Information Technology, Engineering Department, University of Applied Sciences) - Gneisinger, Walter (TraCEr, Laboratory for Traceology and Controlled Experiments at MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, RGZM) - Marreiros, João (TraCEr, Laboratory for Traceology and Controlled Experiments at MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, RGZM; Institute for Prehistoric and Protohistoric Archaeology, Johannes Gutenberg University; ICArEHB, Interdisciplinary Center for Archaeology and Evolution of Human Behaviour, University of Algarve)

Abstract format: Oral

Use-wear analysis relies on reference collections to identify the use of archeological tools, and these collections are created via experimentation. Traditionally, experiments are performed manually by the experimenters themselves (actualistic, pilot or first-generation experiments). While such experiments are important to identify which factors (raw material, contact material, action, duration...) influence use-wear formation, a mechanistic, cause-effect relationship is out of reach. On the other hand, mechanized, controlled (second-generation) experiments can resolve such causal relationships. However, the way to bridge the two types of experiments to answer archeological questions is still debated.

Here we present a series of experiments that does just that: go from a highly controlled setup characteristic of material testing experiments to human actions. First, we used a material tester (Inotec SMARTTESTER) in a straight uni-directional cutting action. Second, we used a collaborative robot (Universal Robots UR10e) in a similar action. Third, we recorded a manually-guided uni-directional cutting action (human-like, i.e. not perfectly straight) on the robot with a custom-made software. Fourth, we introduced variability in the recorded movement: small random variation in position and force exhaustion. Finally, we performed the action manually.

In order to isolate the effect of the movement itself, force, speed and acceleration (except for the manual experiment), as well as number of strokes and movement length, were kept constant. Additionally, both the tool and the contact material were standardized. The flint tools were cut to a standardized 45° edge angle with a diamond band saw. The contact material was synthetic bone plate. Such bone plates have similar physical properties to true bone, but make it easier to compare across experiments thanks to their homogeneity and flat morphology.

We quantified use-wear polish on each sample at the end of the experiments and applied Bayesian modelling to test for the presence of significant differences.

3 ABRASIVE WEAR FORMATION ON CHERT FROM DIFFERENT RAW MATERIALS: A CONTROLLED TRIBOLOGICAL EXPERIMENT

Abstract author(s): Rodriguez, Alice - Yanamandra, Kaushik - Witek, Lukasz - Behera, Rakesh Kumar (New York University) - Iovita, Radu (New York University; Eberhard Karls University of Tübingen)

Abstract format: Oral

The identification of ancient worked materials is one of the fundamental goals of lithic use wear analysis and one of the most important parts of understanding how stone tools were used in the past. Given the documented overlaps in wear patterns generated by different materials, it is imperative to understand how individual materials' mechanical properties might influence wear formation. Because isolating physical parameters is necessary for such an endeavor, controlled rather than replicative experiments and surface topography measurements are necessary to better grasp how polish formed on stone tools. Therefore, we used a tribometer to wear natural flint surfaces against five materials (bone, antler, two kinds of wood, and ivory) under the same force, speed, and angle over one, three, and five hours. The study aimed to test if there is a correlation between polish formation and the hardness of the worked material. We measured each raw materials' hardness using nano-indentation test, and we compared the surface texture of the polished chert bits using a metrology microscope. The interfacial detritus powder was analyzed with a scanning electron microscope to look for abraded flint particles. We demonstrate that, contrary to expectation, softer materials, such as wood, create smoother polishes than hard ones, such as ivory.

4 OBJECT IMPERMANENCE: USING 3D MICROSCOPY TO ASSESS PERISHABLE MATERIALS THROUGH BONE MICROWEAR

Abstract author(s): Martisius, Naomi (The University of Tulsa)

Abstract format: Oral

Ancient people undoubtedly used a variety of materials that are not often found in the archaeological record due to their tendency to decompose over time. Perishable materials such as animal skins or vegetal matter would have been used for clothing, footwear, containers, and other objects. Direct evidence for such items is often lacking, especially in very old deposits, but indirect evidence in the form of microwear traces can be found on more durable materials that came in contact with these items prior to deposition. Tools made out of bone are an ideal candidate for assessing wear from perishable materials because they tend to be used repetitively for long stretches of time, accumulating well-developed microwear traces.

In this study, I employed 3D microscopic methods to quantitatively evaluate traces from three perishable materials on replicated bone spatulas, a common bone tool form used over millennia. All objects were made from Cervus elaphus ribs and were manufactured similarly using a ground stone. Next, each object was used for 40 minutes on one of three perishable materials (fresh animal skin, processed leather, and dry bark). Bones were scanned with a confocal microscope and evaluated using 3D surface texture parameters including surface roughness [Sa], peak curvature [Spc], and isotropy [Ist]. Quantitative measurements of the bone surfaces varied, but some patterns were evident and reflective of the differences in properties of the three perishable materials. The two different states of animal skin tended to round the upper reliefs of the bone surfaces, while bark flattened the surface reliefs. Fresh animal skin was the most abrasive of these materials and resulted in smoother surfaces overall. This study indicates that 3D microscopic methods have the potential for indirectly evaluating perishable materials that once came into contact with ancient bone artifacts, contributing to our understanding of ancient human behavior.

5 COMBINATION OF PETROLOGICAL, GEOCHEMICAL AND NON-USE-WEAR FOR THE TRACEOLOGICAL ANALYSIS OF THE MOST REPRESENTATIVE RAW MATERIALS FROM OLDUVAI GORGE (TANZANIA)

Abstract author(s): Alonso, Patricia (Instituto de Evolución Humana en África - IDEA; Centro Nacional de Investigación sobre la Evolución Humana - CENIEH) - Rios-Garaizar, Joseba (Centro Nacional de Investigación sobre la Evolución Humana - CENIEH) - Panera, Joaquín - Rubio-Jara, Susana (Centro Nacional de Investigación sobre la Evolución Humana - CENIEH; Instituto de Evolución Humana en África - IDEA) - Martín-Perea, David Manuel (Museo de Ciencias Naturales; Universidad Complutense de Madrid; Instituto de Evolución Humana en África - IDEA) - Pérez-González, Alfredo - Rojas, Raquel (Instituto de Evolución Humana en África - IDEA) - Domínguez-Rodrigo, Manuel (Universidad de Alcalá de Henares; Instituto de Evolución Humana en África - IDEA) - Santonja, Manuel (Centro Nacional de Investigación sobre la Evolución Humana - CENIEH; Instituto de Evolución Humana en África - IDEA)

Abstract format: Oral

The traceological discipline has been characterised by a constant theoretical and practical revisionism, which has led to the application of increasingly precise methods and techniques that allow for more integrated analyses and interpretations to be developed from both reference collections and archaeological material. The progressive incorporation of a wide lithological variety in the study of use-wear traces, such as quartzite, quartz and volcanic rocks, has contemplated new methodological and technical challenges for their traceological analysis. The lithological variability recorded from the lithic industry found in the archaeological deposits of Olduvai Gorge, presents a favourable scenario for the combination of different analyses that allow a more detailed understanding of the formation and development of use-wear. In this communication we present, in a preliminary way, the experimental results obtained from the most representative raw materials (Naibor Soit quartzite and basalts) of the Bed II archaeological sites after the integration of petrological, geochemical and non-use-wear traces analyses to our experimental traceological study. The combination of these analytical methods permit us to characterise the micro-topography of each lithology and determine the degree of influence that the structural and mineral variability of each raw material has on the formation and development of the use-wear traces. In order to characterize more precisely the structural and geochemical influence on the formation and development of the use-wear traces, a wide range of activities as well as organic materials (wood, non-woody plants, animal carcasses and bone) have been included in the experimental reference collection. This organic variety in different states of preservation and under the exercise of different actions presents an important challenge for the characterisation of the formation and development of use-wear traces. Seeking a more concise characterisation of the use-wear traces, the incorporation of analytical methods such as petrology, presents significant advantages for the traceological interpretations.

6 USE-WEAR ANALYSIS OF NEOLITHIC FLAKED AND GROUND STONE AXES AND ADZES FROM THE EASTERN GOBI DESERT

Abstract author(s): Evoy, Angela (Cosumnes River College)

Abstract format: Oral

This paper presents results for the first use-wear analysis of Neolithic flaked and ground stone axes and adzes from the eastern Gobi Desert. The aim of this study is to define patterns of wear development on basalt and siliceous stone axes and adzes resulting from contact with various materials. I hypothesize that the axes and adzes were primarily used for tree felling and woodworking but include other economic activities. With limited paleoenvironmental reconstructions for this region, and no evidence for the presence of trees during this temporospatial period, hypotheses for the probable use of these tools were based on the body of ethnographic

literature. To define patterns of wear on the archaeological assemblage, use-wear methodologies were adapted and incorporated into an experimental replicative program. An experimental comparative collection of basalt and chert axes and adzes was created. The experimental tools were used for tree felling, planing wood, hide scraping, butchering, and digging. Poplar was selected for tree felling and woodworking activities as palynological analyses indicates the genus *Populus* may have been an available arboreal resource in arid Northeast China during the late Neolithic (Demske and Mischke 2003). Replicated axes and adzes were analyzed at all stages of manufacture and use to discern the differential development of wear from contact materials. The experimental collection allowed for interpretation of use-wear traces on the assemblage of Neolithic axes and adzes from the eastern Gobi Desert. Results suggest that these tools were primarily used as tree felling and adzing tools but also include hide work and secondary use for plant pounding. The wear patterns identified here have the potential to broaden our understanding about the use of stone axes and adzes in other parts of arid Northeast Asia as these tools may have been used for similar activities.

7 CONSISTENCY IS A BEECH – ON SOCKETED AXES, EXPERIMENTAL CONTROL AND LIGNEOUS CONTACT MATERIALS

Abstract author(s): Thaler, Ulrich (Römisch-Germanisches Zentralmuseum - Leibniz-Forschungsinstitut für Archäologie)

Abstract format: Oral

Starting from the requirements of a specific experimental set-up, this contribution builds towards a discussion on the choice and preparation of a single representative contact material for use-wear experiments from a wider class of similar, yet non-identical prehistoric contact materials.

The set-up in question is a mechanical apparatus for the laboratory-based simulation of wood-chopping with bronze axe replicas. Strict experimental control is a prerequisite for isolating the influence of individual variables such as alloy composition on the formation and preservation of use-wear on copper-based artefacts. The concomitant need for consistency extends to the contact samples used. Characteristics of wood, however, as presumably the primary contact material for prehistoric axes, not only vary from species to species and tree to tree, but are also contingent on specifics such as the moisture content of a sample or even its (former) position and orientation in a tree.

Thus, the choice and preparation of wooden contact samples need to be guided by practical considerations as well as archaeological ones; the latter include, e.g., the 'period appropriateness' of a tree species based on its post-glacial expansion and the documented prehistoric uses of its wood for fuel, timber and portable artefacts. Practical considerations encompass the textural homogeneity of the wood of a given species and the ease or difficulty (as well as possible procedures) of pre-treatment, resulting, e.g., from the different anatomical characteristics of heartwood and sapwood species. Practical issues also extend to aspects such as the consistency of supply, with implications for reproducibility, and, linking back to archaeological criteria, the choices in previous experimental studies.

Making the case for European beech (*Fagus sylvatica*) in the given experimental context will highlight the potential complexity of an often underdiscussed element in traceological experimentation and contribute to the formulation of general criteria for single experimental contact materials.

8 PLANT HARVESTING VARIABILITY DURING THE NEOLITHIC ANALYZED THROUGH TEXTURE ANALYSIS OF SICKLE GLOSS

Abstract author(s): Ibáñez, Juan (Spanish National Research Council - CSIC) - Anderson, Patricia (CNRS) - Mazzucco, Niccolò - Pichon, Fiona (IMF-CSIC)

Abstract format: Oral

The Neolithic is a period of intensification in plant exploitation activities. Cereal harvesting in agricultural practices was carried out with flint or obsidian sickles. During the origins of agriculture, wild cereals were first reaped in natural fields, later cultivated and finally domesticated. Different species of cereals were cultivated and processed, as einkorn, barley, naked wheat or emmer. Flint tools could have been also used for processing domestic crops as part of threshing sledges. Moreover, other plants, as reeds or rushes, were reaped in order to use them for covering roofs, making mattings or basketry, among other uses. Thus, plant cutting traces, which after few hours of use generate macroscopic sickle gloss, show quite varied characteristics (more domed or flatter, more or less abraded...). In order to understand this variability, we use confocal microscopy and texture analysis. We intend to understand through experimentation how different conditions in plant cutting affect the characteristics of usewear polish, in order to unveil Neolithic technologies used for exploiting plants.

9 AN INSIGNIFICANT OTHER? PRIMACY OF 'FOUNDER CROPS': ISSUES AND IMPLICATIONS FOR GROUND STONE USE-WEAR STUDIES IN SOUTHWEST ASIA

Abstract author(s): Pedersen, Patrick (Centre for the Study of Early Agricultural Societies - CSEAS, Department of Cross-Cultural and Regional Studies, University of Copenhagen) - Arranz Otaegui, Amaia (Muséum National d'Histoire Naturelle. UMR 7209 - Archéozoologie, Archéobotanique: Sociétés, Pratiques et Environnements - AASPE; Centre for the Study of Early Agricultural Societies - CSEAS, Department of Cross-Cultural and Regional Studies, University of Copenhagen) - Richter, Tobias (Centre for the Study of Early Agricultural Societies - CSEAS, Department of Cross-Cultural and Regional Studies, University of Copenhagen)

Abstract format: Oral

This paper explores issues related to ground stone tool (GST) use-wear studies within the archaeology of the Epipaleolithic-early Neolithic transition in Southwest Asia (SWA). By surveying published use-wear studies within this field, we argue that the focus of GST use-wear in SWA contexts have had, and continues to have, an 'unhealthy' focus on a limited range of contact materials ('others'). Studies of GST use and use-wear in SWA have tended to focus on plants normatively associated with the Neolithic transition in SWA and their food economies: cereals, legumes etc. both in interpretation of use-wear traces and in experimental programs. However, growing archaeobotanical evidence, as well as ethnographic evidence from across the globe, highlight the important role that plants other than the traditional Neolithic 'founder crops' played in past diets. One of these 'other' plant groups is underground storage organs (USO: rhizomes, tubers etc.). Recent work on material from two sites, Shubayqa 1 and 6. dated to the late Epipaleolithic Natufian to late Pre-pottery Neolithic (PPNA) periods of SWA, have further elucidated the role of USO's. This study it draws on that recent data, coupled with GST data from Shubayqa 1 and 6 and our recent experimental study on tuber exploitation in the Natufian, to argue that though cereals and their processing may have been important, projecting their later primacy into the Paleolithic or even the PPNA risks clouding the nuances of past foodways. This 'founder crop' focus unfortunately results in a view mired by deterministic narratives. We wish to deflect this focus and nuance the normative, linear view of the cereals and GST 'marriage' as the quintessential core of the Neolithic transition. By divorcing this view we open up avenues to explore the more 'insignificant' other(s), materials lost by the narrow gaze of current GST use-wear studies in SWA.

10 VARIABILITY OF GRINDING TRACES RECORDED ON BONE MATERIALS. EXPERIMENTAL AND TRACEOLOGICAL STUDY

Abstract author(s): Orłowska, Justyna - Osipowicz, Grzegorz (Institute of Archaeology, Nicolaus Copernicus University in Toruń)

Abstract format: Oral

Grinding is one of the oldest known bone processing techniques. Archaeological finds indicate that in prehistory, various types of stone plates were used for grinding bone objects, the type of which (mainly crystallinity) could have a large impact on the morphology of traces formed on the worked surfaces. It is believed that the grinding process was often supported by additional treatments, such as adding sand or water, which influenced not only its efficiency but also the characteristics of the traces formed during its duration. For this reason, grinding and, above all, the possibilities of identifying its various variants during the microscopic analysis of prehistoric materials is still insufficiently known.

This problem was an impulse to undertake experimental and traceological studies, the main goal of which was to precisely, multi-faceted characterization and classification of functional traces resulting from grinding osseous raw materials on various types of grinding plates (i.e. various sandstones, quartzite, gneiss) using several techniques supporting the process (i.e. admixture in a form of water, dry and wet sand and softening of the bones). An answer was also made to the question of the influence of working time on the characteristics of this type of technological traces. The presented studies were designed to verify the scope of the possibilities of interpreting the traces that are the result of grinding, which are registered on prehistoric artefacts.

The project is financed by the National Science Centre, Poland (project no. 2019/32/C/HS3/00615).

11 BEHIND THE SCENES – TRIBOLOGY AND FRACTURE MECHANICS TO UNDERSTAND USE-WEAR FORMATION AND PALAEO-LITHIC STONE TOOL USE

Abstract author(s): Schunk, Lisa - Calandra, Ivan - Gneisinger, Walter (TraCEr, Laboratory for Traceology and Controlled Experiments at MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, RGZM) - Marreiros, João (TraCEr, Laboratory for Traceology and Controlled Experiments at MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, RGZM; Institute for Prehistoric and Protohistoric Archaeology, Johannes Gutenberg University, Mainz, Germany; ICArEHB, Interdisciplinary Center for Archaeology and Evolution Human Behaviour, University of Algarve)

Abstract format: Oral

Traceological studies aim at the recognition and the identification of use-wear traces on artefacts in order to gain a functional interpretation of past human technologies. However, a visual identification and interpretation of the traces is known to be dependent on different mechanics involved, such as those related to the contact material, but also to the tool raw material and morphology, the use intensity and the performed task. Therefore, an understanding of the fundamental mechanics affecting wear formation is necessary to build reliable interpretations based on causation.

The cause-effect relationship between individual variables and the formation of use-wear can only be investigated by conducting controlled, second-generation experiments. In order to test individual variables, others have to be standardised. This applies e.g. to the contact material.

The here presented sequential second generation experiment tested for differences between soft and hard contact materials. In order to investigate the effect of the contact material on the wear formation, natural - pork skin and bone - as well as artificial contact materials - tissue pad and bone plate - have been used. Unidirectional cutting movements have been performed with a mechanical device using standardised tools. Force, velocity, acceleration and cutting stroke length were kept constant, allowing for an improved understanding of the formation of use-wear traces. Combined with qualitative and quantitative use-wear analyses, the data generated throughout the experiment did not only provide insights into the development of use-wear, but also into abrasion processes and fracture mechanics within the experimental setup. Concerning these aspects, no significant difference between the natural and artificial contact materials could be observed. Consequently, it can be argued that the use of standardised contact materials can be an advantageous choice in controlled experimental setups. Moreover, the experiment highlights the relevance of use intensity and duration in the context of wear formation.

12 THE CONTRIBUTION OF REPLICATIVE HUNTING TRIALS TO UNDERSTAND IMPACT CONTACT MATERIALS

Abstract author(s): La Porta, Alice (University of Manchester; University of Exeter)

Abstract format: Oral

The attempt to identify stone projectiles and their delivery systems through the analysis of impact traces has been a major goal in the field of traceology. However, less attention has been paid to the recognition of the impact materials against which projectiles can strike. Here we present the results of two different sets of hunting trials, specifically designed to identify different hand-delivered weapon systems, that have also offered information on impact against specific materials. The influence that different variables, such as delivery modes, ballistic parameters, and impact materials, can have on the formation of macroscopic and microscopic traces during projectile impact was investigated. Integrated results between macroscopic and microscopic wear traces and experimental variables showed that clusters of trace patterns provided useful markers for determining impact against specific hard contact materials, such as bone and ground impacts. Whereas other soft contact materials, such as meat and flesh, were underrepresented. These results may contribute to the debate on trace formation in projectile activities and their representativity.

13 CONCLUSIONS AND QUESTIONS FROM AN EXPERIMENTAL AND USE-WEAR STUDY OF STONE BATTLE-AXES AND AXE-HAMMERS USED IN CONTACT WITH BONE

Abstract author(s): Roy, Amber (Newcastle University)

Abstract format: Oral

Antiquarians often argued that stone and flint artefacts, such as axes and arrowheads, were weapons, or symbols of a warrior elite. Initial interpretations of British Early Bronze Age stone battle-axes and axe-hammers were just that. This has remained a potential interpretation of the function of these implements despite its grounding in stereotypical assumptions rather than scientific analysis.

This paper draws upon data from the first large scale application of use-wear analysis and experimental archaeology on British Early Bronze Age battle-axes and axe-hammers from Northern Britain and the Isle of Man. It investigates two hypotheses, firstly that these implements were used as weapons and, secondly, that they were used in animal slaughter, with a single experiment using axe-hammer (in contact with bone and flesh) to strike pigs heads with a vertical thrusting chopping motion to test both hypotheses. It also draws upon experiments using battle-axes and axe-hammers in contact with wood and soil and stones.

Based on analogy with experimental use-wear formation, analysis of use-wear on over 100 battle-axes and axe-hammers revealed a small number were used in contact with bone and flesh and had no sign of contact with other tools or weapons. However, does this reflect their use as weapons or in animal slaughter, particularly when contact with multiple materials through combat was not tested experimentally?

The paper discusses the results gained from the methodology and how this could be improved to better question battle-axe and axe-hammer use as weapons.

14 PLAYER 2, READY. FIGHT! CONTROL, ACTUALISM, AND CONTACT MATERIALS IN PREHISTORIC COMBAT EXPERIMENTS

Abstract author(s): Gentile, Valerio (Leiden University)

Abstract format: Oral

This talk discusses the potential and the issues connected to the implementation of experimental archaeology and traceology applied to the study of prehistoric martial practices.

In testing combat situations with melee weapons, 'the other' plays a pivotal role. On one hand, contact material majorly affects both the type of trace generated as well as the degree of success in performing specific actions. On the other hand, contrary to some other activities, 'the other' in combat scenarios has its own active agency: in this context, 'the other' is ultimately the opponent, who contributes to trace formation with their choices and movements while also representing the final intended contact material

(the target to be hit). This peculiarity poses a vast array of ethical and methodological issues: a.o. health and safety concerns or the feasibility of highly controlled experimental layouts when reproducing an activity in which not only materials but also multiple human users are involved as main variables.

This talk will delve into these issues while illustrating and critically evaluating a methodology for combat experiment which attempts to strike a balance between actualism and a degree of control necessary to ensure the reliability of the results.

15 WEAR-ANALYSIS AS THE MICROWEAR ASSEMBLAGE

Abstract author(s): Crellin, Rachel - Tsoraki, Christina - Harris, Oliver (University of Leicester)

Abstract format: Oral

Beyond the Three Age System (a research project at the University of Leicester, UK) has been exploring how we can bring microwear analysis and new materialist theory into conversation. In particular, the concept of assemblage, drawn from the work of Deleuze and Guattari, has proved useful. Assemblages are a way of rethinking the basic structures of the world. Rather than focusing on bounded entities, they instead consider how the world emerges through entangled relationships between humans and non-humans which are always in process. We have been approaching use-wear analysis through this theoretical lens and thinking of it as the 'microwear assemblage'. First, because it always emerges from a heterogeneous collaboration between humans and non-humans (from microscopes to reference collections, cameras to gloves). Second, because it explores relationships between materials that press into and change each other (we term this affect in the language of assemblage). Third, because we see microwear itself as a process: wear-analysis is not a technique where we simply reveal how an object was used, it is a process of material engagement through which interpretations emerge.

Thinking about that process brings us to a specific set of experiments we have not conducted. As part of the project, we have carried out use-wear analysis on materials from Early Bronze Age burials in Britain. Analysis of one burial revealed that a collection of lithic grave goods (including repurposed older tools) had been used as a portable stone tool kit for working metals. Our analysis suggests that metals are the 'absent present' in this grave: gold and copper alloy both appear as contact materials that have left traces on lithic grave goods. Where could we go next? What experiments might follow from this realisation? The microwear assemblage reveals the absent 'other' and directs our action to future experiments.

16 SAME SAME, OR VERY DIFFERENT? LOOKING AT GRINDING TOOLS FROM DIFFERENT TASK FIELDS

Abstract author(s): Abar, Aydin (Institut für Archäologische Wissenschaften, Ruhr-Universität Bochum)

Abstract format: Oral

When it comes to the Metal Ages, grinding stones belong to the most understudied material remains found both on excavations and surveys, oftentimes remaining unpublished. This is particularly surprising as they play a fundamental role within many everyday activities, including food production. The situation is somewhat better in the context of mining archaeology, where questions about techniques, technologies and modes of labour traditionally play a more important role, and oftentimes finds tend to be rather sparse. First studies on grinding tools found in ore processing contexts indicate that functional reasons played an important role, when it came to the procurement of certain rocks as raw materials for grinding implements. Still, many questions remain unaddressed e.g. kinesthetics or work place organization and attribution of tools to certain task fields e.g. "grinding ore" or "grinding cereals" happens ad hoc, and is usually based on the surrounding context only.

The main aim of the presentation is to give a preliminary report on a case study carried out on several grinding stones from different Late Bronze Age sites in Trentino, including objects from settlements as well as ore processing sites. It provides a first glimpse into the question to which degree grinding stones associated with food-processing and ore-processing resemble each other and in which points they differ, from morphometry to macroscopic use-wear traces.

17 A 'FAMILY OF WEAR': EXPLORING USE-WEAR PATTERNS ON AD HOC BURNISHING TOOLS

Abstract author(s): Dubreuil, Laure (Trent University) - Robitaille, Jérôme (EHES) - Gonzalez-Urquijo, Jesus (Instituto Internacional de Investigaciones Prehistóricas de Cantabria, Universidad de Cantabria) - Marreiros, Joao (Laboratory for Traceology and Controlled Experiments - TraCEr, MONREPOS - Archaeological Research Centre and Museum for Human Behavioural Evolution. RGZM) - Stroulia, Anna (University of Southern Indiana)

Abstract format: Oral

Having traditionally focused on 'formal' tools (e.g., celts and grinding implements), the field of macrolithic studies has recently expanded to include 'ad hoc' implements (i.e., used without prior or with minimal manufacture). Use-wear analysis, in particular, has been instrumental in not only identifying 'ad hoc' tools, but also demonstrating the potential of these artifacts to illuminate a wide range of ancient activities. Among these activities is the burnishing of 'plastic' mineral materials such as mud, clay, or plaster carried out in construction, pottery production, and other contexts. This presentation focuses on pebbles used in an active abrasive manner to regularize, smoothen, and/or polish surfaces made of clay or mud material. We discuss several examples of such tools from the Natufian of the Southern Levant and the Greek Neolithic and compare their use-wear characteristics to those of both ethnographic and experimental specimens. We argue that: 1) the recurrent use-wear features observed on these tools may allow us to define a

'family of wear' characteristic of burnishing plastic mineral material in general; 2) further experimentations and quantification are necessary to better define the wear patterns associated with specific use contexts.

18

CONDUCTING USE-WEAR ANALYSIS AND EXPERIMENTAL RESEARCH IN SOUTH BRAZIL: LEGAL CHALLENGES AND POSSIBILITIES

Abstract author(s): Rodrigues, Felipe (University of Exeter)

Abstract format: Oral

Experimental archaeology and use-wear analysis in Brazil are at a crossroads when it comes to using native contact materials. On one side, there is a need to conduct experiments as contextually accurate as possible by using native materials, thus increasing the confidence of experiments. On the other side, archaeologists need to abide by the current legislation for preserving native fauna and flora which can be limiting to experimental research questions.

This paper discusses the current legal challenges posed by preservation needs and how to plan an experiment around it by presenting a use-wear analysis research conducted in South Brazil. In addition, it briefly presents two Brazilian laws (laws n°9.605 and n°11.428), which relate to environment preservation and directly affected the procurement of contact materials for this research.

This use-wear analysis research aimed to better understand the use of different lithic raw materials by Southern Jê people during pre-colonial times. For that purpose, eight different species of flora native to the Atlantic Forest biome were chosen as contact materials for a total of 32 actualistic experiments, based on historical descriptions of Southern Jê traditional crafts. The activities consisted of scraping, cutting, and sawing the plants to extract fibers, debark, split, smoothen their surfaces, or add a point to them. Although the aim of the experiments was to understand the wearing of the tools, the contact materials were pivotal in determining the tasks conducted.

This paper reports on the challenges faced, how they were tackled and shows it is possible both to align environment preservation interests and to foster the use of native contact materials for experimental use-wear research. This study can serve as an example for future research in Brazil and elsewhere where similar challenges may be present.

19

A GLOBAL 3D USEWEAR CHARACTERISATION OF PRIMATE AND HOMININ PERCUSSIVE TECHNOLOGY

Abstract author(s): Proffitt, Tomos (Max Planck Institute for Evolutionary Anthropology) - Arroyo, Adrián (Institut Català de Paleoecologia Humana i Evolució Social - IPHES-CERCA) - Reeves, Jonathan (Max Planck Institute for Evolutionary Anthropology) - Benito-Calvo, Alfonso (Centro Nacional de Investigación sobre la Evolución Humana) - Barrett, Brendan (Max Planck Institute for Animal Behavior) - Dogandzig, Tamara (Max Planck Institute for Evolutionary Anthropology) - Tan, Amanda (Durham University) - Falótico, Tiago (University of São Paulo) - de la Torre, Ignacio (Spanish National Research Council-CSIC) - Luncz, Lydia (Max Planck Institute for Evolutionary Anthropology)

Abstract format: Oral

Percussive technology has, in recent years, become an important avenue of research for understanding the wider tool use behaviours of early Homo beyond the production of sharp cutting flakes and tools. Recent discoveries of the earliest lithic technology suggest that percussive behaviour was probably an important component of the subsistence strategies of Pliocene hominins and possibly beyond.

Recent research has sought to better understand the range of percussive behaviours potentially undertaken by ESA hominins by describing damage patterns produced on tool-using non-human primate percussive tools. These studies have led to developments in analytical methods which allow the fine-grained quantification of use wear damage on percussive tools. To date, however, these studies have been applied to a small number of behaviours, primarily nut cracking. To explore the variability of use wear pattern across primate percussive stone tools it is important to apply these methods in a holistic manner to a wide range of percussive behaviours and tools.

Here we present the first comprehensive cross species study and comparison of percussive damage on hammerstones for all known tool using non-human primates and a range of Early Stone Age (ESA) percussive artefacts. By using a hybrid visual and 3D quantification of use wear patterns on the active surfaces of percussive stone tools we are able to present a detailed characterisation of the various damage patterns caused through different uses. Our results show that percussive damage characterisation is significantly affected by the objects on which the tool was used. The results allow for the identification of species and behaviour specific percussive use wear patterns which may be able to help interpret archaeological percussive technology. This study has also elucidated a complex interplay between the raw material type, percussive target and action motion for which future research must focus in order to understand these variables.

313

EARTH, WATER AND FIRE: APPROACHING LIVING HABITAT AND COMMUNITY LANDSCAPE MANAGEMENT

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Cantisani, Matteo (Institut für Archäologische Wissenschaften, Ruhr-Universität Bochum; Ruhr Universität Bochum, Zentrum für Mittelmeerenstudien) - Gheorghiu, Dragoș (Doctoral School, National University of Arts, Bucharest; Instituto Terra e Memória - Mação, Centro de Geociências da Universidade de Coimbra) - Von Rügen, Constance (Institut für Archäologische Wissenschaften, Ruhr-Universität Bochum)

Format: Regular session

The relationship of humans with natural resources keeps societies functioning yet also endangers environments and triggers social tensions. Although recent holistic approaches in archaeology have addressed the transformative role of resources in ancient societies, scholars in the humanities, social and natural sciences have not sufficiently explored the relationship in terms of sustainability. This resource-culture dynamic entangles humans and habitats in global histories of interrelationships. Habitat is a central concept here, for it implies a generative aspect which must be acknowledged in the development of sustainable non-Cartesian models in our relationship with the environment. This session aims to expand existing phenomenological, experiential, and praxitological discourses by offering an interdisciplinary venue to discuss this topic in terms of landscape management that both structures, and is structured by, sustainable habitats. Management is to be understood not only in relational terms but also through sensory experiences, dwelling within the landscape, and its symbiotic dimension. For this reason, the transformative role of natural resources in practices that shape landscapes will represent a particularly welcome topic, through case-studies and/or more theoretically-focused papers. Topics may include, but are not limited to, the appropriation of clays, water resources, and the central role of fire in making landscapes lived habitats. Therefore, papers will be very welcome which discuss pottery-making, (de)forestation activities, and building practices, or that explore the idea of anthropogenic spaces as living habitats also affecting ecological sustainability. More generally, archaeological research is encouraged from the intersection of philosophy, social and environmental sciences, and creative engagements with materials and resources that focus on the interrelationship of humans with their lived, experienced environments. The debate fostered by this session will offer a fresh understanding of these interrelationships, and new perspectives to discuss human resiliency and sustainable developments beyond the Cartesian separation of the human and natural.

ABSTRACTS:

1

COPING WITH A CROWDED HABITAT: HOMO AS PREY, PREDATOR, AND IMITATOR

Abstract author(s): Bouissac, Paul (University of Toronto)

Abstract format: Oral

The imagination of Homo surviving and evolving in a natural environment all too often glosses over the fact that these hominins and early humans had necessarily to share their niches with other organisms competing for the same vital resources and offering various solutions to similar challenges. While no human groups could ever survive far from a regularly accessible source of water and deprived of some form of protective shelter, they had to contend in addition with powerful animals that had equal claims to these resources. The representation of the prehistoric environment as mostly providing mineral and vegetal resources, and some occasional live prey (the hunter-gatherer model), is a simplistic theoretical vision. All the habitable niches on the earth are crowded with organisms that share the same vital imperatives ruled by hunger. Early humans were not the first inhabitants; they always found, wherever they went, predators, pests, and parasites for which they were natural prey. In fact, they had evolved in constant interaction with these organisms that offered them examples of longstanding adaptations through some modifications of their environment that greatly pre-dated the emergence of Homo. Cognitive competences such as "theory of mind", analogical thinking, and imitative behavior would naturally lead early humans to shelter exploitations, arboreal constructions, digging and damming, clay use, and even ways of weaving. The physical and mental lives of early humans must be imagined as entangled with a diverse and crowded animal population teeming with adaptive activities. This paper will review some of the main examples of landscape transformations due to animal industry, from termites to beavers. This perspective should contribute to situate landscape management by humans in a wider biological context.

2

THEIR HABITAT WAS A LIVING ORGANISM: HUMANS/NON-HUMANS ARCHITECTURAL ENTANGLEMENTS IN THE HISTORICAL LANDSCAPE OF ICELAND

Abstract author(s): Vaquero, Pablo (University of Glasgow; University of Granada)

Abstract format: Oral

Much thought has been given to the study of how humans managed natural resources, shape the landscape, and were shaped by it. Many debates around this topic have focused on economic production and subsistence. By contrast, less attention has received the question of how past cultures created their living-space, their habitat. No doubt, this happened in a constant interrelationship between humans and non-humans; but the scale of impact, sustainability, and disruption vary from place to place and historical period.

Human Ecodynamics (HE) and Historical Ecology offer the possibility of approaching the topic from a complex and integrative perspective. Both propose the study of the human-natural system(s) through space-time, asserting the bi-directional agency of humans and non-humans. This school of thought aims at understanding synergies between different entities by recognising the existence of non-linear dynamics of causality and hierarchical/heterarchical scales. In this sense, it widens our conceptualisation of landscapes and, to be sure, habitats.

In this paper, I apply this vision by focusing on the historical feature of the Icelandic habitat par excellence: turf houses. They represent rural architectural elements that have stood for more than a millennium as the home of Icelanders. In the last century, however, they have been abandoned both architecturally and ontologically -i.e. as human-decentered, vernacular, projects. These elements were built thanks to the constant interrelationship of biotic (including humans) and abiotic entities - a constant flux of matter through time-space. The habitat of Icelanders can be conceived thereby as a living, symbiotic, organism. Recognising these entanglements and their meaning, I argue, is fundamental for interpreting the historical complexity of rural landscapes. It is through this lens that we can think outside of our current frameworks and realise the existence of more sustainable ways of creating habitats and, by extension, managing landscapes.

3 LONGING FOR ASSEMBLY: THE SIGNIFICANCE OF BEINGNESS OF PLACE

Abstract author(s): Dods, Roberta (University of British Columbia)

Abstract format: Oral

Our evolved and evolving responses to both socio-cultural and biological drivers of change can be seen in the archaeological record. This record is our tome of becomingness. We came to defining our specific spaces/places (niche / habitat / Ecotope, even territory, etc.) through nouns prefaced to -scape (sea-, water-, land-, town-, city-, sound-, etc.) thus creating infinitesimal to expansive clusters of meaning many with flexible, indeed nebulous, boundaries. These spaces can extend from the theoretical construct of hypervolume (Hutchinson 1957), the n-dimensional environmental space encompassing a focal organism (here the genus Homo), population or species in a hypothetical referential frame or imaginary volume to existential musings of conceptual frameworks for metaphors (dreamcatchers, saṃsāra [Bhavacakra] or mandalas) of our becomingness as situated in the cyclical events that are "refracted through various external factors... mediated between the physical and social worlds of humans". Our places in worlds of time and space are "not merely 'revealed' and 'discovered' in a social and political context" but rather are "constructed and negotiated" (Colwell-Chanthaphonh and Ferguson 2006: 148; 159) through deep observation that can, fundamentally, include and then, through contemplation, transcend. We are challenged by both adaptation (biological) and adaptability (behavioral) as we consider the various drivers that have shaped our beingness. Effectively, from our evolving identity, we discovered an understanding of the composed unity of the intricacies of multiple biotic, socio-cultural and spiritual communities. We have come to recognize that our worlds became variously changing -scapes of existence defining our layered identities from self to cultural components of living in congress.

4 THE TOUCH OF THE DEEP: NOVEL ENGAGEMENTS WITH MARINE BEINGS IN THE SOCIAL SPACES OF MINOAN CRETE

Abstract author(s): Anderson, Emily (Johns Hopkins University)

Abstract format: Oral

This paper examines how certain forms of Cretan Bronze Age material culture afforded innovative engagements between people and nonhuman organisms of the sea by "drawing them up" and into the above-ground spaces of Minoan sociocultural experience. I examine two case studies. First are early wall paintings from the palace of Knossos, where sponges were covered in paint and then pressed upon the surface of the wall. I am interested in the indexical relationship between the sponges, organisms of the sea floor, and the wall "decorations", and how resource extraction by skilled figures (sponge divers) mediated this link. The second case study concerns a corpus of ceramic vessels crafted with high relief renderings of sea organisms on their surface. I consider how the vessels brought people a new haptic engagement with sea forms that literally brought into their hands. Both of these indicate ways in which the sea was novelly made present within the lived experiences on the land.

5 RECONSTRUCT THE LATE NEOLITHIC AND THE BRONZE AGE VILLAGE THROUGH GEOARCHAEOLOGY: CASE STUDIES FROM ITALY AND SOUTHERN FRANCE

Abstract author(s): Peinetti, Alessandro (Laboratoire Archéologie des Sociétés Méditerranéennes, UMR 5140 (CNRS, Univ. Paul Valéry Montpellier 3; LabEx ARCHIMEDE - programme IA- ANR-11-LABX-0032-01; Università di Bologna)

Abstract format: Oral

Archaeological sediments are considered as both an environmental and a cultural archive of past societies and human practices. This theoretical advancing is also due to the development of Geoarchaeology and, in particular, to the exceptional development of soil micromorphology adapted to archaeological contexts in the last forty years. Soils and sediments record human activities and furnish data about the use of space, dwelling activities and landscape use through the analysis of formation processes of archaeological deposits and occupation surfaces.

Between the end of the Neolithic and the Bronze Age, settlement sites with different forms are observed between Southern France and Italy. These variability concerns not only the shape and the organisation of the built space, or the environmental and topographic context of settling, but also the development and preservation of stratification of each site. All these settlements are described

and considered as villages, but such variability in terms of forms reflects different lifestyles and different way to organize and manage the built environment.

In order to explore this variability, we choose to compare three different sites: La Capoulière (Southern France, Late Neolithic); Via Ordriere-Solarolo (Northern Italy, Middle Bronze Age); Mursia (Pantelleria, Early Bronze Age). In each site, we carried out a spatial geoarchaeological analysis. Soil micromorphology is the main analytical tool adopted for this work. Some examples from these researches will be shown to explore some topics as: (1) the procurement and use of pedo-sedimentary resources for building; (2) building practices; (3) procurement and the management of other goods for production and consumption activities; (4) the use of space and the organisation of inhabited areas.

Through these different examples, the constants and the variables of the way to inhabit the village and the social and economical implications of different lifestyles recorded by archaeological sediments will be explored.

6 CLAY, STONES AND SHERDS - DWELLING IN THE NURAGIC LANDSCAPE OF SANT'ANTIOCO/SOUTHERN SARDINIA

Abstract author(s): Usadel, Marie - Klingenberg, Tim - von Rüden, Constance (Ruhr University Bochum)

Abstract format: Oral

The incorporation of raw materials as resources plays a major role for understanding the act of dwelling in a landscape. However, this process cannot be described as a one-sided act of environmental exploitation or control by a human community, rather it has to be understood as a mutual entanglement of humans and materials in a non-cartesian way. Therefore, we not only aim to carve out how the daily practices of the inhabitants of Sant'Antioco are assembling the different materials and human actors involved through time, we also aim to bring the sensory engagement of the human actor into the foreground of the discussion. Hence, the presentation will focus on the building activities and specific architecture as well as on the pottery production of the Nuragic period and question their specific choice or disregard of materials while taking into consideration their places within the landscapes. Moreover, it wants to discuss the generative abilities of material and immaterial resources to enable a certain sustainability and when this equilibrium might be destroyed.

7 STARTING FROM SCRATCH? APPROACHING RESOURCE MANAGEMENT IN IRISH VIKING TOWNS

Abstract author(s): Boyd, Rebecca - Stone, David (University College Dublin)

Abstract format: Oral

Ireland, prior to AD800, was entirely rural. The foundation of Dublin, Ireland's first town, required an adjustment in attitudes to lifestyles, but also to resource procurement and management strategies.

How did this new urban population sustain itself? Its environment was almost entirely organic. With the exception of occasional stone monumental structures (churches or town walls), domestic buildings were made of wood, thatch and other natural materials (straw, brushwood, clay, stone etc). Sourcing, supplying and managing these resources must have been of major concern for the townspeople. This takes on extra prominence when considered in the light of the frequent need for replacement of individual building materials - roof supports, thatch, bedding material - and the regular replacement of entire structures at any point in time. These questions of resource procurement have been indicated in Viking Age towns in Ireland through sporadic environmental approaches within developer-led archaeology but they have not been seriously addressed.

In this paper, we present an overview of some questions which we see as relevant here. We also survey the existing evidence particularly noting the value of commercially derived archaeological data.

Urban settings and urban-rural relationships require us to re-evaluate what and how we investigate those intersections between human and environment and between archaeology and interpretation. These datasets and avenues of investigations will lead to new insights into the interrelationships between urban and rural habitats and landscape and resource management strategies in the Viking Age.

8 DWELLING IN THE CHALCOLITHIC: THE RELATIONSHIP BETWEEN SETTLEMENTS AND THE ENVIRONMENT

Abstract author(s): Gheorghiu, Dragos (National University of Art; ITM Macao)

Abstract format: Oral

In South Eastern Europe, during the Chalcolithic, human settlements used a complex relational strategy with the geographic environment, based on a control system that used both a series of ritual separations, and the recombination of the materiality of the surrounding landscape.

The positioning of the settlements between dryland and water required numerous ritual and functional separations, both between the closed tell - settlement and the wilderness or the necropolis, as well as between the tell and its subordinate, seasonal settlements. The separation from the landscape was also one based on substance: the settlement was the result of the processing of the "wild" materiality and the production of a new one, that of composite materials, by combining the clay with water, plants and [cyclically] with fire.

The compact organization of the interior of the tell-settlement required a certain type of relationship with fire, as well as that required by the internal organization of the house. All these material relations can be found in the symbolism of the objects of the interior space of the house, which support, on a micro-scale, the relations between the act of inhabiting, water, clay, plants and fire.

9 MODELLING FOOD CONSUMPTION AND WOOD UTILISATION AS INDICATORS FOR PERCEPTION, COMPETITION AND LANDSCAPE MANAGEMENT

Abstract author(s): Boenke, Nicole (Ruhr-Universität Bochum)

Abstract format: Oral

The importance of food supply and the dependency on wood have been outlined by researchers from the fields of archaeology and archaeobotany for decades. Without a solid basis represented by those two factors, the establishment of complex structures is close to impossible. This specifically applies for specialised organised communities as we particularly encounter since the Metal Ages. Therefore, it is not surprising that in order to emphasize the development of ancient societies towards 'modern' 'industrialized' economies, archaeologists often argue in patterns of superlatives such as economic efficiency, enormous (trade) distances or landscapes devastated due to the exploitation of resources. In fact, this is proofed just in few cases, but unfortunately those results are frequently taken to create an image of ancient communities in general. But I would rather see the examination of extremes as one of the possible scenarios. Lacking 'attractiveness' is not the only reason for the rareness of studies focused on the individual scales and on private or small-scale common decisions, which were based on the taste or other personal preferences of ancient people. Unfortunately, individual experiences are much harder to verify than large bulks of statistic data. For the reconstruction of living environments data modelling is a principal and very effective tool to be applied. However, at this point another principal question arises: how to proof all the ancient motivations not easily fitting in (economically) rational patterns?

Based on the archaeological results of an Iron Age Salt mine in the Alps the paper takes a look on the constructed antagonism between mining and sustainability as well as on decisions apart from reasonable motivations. Other case studies are picked up to show implications on food and wood utilisation in Europe and Western Asia.

10 LIVING ON A SMALL VOLCANIC MEDITERRANEAN ISLAND: THE CASE OF USTICA AND ITS PREHISTORIC PALEOENVIRONMENT

Abstract author(s): Speciale, Claudia (Istituto Nazionale di Geofisica e Vulcanologia, Naples; University of Las Palmas, Gran Canaria)

Abstract format: Oral

This paper interprets the first analytical data to emerge from the island of Ustica (north-western Sicily, Italy) during the Neolithic and the exploitation and management of the limited local resources starting from the first human occupation in the mid-5th millennium BC. The small volcanic island of Ustica experienced several dynamics of occupation and abandonment, until the very last phase of colonization in the mid-17th century AD. The recent investigation of the site of Piano dei Cardoni (4600-4200 BC) attests the presence of human communities in some areas of the island, that probably represented a bridge in the obsidian trade route and exchanges between Aeolian islands and western Sicily. The analyses of plant macro-remains and the comparison with data on local vegetation obtained from historical literary sources and modern flora checklists show the disappearance of some woody species, today extinct or only occurring as re-introduced trees. The onset of agro-pastoral practices in the mid-5th millennium BC, testified by the archaeozoological dataset, brought about significant changes to the local pristine plant communities, probably once characterised by evergreen woodland. Local human communities exploited local and imported raw materials and objects, as attested by the analyses on lithic tools (flint, obsidian and other volcanic rocks) and pottery, showing an exploitation of several local resources throughout the island and a reliance only on specific exotic materials like obsidian. Recent analyses on the human bones from the site are highlighting origin and entity of the human population occupying this territory for the first time.

11 FROM SPACE TO PLACES, FROM LANDSCAPE TO BUILTSCAPE: RECONSTRUCTING PREHISTORIC ARCHITECTURES IN CENTRAL SICILY

Abstract author(s): Giannitrapani, Enrico (Confederazione Italiana Archeologi; Arkeos - Servizi integrati per i Beni Culturali)

Abstract format: Oral

Landscape is the geographical and political space where human history is expressed in a relationship of mutual conditioning with nature. It is a dynamic entity, a container of individual and collective memories, as it bears the 'signs' of the history of its transformations. To study the landscape is to understand its phenomenological value, that is the cognitive, symbolic and 'political' ability to interact with the environment. This determines the development of complex modes of production and reproduction of the material conditions of human communities. The identity of places is always built through complex relations, conflictual and dialectical, a constant relationship with alterity. Spatial experience is not innocent and neutral but produces hierarchical power relations based on age, gender, and social position. It constitutes a contradictory and conflict conscience through which individuals act. Every interaction between people and the natural environment creates a 'built' environment: one of the landscape's key transformative processes is architecture. It aims to organise the space where human beings live, transforming natural spaces into humanised places, into a builtscapes. To build a house is a social process, determined by the cultural and historical conditions to which it belongs. If providing shelter is the house's passive function, then its active purpose is to create an environment suitable for a community and its mem-

bers. Houses are social and 'political' units of organization of space. As a place of residence, production and consumption, the house expresses different meanings: family structure, social and production relations, interactions with natural resources. Architecture, then, is an ideological means to structure human society. After a synthetic theoretical discussion on spaces, places, and houses, recent researches on prehistoric central Sicily's domestic architecture will be introduced as a significative case study.

12 SENSES AND SOCIAL NEGOTIATIONS IN THE AMARNA WORKMEN'S VILLAGE

Abstract author(s): Rocha da Silva, Thais (University of Oxford; University of São Paulo)

Abstract format: Oral

The investigation of ancient Egyptian houses has paid little attention to the sensory elements that shape our lived experience. Houses have been investigated through typologies and an economic perspective that frames social life as a consequence of (re) production of goods and people. In this presentation, I explore how material culture can inform us about the interplay of the senses on social interaction within the domestic sphere in the Amarna Workmen's Village, a settlement built to house the workforce engaged on royal projects in the New Kingdom. The village was established by the Egyptian administration at the edge the desert, distant from the Nile but still connected with the city. This location demanded regular deliveries of supplies and water from the government to the local inhabitants and a spatial arrangement of the domestic space that could keep the place functioning. I show how an approach that integrates the architectural features of the village with the distribution of domestic facilities (food preparation, water storage) reveal a different sense scape, that where we can perceive social negotiations.

315 CONFLICT ESCALATION AND DE-ESCALATION IN URBANITY

Theme: 4. Globalisation and archaeology

Organisers: Loy, Anna (ROOTS Kiel) - Alliata, Victoria (CAU Kiel) - Cembrzyński, Paweł (ROOTS Kiel) - Zeviani, Camilla (University of Cambridge)

Format: Regular session

Urbanisation is a process in which people have to cope with changing conditions and increasing complexity. Such conditions not only involve an increase of population numbers and density, but also social competition, a competition for resources and development of new modes of interaction.

Urbanity can be seen as a lifestyle or interaction system which addresses issues of continuously increasing complexity and necessarily requires corresponding mechanisms of conflict resolution and de-escalation. Both escalation, potentially leading to the annihilation of at least one of the conflict parties, and de-escalation, potentially leading to cooperation, may present themselves as changes in this system. Inevitably different elements of society will be differentially affected and may be caught somewhere between fluidity and resistance.

Given the high potential for competition within urban places, we might expect an interrelation between urbanity and violence. However, urbanity apparently exhibits a rather low frequency of violent conflict. Urbanity is thus a telling example of successful resolution of conflict escalation and de-escalation, a topic which is essential for the understanding of resilient urbanity and urbanisation.

This session may evolve around questions such as:

- How can processes of escalation and de-escalation be found in the material record?
- What evidence do written sources introduce?
- Which insights can ethnography bring to the debate?
- Are there other possible sources of insight?

In this session, we aim for contributions addressing the identification and analysis of conflict escalation and de-escalation within urban places and processes, and especially the analysis of de-escalating strategies in urban contexts. We want to find out, how people cope(d) with strains on personal and communal identity in urbanity. Contributions from prehistoric and historic archaeology, from sociology, from ethnography as well as from other fields of research and a global perspective are warmly encouraged.

ABSTRACTS:

1 CONFLICT PROCESSES AND URBAN PROCESSES INTERCONNECTED

Abstract author(s): Alliata, Victoria (CRC 1266: Scales of Transformation Kiel) - Loy, Anna (ROOTS Cluster of Excellence Kiel) - Nakoinz, Oliver (Institute of Pre- and Protohistoric Archaeology, Kiel)

Abstract format: Oral

Urbanity can be understood as a process that represents a balance between centripetal and centrifugal forces, and includes a set of practices and structures that keep this balance in a dynamic development.

While centripetal forces are represented by interaction opportunities, centrifugal forces are rooted in system complexity, community thresholds, and conflicts. These conflicts arise from unequal opportunity distribution, different individual interests and the sheer scope of diverse interaction possibilities between individuals with different interests in an urban system. Conflicts can be described as processes of escalation and de-escalation, with conflict potential representing an important pre-condition.

Urban conflict potentials as described above require specific solutions and specific strategies. With this paper, we want to explore the interrelationship of conflict processes and urban processes. Which strategies of conflict solution, of coping with conflicts and conflict prevention are visible in the archaeological record of urban and proto-urban sites? Do conflict de-escalation or solution strategies shape the urban profile of a place? Can a failed conflict solution compromise or even stop the urban process? The examples discussed here will include Heuneburg, Manching, and further urban and proto-urban centers in Europe.

2 URBANIZATION HALTED: REGIONAL POLITICS AND DEMOGRAPHIC CHANGES BETWEEN THE 7TH AND THE 6TH CENTURIES BC

Abstract author(s): Zeviani, Camilla (University of Cambridge)

Abstract format: Oral

The presence of cities has been traditionally connected to concepts of civilization, the urban form being the head of a hierarchy and the final result of an evolutionary process (Stage Theory). The Classical world and its examples of stable, long-standing urbanism had provided the paradigm for the definition of urbanized societies: more recent analysis in other parts of the world have proven, however, the existence of urban variabilities that distance themselves from the paradigm. Representing the earliest urbanized society in Western Europe, Etruscans present a crucial case study: through archaeological surveys, it is now possible to quantify different urbanization patterns, as well as drawing comparisons of strategies of control enacted by each place of power. Rural settlements represent leftovers of the rural structure that supported this expansion and assured the success of urbanization. However, urbanization was not unanimously embraced as the preferred social structure. Elements of conflict and resistance can be examined in smaller and short-lived enclaves of political power that tend to emerge in the formative period of city centers, usually connotated by religious/ aristocratic values and ideology. One of these is the site of Poggio Civitate (Tuscany, near Siena). Occupying a frontier, its function has been subjected to different interpretations, which lacked however data more recently acquired in surveys led in the area. By analyzing and properly identifying the nature of this Etruscan site, this paper seeks to show that urban development could often be limited by the activity of traditional elites and by the complex management of regional politics. It will highlight how the rural population was strictly dependent and tightly tied to the center, which restricted its development and capitalizing on its economic production until it was dismantled by other, fully urbanized regional powers.

3 RELATIONAL URBANIZATION IN THE MYCENAEAN GREECE: CONFLICT DE-ESCALATION IN LATE BRONZE AGE PALATIAL SETTLEMENT NETWORKS

Abstract author(s): Zeman, Piotr (Adam Mickiewicz University in Poznań, Faculty of Archaeology)

Abstract format: Oral

Mycenaean civilization emerged on the Greek mainland in the first half of the second millennium BC, and gradually dominated the Aegean. During the 14th century BC (Late Helladic IIIA), after a period of formative rivalry between various Early Mycenaean centres, it entered the so-called palatial period. It was an era of gradual centralization of administration and economy around the palaces, monumental residences of a ruler and his bureaucratic administration. The appearance of the palaces led to the development of palatial towns, i.e. settlements consisting of the palace and the lower town surrounding it. Those towns served as key nodes of urbanized, functionally and structurally organized regional settlement networks. They were political, economic and religious capitals of Mycenaean palatial states. Through the distribution of elite burial forms and monumental architecture, and both written and material records related to economy, we can see how the involvement of the palatial states extinguished the constant conflict and rivalry between competing local elites, that were characteristic of the Early Mycenaean period. Instead, various regional centres, organized in a hierarchical system, were now dominated by the palatial town, often serving a specific function within the palatial economic system. In the same time the ruling palatial elite applied various strategies of de-escalating social tensions, mainly through redistribution of goods and land, massive communal feasts and strict control of the circulation of prestigious items. In this paper I try to explain those processes, by discussing formation of palatial towns and their regional settlement networks in the regions of Messenia and Argolid. Despite regional differences between various Mycenaean centres, some general conclusions are also drawn regarding de-escalation of conflict in the urbanized palatial settlement networks of the Late Bronze Age Greece.

4 SETTLEMENT PATTERN AND SOCIAL DYNAMICS IN NORTHERN ABRUZZO BETWEEN THE 8TH AND THE 6TH CENTURY BC

Abstract author(s): di Giovanni, Andrea (Università La Sapienza, Roma)

Abstract format: Oral

Northern coastal Abruzzo is still today a territory difficult to investigate from various points of view. It is enclosed between territorially and culturally defined area, as it is bordered by the mountains to the west, the Adriatic to the east, the Picenum (with the Tronto river as a natural limit) to the north and the territory of the Marruccini to the south of the Pescara river. Moreover, an inner border line is defined by the location of sanctuaries placed between different population. Archaeological investigations have brought to light many sites that have never been fully investigated, leaving the understanding of the territory incomplete. Indeed, between the end of the Bronze Age and the early Iron Age (8th-6th century BC), the general trend of settlements is to move toward high visibility and controlling places in the landscape (incastellamento), different local response than the Tyrrhenian-style urban forms. This denotes the need for territorial control in an area morphologically divided by medium height hills and small rivers, with settlements of

different sizes built on plateaus (as for the Umbrians and Picenes), on single and multiple hills with the presence of often more than one relative cemetery. It is important to note that the area is a meeting point for at least four different cultural groups identified in historical times as Pretuzi, Vestini, Marrucini and the ager Hadrianus (not identify to any said population). This presentation intends to investigate the causes and the dynamics of internal conflicts that gave origin to the need to build settlements and outposts on high ground through the analysis of the unpublished data coming from Atri's site and their role in the wider frame of the settlement pattern of the area.

5 VIOLENCE AND CONFLICT DE-ESCALATION IN PRE-ROMAN CENTRAL APENNINE (6TH – 5TH CENTURY BC)

Abstract author(s): Scarsella, Elena (Cambridge University)

Abstract format: Oral

This paper aims to investigate the apparently counterintuitive role of armed conflict in the de-escalation of social conflict in the mountain societies of Archaic Abruzzi, Central-Apennine. Mediterranean mountains are an interesting landscape under many aspects, and they contribute to the shaping and the formation of the unique identity of the populations inhabiting them. This paper will approach the topic from a landscape perspective, without excluding the data coming from material culture, but integrating them within a broader, holistic, framework. Indeed, the constraints of the environment, the limitations of the climate, and the rugged nature of their morphology create the basis for a fragmented human landscape. Phenomena of centralisation and urbanisation that developed on the Tyrrhenian coast and in Greece already by the 7th century BC, happened in the mountainous Abruzzi only much later and under different circumstances, namely the Roman influence. Until then, on the other hand, the settlement pattern obeyed rules dictated by the landscape and the peculiar social structure of the area. Organised around a central hillfort and focussed on the defence and control of mountain passes that connect the valleys, the settlement pattern here relied on a complex system of small hillforts and outposts, often very far from each other. The cemeteries reflect this pattern: together with extensive burial sites on the plains, small necropoleis were often associated with isolated outposts and smaller settlements. Within this complex territorial system and based on the abundance of functional weapons and osteological traces of widespread violence among male adults, conflict seems to be a fundamental aspect of the delicate balance of power of the area, at least from the beginning of the 6th to the first half of the 5th century BC, namely the formative years of the people that will be later called Vestini by the literary sources.

6 SPACES OF INEQUALITY AND CONFLICT IN URBAN HISTORIOGRAPHY OF THE MIDDLE AGES

Abstract author(s): Müller-Liedtke, Catharina (ROOTS Cluster of Excellence, CAU Kiel)

Abstract format: Oral

In the urbanization boom in Central Europe, which lasted from the 11th to the 15th century, the inhabitants of the cities consolidated into burgher communities. These communities developed their own intrinsic moral values and agency, which has been repeatedly quarrelled over. In this progress they created a demarcation that was also perceived from the outside. This presentation will investigate spaces of inequality and conflicts within urban historiography from the 13th to the 15th century. In this regard, the focus is on the hermeneutic textual analysis of urban conflicts as a cause and consequence of social inequality. How were urban conflicts presented? Which urban conflicts are present? How are these conflicts spatially located and how were the conflicts perceived by different individuals? Finally, examples from urban historiography (Augsburg, Cologne, Nuremberg, Strasbourg) will be explored to discuss whether they have relevance to archaeological examples. How can the literary description of a conflict and the material findings be related to each other? To what extent can a text-based perspective be supplemented with material access from archaeology and vice versa?

7 VIOLENCE-RELATED TRAUMA AND SOCIAL CONFLICT AT PRE-HISPANIC ANDEAN CITIES VS. THE OUTLANDS: INSIGHTS FROM BIOARCHAEOLOGICAL BIG DATA

Abstract author(s): Scaffidi, Beth (University of California, Merced) - McCool, Weston (University of California, Santa Barbara)

Abstract format: Oral

Many cities and sociopolitical centers of the pre-Hispanic Andes were mixing pots of people hailing from disparate geographic origins and with distinct practices, preferences, and individual and communal identities. For example, the Inca Empire of the late pre-Hispanic Andes is known to have practiced the forced and heavily incentivized resettlement of ritual practitioners, laborers, military conscripts, and other groups, united in the common cities of the empire. Earlier states and empires may have enacted similar policies. As these peoples came together into an urban setting from disparate places with sometimes incongruous cultural systems, did these social difference lead to tensions that boiled over into violent conflict?

This paper leverages a bioarchaeological big data approach to exploring the relationships between the frequency and type of violence-related cranial trauma (a proxy for interpersonal violence), site sociopolitical organization, settlement/city size, geographic location (plotted in GIS), and evidence for violent ritual like human trophy-taking or sacrifice. Cranial trauma rates are lower for burial samples from large settlements and cities relative to those from the provinces. This data should be interpreted cautiously given that burial samples do not reflect natal individuals injured and buried outside of the site, and since antemortem wounds could have occurred in other locations. Nonetheless, the patterns observed here suggest that Andean cities maintained systems of de-escala-

tion that mitigated violent interpersonal conflict within large settlements and cities. Violent, sometimes public spectacles may have comprised a social order that helped to ease conflicts in multi-ethnic urban settings.

8 THE ETHNOGRAPHY OF CONFLICT ESCALATION AND DE-ESCALATION

Abstract author(s): Stoddart, Simon (University of Cambridge; University of Kiel)

Abstract format: Oral

This presentation will examine the social processes of conflict escalation and de-escalation in settlement nucleations of different scales, with the assistance of ethnographies provided by Goody, Kopytoff and Boissevain. The work of Goody will be deployed to study the key issue of succession between different political authorities and conflict occurs and is reduced at this very sensitive moment of transition. The work of Kopytoff on the internal frontier will be assessed to understand how issues of conflict are resolved in a landscape setting, developing over time. Finally, the work of Boissevain will be examined to understand how these issues play out in the intensity of small scale societies, encountered with a high frequency on islands but also applied to larger territories. Finally, these models will be explored to see whether they have relevance to archaeological examples which will be drawn from European data, ranging from the Neolithic to the Iron Age.

318 HOW CAN METAL CORROSION PRODUCTS CONTRIBUTE TO ARCHAEOLOGICAL RESEARCH? - ARCHAOMETALLURGY@EAA, PART 1

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Rose, Thomas (Department of Bible, Archaeology and the Ancient Near East, Ben Gurion University of the Negev; Scienze dell'Antichità, Sapienza - Università di Roma) - van der Stok, Janneke (University of Amsterdam; Metals Inc.) - Peters, Manuel J. H. (Politecnico di Torino; Universidade de Évora)

Format: Regular session

In archaeology, the outer surface of a metal artefact is increasingly valued. Corrosion products and adhering material often contain valuable information (e.g. ghost structures) and can significantly contribute to the artefact biography. In the conservation sciences, alteration layers are regularly examined to gain information about the local environment and the alloy with the aim to design the best treatment possible.

With the spread of affordable and easy-to-use portable equipment like pXRF, the number of analyses from this outer surface is increasing and curators become even more critical when it comes to invasive sampling. Using corrosion layers for analysis instead of exposing fresh metallic surfaces might allow access to more objects and could also be considered to gain sufficient information to answer a number of research questions. However, the plethora of different influences and processes during metal corrosion makes this task very challenging.

This session will therefore initiate the discussion on how to deal with alteration layers, from multiple perspectives and for all types of metal alloy, from copper and iron to silver, from the first metals to modern times. We want to explore matters such as the most efficient way to exploit the information potential of these outer surfaces, the best way to deal with difficulties arising from the combination of different analyses and to incorporate an environmental perspective on metal artefacts. Views from multiple disciplines, like archaeology, conservation science, materials science and technical art history will all aid in this discussion and widen our respective horizons.

We welcome all contributions dealing with the outer surface of archaeological metal objects as well as advantages and limitations in investigating them. The aim of this session is to raise awareness for this seemingly undervalued part of metal artefacts and to discuss how corrosion products can be incorporated into current archaeological research.

ABSTRACTS:

1 CORROSION ON METAL ARTIFACTS: RECENT DEVELOPMENTS AND CHALLENGES

Abstract author(s): Rose, Thomas (Ben-Gurion University of the Negev; Sapienza – University of Rome)

Abstract format: Oral

First and foremost, corrosion is the result of the interaction between a metal and its environment. Therefore, conservation sciences regularly examine corrosion products of archaeological objects in order to reconstruct the depositional environment and design the best treatment for the object. However, corrosion can also bear valuable information about the artifact and its context. Admittedly, it is often very challenging to get beyond the influences of the depositional environment. But should this not be our ambition in dealing with valuable heritage, allowing us to minimize invasive sampling because it can cause corrosion on the freshly exposed surface? Often, we have to deal with corrosion products anyway: they are the only thing remaining of what was once a metal object. Additionally, affordable and easy-to-use analytical methods become more and more popular and are usually providing surface analyses. Left aside these pure necessities, facing this challenge allows accessing valuable information otherwise ignored or even lost. Hence, picking up the challenge is definitely worth it, although it is not an easy one.

This presentation will provide an overview about the current developments and different challenges in the investigation of corrosion products in the archaeological disciplines. Based on this overview, the contributions in this session will be introduced and put in a wider context in order to provide a more general perspective on the plethora of aspects investigated through the analysis of corrosion products.

2 MULTIPLE-SCAN VOLTAMMETRY: AN ARCHAOMETRIC TOOL FOR DATING ARCHAEOLOGICAL BRONZES

Abstract author(s): Mödlinger, Marianne (University of Genoa) - Doménech-Carbó, Antonio (Universitat de València) - Doménech-Carbó, María Teresa (Universitat Politècnica de València)

Abstract format: Oral

The application of a multiple-scan strategy to nanosamples taken from 18 cross-sections of Bronze Age arms and armour, as well as two Roman coins, using the voltammetry of immobilized microparticles (VIMP) methodology is presented. The described analytical method is non-invasive, as only a few nanograms of corrosion from the object's surface are needed for the analyses. The voltammetric responses in contact with aqueous acetate buffer can be attributed to the reduction of cuprite with variable degree of compaction and crystallinity revealing significant differences in the gradient of such properties with depth. The voltammetric study of the metallographic samples of the bronze objects shows correlation with the age of the objects, respectively the period of their deposition. We discuss also (potential) influence of different factors on the VIMP measurements, such as deposition context (soil, water), chemical composition of the copper alloys, and microstructural features (as-cast, annealed, work-hardened), and how to overcome these issues.

3 USING IRON CORROSION PRODUCT MULTI-TECHNIQUE ANALYSES TO TRACE THE TEMPERATURE OF ANCIENT FIRES: METHODOLOGY AND APPLICATION TO NOTRE-DAME IN PARIS

Abstract author(s): Neff, Delphine (CEA) - Dillmann, Philippe (CNRS) - Syvilay, Delphine - Azéma, Aurélia (LRMH) - L'Héritier, Maxime (Université Paris 8; CNRS-ArScAn)

Abstract format: Oral

Iron corrosion product layers formed on archaeological artefacts depend on their history. Forging, use and fires can induce corrosion in an atmospheric environment at ambient or higher temperatures. Then, the archaeological context environment induces further corrosion processes likely to evolve over time. High temperatures are among the factors much likely to change the nature of corrosion compounds. At low temperatures, in aerated media, goethite is the main precipitated corrosion product. Hematite can form from goethite at temperatures above 300°C. As fire temperatures usually exceeds 800 to 1000 °C, investigating the transformation of an artefact's ambient corrosion feature is likely to be used to trace the course of such an event.

To determine the corrosion phases and assess their evolution with temperature, a set of fifteenth-century corroded iron cramps from Metz cathedral were heated at 300, 400, 600, 800 and 1000°C during 1 and 6 hours. The resulting heated corrosion layers were analysed by SEM-EDS and μ -Raman spectroscopy on the surface and on cross sections. Furthermore, a temperature calibration curve was obtained from the decomposition of specific hematite spectrum peaks.

This methodology was then applied to iron cramps reinforcing the upper walls of cathedral Notre-Dame de Paris (early 13th c.) which suffered several hours of blaze. Corrosion product samples were collected in situ and transverse cross sections were prepared on a few deposited cramps. Elemental composition and structural analyses reveal the presence of a ten-micrometer-thick wüstite layer assessing temperatures higher than 570°C. Thanks to the calibration curve, temperatures between 600 to 1000°C were identified depending on the cramp location leading to a better understanding of the fire dynamics. Such study improves the knowledge of high temperature iron oxidation features. This method is likely to be applied on other archaeological sites to assess the importance (or existence) of past fires.

4 INVESTIGATING TEXTILES IN METAL CORROSION PRODUCTS OF THE GALLOWAY HOARD, C. AD 700-900

Abstract author(s): Harris, Susanna (University of Glasgow) - Davis, Mary (National Museums Scotland)

Abstract format: Oral

Textiles are some of the most ephemeral materials in the archaeological record. By examining the corrosion products of metals, textile researchers have been successful in detecting evidence for textiles (e.g. Bender Jørgensen 1992, Gleba 2017). Conservators encounter textile traces in corrosion products when working with metal artefacts. Textile are preserved in a spectrum of metal corrosion products ranging from predominantly organic material preserved due to the biocide effect of mineral salts, to fully mineral replaced structures (Janaway 1983). The effect of preservation in this way leads to unusual textile vestiges, as mineral preserved textiles adhere to metal structures creating patterns that can be difficult to identify, distinguish from metal dendrites, or the shape of corrosion itself. In this presentation, we discuss the practical and methodological issues of examining textile traces in metal corrosion products. Focusing predominantly on textiles preserved on the artefacts of the early medieval Galloway Hoard, we consider a suite of microscopy and digital imaging methods to identify textile structures. The methods covered include portable dino-lite microscopy, optical light microscopy, Scanning Electron Microscopy (SEM) and digital SLR using Reflectance Transformation Imaging

(RTI). Through the results we consider the significance of the technical and contextual information gained from examining textile traces on the metal objects of the Galloway Hoard.

5 THE ROLE OF IRON IN THE INTERPRETATION OF AN EARLY ANGLO-SAXON BURIAL SITE

Abstract author(s): Penton, Sharon (Conservator in Private Practice)

Abstract format: Oral

Iron is probably the most common yet most neglected of the archaeological metals. It does not survive well underground but because of the way it reverts back into the soil it can preserve the impression of other organic materials around it in great detail. Cliffs End Farm is a prime example of how iron aided in the interpretation of an otherwise poorly preserved Anglo-Saxon burial site. A significant amount of information was extracted from the iron artefacts using investigative cleaning and analytical tools such as X-radiology, Scanning Electron Microscopy (SEM) and X-ray Florescence (XRF). X-radiography aided the careful micro excavation of artifacts from soil blocks and enhanced details of design and manufacture otherwise not visible. Mineral preserved organics such as cloth and plant materials could be identified with both visual examination as well as SEM. Other metal identified with XRF were preserved due to the preferential corrosion of the iron around it. Had these artifacts not been treated by a conservator detailed information leading to the interpretation of the site would have been lost.

6 TO THE RAINBOW AND BEYOND: MULTICOLOURED CORROSION PRODUCTS ON SILVER AND GILT OBJECTS

Abstract author(s): van der Stok, Janneke (University of Amsterdam; Metals Inc.) - Joosten, Ineke (Cultural Heritage Agency of the Netherlands) - Beentjes, Tonny - van Bommel, Maarten (University of Amsterdam)

Abstract format: Oral

Silver, gold and gilt copper and silver objects recovered from the sea may display an intriguing colour palette. What appears to be a dirty artefact at first glance, can unravel stories about life in the past. It all starts with realising that the outer surface of the object might contain valuable information. Information about its manufacture and use in the past, the object's degradation process, its chemical and mechanical stability and the relation with other finds from the same archaeological context.

The increasing awareness of the information potential of pristine and uncleaned archaeological objects results in an increased number of studies of the outer surface. These are often conducted with an array of analytical techniques, ranging from non-destructive (like X-ray imaging) to those that require destructive sampling (like metallography).

The Dutch AMOR-project is an example of such a study, where alteration layers play a key role. The main research question is: what would be the best way to extract information from precious metal objects from a marine context? More specifically, the outer layers of a selection of objects are meticulously examined to find traces that add to the artefact biography. A selection of analytical techniques is applied, based on visual examination of the differently coloured areas on multiple artefacts. By interpreting the results with an interdisciplinary team, effort is being made to transfer this knowledge from a purely academic exercise into practical output that appeals to the public. As this is quite a challenge, this presentation will elaborate on some of these issues, as well as on more technical difficulties that arose during the analytical studies. Overall, the added value of corrosion and its adhering material will be highlighted, based on (precious) metals finds from a marine context.

7 METAL USE IN THE LATE ROMAN PERIOD. METHODOLOGICAL LIMITATIONS AND POSSIBILITIES OF PXRF DATA FROM COPPER ALLOYS FROM GERMANIA SECUNDA

Abstract author(s): van der Meulen-van der Veen, Berber (Cardiff University)

Abstract format: Oral

As part of a larger PhD project into the material culture of the Late Roman period in Germania Secunda and Germania Magna, a large pXRF dataset of 651 Late Roman copper alloy dress accessories was gathered. The dataset consists of objects borrowed from a variety of private collectors, museums and archives. This meant that the finds were not allowed to undergo deep-cleaning or destructive sample taking. As with all pXRF research on archaeological metals (e.g. Roxburgh 2019), this has raised issues about the influence of corrosion processes on the analysis results.

In this paper, I would first of all like to discuss the methodological intricacies of dealing with surface pXRF data from archaeological metals, both in running the analyses and the data processing stage afterwards. The methodological choices made for this project will be discussed, including data normalisation, proving internal consistency of results across the dataset and how to deal with over- and underrepresentation of certain elements (Fernandez et al. 2013).

Secondly, the aim is to formulate a more fluid approach to understanding metal use in the Late Roman period, by looking at the relative chemistry of these objects. This can address questions of access to raw materials, recycling practices and alloy choices both inside and outside the Roman Empire and across the 4th and 5th centuries. As the dataset includes both objects traditionally associated with the military and with female or "Germanic" identities, it can also be used to address a number of social questions. One of the methods explored in this context is the exploration of chemical spaces for copper (Bray et al. 2015) by tracing the presence/absence of arsenic, antimony, silver and nickel as trace elements in these copper alloys.

8 MICROSCOPIC AND SPECTROSCOPIC DETERMINATIONS OF CORROSION PRODUCTS ON COINS AND OTHER METALLIC ARTEFACTS UNCOVERED BY METAL DETECTORS

Abstract author(s): Gebremariam, Kidane (University of Stavanger)

Abstract format: Oral

Understanding of the corrosion products of archeological metal artifact is essential for well-informed conservation interventions. Preventive measures could also be taken to avoid or minimize deterioration of these objects during storage and display. Various methodologies can be applied for the characterization of the corrosion products on deteriorated metallic objects at different scales of observations depending on the focus of the study. Microscopic and spectroscopic methods are applied to explore the variations in the morphologies and compositions of corrosions products on some coins and different metallic objects acquired by metal detectors. Some of the results will be presented in this contribution. The corrosions products reflect the composition of the metal and its burial condition among other factors. Besides assisting conservation works, systematic study of the corrosion products of metallic objects could facilitate better understanding of the mechanisms of the deteriorations. It is also imperative to take into account the impact of the composition of the patina when applying non-destructive surface analytical methods such as X-ray fluorescence spectroscopy.

9 CORRODED CLUSTERS: INVASIVE VERSUS NON-INVASIVE TECHNIQUES TO DETERMINE COPPER ALLOY ARTEFACT GROUPS FROM ALBALAT (ROMANGORDO, SPAIN)

Abstract author(s): Peters, Manuel J.H. (Department of Applied Science and Technology, Politecnico di Torino; Department of History, Universidade de Évora; HERCULES Laboratory, Universidade de Évora) - Bottaini, Carlo (HERCULES Laboratory, Universidade de Évora; CityUMacau Chair in Sustainable Heritage, Universidade de Évora) - Gilotte, Sophie (Centre National de la Recherche Scientifique) - Mirão, José (HERCULES Laboratory, Universidade de Évora; Department of Geosciences, Universidade de Évora) - Grassini, Sabrina - Angelini, Emma (Department of Applied Science and Technology, Politecnico di Torino)

Abstract format: Oral

In archaeometry, the move to non-destructive methods has led to widespread criticism concerning the use of portable X-ray Fluorescence (pXRF) for the investigation of archaeological artefacts. Corroded artefacts can provide unreliable results when it comes to surface analysis, due to enrichment and depletion processes such as decuprification and stannification.

This research investigates artefacts from the Islamic site of Albalat (Southwest Spain), which was occupied from the 10th to the 12th century AD. For this study, more than 30 previously unexplored copper-based objects were selected. Several pXRF measurements were carried out on the surface of each artefact, as well as on the metal cross-sections. The results were submitted to statistical analyses including principal component analysis (PCA) and cluster analysis to find compositional trends and possible correlations between clusters and artefact types.

Although there are differences in the individual compositional results of each artefact, related to the corrosion process, the identified clusters for both methods are very similar. The two largest clusters are a group of relatively pure copper-based alloys and a group with a significantly higher Zn component. Other elements include lead and tin. The clusters appear to correspond to clear artefact categories. The copper artefacts are primarily of simple form and function, representing implements such as nails. The brass-like alloys appear to be used for decorative elements.

The correlation between alloy and artefact class implies a conscious selection of alloy components for the desired function of the artefact. This provides an insight into Islamic metal manufacturing techniques in the Iberian Peninsula in the 12th century AD.

On the one hand, this study highlights some of the common issues with surface analysis. On the other hand, it shows that, when treated carefully, non-destructive analysis can be used in a comparative way, yielding similar results to destructive analysis on the same samples.

A. ORGANIC PSEUDOMORPHS: AN INTRODUCTORY GUIDE FOR CULTURAL HERITAGE PROFESSIONALS

Abstract author(s): Acuna, Katerina (Winterthur/University of Delaware Program in Art Conservation)

Abstract format: Poster

Organic pseudomorphs are mineralized organic materials preserved in the corrosion crusts of metal artifacts. They can reveal information about organic materials in contact with metals that have long since degraded, like wood and textiles. Pseudomorphs tend to form in stagnant, damp environments where metal objects and organic materials are adjacent and are buried in soil conducive to slow fiber degradation and metal corrosion. The surfaces of pseudomorphs are delicate and vulnerable to physical damage. It is important that archaeologists and cultural heritage professionals are widely aware of pseudomorphs so they can be documented, physically preserved, and studied with greater frequency. This poster will provide basic guidelines on what pseudomorphs are, how to identify them, how to care for them onsite, and offsite follow-up. The poster will be accompanied by an educational pamphlet for conference participants to share with students and colleagues. The guidelines on the poster and pamphlet will be informed by an ongoing research project between the Winterthur/University of Delaware Program in Art Conservation and the University of Pennsylvania Museum of Archaeology and Anthropology (the Penn Museum), in which digital microscopy has been used to document pseudomorphs from Ur. Images of pseudomorphs from Ur obtained during research carried out in the spring of 2020 will accompany the guidelines as didactic tools.

B. ANALYSIS OF UNCONSERVED ARCHAEOLOGICAL COPPER ALLOY OBJECTS

Abstract author(s): Vasiliauskaite, Asta (Klaipeda University; Vytautas the Great war museum)

Abstract format: Poster

This poster will present an assessment of the applicability of the pXRF Niton XL3t to non-destructive analyses of archaeological metal with focus on the analysis of the composition of copper alloys and the effects of corrosion. Would it be any use to perform analytical analysis before conservation? The objects from two burials dating 3rd-5th centuries AD from Marvele cemetery in Kaunas, Lithuania were selected for XRF analysis. Marvele cemetery dating 2nd to 14th centuries AD is one of the largest burial sites in Lithuania with about 1500 human burials and few hundred horse burials. Few iron and over 30 copper alloy objects from the rich woman's burial and the child's burial underneath it were selected for metal composition analysis. Two readings were taken for each object: one at untreated area, covered with thick layers of corrosion products, and another at the cleaned spot. Results are discussed in relation to the composition similarities of the objects from both burials and the data usefulness for conservators to inform them of the degree to which the corrosion crust is developed.

319 IMPR - PHYTOLITHS IN GEOARCHAEOLOGY AND MICROMORPHOLOGY

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Vrydaghs, Luc (MARI - VUB) - Polo-Diaz, Ana (Marie Skłodowska-Curie Fellow - MSCA-IF, Department of Archaeology, University of Sheffield)

Format: Regular session

Phytolith studies are an essential aspect of modern geoarchaeological research. Phytoliths are indeed observed on samples provening from diverse geographical locations, environments and time periods. Present session intends to bring together geoarchaeologists/micromorphologists and phytolith specialists working on archaeological deposits.

Traditionally, both specialists work on different mediums: the phytolith specialist analyses bulk samples, while the geoarchaeologist/micromorphologist studies thin sections of sediment/soil blocks preserving the original stratigraphy of the deposits. Consequently, both approaches document different aspects of the phytolith record. Thin sections inform about the spatial context and formative processes. The analysis of bulk samples details the morphological diversity of the assemblages and relative concentrations. Integrating both methods has thus potential to considerably boost their respective analytical capacities and to fuel discussion in both research fields. Of major relevance are issues relating to morphological diversity, the (post)depositional histories and the discrimination of phytoliths sharing (or not) a common botanical origin.

One is forced to note that indeed few phytolith specialists attend micromorphological workshops. Likewise few micromorphologists attend IMPR. The purpose of present session is to initiate such meetings aiming at bridging both research fields. As a first step, micromorphologists are invited to report on their phytolith observations regarding the questions above highlighted, and to discuss them with the broader phytolith community.

A microscopic session will follow these presentations. Its purpose is to raise awareness among specialists of both fields on the potential of phytolith analysis of thin sections.

ABSTRACTS:

1 20 YEARS OF LOOKING AT PHYTOLITHS IN ARCHAEOLOGICAL SOIL THIN SECTIONS: A REFLEXION

Abstract author(s): Devos, Yannick (Vrije Universiteit Brussel)

Abstract format: Oral

Traditionally, phytolith research focusses on the study of bulk samples collected during archaeological field campaigns. However, phytoliths are regularly reported by soil micromorphologists studying their archaeological soil and sediment thin sections. These thin sections are thin slices of undisturbed soil and sediments. Importantly, all components are captured in the position they had in the original soil and sediment profiles. Despite a series of limitations – the phytolith record is not concentrated, phytoliths cannot be rotated and are cut at random angles – the study of phytoliths in these thin sections is feasible. Beyond being a feasible task, it is also a promising asset (Vrydaghs & Devos, 2018).

Over the last 20 years a specific research protocol has been developed to describe and interpret the phytoliths observed in thin sections. Present contribution intends to discuss to what extent this method can contribute to our understanding of different aspects, such as the origin and taphonomical history of plant remains in archaeological deposits. Furthermore, it will be argued how it opens perspectives for morphometrical analysis and how it can be integrated within the framework of geoarchaeological research.

The presentation will be illustrated with a series of case studies, mainly from Brussels and Flanders.

Reference

- Vrydaghs, L. & Devos, Y., 2018. Phytolith Analysis on Soil and Ceramic Thin Sections. In: Smith, C. (Ed.), Encyclopedia of Global Archaeology: Living edition. Springer. https://doi.org/10.1007/978-3-319-51726-1_3286-1.

2 PHYTOLITHS IN EARLY MEDIEVAL FLOORS FROM NORTHERN FRANCE

Abstract author(s): Borderie, Quentin (CNRS UMR7041 ArScAn)

Abstract format: Oral

Due to the lack of well-preserved stratifications and to the absence of micromorphological investigation on historical domestic building, the nature of medieval indoor floors is barely known in Western Europe, except concerning hardened stone materials (pavement, mosaics). Recent micromorphological investigations focused on early medieval floors from high statute dwellings (castra) from Gien (Loiret) and Boves (Somme) have revealed that floors can be partly or totally made with graminiae phytoliths. Those plant remains are located on the surface of earthen floors, but they can also be the only material recovering trampled waste. The absence of phosphate features or of faecal spheruliths ruled out the hypothesis of the use of dung to build the floors. Moreover, the morphometric analysis of the dendritic phytoliths show that most of them are formed in cereal husks. Rare occurrence of such a practice have already been notice in France, but only for the 14th – 15th c., like in the milites houses of Chalucet (Haute-Vienne). In Boves, the thickness of the layers and the probable regular cleaning of floors seem to indicate that the processing of crops took place into the building. In Gien, the plant mats are thinner and include other plant material. This can indicate that the crops are processed in the surrounding and that husks are reuse in order to build floors. In addition to the new data on floor material and building processes, those results also highlight the ways of processing cereal and give new evidence of social practice of waste management.

3 ANIMAL INDOOR PENNING AND STORAGE ACTIVITY IN THE EASTERN PYRENEES: THE CASE-STUDY OF LATE IRON AGE BALTARGA, Cerdanya

Abstract author(s): Portillo, Marta (Department of Archaeology and Anthropology, Institució Milà i Fontanals - IMF, Spanish National Research Council - CSIC, Barcelona) - Sisa, Joaquim (Department of Prehistory, Autonomous University of Barcelona - UAB) - Alliot, Pascal - Olesti, Oriol (Department of Antiquity and Middle Age Studies, Autonomous University of Barcelona - UAB)

Abstract format: Oral

Over the last decades microarchaeological and ethnoarchaeological approaches including combined studies of phytoliths, calcitic faecal microfossils and micromorphology have demonstrated the critical importance of animal dung deposits for reconstructing past human life-ways in mountain areas, primarily within naturally sheltered sites such as caves and rockshelters. The case study of Baltarga (Bellver de Cerdanya, eastern Pyrenees) provides direct evidence from simultaneous storage and animal penning, along with the faunal remains, in situ in anatomical connection, of a number of ovicaprines and even a horse, occurring within the same building, corresponding to a destruction event by fire dating to the second half of the 3rd century BC. Through simultaneous examination in micromorphological thin-section and integrated phytolith and calcitic dung spherulite analyses, the current study provides direct evidence for animal management and organisation of space at Late Iron Age Baltarga by examining indoor animal penning deposits at high-resolution.

Micromorphological results point to a well-preserved microstratigraphic sequence that allows us to characterize this type of occupation deposits related to animal management through highly significant markers and to reconstruct its use/life episodes at an optimal resolution scale. Phytolith-rich assemblages from in situ dung accumulations further provide insights into herbivorous regimes, dominated by a range of grass matter suggested to derive from fodder and/or grazing through the penning lifetime.

This integrated approach contributes to the understanding of the depositional pathways and taphonomic histories of penning deposits within built environments, critical for the reconstruction of activity areas and practices related to animal management strategies, foddering/grazing activity, and their archaeological implications for site formation processes, concepts of space within the settlement, health, as well as the complexity of interactions between people and animals in mountain areas.

4 PHYTOLITHS AND CAVE AND ROCK-SHELTER DEPOSITS IN EARLY FARMING: PROVIDING ARCHAEOLOGICAL CONTEXT FROM THIN SECTIONS FOR MICROMORPHOLOGICAL ANALYSIS

Abstract author(s): Polo-Diaz, Ana (Department of Archaeology, University of Sheffield.)

Abstract format: Oral

Mountainous areas can be considered a major vector in the introduction and expansion of early farming in SW Europe. Such relevance is closely related to current evidence indicating an extensive use of caves and rock-shelters to keep livestock from the Neolithic through to the Bronze Age. Accordingly, deposits preserved in these sites frequently consist of fumier accumulations from animal herding, but they also hold evidence of further aspects of early farming life as living areas and burial features. The resulting sediments of these activities are a mixture of weathered and burnt organic remains in which a significant portion corresponds to phytoliths. In parallel to traditional quantitative study of phytoliths from bulk samples, analysis of phytoliths using sediment and soil micromorphology can improve our understanding of the dynamics involved in the formation process of the deposits.

In this presentation a selection of phytolith assemblages documented in thin sections for micromorphological analysis from cave and rock-shelter deposits from the Iberian Peninsula is presented. The objective is to emphasize the importance of addressing the study of phytoliths in light of the sedimentary context of preservation for the characterization of early agro-pastoral activities and the assessment of the integrity of the archaeological record.

5 PHYTOLITH AND MICROMORPHOLOGICAL ANALYSIS AT THE MIDDLE-TO-LATER STONE AGE SITE OF LOVEDALE, FREE STATE, SOUTH AFRICA

Abstract author(s): Wroth, Kristen (Eberhard-Karls-Universität Tübingen) - Bousman, Britt (Texas State University) - Tribolo, Chantal (CNRS-Université Bordeaux Montaigne) - Rossouw, Lloyd (National Museum, Bloemfontein) - Kolska Horwitz, Liora (Hebrew University of Jerusalem) - Miller, Chris (Eberhard-Karls-Universität Tübingen) - Toffolo, Michael (CNRS-Université Bordeaux Montaigne)

Abstract format: Oral

The archaeological record of South Africa has provided striking evidence for behavioral variability and technological innovation among groups of early modern humans. Much of our understanding of these groups comes from the deep, well-stratified deposits found within caves and rock shelters, shedding light on many aspects of past behaviors. However, caves and sheltered sites are not available in all landscapes and this record may produce a biased view of important human activities, such as hunting and foraging behaviors that took place in the open landscape. Open-air sites are often more difficult to find and interpret due to a variety of concerns over preservation and their placement within a dynamic, erosional landscape. Thus, the combination of geoarchaeological and microarchaeological techniques is key to understanding how open-air sites formed, how they changed through time, and their place within specific environmental and ecological conditions.

This paper presents the results of micromorphological and phytolith analysis on sediment samples collected from Lovedale, a Middle-to-Later Stone Age site located in the Free State near Bloemfontein. The micromorphological analysis of intact blocks of sediment from this open-air site provides insight into the site formation processes, showing shifts in the depositional environment as the course of the local river changed. The micromorphology also gives important context for interpreting the surprisingly rich phytolith samples. Grass phytoliths dominate the plant microremain assemblage and show evidence for vacillations between wetter and drier periods throughout MIS 4-2. Together, these analyses provide a more holistic picture of the paleoenvironment, speaking both to local landscape change and regional environmental shifts. These data address some of the gaps in the paleoenvironmental and geoarchaeological record for this period in the region and add to a growing picture of human-environment interactions during a critical stage of evolution.

6 FIRES OF A HOUSE – BURNING EVENTS IN A MIDDLE BRONZE AGE VATYA HOUSE AT SZÁZHALOMBATTA-FÖLDVÁR TELL SITE (HUNGARY)

Abstract author(s): Peto, Ákos (Hungarian University of Agricultural and Life Sciences) - Kovács, Gabriella - Vicze, Magdolna (independent researcher)

Abstract format: Oral

The investigation of fires and burning has a long history and the applied methods are also greatly varied. There are a number of investigations regarding the Neolithic, but Bronze Age has not been excessively studied in this regard so far. In this study we aim to add further details to this topic via the conjoint application of thin section soil micromorphology and phytolith analysis. The combination of these techniques has been proven to be highly advantageous due to their high resolution. Various burning events were investigated at a Middle Bronze Age Vatyá house from the tell site of Százhalombatta-Földvár, Hungary. Three types of fire are in focus here out of which two are thoughtfully prepared and implemented. One of them was set for the cleaning of the house, the other one for the hearth, while the last one closed down the house's life. While in the first two cases everyday life is under the microscope, the latter is more enigmatic and it is hard to tell if it was an accident or purposeful destruction. Thin section soil micromorphology and phytolith analysis in fixed analytical environment (thin section) was applied to shed light on the details of the fire events.

7 INTEGRATING PHYTOLITH AND MICROMORPHOLOGICAL RESEARCH IN CENTRAL ANATOLIA: INSIGHTS INTO EARLY HOLOCENE HUMAN-PLANT-ANIMAL DYNAMICS

Abstract author(s): Garcia-Suarez, Aroa (University of Reading) - Portillo, Marta (Institució Milà i Fontanals - Spanish National Research Council)

Abstract format: Oral

The tight integration of phytolith and micromorphological methodologies is a very promising line of work in environmental archaeology, since it allows us to combine the strengths of both quantitative (i.e. concentrations of micro-remains) and qualitative (i.e. micro-contextual) studies. In this paper, we present case studies from the Central Anatolian Neolithic record to illustrate the many advantages associated with this interdisciplinary approach, particularly when capable of expanding/dismissing functional interpretations of archaeological contexts defined by field observations. We then evaluate these results under the light of ethnographic research in modern Turkish villages, highlighting how these investigations contribute to refining archaeological interpretations of deposits and embedded micro-remains from comparable contexts.

Phytolith spot samples were collected from the sediment blocks before preparation for manufacture into thin-sections, resulting in the strong association of microfossil and micromorphological data. Results demonstrate how the combination of geo- and bio-markers leads to solid interpretations on key archaeological issues such as uses and concepts of space, landscape exploitation and herd management, in particular feeding regimes and dung use. Specifically, micromorphology has made significant contributions to our understanding of the depositional pathways and taphonomic alterations of plant contents in the studied contexts, whereas

phytolith analyses of spot samples have allowed us to overcome the limitations posed by the observation of plant microfossils in micromorphological thin-sections. Through this combination, depositional processes, ecological choices and post-depositional alterations are identified and understood more accurately.

8 ONCE UPON A TIME... STORYTELLING PHYTOLITHS IN ARCHAEOLOGICAL THIN SECTIONS FROM THE ROYAL TOMB OF QATNA (SYRIA)

Abstract author(s): Pümpin, Christine (Integrative Prehistory and Archeological Science - IPAS, University of Basel) - Vrydaghs, Luc (Maritime Cultures Research Institute - MARI - Vrije Universiteit Brussel) - Reifarth, Nicole (CICS - Cologne Institute of Conservation. Sciences Textiles and Archaeological Fibres - TAF) - Doutrelepon, Hugues (ROOTS, Bruxelles) - Ball, Terry (Department of Ancient Scripture, Brigham Young University - Provo)

Abstract format: Oral

The discovery in 2002 of the Late Bronze Age Royal Tomb of Qatna (Tell Mishrife, Syria) – in use for about 450 years – implied the integration of many different disciplines to collect and save as much data from the archaeological find as possible. The examination of soil thin sections from the different burial chambers and passageways provided evidence for various phases of construction as well as other human activities in the tomb. During this study, phytoliths have been repeatedly observed. For a better understanding of their origin and nature, the biogenic opal in the thin sections from organic floor deposits, vessel contents, as well as deposits directly connected with human burials were analysed. In general, phytoliths are present in most parts of the tomb. However, there are areas where they are conspicuously frequent and in some cases still in anatomical position, such as on a stone bench, in-between a multi-layered textile deposit mineralised into gypsum, associated with a burial. These biogenic remains most likely came into the tomb in conjunction with the construction material and the grave goods. With the systematic and careful documentation including detailed mapping, the study of phytoliths in thin sections proved to be of special significance, as it provided important information about preservation conditions, sediment accumulations or even details of funeral activities. The results demonstrate the importance of a close cooperation between micromorphology and phytolith studies, permitting new perspectives understanding micro-remains through closely intertwined analytical methods in complex archaeological structures.

9 PHYTOLITH AND MICROMORPHOLOGY RESULTS FROM A NEOLITHIC ASH-PIT IN EASTERN CHINA

Abstract author(s): Duan, Qimeng (Institute of Cultural Heritage, Shandong University) - Rao, Zongyue (Shandong Provincial Institute of Cultural Relics and Archaeology) - Jin, Guiyun (Institute of Cultural Heritage, Shandong University)

Abstract format: Oral

Dongjiabai site locates in eastern China, in which Neolithic remains including houses and ash pits dated to 6500-6000 BP had been unearthed. In this research, soil micromorphology and phytolith samples were collected from ash pit H18 in which 13 deposit layers were recorded as ①-⑬. High density of phytolith from rice and millets were extracted from layer ③, ④, ⑩a, ⑩c, and ⑪. Soil micromorphology analysis shows that the high density of crop phytoliths in some layers were the results of the deposition of burnt organic materials including crop-processing by-products other than fresh by-products.

In our previous research, the high density of crop phytoliths, especially that from cereal husk, were used as a proxy to infer the location of crop processing. However, by combining the analysis of phytolith and soil micromorphology in this research, we conclude that the previous proxy is not appropriate. This research indicates that when discussing crop processing issues, the phytolith analysis should be done along with soil micromorphology to define the formation process.

10 INTEGRATING PHYTOLITH ANALYSIS OF BULK SAMPLES AND SOIL THIN SECTIONS. THE CASE OF THE RUE DES BOÎTEUX, BRUSSELS (BELGIUM)

Abstract author(s): Hermans, Rosalie (Maritime Cultures Research Institute - MARI, Vrije Universiteit Brussel - VUB) - Chevalier, Alexandre (Royal Belgian Institute of Natural Sciences - RBINS, Brussels) - Albert, Rosa Maria (Catalan Institution for Research and Advanced Studies - ICREA; Dep. of History and Archaeology, University of Barcelona) - Devos, Yannick - Vrydaghs, Luc (Maritime Cultures Research Institute - MARI, Vrije Universiteit Brussel - VUB)

Abstract format: Oral

During a rescue excavation in 2014, a Dark Earth (13th – 15th centuries) was uncovered at Rue des Boîteux, Brussels (Belgium). An interdisciplinary study, which included geoarchaeology and archaeobotany, permitted to identify this Dark Earth as corresponding to the remains of a late medieval garden.

The present contribution focuses on the results obtained from the phytolith analysis from the Dark Earth. The phytolith analysis was conducted within a complex methodological framework. It involved the analysis of phytoliths from bulk samples processed through three different extraction methods and the study of soil thin sections. Despite its potential, the study of phytoliths from soil thin sections is not commonly applied. The combination of both methods is even less frequent (e.g. Banerjee et al., 2019).

Within this presentation, we aim to evaluate the advantages and disadvantages of combining various phytolith extraction methods from bulk samples. In a next step, the results of the analysis of bulk samples are compared with those obtained from the analysis of soil thin sections. These comparisons show that the different methods complement each other. This integrated approach permits

to obtain a more detailed dataset regarding morphological diversity and relative frequencies. It also enables a better understanding of the origin of the phytoliths and the impact of (post)-depositional processes on them.

References

- Banerjea, R. Y., Badura, M., Brown, A., Morandi, L. F., Marcinkowski, M., Valk, H., Ismael-Meyer, K. and Pluskowski, A. (2019). 'Feeding the Crusades: Archaeobotany, Animal Husbandry and Livestock Alimentation on the Baltic Frontier', *Environmental Archaeology: the Journal of Human Palaeoecology*, p. 1–15.

321 CONTEMPORARY APPROACHES TO THE INVESTIGATION AND MANAGEMENT OF ARCHAEOLOGICAL RESOURCES IN ALLUVIAL ENVIRONMENTS

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Crabb, Nicholas - Carey, Chris (University of Brighton) - Howard, Andy (Landscape Research and Management) - Ghilardi, Matthieu (Centre Européen de Recherche et d'Enseignement des Géosciences de l'Environnement - CEREGE)

Format: Regular session

Alluvial environments contain rich archaeological records, both in terms of ecofactual and artefactual evidence, but they are also challenging to investigate. The subsurface stratigraphy of river valley floors is complex, with fine-grained alluvial sediments concealing archaeological remains and sites, whilst at the same time preserving organic deposits. The burial of such rich archaeological records within and under alluvium renders most conventional techniques of archaeological prospection ineffective and alternative solutions, largely derived from earth sciences, have therefore been sought.

Although recognition of this challenge is not new, the variety and sophistication of methods available has increased in recent decades. This includes, but is not limited to, terrestrial investigations to create stratigraphic profiles of sediment architectures, airborne and satellite remote sensing techniques to understand the geomorphological complexity of these systems, and deeper methods of geophysical survey, allied to 3-dimensional computational modelling. In tandem with this, absolute dating of sediments has provided a step-change in understanding the timing and speed of change within these sedimentary systems. This is most commonly achieved through radiocarbon and optically stimulated luminescence calibrated through Bayesian statistics, and has led to the definition of legacy sediments and wider-scale human impacts across catchments. Despite this, optimal methods for the investigation of archaeological potential within these alluvial systems requires further development. Consideration of how these different data sources and approaches can be integrated will provide greater understanding of past human impacts across river catchments and ultimately enable more effective management of the historic environment resource.

In this session, we therefore call for papers from archaeologists and associated heritage professionals that critically assess the role that multi-methodological approaches can make towards elucidating the alluvial archaeological record. In particular, we welcome contributions that integrate these methods synergistically to form more holistic interpretations and models of alluvial evolution and past human-environmental dynamics.

ABSTRACTS:

1 ALLUVIAL FLOODS IN THE GREEK-ROMAN SETTLEMENT OF ELEA-VELIA: AN ARCHAEOLOGICAL PRELIMINARY REPORT

Abstract author(s): Tescione, Teresa - Cicala, Luigi (Università di Napoli Federico II)

Abstract format: Oral

The Elea-Velia settlement is located in the Southern Cilento. The town has been founded in the end of the 6th century BC by Phocaea inhabitants. The entire history of the Greek-Roman town has been influenced by the Frittolo stream dynamics which caused several alluvial floods in the Southern Quarter since the 1st century AD until the 6th century AD, when the Greek-Roman settlement has been definitely abandoned.

The recent geo-archaeological investigations have identified the cause of the alluvial floods in the human-environmental interaction and they have carried out a paleo-environmental reconstruction.

The paper involves a multi-methodological approach, combining the results of geological, environmental and archaeological studies. The main goal is to present a chronological reconstruction of the settlement changes following each alluvial flood event and the management/acceptance of the hydraulic risk affecting the area. For this purpose, the aim of the paper intends to show available data from a sample-area of the recent archaeological excavations in the Southern Quarter. Specifically, the results of the pottery's chrono-typological and quantitative analysis and walls' stratigraphical studies are integrated to obtain a wider reconstruction.

2 GEOMORPHOLOGICAL AND ARCHAEOLOGICAL PERSPECTIVES REVEAL THE IMPACT OF ALLUVIAL ENVIRONMENTS ON HUMAN ACTIVITIES IN THE PERGAMON MICRO-REGION—AND VICE VERSA

Abstract author(s): Becker, Fabian (Freie Universität Berlin / Physical Geography) - Knitter, Daniel (Christian-Albrechts-Universität zu Kiel / Landscape Ecology and Geoinformation) - Yang, Xun - Schütt, Brigitta (Freie Universität Berlin / Physical Geography)

Abstract format: Oral

Alluvial settings play a key role in the understanding of site locations in the micro-region of the Hellenistic–Roman Imperial urban centre of Pergamon—not only for the growth of the city on an alluvial fan, but also for the rural estates, agricultural areas, and the road network in the wide Bakırçay alluvial plain.

We integrated different types of data related to a range of spatial entities and temporal scales to parse the entangled development of the alluvial environments around Pergamon and in its hinterland.

This multi-method approach aims to reconstruct the distribution of (pre-)recent wetlands and flood dynamics. It is based on the analysis of the structural setting of a graben-conducted plain inherited from Miocene fault-block tectonics, palaeo-environmental data from sediment sequences, historic maps of the early excavators, geomorphometric data, and multi-spectral satellite imagery. We used least-cost path analysis to integrate the different approaches and to evaluate the effects of different alluvial settings on settlements and human movement. Furthermore, a geomorphological contextualisation of archaeological data from the urban centre of Pergamon and its micro-region supports the palaeo-environmental reconstructions.

Our analyses conducted in the Bakırçay plain reveal that the ancient road network around Pergamon was quite well adapted to the dynamics of the alluvial plain, e.g. flooding and seasonal wetlands. Sedimentology and tectonics show that the general setting of the plain in ancient times and today was similar; although parts of the plain are flooded in winter, the development of settlements and the road network was possible.

The analyses of the Bergama alluvial fan showed that humans actively shaped the hydro-morphological setting of (peri-)urban areas—including construction terraces and river embankments. Moreover, humans have also been affected by increased morphodynamics, such as flooding and sediment dynamics.

3 REMOTE SENSING IN ALLUVIATED LANDSCAPES: THE POTENTIAL OF A SYNERGISTIC APPROACH TO ENVIRONMENTAL MODELLING OF THE RIVER VALLEY FLOOR

Abstract author(s): Crabb, Nicholas - Carey, Chris (University of Brighton) - Howard, Andy (Landscape Research and Management) - Jackson, Robin (Worcestershire Archaeology) - Brolly, Matthew - Burnside, Niall (University of Brighton)

Abstract format: Oral

The deposition of fine-grained alluvial sediments within river floodplains can bury, conceal, and preserve archaeological sites and features. These sediments are often thick (>1m), preventing the detection of archaeological remains using common prospection techniques, such as shallow geophysical survey and aerial photography. Despite this, it is possible to determine zones of archaeological/paleoenvironmental potential in alluvial environments through deposit modelling; the recording of sub-surface sediments and stratigraphy, to identify geomorphological variation. This is normally achieved through intrusive investigations, such as boreholes/coring or trial trenching. However, the analysis of alluvial landform assemblages from remotely sensed data has significant potential to aid the investigation of these environments. Moreover, with several recent technological advancements, such as the advent of small Unmanned Aerial System (sUAS) instruments and increasing spaceborne capabilities, remotely sensed datasets are increasingly accessible for geoarchaeological research.

This paper provides an assessment of the capability of contemporary remote sensing techniques (e.g. airborne LiDAR, Synthetic Aperture Radar (SAR), and satellite and sUAS mounted multi/hyperspectral) to model geomorphological components of river valleys and identify their archaeological potential. It reviews previous applications and provides a case study from the Lower Lugg valley, UK, where these datasets are compared with ground-based sediment sampling. This research examines the relationship of near-surface and sub-surface sediment variability of different valley components through computational image analyses. It also uses separability measures to provide a quantification of the effectiveness of different image enhancement procedures for the characterisation of these components. The results demonstrate these technologies can provide significant insights into the geomorphological complexity and variability of alluvial environments and subsequently facilitate a geoarchaeological assessment of their potential. The results will, therefore, be of interest to archaeologists and heritage managers working within these environments, as they have the potential to offer a more cost-effective and detailed representation of archaeological resources in alluviated landscapes.

4 APOGEE, DECAY AND TRANSFORMATION: A GEOARCHAEOLOGICAL PERSPECTIVE ON ABANDONMENT AND POST-ABANDONMENT PROCESSES IN THE TEMENOS OF THE ARTEMISION OF EPHEBUS

Abstract author(s): Lourenço Gonçalves, Pedro (ÖAI - ÖAW)

Abstract format: Oral

Transformation processes on the Artemision of Ephesus following its heydays (i.e., during the Roman Imperial era and the phases postdating the end of the cult until Mediaeval times) are the target of ongoing geoarchaeological investigations as part of the multidisciplinary research project "ART_TE – Temenos&Territorium" (ÖAI / ÖAW). Since the rediscovery of the temple 125 years ago, research has targeted the consecutive temple buildings and associated altars, largely disregarding the post-Roman deposits and

remains. The focus of the ART_TE project is not the direct impact of a divinity, nor sacred buildings and votive deposits, but rather the infrastructural facilities, the temenos, and the economic and political power and significance of the sanctuary, during Roman times and beyond the closure and abandonment of the temple. Planned geoarchaeological investigations during 2020 included the drilling of boreholes in the area of the temenos with subsequent sedimentological and geochemical analyses of collected samples. However, fieldwork was postponed in 2020 due to the COVID-19 pandemic, and it is still uncertain when this work will be able to resume. More than presenting the context of our project and the preliminary results of the on-going investigations, this paper aims to discuss alternative strategies and methods for geoarchaeological research, particularly when fieldwork and the acquisition of sedimentological data is not guaranteed.

5 GEOARCHAEOLOGY OF THE MEDIEVAL BRIDGE AT AVIGNON (SOUTH FRANCE): MANAGING AND IMAGING THE GEOSCIENCES, ARCHAEOLOGICAL AND HISTORICAL DATA

Abstract author(s): Ghilardi, Matthieu (CEREGE - CNRS)

Abstract format: Oral

This paper aims to precisely locate the medieval arches of the so called Avignon's (Saint Bénézet) Bridge (South France) and to reconstruct the fluvial dynamics of the Rhone River from Early Medieval Times to the 18th century AD. Until now, just four remnant arches are still visible and it is estimated that 22 arches (which represents a total length of approximately 920 meters) were built to span over one of the largest French Rivers. A medieval wooden bridge was probably erected from 1177 until 1185, and was rebuilt with stone arches around mid-13th Century AD. The structure of the bridge being vulnerable, seasonal floods proved a never-ending threat and cause of damage which was frequently repaired with masonry or wood. Questions arose about the location of the "lost arches" and evident flood. From 2011 to 2014, a joint team composed by laboratories affiliated to the French Public Research Centre (CNRS) and to Universities of Avignon and of Aix-Marseille aimed to link the different phases of constructions/destructions of the monument with the fluvial dynamics of the Rhone River for the concerned period. The geoarchaeological approach adopted comprised bathymetric surveys together with geophysical prospections in order to reveal potential locations of arches within the modern Rhone River channels and on the Barthelasse fluvial island. Finally, boreholes have been drilled and later linked with the geophysical data, to reveal the alluvial litho-stratigraphy and describe the geomorphic the changes in the fluvial system. Stratigraphic evidence was reconstructed with geophysical surveys, optically stimulated luminescence and radiocarbon chronologies. Finally, a 4D visualization has been constructed that helps to better understand the relationships between the bridge and the Rhone River during its period of use.

6 HISTORY OF FLOODS. ANALYSIS OF CERAMIC ASSEMBLAGES FROM THE PISA SAN ROSSORE'S ANCIENT SHIPS

Abstract author(s): Tescione, Teresa (Università di Napoli Federico II) - Pace, Gloriana (Museo delle Navi Antiche di Pisa) - Camilli, Andrea (Soprintendenza Archeologia Belle Arti e Paesaggio per le province di Pisa e Livorno)

Abstract format: Oral

The paper's aim concerns the chronological reconstruction of some flood events through the analysis of ceramic assemblages. This research intends to propose an analysis model of archaeological records deriving from natural catastrophic phenomena.

The case-study is the archaeological site of Cantiere delle Navi Antiche in Pisa San Rossore. The excavation has revealed that in a watercourse, probably a tributary of the river Auser, almost eighteen ships, were embedded under eight centuries of silt and clay (3rd cent. BC – 5th cent. AD).

After some exceptional floods due to intense rain, the Arno river broke its embankments close to a bend and poured out huge quantities of water and sediments in the area of this canal, sweeping away everything and leaving materials in the hollows of the ground.

The paper focuses in the analysis of the stratigraphic sequences in the north and south-west area of San Rossore basin (Area 5 and Ampliamento Sud Area), characterized by almost five main catastrophic floods, since Republican age (3rd – 1st cent. BC) until the Late Roman time, in which some riverboats with cargo still on board were involved.

The repeated alluvial floods and the movement of the water stream changed the pottery's primary contexts. Although, the set of ceramic materials offers a wide range of case studies of 'input' in the stratifications, with objects accidentally fallen into the water or thrown purposely, those belonging to the equipment on board or loading ships, those conveyed by floods, etc.

The chrono-typological and quantitative analysis of pottery assemblages revealed a residuality rates and, at the same time, it was useful to date the archaeological deposit. The information processing depends on data recording in a geographical database which allowed the spatial intra-site distribution of pottery in the alluvial deposits.

A. SHALLOW WATER 3D SEISMIC ATTRIBUTE ANALYSIS OF MEDIEVAL ARCHAEOLOGICAL FEATURES IN SOUTHERN SCHLESWIG, GERMANY

Abstract author(s): Detjens, Stine (Centre for Baltic and Scandinavian Archaeology - ZBSA) - Gross, Felix - Wilken, Dennis (Christian-Albrechts-Universität zu Kiel)

Abstract format: Poster

Archaeological assets in the Baltic Sea region are often found at the land-water-transition. Since excavations are time- and cost-intensive and require extensive drainage, geophysical methods like marine 3D seismics are attractive alternatives.

For archaeological prospection image quality is key. Studies do not only aim at detecting objects present, but at characterising them and gaining knowledge about them. This includes size, shape, depth and other properties, e.g. the degradation status.

Seismic attributes (SA) are powerful analysis methods designed to extract information from seismic reflection data that may be more subtle in a traditional seismic image. Being sensitive either directly to changes in seismic impedance, layer thickness or seismic textures and morphology, they enable enhanced quantitative and qualitative interpretation of 3D data sets. Using SA in archaeology has never been tested before and is yet a logical next step. Although there are studies on attribute analysis in archaeological contexts, these relate to ground penetrating radar data recorded on land.

Aiming at enhancing the 3D imaging of submerged and sedimented archaeological features while preserving them in situ, a comprehensive 3D seismic attribute analysis (3DSAA) was performed. Two case studies on a late Viking wreck near Schleswig and the former monastery site Ryd Abbey in Glücksburg were conducted. The examined high-resolution data sets were collected using the PingPong 3D marine reflection seismic system, developed at Kiel University. Using IHS Kingdom 2017 software, all 68 attributes available for calculation were tested and evaluated with regards to their applicability for archaeological investigations in shallow water. The results were validated and contextualised considering previous studies on the targets.

The results show that 3DSAA is feasible for detecting and visualising archaeological assets in shallow water settings. In comparison with traditional seismic amplitude visualisation techniques, SA were able to enhance the imaging of the investigated objects conspicuously.

322 SMALL-ISLAND RESILIENCE AND VULNERABILITY

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Angliker, Erica (ICS-London) - de Angelo Laky, Lilian (Department of History University of Sao Paulo)

Format: Session with keynote presentation and discussion

As environmental issues have become an urgent topic, archaeologists are now turning to ancient societies to see how past communities perceived and interacted with the natural world around them and how the environment, in turn, impacted ancient societies. Along this line of inquiry, one place in particular, where the interactions between environment and human communities has proven interesting to study, is small islands. Although scholars long-believed that small islands worked as closed environments (here referring to the popular 'island laboratory' concept), these places are by no means cut off from external influences. Given their geographically-restricted population and natural resources, small islands – in the past, as today – are considered especially vulnerable to natural and anthropogenic hazards. Indeed, studies continue to show that the resilience of island communities is underestimated and that they remain deeply affected by high-risk situations. Small islands are more exposed than continental areas to demographic and social changes, serious earthquakes and to variations in water level, which threaten to disappear whole territories of an island, or to submerge it entirely. The culture of small islands is also deeply affected by external influences like the influx of mass tourism, which may lead to the disappearance of local traditions. This section aims to further examine how ancient people dealt with the different impacts of the environment on small islands. We welcome papers dealing with the impact of environmental changes on the demographic and social composition of small islands. We also will welcome papers that examine how the environment of the islands influenced the local culture of the islands (i.e. their religious practices, social organisation, economies, material culture and local traditions). Particularly welcome will be studies focusing on inhabited or un-inhabited islands which historically served as cemeteries, maritime strongholds, sanctuaries, pirate-hideaways, or 'goat islands.'

ABSTRACTS:

1 RESILIENT CULTURAL LANDSCAPES AT THE SOUTHERN SHORES AND SMALL ISLANDS OF BRAZIL

Abstract author(s): DeBlasis, Paulo (University of São Paulo; Museum of Archaeology and Ethnology)

Abstract format: Oral

Sambaquis (shellmounds) are typical remnants of shoreline middle and late Holocene culturally well-adapted societies all along the Brazilian coast. Impressive mounds can be found in very productive locations (hot spots) where lacustrine, coastal islands and bay environments meet, with abundant resources from land and sea. In our study area, at the southern shores of the Atlantic coast, where lagoon settings predominate, the larger mounds have been built as enduring cemeteries, meaningful permanent sacred places where surrounding communities have continuously reenacted ritual ceremonies involving the dead (and maybe others). Some of them were active for around two thousand years, with recurrent accretion that promoted the monumental proportions they exhib-

it today. Located at peculiar settings (rocky islands, promontories, stable sand strands) and allowing wide visibility towards each other across the flat and open aquatic scenario, where former small rocky outcrop islands (promontories or sand barriers today) have played a decisive role in configuring socially integrated and lagoon-centered dynamic social territories, as our spatial analyses demonstrate. These mounds speak of a culturally homogeneous landscape where ancestors actively take part, linking together natural and cultural worlds.

2 A BRIEF BUT DENSE HISTORY OF A QUARANTINE ISLAND: FLAT ISLAND IN THE INDIAN OCEAN

Abstract author(s): Cianciosi, Alessandra (University of Amsterdam; Stanford University)

Abstract format: Oral

The purpose of this paper is to present a case study of Flat Island, a small completely uninhabited islet situated offshore from the northernmost tip of Mauritius.

Because of the outbreak of epidemic diseases during the nineteenth century the British Empire chose this site to construct a maritime quarantine station. Every ship suspected of a contagious infection (in particular cholera, fever, or smallpox) had to be quarantined there for a longer or shorter period before landing at the main ports of Mauritius. After this temporary and emergency use, it reverted to being uninhabited in the early twentieth century, and now it is part of the national nature reserves of Mauritius. During the last decades it has become a growing popular day-trip destination, where tourists gather on the shallow lagoon and adjoining beach along the south-eastern side of the island.

From an archaeological perspective Flat Island is a crucial site for Mauritian history, with particular reference to the migration of thousands of indentured workers from different regions of the Indian Ocean to the sugar plantations of the Mascarenes. Research fieldwork has just started to analyse the creation of an anthropic landscape and the drastic environmental transformation, characterized not only by built infrastructure, but also by the introduction of foreign species of animals and plants. The observation of spatial organization of the quarantine station, based on survey and mapping of different structural patterns, has also taken into consideration the cemetery where people who died during the quarantine were buried.

This broad archaeological project aims to retrace the short but intense anthropic history of the island, and to raise awareness and encourage the sharing of knowledge about the environmental heritage of Mauritius.

3 EXPLORING TAIWAN'S FIRST SETTLEMENT USING MODELS OF CULTURAL TRANSMISSION

Abstract author(s): Carrignon, Simon (Department of Anthropology, University of Tennessee; Center for the Dynamics of Social Complexity - DySoC, University of Tennessee; McDonald institute, Cambridge University) - Mesalles, Lucas (National Chung-Cheng University)

Abstract format: Oral

Taiwan hosts the most diverse set of Austronesian languages. From the ten recognised subgroups, nine occur exclusively in Taiwan, with particular diversity in the precipitous terrains of the Central Range mountains, a tectonically active and currently growing mountain chain. Striking similarities between language geographical distribution and geographical attributes led us to hypothesize a link between landscape barriers (e.g. mountain ridges) and connections/links (e.g. rivers), and the spread and diversification of cultural traits.

The present-day Austronesians are thought to derive from a proto-Austronesian population arrived into the Taiwan island 5.600yr BP, displacing and ultimately annihilating earlier Hòabinihians ("negritos") settlers. This proto-Austronesian culture is well characterized in the Taiwanese archaeological record as the Neolithic Tapenkeng corded pottery culture, and is later found in the Philippines from 4000yr BP, before spreading to the rest of Island Southeast Asia and Oceania. While archeological and linguistic evidence point to an Austronesian cultural spread starting from the Taiwan island, the reasons behind the striking linguistic diversity of Taiwan are unknown.

In this contribution, we attempt to reproduce the Austronesian family language diversity of the Taiwanese Central Range mountains. Using an Agent-Based Model we compare different modes of cultural transmission that integrate spatial and demographic factors to reproduce Taiwan's linguistic diversity.

We test models of how the geographic distribution of the 9 languages families came about on the island, contrasting important different scenarios, including in-situ "isolation by distance" process versus any evidence for external migration at different times. Using Bayesian Inference we constrain 1/ which are the important geographical factors (slope, relief and connectivity) giving rise to the cultural diversity found on the Taiwan island and 2/ test which are the migration's scenario that are the most likely at the origin of the Austronesian dispersal into Island Southeast Asia and Oceania.

4 "THE MOST WESTERLY OF CHRIST'S FORTRESSES": NEW RESEARCH ON THE COASTAL PILGRIMAGE TO THE ISLANDS OF SKELLIG (WORLD HERITAGE SITE)

Abstract author(s): Gibbons, Michael (MIAI; IQUA)

Abstract format: Oral

The Skelligs feature a medieval monastic complex which has been heavily conserved since the 1970s.

The earliest antiquarian discussions by O'Flaherty and Smith describe the pilgrimage to Skellig Michael as a key aspect of the site's identity from the 17th century onwards. Historical sources repeatedly refer to the large pattern held on the island by the coastal inhabitants. Archaeological and written evidence suggests suggests this persisted in a much-diminished form into the twentieth century.

Oral reports collected in the 1930's also refer to the practice, although mainly as a now-defunct custom, largely serving as an excuse to harass the unmarried. Despite this, comparatively little post-medieval material related to the pilgrimage appears among the recorded finds and little analysis has been done as to how the surviving built structures may have been utilized as part of the pilgrimage (outside the South Peak).

Recent field work on Skellig Michael and the Little Skellig has confirmed the presence of a small building and possible built trackway on a narrow terrace, first described by local boatman and historian Des Lavelle and subsequently by the author. The stonework suggests a building of considerable age. An overlooked 17th century account refers to a possible hermitage on the Little Skellig which may be the same structure.

During conservation, many features believed to post-date the monastic period were removed; damaging the built heritage of the post-medieval pilgrimage. The surviving oratory/hermitage on the Little Skellig may thus represent one of the only structures related to this phase to survive unaltered by 20th century conservators.

This paper will describe the available written and oral sources related to the late-pilgrimage, discuss the limited available archaeological evidence and suggest a possible connection to the structure on the Little Skellig.

5 THE SMALL ISLAND OF THASOPOULA: INSULARITY AND STRATEGIC CONNECTIONS IN THE NORTHERN AEGEAN

Abstract author(s): da Hora, Juliana (University of Sao Paulo - USP; University of Santo Amaro - UNISA)

Abstract format: Oral

This presentation aims to discuss the relations between the islands of Thasos and Thasopoula. In it, we emphasize the importance of the environmental and cultural interaction of their communities. Thasopoula is an islet that bears traces of occupation since Antiquity. Defensive structures, ceramic fragments and anthropomorphic fortifications that have been found here, allowing us to trace the strategically important movements and dynamics of the islet, which lies between Thasos and the Thracian continent.

Based on this material evidence, we raise questions about the movements of people on small island and the larger neighboring island and the relationship of this to limited resources. The material remains allow us to trace the human presence on Thasopoula from the Archaic period to the Byzantine era. A circular tower used for defensive purposes also served as a means of communication between the islands of the North Aegean and Continental Thrace. Fifth- and fourth-century BC ceramic fragments from various places in the Mediterranean reveal latent social relations between Thasopoula and Thasos, Thrace and other places in the Mediterranean. The islet remained active until modern times, and contains military remains from the second half of the 19th century, highlighting its strategic location in the Aegean. Currently, Thasopoula appears to be uninhabited, however, it still plays an important role in the management of island resources by serving as a site of transhumance of goats for Thasos. Did Thasos, one of the most important poleis in the Aegean, overshadow and dominate smaller and lesser-known islands? This paper examines whether this domination was linked to the limited resources on Thasopoula.

6 RESILIENCE AND VULNERABILITY IN A SMALL ADRIATIC ISLAND: THE CASE STUDY OF VIS IN THE CROATIAN COAST OF DALMATIA

Abstract author(s): Laky, Lilian (University of São Paulo)

Abstract format: Oral

Located in central Dalmatia in the Adriatic Sea, Vis is the most distant inhabited island from the Croatian coast. It was initially occupied by a local population, as testified by settlements dating back to the Bronze and Iron Ages. Only after the Classical period (4th century BC) did the Greeks make their presence felt by founding the polis of Issa in a natural port on the island's northeast coast. Issa was founded by Greeks from another Mediterranean island polis: Syracuse, in Sicily. The urban area of Issa has been subject to archaeological investigation, albeit partial, and scholars have been able to identify the territory of the Greek city. The history of Vis offers an important case study of the impact of the environment on the social and demographic composition of a small island in a Greek city state. The first point of discussion here is the tiny area of the island (c.90 km²), in which the Issaeans had to coexist with settlements of the local population. The second point concerns the expansion of Issa—due most likely to overpopulation—during the Hellenistic period. The ancient Greek city state expanded to the mainland, where it founded Tragyrion and Epetion, as well as to a larger island in the region, where it established Lumbarda. Based on archaeological data on the positioning of non-Greek settlements in relation to the territory of Issa, we shall discuss how this small island environment, limited in its natural resources, may have influenced the distribution and sharing of territory between Greeks and local populations. Relying on archaeological and textual evidence, which we associate with factors known to have led numerous poleis to found sub-colonies, we shall discuss the extent to which the expansion of Issa may have been the product of the impact of a small island environment.

7 AN ISLAND THROUGH TIME: SURFACE SURVEY AND SELECTIVE OCCUPATION ON STRONGYLO (ANTIPAROS)

Abstract author(s): Levine, Evan (Brown University, Joukowsky Institute for Archaeology & the Ancient World; American School of Classical Studies at Athens) - Öztürk, Hüseyin (College Year in Athens) - Papdopoulou, Zozi (Ephorate of Antiquities of Cyclades, Hellenic Ministry of Culture & Sports) - Knodell, Alex (Carleton College, Department of Classics) - Nenova, Denitsa (The Norwegian Institute at Athens) - Athanasoulis, Demetrios (Ephorate of Antiquities of Cyclades, Hellenic Ministry of Culture & Sports) - Tankosić, Žarko (The Norwegian Institute at Athens; University of Bergen)

Abstract format: Oral

Since 2019, the Small Cycladic Islands Project (SCIP) has been intensively surveying dozens of uninhabited islets in the central and western Cyclades, developing a rich dataset of occupation, abandonment, and interaction from the earliest colonization of the Aegean until today. One island stands out as particularly remote and rugged, yet surprisingly rich in its material culture. Strongylo, located at the southwestern end of the island chain of Antiparos, encapsulates the benefits and pitfalls inherent in the occupation of marginal island landscapes and fundamentally informs our notions of human settlement in the Cyclades over the longue durée.

This paper presents a diachronic narrative of the occupation of Strongylo from prehistory to the present. Now completely uninhabited (except by goats), extensive terracing and damming are evidence of durable landesque capital, serving to shape the island for agricultural production and permanent settlement. At the same time, complex, multi-phase architecture reveals variable motivations for the occupation of the island through time: Strongylo provided evidence for habitation, surveillance, pastoralism, industry, and monumental construction. Moreover, the artefactual record signals a diverse range of influences and economic networks through time, underlining the island's integration into, rather than isolation from, neighboring Cycladic centers and the wider Aegean world. Thus, Strongylo offers an important case study in intensive island survey that has shown a dynamic range of activities from multiple, discreet time periods.

8 YERONISOS OFF CYPRUS: SMALL ISLAND, BIG SEA

Abstract author(s): Connelly, Joan (New York University; NYU Yeronisos Island Expedition)

Abstract format: Oral

Thirty years of excavation on Yeronisos off western Cyprus reveals the ebb and flow, expansion and contraction of life on a very tiny "Holy Island." Its story is one of short bursts of vibrant use punctuated by long centuries, even millennia, of abandonment. Connected to Cyprus by a land bridge in the Chalcolithic period, the narrow promontory was used as a hunting/processing camp for the culling of fallow deer. Shortly after 3800 B.C., the land bridge collapsed and an island – one without water – was formed. Abandoned until the late Hellenistic period, the islet underwent a lavish construction program during the 1st century B.C., apparently the work of Ptolemaic army engineers from the nearby garrison at Nea Paphos. Within a few short years, Yeronisos became a significant pilgrimage destination, transformed into an island sanctuary (of Apollo?). With the collapse of Ptolemaic rule in 30 B.C., followed by a devastating earthquake in 15 B.C., the island was again abandoned, only to be reconfigured in Byzantine times as the site of a small basilica/monastic retreat. This paper tracks the interaction of the local Cypriot population with the Ptolemaic administrative presence in Nea Paphos, and across the sea to the royal court of Alexandria in Egypt and the great monastic centers of south Palestine.

9 THE IRON AGE CYCLADES, A STUDY IN RISK BUFFERING

Abstract author(s): Forsyth, Doug (University of St. Andrews)

Abstract format: Oral

In the central Aegean island group known as the Cyclades, evidence of interaction with areas outside of the archipelago and of intra island connectivity is observable in Iron Age (1000 – 500 BCE) contexts on many of the islands. Ceramic finds from Corinth, Athens, Euboea, Samos as well as Egyptian and Levantine items can be observed on Paros, Naxos, Andros, Siphnos, Kythnos, Amorgos, and Delos. Cycladic origin finds have been found in the Levant, Egypt, North Africa, Crete, and in mainland Greece. This is really not surprising given the location of these islands wherein travel between mainland Greece and the East necessitates transiting through the archipelago. There is more to the story however than just location. It will be argued that environmental factors, predominantly low rainfall, made habitation of these islands rather precarious from the perspective of food security. Consequently, human agency played a role in creating an entrepreneurial outlook by some of the islanders seeking to develop strong networks of affiliation with other regions perhaps to serve as buffer zones to rely on during periods of poor food productivity on the islands. Complicating a buffer strategy was the reality that the connectivity of maritime transport was frequently broken by wind and sea conditions that prevented sailing leaving islands isolated from support. Evidence supporting this interpretation will be presented both from the archaeological record as well as ethnographic writings from later periods up to the present day. The Cyclades are remarkable in that they were both connected and isolated in turn which on certain islands fostered a human response of energetically looking beyond the islands themselves and resilience in making do with what little was available in times when external contact was prevented.

10 NETWORKS, COMPLEXITY, AND CONSUMPTION IN THE SMALL ISLANDS OF THE AEGEAN

Abstract author(s): Nenova, Denitsa (Norwegian Institute at Athens) - Knodell, Alex (Carleton College)

Abstract format: Oral

Small islands are often considered minor stopovers within larger important transportation networks—inactive nodes in a more extensive pathway system. The recent study of multiple islets in the Cyclades suggests that such tiny landforms participated in various extensive networks within the Aegean and beyond. The vulnerability of such places, caused by their exposure to the open sea, limited natural resources, and physical isolation from other landmasses, made connectivity essential for the survival of small-island communities. Shifts in settlement patterns within several islets indicate that the need for specific resources varied both spatially and chronologically, in a way that reflects a dynamic long-term history. This paper examines pottery evidence from several sites recently documented by the Small Cycladic Islands Project and published material from other recent survey and excavation projects in small Aegean islands. Through spatial analysis of find spots and the production locations attributed to specific vessel types, this paper explores the extent of production and consumption networks involving small-island environments and how these have varied over time. Changes in the networks modeled in this paper show that at different times small islands were alternately dependent on or isolated from larger Aegean networks of production and consumption.

11 SETTLEMENT, LANDSCAPE AND NETWORK DYNAMICS IN THE PREHISTORY OF THE AEOLIAN ISLANDS

Abstract author(s): Dawson, Helen (Dipartimento di Storia Culture Civiltà, Università di Bologna; Freie Universität Berlin) - Martinelli, Maria Clara (Parco Archeologico delle Isole Eolie, Museo Luigi Bernabò Brea) - Levi, Sara (Department of Classical and Oriental Studies, Hunter College, City University of New York) - Lo Cascio, Pietro (Associazione Nesos, Lipari) - Fiorentino, Girolamo (Dipartimento di Beni Culturali, Università del Salento)

Abstract format: Oral

This paper presents a critical and interdisciplinary review of the archaeological record of the Aeolian Islands (Italy), from their earliest settlement in the mid-sixth millennium BC (Early Neolithic) to the establishment of trans-Mediterranean networks at the end of the second millennium BC (Final Bronze Age). We combine archaeological, archaeometric, bioarchaeological and environmental data to explore the interplay between different prehistoric practices and their spatial settings. The resulting picture reveals different levels of interaction and the critical role of these small island communities in establishing and/or facilitating networks at the local and (inter-)regional scale. Ceramic networks allow us to trace connections between the islands and their neighbours, underscoring the centrality of the island of Lipari, which is further supported by the spatial analysis of the settlement data, in particular by the growing web of intervisibility between contemporary settlements on the Aeolian Islands, Sicily and Calabria. We also highlight significant environmental factors, such as arid phases and volcanic events, and assess their significance in light of the islanders' responses, underscoring their long-term adaptability to the challenges of insularity.

326 EVERYTHING YOU ALWAYS WANTED TO KNOW ABOUT PHYTOLITHS (BUT WERE AFRAID...): THEIR CONTRIBUTION TO THE MODELING OF PAST HUMAN BEHAVIOR

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Chevalier, Alexandre (Royal Institute of Natural Sciences) - Albert, Rosa María (University of Barcelona)

Format: Regular session

This session aims at analyzing and shedding light on the role played by phytoliths studies for the understanding of past human behavior in relation to environment and plant uses both local and non-local, and therefore on their impact on theoretical models shaping our current understanding of human interactions with each other and with nature.

For 50 years, phytoliths have been used in archaeology to bring answers to human behavior related to territory exploitation, impact of human activities on natural vegetations, foodways, trade, transmission of cultural traits, and translocation of plants due colonization.

Phytoliths have been applied to a vast array of supports, primarily on sediments, but also to material culture, such as ceramics, metallic pots or lithic industry, and more recently to human remains, specifically on dental calculus.

But, did they succeed in bringing relevant answers to the archaeologist's questions? Have phytolith studies been able to change our views on past human life, more than just providing anecdotal, one-time information? Did they contribute to change theoretical models regarding past human life and societies activities?

This session doesn't aim only at phytoliths specialists working in archaeology, but also at archaeologists or other specialists who use phytoliths in their own research as many other lines of evidence.

Hence, this session calls for communications that show evidence of such impacts of phytolith studies on our understanding of past human behavior, actions and interactions. Key questions are: What are the strengths and weaknesses of phytoliths? What is exactly their potential? How are they changing our views on the past? To which new analytical approaches do they contribute? What are our expectations about their future potential?

The session is sponsored by the Society for Phytolith Research and it organized in parallel to the IMPR, but it is not formally part of it.

ABSTRACTS:

1 SILICEOUS MICROREMAINS, GEOCHEMICAL MAGNETIC AND MINERALOGICAL ANALYSES OF CORE MATERIAL FROM KILOMBE CALDERA (KENYA), PROXY QUATERNARY PALAEOENVIRONMENT, CONTEXTUALISING HOMININ OCCUPATION

Abstract author(s): Albert, Rosa Maria (ICREA - Catalan Research for Research and Advanced Studies; Dep. of History and Archaeology, University of Barcelona) - Hoare, Sally - Stanistreet, Ian - Gowlett, John (University of Liverpool, ACE) - Stollhofen, Harald (GeoZentrum Nordbayern, Friedrich-Alexander-University - FAU - Erlangen)

Abstract format: Oral

Quaternary lacustrine sequences from East Africa are important archives of orbitally forced paleoclimatic changes, which effects lake-level limit and palaeovegetation, which are considered to control hominin occupation of and evolution within East Africa. Here we investigate in detail a well preserved and fairly continuous lake sedimentary sequence from Kilombe Volcano (Kenya), whose caldera-fill also preserves traces of hominin activity at several localities, involving Oldowan and Acheulean technologies. Our goal was to examine palaeoclimatic and palaeoenvironmental conditions using microbiological and geochemical analyses of bulk sediment samples from lacustrine units in the caldera fill, and its influence on hominin occupation. Microbiological analyses include the identification of various siliceous microremains preserved in the sediments such as phytoliths, diatoms and sponge spicules. Changes in chemical weathering intensity are examined using a multi proxy approach including major and trace element ratios (Chemical Index of Alteration, WIP); Fe-oxide mineralogy (S-ratio, D FD%); and Total Organic Carbon. The identification of phytoliths, diatoms and sponge spicules record vegetation presence and environmental conditions (lake regressions and transgressions) that vary through time. The magnetic and geochemical properties of the clays document from incipient through to intense changes in catchment weathering. Combined results record palaeoclimatic and palaeoenvironmental change during the Quaternary.

2 ARCHAEOBOTANICAL TAPHONOMY AND ARCHAEOLOGICAL INTERPRETATION. PHYTOLITH, SEED, AND CHARCOAL REMAINS FROM THE EARLY UPPER PALAEOOLITHIC SITE OF MUGHR EL-HAMAMAH (JORDAN)

Abstract author(s): Alonso-Eguiluz, Mónica (ERAAUB Equip de Recerca Arqueològica i Arqueomètrica de la Universitat de Barcelona) - Albert, Rosa Maria (ICREA Research Professor; ERAAUB Equip de Recerca Arqueològica i Arqueomètrica de la Universitat de Barcelona) - White, Chantel E. (University of Pennsylvania) - Asouti, Eleni (University of Liverpool) - Boaretto, Elisabetta (Kimmel Center for Archaeological Science - Weizmann Institute of Science) - Nilsson Stutz, Liv (Linnaeus University) - Stutz, Aaron (Bohusläns Museum)

Abstract format: Oral

Post-depositional processes invariably lead to degradation and alteration of the archaeological record. The Mughr el-Hamamah site (Ajlun Governate, Jordan) highlights the potential for taphonomic analysis of macrobotanical remains from contexts often considered too old to preserve such archaeobotanical traces, thus complementing phytolith analysis. Charcoals and legume seeds have yielded radiocarbon dates, placing the Early Upper Palaeolithic (EUP) occupation between 45-39 ka cal BP. The EUP Layer B incorporates micro- (phytoliths) and macrofossils (wood charcoal, seeds and nutshell). However, Layer B has also been subject to significant post-Palaeolithic disturbance from 20th century goat-penning activity).

We present a multi-proxy archaeobotanical study of Mughr el-Hamamah Layer B. Phytolith samples reveal the distribution of modern goat spherulites, showing very limited mixing between recent goat dung deposits and the Palaeolithic Layer B. A similar pattern is shown by the analysis of intrusive insects and modern seeds found in macrobotanical samples. Phytoliths contain both C3 and C4 plants, indicating generally humid conditions with dry spells or arid microenvironments. We documented inflorescence phytoliths, produced during the June blooming season, suggesting, at least, summer use of the cave. Dicot phytoliths and wood charcoals indicate the use of wood fuel, while fruit phytoliths are also present in soil samples taken from hearths. Macrobotanical results indicate the presence of legume seeds, Pistacia nutshell, and wood charcoals (oak, Pistacia, and almond wood). The direct dating of well-preserved charcoals and seeds anchors our understanding of site formation processes at Mughr el-Hamamah by confirming the antiquity of the macrobotanical remains, while the integrated study of micro- and macrobotanical assemblages has mapped the nature and range of post-Palaeolithic intrusions. Our systematic evaluation of archaeobotanical taphonomy permits a robust characterization of the EUP site environment and human uses of plants for food and fuel.

3 MICROBIOMORPHIC (PHYTOLITH) ANALYSIS IN THE GEOARCHAEOLOGICAL STUDY AT THE VOORTHUIZEN-WIKSELAARSEWEG ARCHAEOLOGICAL SITE (NETHERLANDS)

Abstract author(s): van den Berghe, Kasper (Herzen State University; FindX) - Druzhinina, Olga (Herzen State University) - Golyeva, Alexandra (Institute of Geography RAS)

Abstract format: Oral

Phytolith analysis, from the first application to study the genesis of Russian chernozems in 1850, has been successfully used in soil science, paleoecology, botany, and archaeology. And although the latter has been actively using the achievements of the method since the 1970s, phytolith analysis still remains unknown to the vast majority of archaeologists in the Netherlands.

Meanwhile, phytoliths are an essential source of information different from that provided by the study of pollen. While palynological research gives a general insight into plant growth in the region around settlements, phytoliths (plant cell silica copies) present data on the plant species grown, eaten, and used on the settlement itself. This information is contained in the old living layer, as well as in pits (working places and waste pits), postholes, ditches, etc.

Microbiomorphic method of analysis, as a follow up of the phytolith analysis, combines data on phytoliths and other microbiomorphs (ex. plant detritus, diatoms, fungi, etc.) determined in archaeological samples, which further expands the scope of palaeoecological information.

Microbiomorphic analysis was applied as a pilot project to the study of the Voorthuizen-Wikselaarseweg archaeological site, dated to Iron Age and Roman times, located in the central part of the Netherlands. 34 samples have been collected and processed according to the standard sample treatment technique (Golyeva, 2008). All samples were found to be suitable for analysis, with a sufficient number of microbiomorphs.

The study results clarify the available archaeological information on the site and provide new insight on the anthropogenic impact on the landscape manifesting the existence of several phases and types of anthropogenic use of the territory. The research also demonstrates the applicability of microbiomorphic (phytolith) analysis in the case of sandy archaeological layers, which are assumed to bear worse conditions of preservation of traces of anthropogenic activity.

4 THE CONTRIBUTION OF PHYTOLITHS TO THE UNDERSTANDING OF THE HUMAN ACTIVITIES ENTANGLED IN THE EN POTTERY OF NORTHERN GREECE

Abstract author(s): Papadakou, Trisevgeni (Aristotle University of Thessaloniki) - Tsartsidou, Georgia (Ephorate of Palaeoanthropology-Speleology, Hellenic Ministry of Culture, Athens; The M.H. Wiener Laboratory for Archaeological Science, ASCSA) - Papadopoulou, Lambrini (Geology Department, Aristotle University of Thessaloniki) - Kotsakis, Kostas - Valamoti, Soultana-Maria (Department of Archaeology, Aristotle University of Thessaloniki) - Urem-Kotsou, Dusanka-Christina (Department of History and Ethnology, Democritus University of Thrace)

Abstract format: Oral

Phytoliths trapped in the pottery matrix as a result of deliberate addition of plant-derived materials and/or as inadvertent inclusions have been extensively and very successfully studied to address a variety of questions which broadly correspond to two main axes of interest: organic-tempered pottery as material culture, tackling issues such as production and circulation, cultural contacts etc., and organic temper as archaeobotanical evidence. Pertaining to the former line of questioning, the case-study of six EN pottery assemblages from northern Greece presented herein, spanning approximately the 2nd half of the 7th millennium, highlights how the study of phytoliths as markers of human activities can help us explore the convergence and entanglement of different aspects of the Neolithic way of life, and inform us on the practices involved in the construction of these vessels. The organic-tempered pottery, comprising only a small fraction of these assemblages, was examined in regard to the temper's botanical signature using petrographic thin sections and manually extracted material observed under the SEM, and the two methods employed are assessed and compared as to their efficacy regarding the specific research questions. The results hint at a link between the production of organic-tempered pottery and food preparation, revealing at the same time some potential of both inter- and intra-site variability.

5 THE BUDDING OF PLANT MICROFOSSIL RESEARCH IN ESTONIA

Abstract author(s): Unt, Agnes - Niinesalu, Maris - Johanson, Kristiina (University of Tartu)

Abstract format: Oral

The potential of studying archaeological plant microfossils in determining past human foodways in Estonia has so far been underused, however, the need for adapting a suitable method for our material is increasing. Our small work group is currently making first steps to analyse foodcrust and dental calculus from different sites, with the specific focus on starches and phytoliths.

To do this effectively, we are building a reference collection of starches and phytoliths of Estonian food plants, an area mostly unmapped by plant microfossil reference collections. We are focusing on different methods of processing to determine changes in phytoliths and starches such as chewing, crushing and boiling among others.

In our presentation we will introduce the first results of selected case studies from Estonia in regard to phytoliths and starches. Some of these sites have been or are being analysed with other methods, e.g. stable isotope analysis of human bones or lipid residue analysis of pottery, and the results of plant microfossils would help to support or challenge these results.

6 COLONIAL ERA AND AFRICAN-AMERICAN SLAVE FEATURES IN SOUTH CAROLINA: A RECORD FOR COMPARISON

Abstract author(s): Scott Cummings, Linda (PaleoResearch Institute)

Abstract format: Oral

An 18th to 19th century plantation in South Carolina included Colonial era trash pits, wall trenches, and storage pits. A nearby African-American slave settlement, dating to the mid-1850s, is represented by an Antebellum wall trench and an Antebellum and Post-bellum trash pit. These features were examined using pollen, phytolith, and starch analysis for evidence of economic activity, with the opportunity to compare those records of food and resources between the Colonial era and African-American slave features. To-

gether they provide a record of vegetation that describes the local forest and understory vegetation at the time of occupation that included both native and weedy (Amaranthaceae, Ambrosia-type, and Liguliflorae) plants that might have been important as food and/or medicinal resources. The phytolith record identifies the presence of cool and warm season grasses that prefer cool, shady or hot, sunny habitats. Cereal grain cultivation and use is documented at both sites in both the pollen and phytolith records, indicating this staple was available to and used by both populations. Maize (*Zea mays*) is documented in three trash features and two storage pits, spanning both locations. Various native plants such as Virginia creeper (*Parthenocissus*) and poison ivy (*Toxicodendron*) are represented in storage pits, suggesting the possibility that Virginia creeper berries were stored and raising the question of the value of poison ivy as a medicinal. One principle in medicinal application is that plants may be used to treat conditions or symptoms that are similar to the ones they cause. In this case, itching, blistering, and oozing discharges also are observed in chicken pox, shingles, herpes, dermatitis, eczema. The use to which poison ivy might have been put remains a mystery, but either it was collected and stored in this pit or it grew out of the pit immediately after abandonment.

7 NEW METHODS TO REDUCE THE UNCERTAINTY IN MICROARCHAEOLOGY

Abstract author(s): Andreu Diez, Oriol (University of Barcelona) - Albert Cristóbal, Rosa Maria (ICREA; Universitat de Barcelona) - Boaretto, Elisabetta (Weizmann Institute of Science) - Pellicer Moscardó, Jaume (Institut Botànic de Barcelona - CSIC)

Abstract format: Oral

Phytolith analyses and the study of other microremains such as calcium oxalates, spherulites, starches, etc. have been shown to be critical to better understand past and vegetation landscapes directly related to human activities and use of plants. Nevertheless, there are still some limitations that have directly affected our research and that we believe we are currently in a position to address, thanks to the advance of other related disciplines. These limitations are, i) preservation and dissolution of siliceous and calcitic microscopic remains that may affect our correct interpretation of the archaeological record; ii) the problem of redundancy and multiplicity of phytolith morphologies that may elude a precise taxonomic identification; iii) the uncertainty regarding the source of the occluded carbon present in the phytoliths and, therefore, its reliability for ¹⁴C dating. To do this, we propose a methodological approach divided into two fields of action. Firstly, the implementation of the latest advances in computer science and artificial intelligence, using Deep Learning algorithms (Convolutional neural networks) to classification tasks. Then, introducing the application of techniques from other scientific disciplines such as cytogenetics (i.e: flow cytometry), and radiocarbon dating methods (Accelerator Mass Spectrometry) that will complement and expand the multi-proxy microarchaeological approach to improve the understanding of the phytolith production processes, and the interpretation of results, in particular, to improve the taxonomic identification of phytoliths.

We prospect that the implementation of this novel methodological approach will allow us to advance further in our research. In particular, our objective is to apply our results to better understand two different fields of research: a) agriculture as a driver of social change and b) the characterization of fuel in archaeological sites.

- Gender perspectives in teaching public archaeology at university level
- Professional and academic cultures

ABSTRACTS:

1 FEMINIST PERSPECTIVES IN ACTION: LOOKING FOR GENDER IN PUBLIC ARCHAEOLOGY

Abstract author(s): Gonzalez-Marcen, Paloma (Centre d'Estudis del Patrimoni Arqueologic de la Prehistoria; Universitat Autònoma de Barcelona)

Abstract format: Oral

In the last decade there has been a significant growth, both qualitative and quantitative, of academic contributions in the field of gender archaeology. However, if we assume that the development of gender archaeology parts of a search for a critical and informed representation of gender, and particularly women, in the historical narratives, broadly understood as instruments of knowledge, reflection and action, there is surprisingly little and / or poor visibility of gender perspectives in the field of so-called public archaeology.

In this presentation I intend, first, to reflect on why the journey from feminist activism to gender archaeology seems to have become a one-way one, with few return tickets; secondly, I want to discuss the academic difficulties that activist researchers may encounter for making their actions both visible and relevant, and, thirdly, to provide examples and proposals for a higher incidence of gender archaeology in different areas of contemporary society.

2 GENDER ROLES IN ARCHAEOLOGICAL EDUCATIONAL ACTIONS

Abstract author(s): Masriera-Esquerra, Clara (Universitat Autònoma de Barcelona; Universitat de Barcelona) - Cacheda-Pérez, Maria (Universitat Autònoma de Barcelona - UAB)

Abstract format: Oral

The educational potential of archaeology increases when the target audience is children. For this sector of the public, educational actions are based mainly in different kinds of manipulative activities and the use of representational images. However, on the one hand, many hands-on activities tend to stereotype traditional notions of technology and gender tasks division and, on the other hand, most graphic materials that are available are designed to "simplify" scientific discourse implying that gender stereotypes become much more marked even than in representations for a general public.

It is also necessary to understand that in formal or informal educational settings the use of hands-on activities and representational images are entwined with other communicative variables and contexts which structure the educational action. In this presentation we propose to analyse these educational actions that are carried on in school, museum and archaeological heritage contexts and reflect on the implications of the different variables from a gender perspective.

3 ARCHAEOLOGICAL HERITAGE AS TEACHING CONTENT IN PRIMARY EDUCATION. A CASE STUDY BASED ON SOCIAL SCIENCES TEXTBOOKS IN THE CANARY ISLANDS

Abstract author(s): Farrujia de la Rosa, Jose (Universidad de La Laguna)

Abstract format: Oral

Textbooks are the main material resource for Primary Education in Spain, in the case of formal schooling. Textbooks are also the materialization of the published curriculum and, therefore, they contribute to the official and pedagogical knowledge in schools. That is to say, textbooks contain the information that students need to study in order to pass a subject and, in addition, the textbook is the subject guide.

Despite the variety of teaching resources available in the educational field, the technological advances and the various educational reforms that have taken place in Spain in recent years, textbooks are currently the main resource in which supports teaching. According to data from the Spanish Evaluation Institute of the Ministry of Education, this resource is used by 99.1% of Primary Education students.

Taking into account the importance of textbooks as teaching resources in the classroom, this communication analyzes how Canarian archaeological heritage is focused, as educational content, within the Primary textbooks of Social Sciences. This analysis will take into consideration key aspects such as: what is considered archaeological heritage in teaching, how and what is taught, and what is the role of women in the historic fact and in the educational content. The main results of this research show the predominance of the androcentric cultural hegemony, the reproduction of Eurocentric views, the absence of an explicit definition for the archaeological remains and, therefore, for the concept of heritage. This panorama is similar to that registered in the rest of the Spanish State and in Latin America.

327 ENGENDERING PUBLIC ARCHAEOLOGY [AGE]

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Masriera-Esquerra, Clara (Universitat Autònoma de Barcelona - UAB; Universitat de Barcelona - UB) - González-Marcén, Paloma (Universitat Autònoma de Barcelona - UAB) - Díaz-Zorita Bonilla, Marta (Eberhard Karls Universität Tübingen) - Colomer Solsona, Laia (Norsk institutt for kulturminneforskning)

Format: Regular session

Since Public Archaeology examines the role and impact of archaeological activity in a wider social, economic and political aspects, this session would like to add a gender perspective to this examination. Public Archaeology focuses both on how the discipline engages the public in archaeological matters, both research and interpretation of heritage, and on how the public uses archaeological heritage for social, political, educational, and cultural matters. This session aims to explore the inclusion of a gender perspective to this reciprocal relationship, in both theoretical and practical terms. We look for contributions that examine gender politics, roles, norms, and stereotypes present openly and subtly in the practice of public archaeology. But also, contributions that explore these within the theory of practicing public archaeology, and in the practice of theorizing about public archaeology. The session aims thus to engage in the debate of gender values and attitudes attached to archaeological practice for the public, and how these engendered practices and discourses are transferred accepted, maintained, negotiated, and contested by society. Therefore, we envision this session as a meeting place to discuss theoretical approaches and practical experiences focused on gender and feminist perspectives.

Areas of interest for this session on gender/feminism in public archaeology include, but are not limited to, the following topics:

- Public engagement activities in archaeology/heritage
- Collaborative practices and digital networking
- Results of scientific research and the impact of archaeology in the media/social media
- Participatory and engendering archaeology/heritage projects
- Gender perspectives in community heritage/archaeology
- Gender perspectives in archaeological museums and heritage management and interpretation practices
- School/university curriculums and educational practice of archaeology

4 GENDER IN PUBLIC ARCHAEOLOGY: FEMININE DISCOURSES IN RURAL LESBOS

Abstract author(s): Beka, Georgia - Galanidou, Nena (UOC)

Abstract format: Oral

We present research on the reception, conceptualisation, and appropriation of the Paleolithic heritage in insular Greece. In the context of Palaeolithic Lesbos, a project which conducts systematic excavation at Acheulean Lisbori-Rodafnidia on Lesbos island, we have been working with the local rural community to explore how it appropriates its archaeological heritage. Our work lies at the heart of Public Archaeology's attempt to give voice to the local community and bring it to the forefront of archaeological investigation. We are interested in deciphering the ways the local community receives and remakes archaeological meanings and interpret the "Paleolithic past" as "cultural heritage". Our ongoing research examines how different social categories (e.g. women, men, immigrants, young islanders, older people) of the farming community at Lisvori appropriate and narrate the "Palaeolithic past" and what importance they attach to it. In order to investigate their discourse and viewpoint on the emerging cultural narrative, we have used the ethnographic method for data collection and what is largely a qualitative approach.

In this paper we place under our magnifying lens the interaction between the archaeological team and the local community to discuss how identity construction and narration with reference to the Palaeolithic past are differentiated across gender groups. Of particular interest is the role of woman-the-archaeologist heading work in the field, playing a key role in a public discourse that is expected to be the man's domain, and thus challenging the stereotypical expectation of a director of field operations. Of equal interest is woman-the-farmer – which reveals a "buried" dynamic in her bio-history and connects with the archaeological team through the shared endeavour of "digging".

5 ENGENDERING BLACK LIVES MATTER'S REASONS

Abstract author(s): Colomer, Laia (NIKU)

Abstract format: Oral

In Spring 2020 we witnessed a radical act of public engagement with cultural heritage: political activists from the Black Lives Matter-movement tumbled monuments and statues of eminent men but with a racist colonial past. The actions were a performance against the deep-rooted structural racism and its neglected divisive in cultural heritage. However, a feminist analysis to these monuments would acknowledge that they also embed other 'politically incorrect' narratives: they are perfect iconographies of whiteness and maleness normativity. Among critical heritage scholars, the BLM performance raised many discussions on the appropriateness of topping down these monuments, but little, if none, of the arguments given angled it from a gender or feminist perspective. I will argue that these statues do not anymore reflect today's society ideals in relation to genders, that they have become an archaeological element by themselves commemorating distant pasts at all levels, and therefore they are open to become also contested spaces for a hypothetical Women Lives Matters-movement.

6 DISSECTING GENDER FROM BELOW IN SPANISH [PUBLIC] ARCHAEOLOGY

Abstract author(s): Zarzuela, Paloma - Pastor Pérez, Ana (Universitat de Barcelona - UB, Group of Public Archaeology and Heritage)

Abstract format: Oral

This paper is intended as a conversation between two activist archaeologists from contiguous generations. Our aim is to discuss how current feminist and gender agendas are relevant to the archaeological practice today and whether these can meet the premises of Public Archaeology. Here we propose to share intersectional views, dissidences, common struggles or common fractions: from management archaeology studies to social movements; from archaeologies from below to elitist forums.

Are we promoting gendered public archaeology without noticing it? The book "Public Archaeology in Spain" (Arqueología Pública en España) edited by Jaime Almansa Sánchez was published in 2013. For the first time in Spain, a volume gathered together a series of scattered topics related to Public Archaeology. This publication provided an "umbrella" under which management, new technologies and social studies could converge. Scholars spread awareness about the importance of the role of the society as actors rather than as passive recipients of archaeological outputs and knowledge. However, are these interactions embedded with the current trends in gender and feminist archaeology?

This dialogue examines and defines gender issues within participatory and community archaeology. Our conversation is based on the analysis of various extraordinary actions in which we participated and our ordinary lives. New synergies and joint lines of work are expected to flourish. Todas estáis invitadas.

7 CRETAN ARCHAEOLOGY OF THE 1950S AND THE 1960S: AN ENGENDERED ENDEAVOUR

Abstract author(s): Gkazi, Ariadni (University of Crete)

Abstract format: Oral

This paper casts a gender perspective on Public Archaeology in Crete during the 1950s and the 1960s, a period in which official archaeology sharpened its profile and was widely established as the guardian of the archaeological heritage of Greece. This took place against a rapidly changing economy and a society which saw tourism and the infrastructure required to support it as the silver lining

in the cloud of post-war poverty. During the period in question, the protagonists of archaeology in Crete in charge of the major excavation operations and public outreach, were all men; the extremely few female archaeologists certainly did not hold high positions in the hierarchy of the local Ephorates. The protection and the management of the sites and monuments of Crete, officially attributed to the Archaeological Service, was thus a man's task. As was it a man's job to speak about the past and defend it in the public sphere. In this paper I discuss the activity of two male figures of Cretan archaeology, Nikolaos Platon and Stylianos Alexiou, and examine notions of power, honour, pride, hospitality, hierarchy and submission in the wider context of relations between the official archaeology in Crete, Cretan society and central government. These notions are shown to be critical in the way archaeological practitioners defended the archaeological heritage of Crete against destruction. They formed an ethos, shared with fellow Cretans, that often helped them to forge alliances with the local administrative authorities, the press, and cultural organizations so as to exercise more pressure towards the Directorate of the Archaeological Service in Athens and strengthen their claims for more personnel, funding for excavations etc., which in certain cases, as will be presented in the paper, led to fruitful results.

8 SEXUAL VIOLENCE IN ANTIQUITY THROUGH ARCHAEOLOGICAL MATERIAL

Abstract author(s): Akkaya, Ecem (Independent researcher)

Abstract format: Oral

Ancient Greek mythology and literature consists of many events that can be described as "rape" when viewed from today. These scenes have been defined in the literature as rape, pursuit or abduction. The main discussion of the study is relationship between visual representation and gender in ancient societies. The main question of my thesis is; Can we say that sexual violence was accepted in the Aegean world in Antiquity by based on the concept of sexuality accepted today? In my study, I benefit the approaches of postmodern feminist theory to sexuality, representation and gender, Social anthropology, psychology and media studies in the evaluation of these material data. The material is interpreted by studies on the relationship between identity, gender and representation in modern literature. At the same time, Greek mythology and literature will be used. The study uses the methods of gender archeology and feminist archeology studies developed within post processual archaeology in the broadest sense. The basis of the study is Andrew Stewart's article " Rape?". In his article, Stewart focuses on pursuit scenes on 5th-century Athens vases. He also touches on whether these scenes could be directly described as "rape". Edward Harris's "Did rape exist in ancient Greece? Further Reflections on the laws about Sexual Violence" is a study of the ancient Greek society's attitude of rape and sexual violence. Keuls, in the book "Phallus Reign" emphasizes B.C. 5th century Athens vase paintings and examines them in the context of "phallocracy" and rape culture. In my study, which is a compilation based on published material, I will discuss the subject by prioritizing the archaeological material. The main contribution of this study is to examine scenes defined as rape and pursuit more comprehensively in the context of representation and gender.

330 THE CARPATHIAN BASIN AS A MELTING POT? PERSPECTIVES ON SOCIAL AND CULTURAL DIVERSITY FROM THE NEOLITHIC TO THE BRONZE AGE

Theme: 4. Globalisation and archaeology

Organisers: Szilagyi, Kata (Mora Ferenc Museum, Szeged; University of Oslo, Institute of Archaeology, Conservation and History) - Furholt, Martin (University of Oslo, Institute of Archaeology, Conservation and History) - Hofmann, Robert (Kiel University, Institute of Pre- and Protohistoric Archaeology) - Depaermentier, Margaux (Archaeological Institute, Department of Early Medieval and Roman Provincial Archaeology, University of Basel) - Kempf, Michael (Institute of Archaeology and Museology, Faculty of Arts, Masaryk University)

Format: Regular session

The session focuses on the Carpathian Basin as a social and cultural melting pot during the Neolithic, Chalcolithic and Bronze Age. Due to its location at the interface of diverse environments and historical landscapes it had the character of a contact zone and was an arena for numerous instances of interaction, which resulted in manifold forms of material culture linking distinct parts of Eurasia. In the past, archeologists aimed to tackle the challenges of interpreting the materials by creating various cultural groups and studying their chronological positioning. In the last decades new research methods (e.g. Bayesian approach of radiocarbon dating, multidisciplinary field survey, aDNA) together with new theoretical perspectives provided the means of studying materials, sites or microregions in a refined fashion. As a result, the prehistoric narratives of regional and supra-regional level have become increasingly detailed (event-based resolution). The arising challenge is twofold: firstly, the integration of heterogenous datasets and contradictory perspectives on the past, secondly, to implement findings into scientifically-sound concepts (social organization, landscape perception, technological studies), and, lastly, to integrate the dynamics of the distinguished aspects.

The aim of this session is to discuss the details of transmission and transformation processes from the social archaeological perspective, compare the different periods and focus on diachronic change. We would like to consider the ways of integrating legacy and recent datasets towards answering new questions related to the Carpathian Basin.

We welcome contributions to the following questions:

- How did new traditions, ideas and practices spread between the Carpathian Basin and adjacent regions?
- How can different research methods be used to formulate coherent models on settlement patterns, natural environment and social organization?
- How can we quantify the scales of the transformation in different periods?

- How are current research models and theories affecting the interpretation of past findings?

ABSTRACTS:

- 1 TAKE A SEED! TRACING NEOLITHIC AGRICULTURAL DEVELOPMENT IN THE CARPATHIAN BASIN THROUGH MULTIVARIATE STATISTICS AND ENVIRONMENTAL MODELLING**

Abstract author(s): Kempf, Michael (Masaryk University Brno)

Abstract format: Oral

The Carpathian Basin represents the cradle of human agricultural development during the Neolithic period, when large parts were transformed into cultural landscapes by first farmers from the Balkans. It is assumed that an Early Neolithic subsistence economy established along the hydrologic systems and on Chernozem soil patches, which developed from loess deposits. However, recent results from soil chemistry and geoarchaeological analyses raised the hypothesis that extensive Chernozem coverage developed from increased land-use activity and that Early Neolithic cultural groups were not restricted to loess-covered surfaces but rather preferred hydromorphic soils that developed in the floodplains. This article performs multivariable statistics from large spatial datasets of Neolithic sites in Hungary and allows tracing Early to Late Neolithic site preferences from digital environmental data. Quantitative analyses reveal a strong preference for hydromorphic soils and a significant avoidance of loess-covered areas and Chernozem soils throughout the Early Neolithic followed by a transformation of site location preferences during the Late Neolithic period. These results align with socio-cultural developments, large-scale mobility patterns, and land-use and surface transformation, which shaped the Carpathian Basin and paved the way for the agricultural revolution across Europe.
- 2 AGRICULTURE, REGIONAL VARIATION AND THE DEVELOPMENT OF SOCIAL INEQUALITY IN THE CARPATHIAN BASIN**

Abstract author(s): Duffy, Paul R. (The Archaeology Centre, University of Toronto; Italian Academy for Advances Studies in America, Columbia University) - Johannsen, Niels (Department of Archaeology and Heritage Studies, Aarhus University)

Abstract format: Oral

The 'ard' or scratch plough may have had major transformative consequences – not only for agriculture but, perhaps to a surprising degree, for the emergence of social inequality in prehistoric Europe. Archaeologists have long sought to identify the conditions under which social inequality first emerged in Europe. Some suggest that the rise of a class of warrior people, who controlled trade across Bronze Age Europe in a way that benefited some and not others, was responsible. In recent years, however, tantalizing evidence has suggested that the plough was both the spark and the fuel for inequality in the Old World. In this paper, we assess the physical evidence for plough agriculture at tell settlements in Hungary, Serbia, and Romania. We model the population numbers local agriculture would have supported at these tells, using grain production estimates of different agricultural regimes. We estimate the degree of social inequality each of them likely sustained by comparing the consumption and production of prestigious goods between them. Finally, where available, we discuss the mortuary data from cemeteries near to tell populations to estimate the extent to which local communities experienced inequality. Together, we hope to highlight the ways in which plough agriculture was intertwined with emerging social inequality during the Bronze Age, and the paths in which plough agriculture played a minor role.
- 3 LIKE A SAILING STONE: „CULTURAL“ CHANGE DURING THE NEOLITHIC OBSERVED IN LANDSCAPE TRANSFORMATION IN THE AREA OF GORJANI, CROATIA**

Abstract author(s): Sosic Klindzic, Rajna (University of Zagreb Faculty of Humanities and Social Sciences) - Kalafatic, Hrvoje (Institute of Archaeology Zagreb) - Hrsak, Tomislav (Archaeological Museum Osijek) - Šiljeg, Bartul (Institute of Archaeology Zagreb)

Abstract format: Oral

Image of Neolithic people living simple peasant life in a small helmets was dominant interpretation for the last 150 years. Evidence of complexity and evidence of large sites were often perceived as special and/or unique. In the last two decades new evidence emerged from various types of research: large scale infrastructural work revealed large area of settlements and availability of aerial imagery showed much larger number of large and complex Neolithic sites than previously thought. As in many other parts of Europe, recent research in Eastern Croatia revealed great number of such sites as well. Here we will present area around village Gorjani in Slavonia, Croatia during the Neolithic period.

Using combination of geophysical research (magnetic survey), satellite imagery, coring, field survey, radiocarbon chronology and pottery analysis, new patterns of spatial organization and cultural transformation began to outline. We will also use comparative analysis of modern settlements in the area and their transformation during last several centuries to evaluate its appropriateness to serve as a proxy for understanding how prehistoric societies, settlements and landscape transformed during time.

- 4 THE NEOLITHIC LANDSCAPE: A SCENE FOR THE CULTURAL DIVERSITY OF NORTHEAST HUNGARY BETWEEN 6000-4500 BC**

Abstract author(s): Füzési, András (Eötvös Loránd University)

Abstract format: Oral

The cultural diversity of the Carpathian Basin is clearly demonstrated by changes in ceramic decorations. Ferenc Tompa and Gordon Childe already paid close attention to this phenomenon in their definitive monographs (1929). This cultural diversity coupled with a very mosaic environment of the Carpathian basin, which correspondence suggested a kind of causality between these conditions. The analytical archaeology with its distinct methods was able to demonstrate such correlations, mapping cultural groups and environmental regions with definite boundaries. The new concept of landscape theory in connection with system and entanglement theory, taskscape, and network analysis offers a wider and more complex framework of the interpretation. Among the different (ecological, cultural, economic, and symbolic) aspects of the landscape, a host of connections exists, sprouted from the societies that created those landscape phenomena.

In such a wide region like Northeast-Hungary, many microregions coexisted in every archaeological period with different ecological backgrounds and social-cultural traditions. Polgár Island is a prominent micro-region in this area, which has been investigated by the ELTE Institute of Archaeological Sciences since 1989. Its cultural diversity throughout the Neolithic reflects a special strategic position. Many other microregions, like Füzésabony, Rétköz, Bodrogköz, existed in the Neolithic period and had a diverse cultural identity. The creation of these identities was running parallel to and through the creation of the local landscapes. Connections between landscape and culture are multivariate and based on their concepts: Landscape created by humans within the environmental framework and Culture created also by humans because of the environmental restrictions.
- 5 MERGING TOGETHER OR MELTING AWAY? NEOLITHIC TRANSITIONS IN THE NORTHERN MAROS FAN, HUNGARY**

Abstract author(s): Salisbury, Roderick (University of Vienna, Dept. of Prehistoric and Historical Archaeology; Austrian Academy of Sciences) - Bácsmegi, Gábor (Munkácsy Mihály Museum, Békéscsaba)

Abstract format: Oral

The Carpathian Basin in prehistory was a 'melting pot' of cultural elements, people, and materials. For the Middle Neolithic (Hungarian chronology, c. 5500-5000 BC), the Linearbandkeramik phenomenon has dominated archaeological interpretations. This focus on one supposedly preeminent cultural group generates challenges for interpreting diverse materials and chronological positioning in the eastern Carpathian Basin. Here, the eastern LBK variant might not have been as dominant or long lasting, when compared to western Europe. Instead, several groups occupying smaller geographical areas, including Szakálhát and Esztár, appear to have existed within the same regions and time-period as the eastern LBK. These smaller groups are most likely to have been the founding populations of the well-known Late Neolithic tell societies. In this presentation, we introduce a new project – South Békés Landscapes – located in the archaeological under-explored region of the northern Maros fan in Békés County, Hungary. One of our research goals is to understand the relationship between Szakálhát and Alföld LBK communities, and the processes by which conflicting traditions, ideas, and practices merged or melted away. Furthermore, we want to understand the prehistoric human-environmental interactions that contributed to the rise of tell-living. Our approach integrates multidisciplinary field surveys, remote sensing, and geoarchaeology with heterogeneous contributions by local collectors, rescue excavations, and legacy data from local museums. Still in its early stages, our project has produced new data, which we present along with legacy data to make sense of the South Békés landscape.
- 6 SOCIAL TRANSFORMATIONS IN THE LIMINAL AREAS. A MULTIDISCIPLINARY VIEW FROM IDJOŠ GRADIŠTE SITE IN THE NEOLITHIC**

Abstract author(s): Maric, Miroslav (Balkanološki Institut Srpske Akademije Nauka i Umetnosti, Beograd) - Mirković Marić, Neda (Međupštinski zavod za zaštitu spomenika kulture Subotica) - Bulatović, Jelena (Laboratorija za Bioarheologiju Filozofski Fakultet Univerziteta u Beogradu) - Marković, Nemanja (Arheološki institut, Beograd) - Amicone, Silvia (Competence Center Archaeometry-Baden Württemberg, University of Tübingen; Institute of Archaeology, University College London)

Abstract format: Oral

Idjoš Gradište site, located in Serbian Banat is the subject of a multidisciplinary archaeological research since 2014, focusing on formation and transformation of human societies between the Neolithic and Late Bronze Age, human landscape interactions, local area networks, communications and trade and exchange in a liminal area constantly awashed by influences of major traditions originating both of the Balkans and the Carpathian basin.

The site with several settlement horizons, occupied between the late sixth millennium and the first millennium BC is a large area of diverse traces of human activities, illustrating its varying use through time.

In our efforts to elucidate the origins, development and transformations of local population through time, a multidisciplinary approach to material culture remains, Bayesian chronological dating of events and scientific analysis of period proxy data is crucial.

We present the current state of research on the Neolithic settlement after five seasons and propose directions for future activities.

7 RAKING OVER THE ASHES: INTERDISCIPLINARY STUDIES FOR ASHMOUNDS BELONGING TO NOUA CULTURE (LATE BRONZE AGE)

Abstract author(s): Brasoveanu, Casandra - Asăndulesei, Andrei - Tencariu, Felix-Adrian (Arheoinvest Research Centre, Science Department, Institute of Interdisciplinary Research, Alexandru Ioan Cuza University of Iasi) - Brunchi, Radu-Alexandru (Doctoral School, Faculty of History, University Alexandru Ioan Cuza of Iasi) - Danu, Mihaela (Faculty of Biology, Alexandru Ioan Cuza University of Iasi) - Pîrnău, Radu Gabriel (Geography Department, Romanian Academy, Iași Branch)

Abstract format: Oral

Romanian Late Bronze Age, although very rich in archaeological discoveries, still remains unknown and misunderstood, because the vast majority of archaeological research has consisted of conducting field research or small surveys. Most of the data known so far were obtained by accident, in the context of the systematic research of settlements specific to other prehistoric periods.

During this time frame, a large part of the territory of today's Romania was occupied by Noua culture communities. The main characteristic of their settlements is the presence of so-called ashmounds. The little research undertaken that focused on their investigation, concluded that the remains are burned dwellings. Contrary to this hypothesis, recent research has shown that in the composition of these gray spots there is no ash. Also, the results obtained from the so far conducted magnetometric research, show no thermoremanent contrast generated by the ashmound. This confirms that the composition cannot belong to burned dwellings. Recently, these structures started to be seen as possible household pits, whose content has led to changes in soil color, thus sparking new controversies. The use of geophysical methods (GPR, magnetometry, electrical resistivity), together with pedological and archaeobotanical analyzes, for several case studies from NE Romania (an important area of concentration of settlements of this type) meets these concerns and seeks to find the answer regarding the ashmounds content, the planimetry of the settlements (some of the excavations suggest that the dwellings could have been placed between the ashmounds; the usage of geophysical methods will be able to confirm or invalidate such theories) and the human-environment relationship. The case studies were chosen from Jijia river basin, where 336 such settlements were identified. In conclusion, we believe that the interdisciplinary investigations of Noua sites, using modern research methods, can complete the existing information and can help to better understand these communities.

8 MODELLING THE SETTLEMENT SYSTEM OF LATE 6TH MILLENNIUM CAL BC SOUTHERN TRANSDANUBIA: OPPORTUNITIES AND LIMITATIONS

Abstract author(s): Oross, Krisztián (Institute of Archaeology, RCH, Eötvös Loránd Research Network, Centre of Excellence of the Hungarian Academy of Sciences, Budapest) - Gortva, Gergely (Archaeological Heritage Protection Directorate, Hungarian National Museum, Budapest) - Jakucs, János (Institute of Archaeology, RCH, Eötvös Loránd Research Network, Centre of Excellence of the Hungarian Academy of Sciences, Budapest) - Lyublyanovics, Kyra (Archaeolingua Foundation, Budapest) - Marton, Tibor (Institute of Archaeology, RCH, Eötvös Loránd Research Network, Centre of Excellence of the Hungarian Academy of Sciences, Budapest) - Serlegi, Gábor (Castle Headquarters Integrated Regional Development Centre, Budapest) - Vágvölgyi, Bence (Independent researcher)

Abstract format: Oral

The pivotal role of Neolithic Hungary as a connecting link between south-east and central Europe has long been recognized in the research of Prehistory. Recent large-scale excavations in southern Transdanubia and the following site-based studies of late 6th millennium cal BC settlements reveal a constant alteration and recombination of material culture, the elements of which have often been attributed to clearly separate entities. Series of AMS radiocarbon dates and their formal modelling provide a firm basis for comprehensive chronologies on various scales, even beyond detailed site biographies. Although hundreds of sites had been known before the intensive research activity of the past 25 years, no attempt was made to reconstruct the settlement network, except for a simple mapping of recorded sites.

The integration of datasets from previous fieldworks and fresh excavations, and the results of micro-regional surveys, facilitate a new level of modelling for the period between ca. 5350 and 4900 cal BC. This paper aims to present the regional settlement network independently of their associated material culture, as a coherent system of varyingly linked elements. We are seeking to answer whether any specific patterns are present, and if so, how do they correlate with other types of evidence derived from the archaeological record. The ongoing work also serves as a methodological experiment that intends to harmonize models of the settlement system with results of revolutionary, expanding research fields, e.g. absolute chronology and archaeogenetics. Further on, implications on the interpretation of the social organisation of early farming communities will also be discussed. A regional approach can demonstrate the dynamics of the settlement system, its potential for the Neolithisation process of central Europe, its further development and its relations towards both central Europe and more southerly areas in a long-term process that comprises almost half thousand years.

9 SMELTING POT OR SALAD BOWL? NEOLITHIC CENTER-PERIPHERY RELATIONS IN THE BALKANS AND THE CARPATHIAN BASIN

Abstract author(s): Hofmann, Robert (Kiel University, Institute of Pre- and Protohistoric Archaeology)

Abstract format: Oral

In a long-term historical perspective, in the Balkans and the Carpathian Basin we are dealing with 1) the chronologically and regionally differentiated introduction of producing economy in the Early Neolithic, 2) the subsequent consolidation of Neolithic societies in settlement systems characterized by increased regionalization and sedentariness in the Middle and Late Neolithic, and 3) the crisis and disintegration of this world at the transition to the Eneolithic. In the course of these processes, temporarily, large agglomerated villages emerged and regional differentiation took place between densely populated, particularly innovative core regions on the one hand and peripheral regions on the other. The dynamics of these processes can only be understood through the integrated analysis of different spatial scales, whereby micro-, meso- and macro-regional phenomena have to be distinguished. The paper attempts to outline center-periphery relations in the Carpathian Basin and adjacent areas under consideration of case studies in Okolište (Central Bosnia) and Bordoș (Serbia) and selected proxies such as site density, ceramic styles, settlement forms and metal objects. The Carpathian Basin proves to be a zone of intensive exchange and communication at the interface of different dynamic Neolithic 'world systems' beared by village-based pre-state societies with egalitarian ideologies.

10 NEW RESEARCH ON THE LATE NEOLITHIC TELL-SETTLEMENTS IN THE GREAT HUNGARIAN PLAIN (A CASE STUDY OF THE SZEGVÁR-TÜZKÖVES SITE)

Abstract author(s): Raczky, Pal - Füzesi, András (ELTE Inst. of Arch.Sciences) - Mesterházy, Gábor (Várkapitányság NZrt) - Szilágyi, Kata (Móra Ferenc Museum, Szeged) - Bánffy, Eszter - Rassmann, Knut (RGK DAI) - Stibrányi, Máté - Serlegi, Gábor - Klem-bala, Zsombor (Várkapitányság NZrt)

Abstract format: Oral

Before the 1990s, Hungarian archaeological research principally focused on the stratigraphy of the Neolithic tells of the Carpathian Basin. Later, there were efforts to set these tells within a broader South-East European context, specifically in terms of overall settlement patterns and their chronological dimensions. More recent

evidence would suggest that tells (Tisza-Herpály-Csószhalom), circular enclosures (Lengyel) and single-layer settlements with a concentric layout (Cucuteni-Tripolye) embodied three different expressions of monumentality. It also became clear that these monumental "forms of expression" were enmeshed to create specific

architectural forms, multi-component sites in the Tisza region at the turn of the fifth and the sixth millennium BC.

Taking the above as our springboard, we launched a new multidisciplinary research project (ELTE, RGK), whose goal is the study of the iconic Neolithic tell settlements in this region. One of the first, perhaps symbolic, results of this work was achieved at the Szegvár-Tüzköves site, a since long known settlement of the Tisza

culture where the clay figurine known as the Sick God was found. Formerly, little more was known about the whole settlement than that it extended over 11 ha and that it had been completely destroyed. Yet, in 2020, an extensive magnetometer and experimental GPR survey was conducted at the site. As it turned out, the settlement

covered nearly 31 ha, and we identified structured units of burnt houses ringed by an enclosure of multiple circular ditches. We were also able to determine the exact location of the earlier excavation trenches within the spatial context of the settlement.

11 A MINIMALLY INVASIVE AND MULTISCALAR APPROACH TO THE INVESTIGATION OF TELL SETTLEMENTS USING THE EXAMPLE OF THE BAPSKA SITE

Abstract author(s): Scholz, Roman (RGK - Romano-Germanic Commission DAI)

Abstract format: Oral

The Romance-Germanic Commission has been investigating the settlement landscape around the Bapska site since 2013, together with the University of Zagreb. This tell in the very east of Croatia is currently considered the westernmost known tell settlement of the late Neolithic. The stratigraphic sequence includes layers of the Starčevo, Vinča and Sopot cultures. Thus, the Tell, with a total thickness of approx. 4.5m, represents an important cultural archive that has been extensively investigated over the past few years using geophysical prospecting methods, intensive drill exploration, excavations and remote sensing operations. In addition, the existing satellite sites in the vicinity were included in the work. The presentation is intended to show the field archaeological methods that are to be used in the context of our entire research project. One of the overarching project objectives is to investigate the differences in the settlement landscapes. We concentrate on the tension between centrality and decentralization, on patterns of settlement and population sizes, on settlement-internal and regional spatial planning, subsistence strategies, forms of social organization and the development of regional patterns of house architecture and material culture. We examine the changes on a graduated scale. It is the level of the settlements, the surrounding micro-regions and, at the top level, it is the supra-regional exchange networks. The work in Bapska should provide some of the basic data to answer these research questions.

EARLY NEOLITHIC LITHIC RAW MATERIALS – EVIDENCE OF TRADE OR DIRECT ACQUISITION?

Abstract author(s): Sommer, Ulrike (Institute of archaeology, UCL)

Abstract format: Oral

The northern edge of the Carpathian Basin was a contact zone between incoming Neolithic and Mesolithic populations during the late Starčevo-Körös-Criş culture (SKC). A-DNA analyses show only a small genetic input by groups identified with hunter-gatherers in this time period, but, lacking formal cemeteries, burials tend to be quite rare. However, the economy in this area has a much larger hunting component than the core areas of SKC. In Tășnad-Sere (Romania), almost 47% of the animal bones derive from wild species, an uncharacteristically high percentage also found in several other sites of the period in NE Hungary.

Most of the raw materials for chipped stone tools come from sources at the rim or wholly outside the Carpathian Basin, which is no surprise given the predominantly alluvial soils of the former Pannonian sea. While the Blond Balkanic flint from the pre-Balkan platform was already used in the earliest Neolithic of SE-Europe and probably marks the maintenance of links to the “old homeland”, the supply with obsidian and Wolhynian flint is often attributed to a contact with local populations, which may have paved the way for the Neolithisation of these areas during the LBK/ABK. This would indicate trade as a primary factor in establishing and strengthening contacts between different groups, a mechanism popular in both traditional and processional models of culture change. This narrative ignores, however, the limited mobility of Mesolithic groups as reflected in lithic resource spectra.

In my contribution, I am going to discuss alternative mechanisms of raw material procurement and the relation between SKC- and local populations.

THE IMPLICIT ASSUMPTION OF STONE TOOL DIVERSITY PATTERNS: EXPLORING ECONOMIC, SOCIAL AND RITUAL VALUATION PROCESSES OF LITHIC MATERIALS

Abstract author(s): Szilágyi, Kata (Mora Ferenc Museum)

Abstract format: Oral

This paper investigates in what way the quantity of raw material extraction, circulation, production and use of objects is connected to changes in the social systems (social complexity, inequality). To study this question, it is of crucial importance to understand the different dimensions of value of lithic artefacts. Value is a subjective concept which is determined by social interaction in real life contexts and thus variable and culture/society specific. Nevertheless, it is crucial to have an idea of how, in what ways and what kind of values and value-systems governed prehistoric societies.

Current accounts of the emergence of social inequality during the Late Neolithic and Chalcolithic period in Southeast Europe are as yet mostly based upon the presence of a few richly furnished burials, interpreted as expressions of individual social status and thus social inequality of the communities in question. However, the economic basis of this potential process of social stratification is poorly understood, due to a lack of systematic and quantifiable data on its economic background, such as raw material use and circulation during the period before and during the potential social transformation.

Studies of social organization normally focus on exotic materials, like Spondylus shells and early copper, or elaborate pottery. To systematically target the quantitative distribution and exchange of stone tools made from different raw materials and to examine their integration into culture-specific systems of value is an approach that fully integrates lithic studies and studies of the development of social systems. This will help to promote a better understanding of the social and economic role of lithic materials in prehistory and it will provide a more solid, quantitative basis for studies of socio-economic developments.

CHALLENGING TIMES - CULTURES, GROUPS AND POTTERY STYLES IN EASTERN CENTRAL EUROPE IN 4500-4000 CAL BC

Abstract author(s): Szilágyi, Márton (Eötvös Loránd University)

Abstract format: Oral

In comparison with other periods of the Neolithic and Copper Age of Central Europe, the second half of the 5th millennium cal BC is a little underrepresented in the archaeological research. This situation is due to several reasons. One of these is that the earlier and later periods are represented by large cultural units, such as the LBK, the SBK, the Lengyel-complex, the TRB and the Baden-complex. Therefore, these periods obtained more interest among scholars and were studied not only from a local, but also from a wide, macroregional perspective. Contrastingly, the period between 4500-4000 cal BC is characterised by several small cultural groups throughout the Carpathian Basin and its western surroundings.

As a result, this period is characterised by different archaeological cultures, groups and/or pottery styles. Although some theories describe this phenomenon as an „interaction sphere” in the Late Lengyel period, these groups are mostly still seen as diverse cultural entities defined by pottery styles. This image became fuzzier with a new series of AMS dates from different areas of the region, which resulted in the collapse of the typochronological system built up during the 20th century.

In contrast with this fragmented picture, we can see large macro-regional networks, through which not only objects but also ideas and technologies were spread (e.g. copper objects and metallurgy, stone raw materials and knapping technologies, etc.).

One of the many crucial points is to understand how pottery styles were used in this wide region, and how do certain elements of these styles overlap one another. Can we identify existing entities based on pottery, or is it a part of such a large network as other

cultural elements? In this paper, the framework of a newly started project will be presented, which aims to reconsider the cultural relations of the mentioned period.

CONNECTIONS AND RELATIONS BETWEEN THE CULTURES FROM LATE COPPER AGE TO EARLY BRONZE AGE IN EASTERN CROATIA

Abstract author(s): Balen, Jacqueline (Archaeological museum in Zagreb) - Miloglav, Ina (Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb)

Abstract format: Oral

Based on the collected data, which includes 14C dates and analysis of the material, from the recent archaeological excavation in the area of Eastern Slavonia, the authors will present a more comprehensive picture of the transition from Late Copper Age to Early Bronze Age period, with special emphasis on late Vučedol and Vinkovci Culture settlements.

The period of the Late Copper Age in Eastern Croatia was marked by the Vučedol Culture, which by the settlement organization, specialized potters, increased metallurgic activities, and social stratification reflects the new upcoming era in the prehistory - the Bronze Age. In the same region, the Vinkovci culture replaced (or inherited) the Vučedol culture in the beginning of the Early Bronze Age. The question of the division of both cultures into several phases, and thus the meaning of typological-chronological analysis of the ceramic material, is additionally raised. It seems that the basic differences can be noticed in different geographical areas in the same date frame, which further indicates the natural shift of the population and the blending of older, existing and new cultural phenomena.

VRÁBLE IN CONTEXT: THE VARIABILITY OF BURIAL AND DEPOSITION PRACTICES IN NEOLITHIC SETTLEMENTS OF THE CARPATHIAN BASIN AND BEYOND

Abstract author(s): Furholt, Martin (University of Oslo) - Cheben, Ivan (Slovakian Academy of Sciences Nitra)

Abstract format: Oral

The deposition of human bodies and body parts in and beside enclosure ditches is a phenomenon most prominently discussed in the context of LBK sites such as Herxheim or Asparn-Schletz, which date to the late 6th millennium BC. The LBK and Želiezovce settlement site of Vráble, Slovakia, provides a new, striking example. Comparable phenomena have however been discovered in several settlements of other archaeological affiliations and seem to represent an overall common theme, which could tentatively be characterized as circling around a symbolic marking of settlement space. However, the details of how human bodies are treated vary greatly from site to site, and they range from the deposit of cremated bones, to single bones or limbs, to the deposition of body parts and headless individuals. Other cases show traces of extensive violence, which have traditionally been interpreted in terms of warfare, torture or capital punishment. In this paper, we will discuss different frameworks of interpretations, from the more profane ones mentioned to those emphasizing ritual or magic, to make sense of this diverse and yet similar set of practices.

TRANSMISSIONS OF THE MIDDLE COPPER AGE PATTERNS FROM THE CARPATHIAN BASIN TO LESSER POLAND AND THEIR LOCAL ADAPTATIONS

Abstract author(s): Wilk, Stanislaw (Jagiellonian University in Krakow, Institute of Archaeology; The Karkonosze Museum in Jelenia Góra) - Nowak, Marek (Jagiellonian University in Krakow, Institute of Archaeology)

Abstract format: Oral

Societies of the Early and Middle Copper Age in the Carpathian Basin constituted an exceptionally important civilization centre, strongly influencing other areas of the eastern part of Central Europe. Processes of reception of these cultural patterns by peripheral communities are still relatively poorly recognized. This applies i.a. to Lesser Poland. Between 4100-4000 BC there appeared in this territory communities which assimilated new, southern patterns of the Copper Age. Archaeologically, they are reflected by the Lublin-Volhynian culture and the Wyciąże-Złotniki group. In recent years quite a lot of new data connected with these units have been acquired, which refer to burial rite, copper artefacts, absolute chronology, territorial distribution, and cultural taxonomy. These data demonstrate that Eneolithic trends in Lesser Poland emerged as a result of selective cultural transmission and adaptation, donor of which were late Bodrogkeresztúr culture, Hunyadihalom culture, as well as the Ludanice group. The possibility to explain in detail the reception mechanisms, particularly from the social and ideological perspective, have been provided i.a. by discovery of a cemetery in Książnice. In particular, attention should be paid to the changes in the social structure related to 1) the “sepulchral” ideology, strongly distinguishing sacrum and profanum, 2) the elitism of a part of burials, 3) the strong gender differentiation of grave goods and position of the deceased. In conclusion we will argue that the Lublin-Volhynian culture and the Wyciąże-Złotniki group are to a large extent a reflection of privileged groups that achieved their status by controlling trade and cultural interactions between the areas north and south of the Carpathians in the period ca. 4050/4000-3700 BC. The presentation is based on results of the projects financed by the National Science Centre of Poland, nos. 2016/23/B/HS3/00387 and 2017/25/N/HS3/01140.

STARČEVO – KÖRÖS – CRIŞ REGIONAL AND MACRO-REGIONAL PALAEODEMOGRAPHY

Abstract author(s): Blagojevic, Tamara (University of Novi Sad, Biosense Institute) - Porčić, Marko (University of Belgrade, Faculty of Philosophy, Department of Archaeology) - Stefanović, Sofija (University of Belgrade, Faculty of Philosophy, Department of Archaeology; University of Novi Sad, Biosense Institute)

Abstract format: Oral

The Starčevo – Körös – Criş cultural complex covered a vast geographical region, chronologically spanning from ~6250 cal BC until ~5300 cal BC. Its importance lies in being one of the first Early Neolithic manifestations in this part of Europe, hence crucial for the understanding of its spread further to the rest of Europe. Changes in settlement patterns, material culture, and economy through time have been studied so far. The demographic processes that could have influenced the rate and the speed of the spread have been addressed for particular regions only. In this paper we present the results of the population dynamics reconstruction on the regional and macro-regional level, using the summed calibrated radiocarbon probability distributions method (SCPD). Regions are defined as follows: 1. Western Romania; 2. Southern Serbia; 3. Central Serbia; 4. Vojvodina; 5. Southern Hungary; 6. Eastern and northern Bosnia and Herzegovina; 7. Eastern and northern Croatia. The two defined macro-regions are: 1. Central Balkans (covering the southern and central Serbia); and 2. Pannonia (covering western Romania, southern Hungary, Vojvodina in Serbia, and eastern and northern Croatia).

LOCAL COMMUNITIES AND LARGE SCALE MOVEMENT OF POPULATION IN THE CARPATHIAN BASIN: NEW PERSPECTIVES ON NEOLITHIC MOBILITY USING ISOTOPE ANALYSES

Abstract author(s): Depaermentier, Margaux (Department of Prehistoric, Early Historic, and Provincial Roman Archaeology, Vin-donissa Professur, University of Basel) - Kempf, Michael (Department of Archaeology and Museology, Masaryk University, Brno; Institute of Environmental Social Science and Geography, University of Freiburg) - Bánffy, Eszter (German Archaeological Institute, Roman Germanic Commission) - Alt, Kurt (Center of Natural and Cultural Human History, Danube Private University; Integrative Prehistory and Archaeological Science, University of Basel)

Abstract format: Oral

Population movements on different geographical, temporal and demographic scales during the Neolithic period have long been implied by the study of archaeological material. One of the most important scenarios being that groups from the “Starčevo-Körös-Criş” complex – which was widespread in the northern Balkans during the Early Neolithic – moved in two parallel waves to the east and west of the Carpathian Basin and brought with them the premises of neolithisation in present-day Hungary. Nevertheless, spread of material culture can still be interpreted in many ways, thus the use of additional and complementary methods such as the analyses of strontium and oxygen stable isotopes provides more accurate data and new perspectives for the study of human mobility. In this study, which is part of a DFG (German Research Foundation) research project entitled “Population history of the Carpathian Basin in the Neolithic Age and its influence on settlement in Central Europe” (Al 287/10-1), 53 Hungarian Neolithic sites were selected for strontium and oxygen stable isotope analyses within a chronological framework spanning from the Starčevo to the Balaton-Lásinja cultures in Transdanubia and from the Körös to the Tiszapolgár cultural groups in the Great Hungarian Plain (Alföld). Based on these isotope analyses and on their consideration at the different scales from the site to the supra-regional level, not only the main stages of neolithisation process but also small-scale mobility was investigated. Sampling more than one tooth per individual also provided insight into the stages of a person’s youth and thus allowed the observation of further mobility patterns at the individual level.

BORDERS? - WHICH BORDERS?

Abstract author(s): Schwenzer, Gerit (no affiliation)

Abstract format: Oral

The modern day border triangle of Austria, Hungary and Slovakia divides an area so rich in archaeology, history and culture which once was so tightly connected. At the far western area of the Carpathian basin a lot of cultural movement happened at the end of the late Iron Age and the beginning of Romanization. In the rough time frame of 150 years four different cultural groups moved in these parts, connected and separated again in the one way or the other. Networks of trade were created which survived into Roman times and were adapted. Borders were more flexibly interpreted than at present day. This paper shall shed some light on the interactions of these cultures at the end of the late Iron Age and the brink of Romanization. A selection of important sites and some key points of the networks as well as the mutual impact of the peoples in this region shall be presented and discussed.

HUMAN-ENVIRONMENTAL NETWORKS IN HEALING CULTS, RURAL SANCTUARIES AND SACRED GROVES BETWEEN INTERSECTIONALITY AND TRANSCULTURAL NEGOTIATION

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Da Vela, Raffaella (SFB1070 ResourceCultures; Universität Tübingen, Institut für Klassische Archäologie) - Krämer, Robinson (Universität Rostock, Heinrich Schliemann-Institut für Altertumswissenschaften) - Blasetti-Fantauzzi, Chiara (Freie Universität Berlin) - De Vincenzo, Salvatore (Università della Tuscia, Dipartimento DISUCOM)

Format: Regular session

Cult places in geographically exceptional positions, such as in caves, on mountain tops, or near springs, played supra regionally significant roles in different geographic and chronological contexts. Serving as important meeting points of local communities, these sanctuaries became transcultural hubs for shared economic spaces and resource landscapes. These cult places can be understood as human-environmental networks, where human and non-human actors were deeply entangled. Ritual experiences and cult(ural) practices built a common platform, allowing to overcome social differences and to negotiate personal identities. Which was the role of the non-human agency in these cult places? Did landscapes have a proactive role in sharing cult practices and in connecting communities?

Food for thought:

- Agency of Landscapes

Communities shaped sacred landscapes on their own socio-economic and religious needs. However, the environment also influenced the choice and the characteristics of cults. What role did landscape features play in the selection of sites for healing cults? Are their implications similar or did they vary in different sociocultural contexts?

- Intersectionality

The focus of these cults on non-human agency allowed worshipers to overcome social conventions and to create new temporarily shared reference values. Were these cults stages for the negotiation of personal identities? Did cult practices construct new or extraordinary identities?

- Sacralization of Resources

Resources, such as salt in pastoralism, wine in the Mediterranean, or rice in agricultural regions of India, became important elements in the semantics of cult. Did the sacralization of resources create spaces of negotiation between communities? Were healing cults bottlenecks in specific resource networks?

- Political Economy

Cult places could serve as institutions for the storage, control and redistribution of goods. Did social groups manipulate parts of the political economy through access to ritual activities, norms, values and beliefs? Can collective feasts at cult places be interpreted as expressions of socio-political power?

ABSTRACTS:

MOUNTAINS OF MEMORY TRIANGULATING LANDSCAPE, CULT AND REGIONAL IDENTITY THROUGH ZEUS

Abstract author(s): Woznura, Adam - Williamson, Christina (University of Groningen)

Abstract format: Oral

Mountains hold a special place in the human mind, possessing a deep ontology unlike any other natural feature. Social geographer Yi-Fi Tuan states: ‘modern nations like to think that a high peak, if not the world’s highest, lies within their border’ (1977: 40). This was no less the case in the pre-modern world, although claims to such heights were typically framed in terms of divine power. Besides political power, mountains can also anchor a special sense of place, intersecting the spheres of the human and the divine. This paper aims to understand the triangular relation between mountains, religion, and regional identity in the ancient world by focusing on three different peak sanctuaries of Zeus: Zeus Lykaeos on Mount Lykaion, Zeus Akraios on Mount Pelion, and Zeus Stratiotes on a mountain plateau by Amaseia. Each of these peak sanctuaries are assessed for their role in providing a regional focus within emerging political landscapes.

The analysis focuses on the physical mountain, the narratives associated with it, the visibility through viewshed analyses, and the role of ritual and festival as the cult becomes absorbed by a nearby city. Through our analysis, incorporating material evidence such as epigraphy and numismatics, we show that visual prominence was not always their main asset. Local myth and legend played a part in foregrounding these cults in the surrounding regions, helping the mountains to acquire a symbolic and political importance over time.

We conclude by suggesting that these mountain sanctuaries of Zeus provided a focus of social memory, were storied places that became important in the political landscape, and were places claimed by nearby cities to legitimise their own place in the landscape, thereby creating a sense of region.

2 MARITIME NETWORK MODELLING FOR THE ANALYSIS OF CULT TRANSMISSION IN THE SARONIKOS KOLPOS (6C-1C BCE)

Abstract author(s): Delacruz, Michael (Oxford University; Newcastle University)

Abstract format: Oral

This paper examines the phenomenon of cult transmission in the Saronic Gulf during classical antiquity in specific relation to its maritime context and the utility of alternative methods of network analyses to illuminate the linkages between cult, economic relations and political instrumentality. Observations from the provisional application of proximal point analysis (PPA), social network analysis (SNA), and network optimization to a limited (but real-world) data set are discussed. The transportation of the healing cult of Asklepios (through its embodiment in the sacred snake) by Telemachos Acharneas in 419 BCE from the Asklepon in Epidauros to the southern slopes of the Acropolis is the example par excellence during this period of the importation of an alien cult in order to secure both religious (as a palliative measure in the wake of plague) and geopolitical (to secure port access on the southern Peloponnese) objectives. Indeed, the locations at both Epidauros and Athens, their orientation, and visual affordance reflect an intertwined relationship between these sanctuaries and the broader environmental setting of the Saronic that in the early years of the Peloponnesian War would become a region of increasingly critical importance. The location of other sanctuaries throughout the Gulf islandscape, such as the Sanctuary of Dionysos on Salamis (which based on archaeological evidence appears to be linked to rites of fertility) or the Asklepon at Troezen reveal a similar territorial consciousness encompassing both a sense of belonging and interconnectedness with the maritime communities around them. Likewise, the proximity of points-of-embarkation and loci of economic activity/production to these and other cult sites in the region indicate a close relationship between specific cult practices and the wider system of socio-economic relations. As a promising set of tools, the application of network modelling, including PPA, SNA, and flow/path optimization, can provide quantifiable affirmation of these relationships.

3 OF SACRED LAKES, SPRINGS AND CAVES: CULT PLACES AND RESOURCECULTURES IN THE NORTHERN APENNINES DURING THE IRON AGE

Abstract author(s): Da Vela, Raffaella (Post-Doc Researcher at the SFB1070 RessourcenKulturen University of Tübingen)

Abstract format: Oral

Sacred groves and lakes, as well as holy caves where healing cults performed their activities, were central hubs in the sacred landscape of the northern Apennines. At the crossroads of transhumance and commercial routes, and at the meeting points of different geo-cultural areas, these cult places in the mountains were difficult to reach, hidden and secluded without any outlook over the plains. Indeed, the secret paths to these places required a guide, whose knowledge of their location was probably individually transmitted. These difficulties of access can be seen as adding value to these places. Worshipers had to experience a difficult journey and learn the path, in order to finally reach a place where they were surrounded by natural elements and thus would become background figures in the divine 'show'. These evocative natural locations were both stage and active agent in the encounters between humans and gods. At the same time, these places attracted worshippers from different neighbouring geo-cultural regions, who left material signs of their presence, including objects that they took away as physical remembrances of these encounters. These objects have been found on the plains on both sides of the Apennine mountains in different cult contexts, and indicate shared cult practices, as well as a geographic spread of religious knowledge and meaning attached to objects. The present contribution aims to discuss the evocative power of these natural places and their value in shaping the evaluation processes of cult objects and rituals across the Etruscan Apennines during the Iron Age.

4 HOLY WATERS AS PLACE OF ENCOUNTER AND NEGOTIATION IN PADANIAN ETRURIA: RECORDS FROM CASTELFRANCO EMILIA AND LAKE BRACCIANO OF MONTESE

Abstract author(s): Neri, Diana (Comune di Castelfranco Emilia - Museo Civico Archeologico) - Campagnari, Sara (Ministero per i Beni e le Attività Culturali e per il Turismo)

Abstract format: Oral

Two important archaeological findings concerning the cult of waters occurred in the Panaro river valley, in the province of Modena. These waters have healthy attributes, such as those coming from salsobromiodic springs, or those from resurgences, providing homeothermy and natural self-purification.

In Emilia-Romagna such natural phenomena are frequently connected with the cult of a goddess, protector of the feminine sphere. During the Roman Age her identity is Minerva, while in most cases she incorporates divinities related to the Etruscan, Celtic and Ligurian melting pot inhabiting the area at the time of Romanization. These places of worship are often located near communication routes, at least from the early Iron Age.

The worship area of Prato dei Monti is located near the soon to come via Emilia in Castelfranco Emilia, formerly Forum Gallorum. The area features many springs and is probably located near the Minerva worship area, quoted by Cassio Dione relating to the prodigia of the war of Mutina (43 b.C.). A border sanctuary exists near the Lake Bracciano of Montese, located in the mountain area. In spite of its marginal location, it bears a strong strategical position, along routes through the valleys. The area is a meeting point for different ethnic groups residing there at the eve of Romanization. These people were shepherds practicing transhumance along the valley thus contributing to important market places such as the Campi Macri. Both places offer various votive objects, dating from the

6th century to at least the 3rd century B.C., when the Celts occupy Emilia-Romagna. During the Roman age the Prato dei Monti area features solely cults of Italic matrix.

5 THE AGENCY OF LANDSCAPES IN THE DEVELOPMENT OF CULTS IN REPUBLICAN CENTRAL APENNINE ITALY

Abstract author(s): Blasetti Fantauzzi, Chiara (Freie Universität Berlin)

Abstract format: Oral

Religious space of the local communities of central Apennine Italy during the Republican period is often determined by the topographical framework and environment of sacred sites, underlining the importance of the topographical contextualisation of such sacred areas. They can be characterised by areas for open-air meetings that are marked by evidence of ritual practices, depositions and sometimes altars, or are linked to a specific natural setting, such as a cave. Between the 4th and 1st century BC there is a widespread distribution of healing (sanatio) cults, often associated with water, and cults connected to pastoralism. During the 2nd century BC some of those sanctuaries underwent a monumentalization process, while others slowly lost importance.

This paper focuses on the agency of landscape in the establishment and development of cults and sanctuaries in the Central Apennine area from the Roman colonization to the Roman Imperial period, with the latter covering an obvious cultural break. By focusing on an area that is specifically defined in time and character, both local characteristics and those shared with the rest of Republican Central Italy can be highlighted from synchronic and diachronic perspectives. Our interpretation of the tempo-spatial patterns acknowledges not only cultural implications but also the significance of topographical distributions and territorial functions of these cults.

6 LANDSCAPE AND CHTHONIC CULTS IN REPUBLICAN CENTRAL ITALY

Abstract author(s): Calapà, Annalisa (Ludwig-Maximilians-Universität München)

Abstract format: Oral

The correlation between natural environment and chthonic cults is often especially striking. Cult places for chthonic deities in ancient Italy could be situated in places with exceptional landscape features, such as volcanic crater lakes (the Avernus being the most prominent example) or caves from which suffocating vapours arose, as in the sanctuary of Mephitis at Ampsanctus. A closer examination of our evidence shows that other landscape elements were associated with underworld gods: dei inferi could be worshipped in sanctuaries located by lakes or rivers, on islands, in thick forests (silvae) or smaller groves, or by the sea. This paper aims to analyze the circumstances that could lead to the formation of a chthonic cult in a specific environment; this can help to assess how, conversely, the environment could be shaped to create cult places for underworld gods in suburban and rural locations. The analysis presented in this paper, which especially focuses on Etruria, Latium and Campania, can also contribute to outline and to understand other relevant issues. Firstly, many cult places for chthonic deities, because of their particular features, seem to have been characterized as liminal zones and contact zones, which could serve as transcultural meeting places and connect people from different communities with each other. The examination of these peculiar aspects could shed some light on some Etruscan sanctuaries located in border areas by lakes or rivers, which have been mostly considered by researchers as water-related 'healing sanctuaries'. Secondly, the paper will also discuss the evidence suggesting that some cult places for chthonic deities were of special significance for marginal social groups, such as freedmen or slaves.

7 CULTS, PLACES, ANATOMICALS. SO-CALLED HEALING SANCTUARIES REVISITED. NEW INSIGHT ON TRADITIONS, INTERRELATIONS AND ALIGNMENTS

Abstract author(s): Boecker, Velia (Deutsches Archäologisches Institut)

Abstract format: Oral

After tackling the question which cult sites we do consider as healing cults – i.e. which kind of topography, architecture, written sources, venerated deities and specific finds provide the basis to assume a sanctuary was specialised in healing – the presentation will focus on the phenomenon of anatomical votives in sanctuaries of Latium (Italy) dedicated in the 4th to 1st cent. BC. These votives were hitherto understood as indicators for so-called healing cults. The archaeological and historical contexts though, e.g. the associated finds as well as the topographic position of the sites and their traditions, have hardly been focused yet. Featuring a holistic and contextualising approach the lecture will present the analysis of more than 100 sites in Latium with a total of over 15.000 anatomical votives regarding their connection to environmental parameters as springs, lakes, mountain tops, caves and connections to roads and settlements. Quantitative and gender-specific analyses are also taken into account. Based on this data the so-called healing cults of Latium can be divided into two main groups which differ from their location, the composition of the dedicated votives, the venerated deities and probably the dedicants.

These two groups presumably root in local cult traditions and were spread by entangled communities with shared or similar religious conceptions. Given that, anatomical votives can be understood as part of an indigenous identity within a broader network of cultural exchange. Very likely the anatomical votives should not be seen as objects with a prescribed meaning in a static cultic frame but as multivalent offerings in a dynamic frame of reference.

Contributing this new insight on tradition, interrelation and alignment may broaden the session's perspective on healing cults and add a significant benefit to the discussion.

8 CULTS AND THE COLONIES – EXTRA-URBAN SANCTUARIES IN COLONIAL TERRITORY IN REPUBLICAN CENTRAL ITALY

Abstract author(s): Bolder-Boos, Marion (Johannes Gutenberg-Universität Mainz, Arbeitsbereich Klassische Archäologie)

Abstract format: Oral

A significant number of extra-urban sanctuaries in Republican Italy were located in the hinterland of Latin or Roman colonies. Many of those cult sites, however, were not founded by the colonists but originated in pre-Roman times and thus went back to indigenous cults. While the Romans often changed certain aspects of these indigenous cults, the cult sites themselves were often continued and could, like the sanctuary of Marica a few kilometres west of Minturnae at the mouth of the Liris River, obtain a quite prominent position within the colonial pantheon. In other cases, however, such extra-urban cult places were abandoned and subsequently forgotten. Only rarely did the colonists destroy a pre-Roman sanctuary intentionally.

Various factors could have affected the continuation or abandonment of an extra-urban sanctuary: its importance for the indigenous population, where it could hold the danger of becoming a rallying place for those resisting Roman occupation; the nature of the cult and its compatibility with Roman religious ideas; the perceived sanctity of the place. The latter aspect leads to the question which role the natural landscape played in which a cult place was situated and whether the location in a geographically exceptional position made a difference. Did certain natural features – such as springs, rivers or grottoes – favour the continuation of a cult site in a colonial setting, even though it was created by an indigenous population? And how was identity negotiated in such a place?

The paper seeks to address these issues by giving an overview of the known extra-urban sanctuaries on colonial territory in Central Italy and their environmental setting, discussing the diverse landscape features as well as aspects of cult and – where possible – the deity (or deities) worshipped there.

9 HEALING CULTS IN SOUTHERN ETRURIA DURING THE ROMAN PERIOD

Abstract author(s): De Vincenzo, Salvatore (Università degli Studi della Tuscia, Viterbo)

Abstract format: Oral

Sacred contexts related to healing (sanatio) are particularly widespread in the whole of Etruria during the Late Republican and Early Imperial period. This paper will analyse the sacred landscape of Etruria between the 4th century BC and the 1st century AD, with special focus on healing cults in relation to agrarian and chthonic cults. The aim is to understand the topographical features as well as the political, commercial and social motivations that were the driving force for the establishment of these cults. A thorough analysis of the votive material by comparing stylistic and stratigraphic data led to a more precise dating of the sites, indicating that the sacred areas that were thought to have been abandoned in the 2nd century BC were in use until at least the Early Imperial Period. In this light, prominent sacred contexts in urban and non-urban areas, especially Veio, Tarquinia, Volsinii Novi and Vulci, will be redefined.

10 REPRESENTATION AND IDENTITY NEGOTIATION IN THE EASTERN IBERIAN PENINSULA. SACRED LANDSCAPES AS SOCIO-POLITICAL RESOURCES IN HISPANIA DURING THE ROMAN-REPUBLICAN PERIOD

Abstract author(s): Kramer, Robinson (University of Rostock)

Abstract format: Oral

In the 3rd–1st centuries BCE, Iberian societies in eastern Hispania faced the presence of Carthage and Greeks and eventually Roman conquest. In particular, the Roman expansion in the Iberian Peninsula led to dramatic changes in social structure, resource management, language and writing, and settlement structure, which often resulted in the transformation from oppida to urban structures.

In this contribution, I examine how these changes were manifested in the religious field and how different actors, especially Iberians and Romans, represented themselves and expressed or negotiated identities in this context. These socio-religious practices can be traced in sacred architecture and modifications of buildings, votive material (e. g. pottery, bronze figurines and statues) and the imagery in ritual contexts. The study of these materials helps to understand the various strategies of representation and the extent to which sacred landscapes could serve as political resources and spaces of social negotiation during the Roman-Republican period."

11 TRACES OF THE ROMAN SANCTUARIES ALONG THE KRKA RIVER

Abstract author(s): Jadric-Kucan, Ivana (University of Zadar, Department of Archaeology) - Sokcevic Purusic, Anamaria (Archaeological collection Burnum, National Park "Krka")

Abstract format: Oral

In the Roman times, the Krka River was a very important geostrategic point which, with its steep deep canyon, was a natural barrier that was impossible to cross. That was one of the main reasons for founding the Roman legionary camp Burnum in its immediate vicinity. Only a few convenient natural positions due to the combination of travertine barriers and valleys allowed crossing over it and contact between the two shores, which were then used by the Romans, as main roads. One of them is the crossing at the Čavlinov buk position, in the upper part of the Krka river. Numerous archeological finds were found here, including inscriptions of the gods

Neptune and Mercury ?, fragments of architecture such as a stone architrave decorated with relief depictions of aquatic animals, pillars and capitals indicate that they probably belonged to a significant sanctuary associated with the river and crossing. On the middle course of the Krka river, at the crossing near Roški slap, a dedicatory inscription to the Liburnian goddess Latri was found, erected by the Praetorian evocate. All this shows how these crossings played an important role in the spiritual life of the travelers and the merchants who passed through it, but also of the soldiers who lived in its immediate vicinity.

12 GODS OF PLACES OR OF PEOPLE? A STUDY OF RURAL CULT SITES AT THE EDGE OF THE ROMAN EMPIRE

Abstract author(s): Mazzilli, Francesca (University of Bergen)

Abstract format: Oral

A recent conference, Naming and Mapping the gods in the Ancient Mediterranean. Spaces, Mobilities, Imaginaries (Toulouse, 10th-12th February 2021), investigated the intersection between the divine and space and between the spaces and designations of the gods. From this symposium it has emerged the importance of spaces and human agents in the formation of religion in Antiquity from ritual practices to naming deities.

This paper aims to discuss to what extent the environment and the social network influenced:

- the erection of rural cult sites and their gods in a specific place, like hilltops;
- the function of these cult sites, from hubs of village community to sacred places because of their location near "healing" and "divine" natural resources.

An analytical approach of the study of rural cult sites in regional case studies at the edge of the Roman Empire (Lusitania, roughly Portugal, and the Hauran in the southern Syria) will be undertaken on two levels:

- Through the study of naming gods: from toponym to deities named after an individual;
- Through spatial analysis: location of cult sites in relation to topography, water sources, and administrative infrastructure network of villages and cities.

A. HONEY BEES AND HONEY: MYTHOLOGY, PROPHECY, AND HEALING

Abstract author(s): Zak, Claire (Texas A&M University)

Abstract format: Poster

Beekeeping occurred on Crete by the 1500s BCE. Coins of Militaea from this time depict Zeus on one side and bees on the reverse with an inscription reading "MELI" (honey). For the ancient Greeks, Crete was seen as the origin place of bees, since it was here that Rhea is said to have given birth to Zeus. On Crete, the future king of the gods was raised on honey and milk, thanks to Melissa, the daughter of the king of Crete, Melisseus. In myth, Melisseus was the first to sacrifice to the gods and Melissa becomes the first priestess to the Magna Mater (and in some versions of the story is turned into a bee herself). Priestesses and attendants to various deities continued to be called melissae after their mythological namesake. Associations with Zeus, Apollo, and Dionysus allowed a prophetic aspect to be attributed to bees, which extended to the sacred landscapes of Mount Dicte, the oracle sanctuary at Delphi, the home of the Thriae prophetic nymphs at Mount Parnassos, and cemeteries.

The ancients believed that if one were to consume honey, they would interact with the divine, and adopt the characteristics attributed to bees. Poets and prophetic figures were often said to have been fed by bees during infancy. By ingesting honey, a person could be pure, chaste, holy, prophetic, or come into contact with the divine. Nectar was not only food for the gods, but also food of bees.

Because of bee's proximity to the divine, honey also had a high sacrificial value and was used in funeral rites as offerings to the dead. Some believe that the bee embodies the soul of the dead and swarms of buzzing bees were the dead flying around on earth. Bees were chthonian creatures, connected to ideas of preservation and resurrection.

B. THE CULT OF NEPTUNE IN BURNUM

Abstract author(s): Jadric-Kucan, Ivana (University of Zadar, Department of Archaeology) - Sokcevic Purusic, Anamaria (Archaeological collection Burnum, National Park "Krka")

Abstract format: Poster

In the upper course of the Krka River (Titius flumen) at the crossing Cavlinov buk, where in Roman times was a bridge that passed through it and the main road, a dedication to the god Neptune was found. During the past, construction works were carried out in this area, during which the remains of Roman architecture were found (parts of architraves with reliefs of amphibians, a fragment of a spiral pillar and a Corinthian capital) and it is possible that these are the remains of Neptune's sanctuary. Furthermore, a monumental head of Neptune? originates from Burnum. The Krka River played an important role in the life of the surrounding population, both indigenous and later Roman, and it was precisely because of it that the Roman legionary camp Burnum was built there. Therefore, the worship of the deity of the sea and running waters was an important part of their spiritual life.

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Feeser, Ingo (Institute for Pre- and Protohistoric Archaeology, Christian-Albrechts-University of Kiel) - Dreibrodt, Stefan (Institute for Ecosystem Research, Christian-Albrechts-University of Kiel) - Niebieszczański, Jakub (Faculty of Archaeology, Adam Mickiewicz University in Poznań) - Robin, Vincent (Interdisciplinary Laboratory for Continental Environments, CNRS, Lorraine University) - Wiethold, Julian (Institut national de recherches archéologiques préventives - Inrap, Direction régionale Grand Est Alsace - Champagne Ardenne - Lorraine Laboratoire archéobotanique)

Format: Regular session

This session offers the possibility to present new results and approaches of bio- and geoarchaeological research with the aim to identify turning points of human-environment interactions of the past and their reflection in the investigated archives. Of particular interest hereby are interdisciplinary approaches, which combine data from different spatial and/or temporal scales.

Investigations of plant remains (e.g. pollen, plant macro-remains, phytoliths, charcoal and wood), geochemical signatures of archaeological artefacts or sediments and soils are regularly and complementarily applied at and around archaeological sites. The results of such local scale studies generally allow an insight to economical activities and subsistence practices. However, in order to get an idea about their general importance and their related impact on the natural environment, they have to be evaluated in context of the (supra-) regional developments as derived from off-site and/or meta-level investigations. Although such a synthesis of palaeoenvironmental data on different temporal and spatial scales is a challenging task, considering the involved individual uncertainties and the increasing complexity, this is regarded to be crucial for describing patterns of ancient human-environmental relationships, including the identification of involved triggers, drivers and thresholds levels. In order to enable holistic reconstructions of human-environment interactions in past landscapes the results of the various disciplines need to be integrated into joint explanatory models. Of particular interest hereby is the identification of turning points of human environmental interaction, at which the qualitative relationship of human activity and their associated environmental impact changed.

Contributions providing new insights on landscape processes reflecting the natural environment's responses to changed prehistoric and historic human activity (e.g. innovations, type of land use techniques) or natural variability (climate, natural disasters) which can be connected with evidence for changed economic activities and land use practices archaeological data on local, regional and supra-regional scale are welcome.

ABSTRACTS:

1 HUMAN-ENVIRONMENT INTERACTIONS IN THE BELGIAN DIJLE-DEMER CATCHMENT (800 BC-1000 AD) – AN INTERDISCIPLINARY APPROACH

Abstract author(s): van Zon, Marleen (Faculty of Arts, Centre for Archaeological Research of Landscapes, KU Leuven; Faculty of Sciences, Dept. Earth and Environmental Sciences, Division of Geography and Tourism, KU Leuven) - Vanmontfort, Bart (Faculty of Arts, Centre for Archaeological Research of Landscapes, KU Leuven) - Verstraeten, Gert - Broothaerts, Nils (Faculty of Sciences, Dept. Earth and Environmental Sciences, Division of Geography and Tourism, KU Leuven)

Abstract format: Oral

Floodplains are highly dynamic environments that have attracted humans throughout history. As such, they have not only been shaped by the interplay of geomorphological, ecological and hydrological processes. They have also been directly and indirectly impacted by human activity. It is in these parts of the landscape that we find ideal research areas to study and reconstruct transformations of human-environment interactions through space and time.

One such area, the Dijle-Demer catchment (Belgium), has been selected as the main point of focus of the Floodplainscapes-project. Prior research has identified human impact as a driving force, if not the driving force, of morphological and ecological change in floodplains. Its progression throughout the Middle and Late Holocene can be characterised as non-linear, ranging from rapid increases to periods of regeneration. How this relates to the human activities involved is the subject of ongoing research and will form the main topic of this presentation.

Archaeological and historical sources are studied and integrated on a large spatial and temporal scale. This facilitates integration with the available environmental studies. Set against a back-drop of climatological and socio-political developments taking place on a supra-regional scale, we aim to identify the complex set of factors that trigger changes in human-environment interactions throughout the Iron Age, Roman and Early Medieval Period. For now, major components are considered to be settlement patterns, agricultural practices and artisanal activities. At a later stage these will be studied in greater detail through several case studies, to come to a high-resolution understanding of the processes taking place on a local scale.

2

PREHISTORIC AND HISTORIC TURNING POINTS IN CENTRAL GREATER POLAND SEEN THROUGH GEOARCHAEOLOGICAL STUDY OF BRUSZCZEWO SETTLEMENT COMPLEX IN SAMICA VALLEY

Abstract author(s): Niebieszczanski, Jakub - Radke, Iwona - Kołaczek, Piotr - Rządziejewicz, Monika (Adam Mickiewicz University in Poznań)

Abstract format: Oral

In the area of central Greater Poland, one of the most well documented multi-cultural sites is that in Bruszczevo. The site is commonly known from its earliest phase of occupation, when the unique fortified settlement of the Unetice culture thrived there during the Early Bronze Age, however the presence of Neolithic activity was also documented. After abandonment of defensive site and a few hundred year of occupation hiatus, the Lusitanian culture people established their ritual center during the Late Bronze Age and Early Iron Age. Afterwards, in a close vicinity, the Przeworsk culture people located their settlement, while the Early Medieval occupation phase was connected to the motte stronghold of the Slavic tribes. This long habitation history occurred in and around the middle part of the Samica Valley, which is believed to be a lake and marshland in the past.

This region witnessed major archaeological projects, which created a well-established cultural reconstruction. The Samica Valley was also a subject of initial geoarchaeological research oriented towards the recognition of general history of the lake development during the Bronze Age and up to the Early Medieval.

The following presentation shows first results of a new geoarchaeological study* which aims to connect the already well-recognized cultural succession with the environmental history of Samica Valley and its transformation due to the fluctuating human impact. Several cores are being submitted in this study to a multiproxy palaeoenvironmental reconstruction, supported by a large series of AMS dating, in order to correlate the turning points in human development (changes in land-use, increased mobility, metallurgy) with changes recorded in natural archives of the Bruszczevo palaeolake and marshes.

*The study "Living by the Lake(...)" is funded by the National Science Centre, Poland, grant no. 2019/33/B/HS3/00193.

3

'XEROS' OR NOT? : THE XEROS RIVER VALLEY IN CYPRUS AND ITS HISTORY THROUGH THE AGES

Abstract author(s): Mylona, Pantelitsa - Vionis, Athanasios (University of Cyprus) - Devillers, Benoît (UMR5140: AMS-CNRS-Université de Montpellier 3)

Abstract format: Oral

The Xeros River (meaning 'dry' in Greek) is located on the south coast of Cyprus in the administrative district of Larnaca. The Settled and Sacred Landscapes of Cyprus (SeSaLaC) project of the University of Cyprus investigates human activity in the valley diachronically through intensive field survey. The project also employs the application of a geoarchaeological approach to shed light on the interactions between human societies and the natural environment, considering alluvial deposits as a suitable indicator of environmental and topographical changes. This paper (a) aims to present preliminary observations on the evolution of the valley through time and (b) attempts to examine how societies adapted to topographical changes due to the shifting of the Xeros riverbed. The relevant results derive from field observations, radiocarbon dating of alluvial paleosols and laboratory analysis, such as XRF and magnetic susceptibility, which allow the establishment of a chronological framework of alluvial formation, the decryption of the alluvial dynamic and the evolution of the valley. Combined with the archaeological data of the field survey, we outline the evolution of settlement systems and movement through time.

4

HOLOCENE GEOMORPHODYNAMICS OF THE TEKKEDERE VALLEY, PERGAMON MICRO-REGION (WEST TURKEY) AND THE INTERACTIONS BETWEEN HUMANS AND THE ENVIRONMENT

Abstract author(s): Yang, Xun - Becker, Fabian (Freie Universität Berlin) - Knitter, Daniel (Christian-Albrechts-Universität zu Kiel) - Schütt, Brigitta (Freie Universität Berlin)

Abstract format: Oral

Sediments and archaeological remains are key archives in understanding human-environment interactions. Associated data on relief and local memories allow to identify potential triggers of changes in the interactions at local to regional scales. Integrating these quantitative and qualitative data, we evaluate the landscape development—especially the entanglement of settlement history and environmental dynamics—in the Tekkedere valley, a small mountainous drainage basin of the Aegean Region in Turkey. The valley lies in the micro-region of the ancient city Pergamon and has been continuously settled since Bronze Age. The settlements were occasionally relocated in the last three millennia.

Our main research aim is to explore how the growth of Pergamon and the rearrangement of settlement patterns in the micro-region between Hellenistic and Roman Imperial Period mark a changing point in human-environment interactions—on the local scale and on a meta level.

Results from geomorphological research in the Tekkedere valley imply that settlements from different periods were located at specific positions. Floodplain sediments of the receiving Bakırçay river are covered by and interfingering with Tekkedere alluvial fan sediments, indicating high flood events. Cycles of coarse and fine fan deposits reflect morphodynamic phases varying in intensity. Soil formations suggest periods of landscape stability, which alternate with intensified erosion indicated by colluvial sediments. First reconstructions of morphodynamics in the valley based on the sedimentological data are in agreement with the modified meta-analyses of 14C-ages from the micro-region. Phases of enhanced morphodynamics in the region can be linked to the increased anthro-

pogenic pressures during the Hellenistic and Roman Imperial Period, which is contrary to findings from other regions in Anatolia. Additionally, an earthquake-triggered landslide was the main reason of the last settlement relocation according to information from locals. Our work widens the perspective that valley-scale settlement patterns may respond to socio-economic transformations and natural hazards.

5 WHAT HAPPENED AFTER GÖBEKLI TEPE? HUMAN-ENVIRONMENTAL INTERACTIONS IN THE URFA REGION FROM A HISTORICO-CULTURAL AND NATURAL SCIENCE PERSPECTIVE

Abstract author(s): Braun, Ricarda (Freie Universität Berlin) - Öğüt, Birgül (Deutsches Archäologisches Institut) - Lange, Matthias (Humboldt Universität Berlin) - Nykamp, Moritz (Freie Universität Berlin) - Knitter, Daniel (Christian-Albrechts-Universität zu Kiel) - Schütt, Brigitta (Freie Universität Berlin)

Abstract format: Oral

From a historico-cultural perspective the Urfa region in southeastern Turkey has a diverse and dynamic history: The occupation of the region began at the latest in the early Neolithic, which is also the most studied period, with sites like Göbekli Tepe and Karahan Tepe as probably the best-known examples. Unjustly less known and researched, however, is the cultural history of the following periods. This is surprising, since at least from the Assyrian period onward in the Urfa region the city of Harran became an influential religious center. However, not only Harran but also the larger Urfa region was of economic and political importance, serving as a major node in a supra-regional trading network. The region's dynamic history was accompanied by major changes in agricultural and livestock use. Besides descriptive landscape-scale studies and few local case studies, it has not yet been systematically investigated how these changes are reflected in landscape archives. Recent geoarchaeological research conducted in the wider surroundings of Göbekli Tepe revealed various phases of increased landscape sensitivity and intensified geomorphodynamic activity. This contribution examines whether the comparison of natural science analyses (e.g., sediments, phytoliths, and dung spherulites) with archaeological and historic sources can reveal turning points in the human-environment relationship.

6 FIRE HISTORY ASSESSMENT IN HIGH SPATIAL RESOLUTION OF LOW MOUNTAIN RANGES IN WESTERN EUROPE: EVIDENCES FOR PAST LAND USE?

Abstract author(s): Robin, Vincent (LIEC - Lorraine University - CNRS)

Abstract format: Oral

Information about past fire regimes provides valuable insights for understanding past landscape dynamics. However, past Human activities in Europe strongly influenced vegetation dynamics and fire history. Therefore, to identify clear and solid patterns of past fire regimes and potential influence on the trajectories of landscapes, it is useful to apply a combination of proxies that may provide highly significant complementary data in order to evaluate past fire regimes with high resolution.

This is what we illustrate here with a multiproxy anthracological dataset for three low mountain ranges in Western Europe, the Harz, the Northern Vosges, and the Ardennes relief. We conducted comparative assessment of various charcoal records from large spatial scale (i.e., micro-charcoal signals from peat-bogs) to high spatial resolution (i.e., soil charcoal signals). The latter proxy also enabled us to assess the type of fuel that fed local fires. Such dataset was complemented by pollen data, which provided insights about human presence, climate constraints and vegetation responses to fire disturbances.

Overall, we identified various patterns of fire and vegetation history, on different spatiotemporal scale. We interpreted these various as the fingerprints of the human socio-cultural development. Moreover, our studies show that our comparative assessment of various paleo-signal permits to gather a more complete picture of the past fire regimes.

7 IS THE KUNGUR FOREST-STEPPE (PRE-URALS, RUSSIA) A CULTURAL LANDSCAPE?

Abstract author(s): Shumilovskikh, Lyudmila - Schmidt, Monika (Georg-August-University Göttingen) - Mingalev, Vitaliy (Higher School of Economics) - Pereskokov, Mikhail - Sannikov, Pavel (Perm State University)

Abstract format: Oral

The Kungur forest-steppe is the most northern outpost of the European forest-steppe located within the boreal climatic zone. Due to its fertile soils, the region is intensively used for agriculture. As a result, 40-50% of the area is covered by arable land and only 10-20% by semi-natural vegetation. How natural is the mosaic vegetation of the Kungur forest-steppe is an open question. First evidence of colonisation with intensive environmental use dates back to the Bronze Age. A strong increase in number of archaeological sites took place at the end of the first millennium BC represented by Glyadnovo culture and during 6th-9th centuries AD - by Nevolino. Finally, the Russian colonization took place. In order to study the nature of the Kungur forest-steppe, we investigated several sediment cores obtained from the region on palynology and sedimentology. Our results clearly show dominance of hemiboreal forests interrupted by deforestation phases corresponding to the settlements periods. An increase of the human impact occurred during occupation of the Nevolino culture, characterized by numerous finds of agricultural tools and pits filled with grains. A strong deforestation of the area and spread of secondary birch forests occurred during the Russian colonization. This period is known for industry development and rapid population growth that led to a massive lumbering of the pre-Ural region during the 18th century. Ancient forests were quickly disappearing especially along the rivers through an intensive forest clearing, frequent fires, spreading of agriculture and overall pasture.

8 ESR DATING DEPOSITS FROM MIROSAVA CAVE, EASTERN SERBIA: CLUES TO MID MIS 3 (DO 14) HUMAN/CARNIVORE INTERACTIONS

Abstract author(s): Blackwell, Bonnie (RFK Science Research Institute; Dept. of Chemistry, Williams College) - Wolfe, Gabrielle - Skinner, Anne (Dept. of Chemistry, Williams College) - Plavšić, Senka - Mihailović, Dušan - Dimitrijević, Vesna (Department of Archaeology, Faculty of Philosophy, Belgrade University) - Dogandžić, Tamara (Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Leipzig) - D.Costa, Jonathan - Yang, Diana - Singh, Imreet (RFK Science Research Institute)

Abstract format: Oral

Sites documenting the fauna and climate in Marine Isotope Stage (MIS) 3 (Late Pleistocene) are rare in Serbia. To understand the population density and the level of competition between people and large carnivores during the Middle to Upper Palaeolithic transition, dating that relies on faunal remains is essential. Mirosava is a small cave (~ 18 m²) formed in the Jurassic limestones within the hilly-mountainous hinterland along the Velika Morava River valley near Čuprija, in eastern Serbia. In 2017, test excavations demonstrated that the cave deposits contained abundant faunal remains, accumulated by carnivores. The diverse fauna includes large, medium, and small carnivores (*Ursus spelaeus*, *Crocota spelaea*, *Canis lupus*, *Vulpes vulpes*, *Meles meles*, *Felis silvestris*), and steppe, but also forest and herbivores adapted to mild climates (*Bison priscus*, *Equus ferus*, *E. hydruntinus*, *Cervus elaphus*, *Dama dama*, *Megaloceros giganteus*, *Capreolus capreolus*), as well as herpetofauna and fish. Electron spin resonance (ESR) can date mammalian teeth from ~ 5-10 ka to ~ 2-4 Ma, with ~ 2-5% precision. Three teeth, an *Equus ferus* milk molar, ET55, a *Bos* or *Bison* premolar, ET53, and a *Canis lupus* canine, ET54, were collected from Layer 3 along with 10 associated sediment samples for ESR dating. Sediment samples were analyzed with NAA for U, Th, and K, by powdering to ≤ 100 mesh. U concentrations averaged 0.30 ± 0.02 ppm in the enamel and from 14.23 to 17.42 ± 0.02 ppm in the dentine. With volumetrically and time-averaged sedimentary dose rates averaging 780 ± 66 μGy/y and cosmic dose rates at 56 ± 6 μGy/y, ET55 dated at 48.0 ± 3.1 ka, while ET53 dated to 48.2 ± 2.0 ka. Their mean age, 48.1 ± 1.7 ka, correlates with early MIS (Marine Isotope Stage) 3, and most likely, with the Moorschoofd-Glinde Interstadial, Dansgaard-Oeschger (DO) Stage 14.

9 TEPHRA CRYPTOGRAPHY IN NORTH MACEDONIA: PLEISTOCENE SEDIMENTARY RADIOACTIVITY ANALYSES IN PALEOLITHIC DEPOSITS AT GOLEMA PEŠT

Abstract author(s): Blickstein, Joel (RFK Science Research Institute) - Blackwell, Bonnie (RFK Science Research Institute; Dept. of Chemistry, Williams College) - Šalamanov-Korobar, Ljiljana - Kitanovski, Blagoja (National Institution Archaeological Museum of the Republic of North Macedonia, Skopje) - Li, Raymond - Li, Richard - Yang, Diana (RFK Science Research Institute) - Spirova, Marina (National Institution Archaeological Museum of the Republic of North Macedonia, Skopje) - D'Costa, Jonathan - Fajja, Mehri (RFK Science Research Institute)

Abstract format: Oral

Large explosive volcanic eruptions produce tephra (ash) deposits that fan out downwind from the volcano itself. Thickly blanketing the ground, the ash shards killed vegetation, extirpating the local fauna for many decades. Respiring volcanic ash can cause silicosis and related lung issues among hominins. Golema Pešt is a cave with Paleolithic site near Zdunje, North Macedonia, whose mouth opens to the southeast at 480 m amsl. Reaching > 5.5 m deep, > 21 flatly lying layer silty-sandy matrix-supported gravel layers with éboulis clasts fill the cave. To measure accurate sedimentary dose rates needed for electron spin resonance (ESR) tooth dates for Golema Pešt, > 125 sedimentary samples from all the layers in Trenches 1, 2, and 5 were analyzed by NAA for their radioactive concentrations. Compared to typical cave sediment, cryptotephra-rich horizons contain high U, Th, and K concentrations, which significantly raise their sedimentary dose rates, while éboulis-rich horizons have very low radioactive concentrations. Found first in Trench 2b, geochemical signatures from the Campanian Ignimbrite (CI, Y5) cryptotephra have now been identified in Trenches 1, 2a, and 5. Moreover, new horizons with high Th-rich concentrations that may hide cryptotephra were discovered at 5-7 other depths within the late Pleistocene deposits both above, and below, the Cl-rich horizon, as well as more Th-rich horizons in earlier Pleistocene deposits. Although the presence of cryptotephra in these horizons must be confirmed, the cave's very high radiation dose rates existing at those times would have increased cancer rates among long-term inhabitants. Nonetheless, after each high Th-rich horizon, deposits show that hominins left the remains from their large hearths surrounded by their faunal kills and their lithic tools. Thus, despite the devastation that each tephra eruption must have rained on the Treska Valley during the Late Pleistocene, Paleolithic peoples continued to use Golema Pešt unabated.

10 FRESH PERSPECTIVE ON THE LATE NEOLITHIC ABORA SITE IN LATVIA

Abstract author(s): Legzdina, Dardega - Zariņa, Gunita (Institute of Latvian History, University of Latvia)

Abstract format: Oral

Abora settlement and cemetery is located in South-eastern Latvia at the Lake Lubāns wetland. It is an inland micro-region approximately 200 km from the coast of the Baltic Sea. Abora is just one of the wetland's 27 Stone Age sites, but it stands out with its many human burials, that are distributed across the inhabitation layers. Archaeological research and excavations at the site took place in the 60s and 70s, and once again in 2008, when organic samples were radiocarbon dated to ~2940 - 2470 calBC.

Over the decades, a robust and interdisciplinary research was carried out on this Stone Age micro-region, incorporating archaeological, palynological, macro-botanical, archaeozoological, and palaeogeographical data. The resulting scientific consensus stated

that the Lubāns wetland was the earliest agricultural region in Latvia, with Abora as one of the most prominent Late Neolithic early farmers' settlement.

During the last years, new research has been carried out, based on carbon and nitrogen stable isotope analysis and radiocarbon dating of the human bones. The new data calls for more cautious and detailed analysis of the land use and inhabitation patterns of the Abora site, and consequentially, of the whole micro-region as well. Although the palynological and zooarchaeological material suggests that the Abora people were familiar with animal husbandry and early farming, the carbon and nitrogen stable isotope analysis have not confirmed farming as a significant subsistence strategy. Moreover, correlation between stable isotope data and radiocarbon dates may indicate chronological shift away from terrestrial resources.

In this paper, we integrated earlier research with the new bioarchaeological data and revisit the previous interpretations of human-environment interactions and transition to farming in this Late Neolithic site.

Research funded by Latvian Council of Science, project No. lzp-2020/2-0032.

11

SOIL (TRANS)FORMATION IN THE CENTRAL EUROPEAN LOESS ZONE AS EVIDENCE OF ENVIRONMENTAL CHANGE AND HUMAN ACTIVITY DURING THE HOLOCENE

Abstract author(s): Krupski, Mateusz (Archeolodzy.org Foundation; Institute of Soil Science and Environmental Protection, Wrocław University of Environmental and Life Sciences) - Kabała, Cezary (Institute of Soil Science and Environmental Protection, Wrocław University of Environmental and Life Sciences) - Mackiewicz, Maksym (Archeolodzy.org Foundation) - Przybył, Agnieszka (Institute of Archaeology, University of Wrocław)

Abstract format: Oral

Soils hold a record of natural and anthropogenic formation processes. This makes them reliable proxies in paleoenvironmental research, especially when preserved prehistoric soils are studied. Such paleosols may be found beneath barrows (kurgans), what additionally allows to place the pedogenesis in a chronological timeframe. By comparing traits of the buried soils, material building the mounds and present-day reference profiles, it is possible to detect environmental (and cultural) change at the level of individual sites and in timescales spanning thousands of years. Comparisons made between several sites may be of regional significance.

Recent pedo-archaeological research on paleosols and barrows, conducted in the Muszkowice and Głubczyce Forests in the Silesian loess zone (SW Poland) indicates:

1. a widespread presence of fertile, humus-rich chernozemic soils, which dominated in the open, steppe-forest landscape at the onset of the Neolithic (late 6th millennium BC) and well into the Late Holocene. Human activity played a prominent role in maintaining the "openness" of the landscape.
2. a transformation of chernozemic soils into clay illuvial soils (Luvisols/Retisols), that occurred in vast territories of the Silesian loess zone sometime during the Subboreal or Subatlantic. This major alteration was caused by more humid climatic conditions, coupled with the spread of dense, close-canopy, beech-dominant forests. On the other hand, chernozemic soils persisted through the Subboreal and Subatlantic and until the present-day in those places, where deforestation has been sustained by continuous human activity (e.g. due to agricultural needs).

Analogous soil transformations were also identified in other areas of the Central European loess zone (in Saxony and Moravia), what suggests regional significance of the described phenomenon, involving shifts between formation of natural and creation of cultural landscapes.

12

CHANGES AT THE TURN OF 6000-5000 BC AND THE ROUNDEL AT NOWE OBJEZIERZE IN THE LIGHT OF THE PALYNOLOGICAL RECORD

Abstract author(s): Czerniak, Lech - Pędziszewska, Anna - Świąta-Musznicka, Joanna (University of Gdansk) - Matuszewska, Agnieszka (University of Szczecin) - Tylman, Wojciech (University of Gdansk)

Abstract format: Oral

At the turn of the 6th and 5th millennium cal BC, a vast area stretching from Ukraine to France saw the LBK collapse, ending one of the most important stages in the colonisation of Europe by farming communities. Despite the phenomenon covering a wide vast area and the changes taking place almost simultaneously, they do not appear to have had a single cause and they followed different paths depending on local conditions. In this paper, we analyse one of such cases. The analysed micro-region is a small 'island' located on the northern periphery of the 'Danube World'. What was the key moment for the settlement of this micro-region was the appearance of the first agricultural villages around 5300-5000/4900 cal BC (LBK), followed by a monumental ceremonial centre, in the period 4850-4500 cal BC (SBK). We do not know whether a local LBK - SBK transformation took place and the roundel was a significant driver of social and religious change, or whether the two settlement events were divided by a hiatus and the construction of the roundel started a completely new chapter of local history? Interpretation of the results of a high-resolution pollen analysis performed in a profile from a lake located in the centre of the above-mentioned micro-region will constitute an attempt to answer this question. The palynological data is indicative of the transformation of mixed deciduous forests under the influence of strong anthropogenic pressure. They also illustrate two settlement phases related to the development of an economy based on the cultivation of cereals (mainly wheat) and animal husbandry, which is confirmed by the presence of coprophilous fungi spores and meadow plant pollens in the sediments. Dynamic environmental transformation is evidenced by a significant share of pollen of plants typical for ruderal habitats. Project subsidised by the NSC Poland (2017/27/B/HS3/02925).

13

BEGINNING OF THE PREHISTORIC TRANSHUMANCE IN THE POLISH CARPATHIANS. THE CASE OF THE HIGH BIESZCZADY MOUNTAINS (SE POLAND)

Abstract author(s): Pelisiak, Andrzej (Institute of Archaeology, University of Rzeszów)

Abstract format: Oral

The High Bieszczady Mountains are located in the Eastern Polish Carpathians in the extreme SE corner of today's Poland. They are located well outside the Neolithic and Early Bronze Age settlement centers. Moreover, they are distinctive by extreme environmental conditions resulting from the altitudes, severe climate, short vegetation period, and barren soils, generally unsuitable for cultivation. Palynological records from peatbogs in Smerek, Wołosate, and Tarnawa indicate human activities in the High Bieszczady Mts from about 3200 BC. Up to the beginning of the Late Bronze Age there are exclusively the pasturage traces.

Archaeological investigations in this area begun in 2012. Up to 2020 more than 70 sites dated to the Late Neolithic and Bronze Age were discovered in the high landscape zones between 1000 and 1300 m a. s. l. Most of these sites is located in a close context of fresh and salt water springs. The sites are represented by single finds of stone artefacts and small assemblages of them. They correspond with the pollen record of animals herding performed by Neolithic and Bronze Age people on this area.

Beginning of the transhumant pastoralism in the high mountain landscape zones of the Carpathians was an important turning point in the human activity and the human-environment relations. This started to be practiced about 3200 BC and was coincided with climatic fluctuations, especially with the abrupt cooling event about 3200 BC.

Beginning of summer pastures in the High Bieszczady Mts. also corresponds with intensification of human activities in other European mountains. There is a lot of signals of this process: discovery of the naturally mummified human body found close to the Tisenjoch Pass and the Similaun Mountain Hut on the Austrian- Italian border, stone constructions linked with seasonal pasturage in the French Alps, and numerous artefacts found in the high mountain landscapes.

14

THE SURPRISING OMNIPRESENCE OF OAK IN THE 3RD AND 2ND MILLENNIA CAL BC IN THE SOUTHEASTERN IBERIAN PENINSULA

Abstract author(s): Celma Martínez, Mireia (Prehistory Department, Autonomous University of Barcelona)

Abstract format: Oral

Quercus evergreen type is the most ubiquitous anthracological taxon in the southeastern Iberian Peninsula in the Copper and the Bronze Ages, despite the idea of the territorial supremacy of Pinus halepensis interpreted by the number of determined fragments and which has led to an interpretation of mesophytic taxa recession in an earlier moment. The palynological interpretations of over-exploitation and forest degradation have been taken from archaeological and bioarchaeological research in the 1980s and 1990s, which in turn have served as the basis for a large number of anthracological studies in the early 20th century. This has produced feedback in the inferential interpretation sustained over the decades, all based on ecological and catastrophic pessimism regarding the forest management of Metal Ages societies.

This work implements a review of the paleoecological interpretation, specifically, of the forest carrying-capacity and the state of the southeastern Iberian Peninsula forests in the 3rd and 2nd Millennia cal BC. The anthracological data is synthesized to be rethought for a new reading and interpretation of the past forests.

Metal Ages societies were believed to be responsible for the destruction of the southeastern forest, but other territorial limits and social organization can be read from the basis of charcoal remains.

48 taxa are present in the territory and display the biodiversity richness, where territorial limits are represented as well as by rare taxa consumed. This study participates in a new understanding of the society-environment relationship, and the cycle of timber production-consumption in a current sub desert environment.

15

CHANGING LAND-USE PRACTICES DURING THE BRONZE AGE IN NORTHERN GERMANY: NEW INSIGHTS FROM THE ARCHAEOLOGICAL SITE MANG DE BARGEN, SCHLESWIG-HOLSTEIN

Abstract author(s): Feeser, Ingo - Schaefer-Di Maida, Stefanie - Filipovic, Dragana - Kneisel, Jutta (Institute of Pre- and Protohistoric Archaeology, Christian Albrecht University, Kiel) - Dreibrodt, Stefan (Institute for Ecosystem Research, Christian Albrecht University, Kiel)

Abstract format: Oral

Palaeoenvironmental research in context of the CRC 1266 (www.sfb1266.uni-kiel.de) aims at reconstructing human impact and land-use changes on different spatial scales. Small sediment archives in the vicinity of archaeological sites, so called near-site archives, strongly reflect local land-use activities. Investigations of sediments from medium to large lakes, so called off-site archives, are commonly used to reconstruct regional developments. By comparing different archives it is possible to differentiate and identify signals of environmental change from a local to over-regional scale as well as quantitative and/or qualitative land-use changes. Approaches of constructing a diachronic over-regional proxy of human impact, based on a combined PCA of high resolution off-site records, were hampered by a qualitative change of human-environmental interaction during the end of the Bronze Age. Near-site investigations in the vicinity of the archaeological site Mang de Barga allowed the reconstruction of local land-use changes, including

pastoral and arable activities. The results indicate that a fundamental change in land-use practices between the 13 to 11th century BC was probably responsible for the observed turning point of human-environmental interaction.

16 MEDIEVAL MINING AND ITS IMPACT ON PEAT RECORDS: A CASE STUDY FROM CRUZ DO BOCELO MIRE (NW IBERIA)

Abstract author(s): Silva-Sánchez, Noemí (Instituto de Ciencias del Patrimonio, Incipit-CSIC) - Biester, Harald (Technische Universität Braunschweig, Institute of Geoecology) - López-Merino, Lourdes (Universidad Complutense de Madrid, Facultad de Farmacia, Unidad de Botánica, ENVIROVEG, grupo UCM 910164) - Armada, Xosé-Lois (Instituto de Ciencias del Patrimonio, Incipit-CSIC) - Martínez Cortizas, Antonio (Universidade de Santiago de Compostela, Facultade de Bioloxía, EcoPast, GI-1553)

Abstract format: Oral

The Northwest of the Iberian Peninsula was one of the most important mining hotspots during Roman times, with the estimation that Iberian mines generated 60% of the European lead production (Nriagu, 1983). Mining activity mainly focused on gold but also on other metals. Fingerprints of this activity were extensively recorded on environmental archives such as peatlands and lake sediments. Contrary to this huge evidence, medieval mining signals are more half-hearted, both in the archaeological and palaeoenvironmental records. Although palaeopollution research on peat records in NW Iberia has shown some metal pollution increases during the Middle Ages, they tend to be smaller than Roman levels both in intensity and duration. An exception to this trend was found in 'Cruz do Bocelo' mire. Besides a clear metal pollution signal recorded during Roman times, there was also evidence of two medieval peaks. The first, peaking at the 6th-7th centuries, is similar in intensity, but shorter in time, than the Roman signal. The second one, between 10-13th centuries, is both higher in intensity and longer in duration. Preliminary analysis of Pb isotope data indicates that this medieval peak is compatible with the local exploitation of metal resources. In this paper we present the results of 'Cruz do Bocelo' palaeopollution study which combines elemental composition by XRF and Pb isotope data. Selected pollen indicators will be also shown in order to evaluate the impact of this possible mining evidence on vegetation. Studies of palaeo-archives located close to the mining and metallurgy centres are badly needed to decipher the local narratives of these activities – in times of social change and reorganization in particular.

17 HOW JOANNITES' ECONOMY ERADICATED PRIMEVAL FOREST AND CREATED ANTHROECOSYSTEMS IN MEDIEVAL CENTRAL EUROPE

Abstract author(s): Lamentowicz, Mariusz - Marcisz, Katarzyna (Adam Mickiewicz University, Poznań) - Guzowski, Piotr (University of Białystok) - Gałka, Mariusz (University of Lodz) - Diaconu, Andrei-Cosmin (Babes-Bolyai University, Cluj-Napoca) - Kołaczek, Piotr (Adam Mickiewicz University, Poznań)

Abstract format: Oral

During European states' development, various past societies utilized natural resources, but their impact was not uniformly spatially and temporally distributed. Considerable changes resulted in landscape fragmentation, especially during the Middle Ages. Changes in state advances that affected the local economy significantly drove trajectories of ecosystems' development. The legacy of major changes from pristine forest to farming is visible in natural archives as novel ecosystems. Here, we present a high-resolution densely dated multi-proxy study covering the last 1500 years from a peatland located in CE Europe. The economic activity of medieval societies was highly modified by new rulers—the Joannites (the Order of St. John of Jerusalem, Knights Hospitaller). We studied the record of these directorial changes noted in the peat profile. Our research revealed a rapid critical land-use transition in the late Middle Ages and its consequences on the peatland ecosystem. The shift from the virgin forest with regular local fires to agriculture correlates well with the raising of local economy and deforestations. Along with the emerging openness, the wetland switched from alkaline wet fen state to acidic, drier Sphagnum-dominated peatland. Our data show how closely the ecological state of wetlands relates to forest microclimate. We identified a significant impact of the Joannites who used the novel farming organization. Our results revealed the surprisingly fast rate of how feudal economy eliminated pristine nature from the studied area and created novel anthroecosystems.

18 ENVIRONMENTAL IMPLICATIONS OF PAST SOCIOECONOMIC EVENTS IN GREATER POLAND DURING THE LAST 1200 YEARS. SYNTHESIS OF PALEOECOLOGICAL AND HISTORICAL DATA

Abstract author(s): Czerwinski, Sambor (Climate Change Ecology Research Unit, Adam Mickiewicz University) - Guzowski, Piotr (Center for the Study of Demographic and Economic Structures in Preindustrial Central and Eastern Europe University of Białystok) - Lamentowicz, Mariusz (Climate Change Ecology Research Unit, Adam Mickiewicz University) - Gałka, Mariusz (Department of Geobotany and Plant Ecology, Faculty of Biology and Environmental Protection, University of Lodz) - Karpińska-Kończak, Monika (Climate Change Ecology Research Unit, Adam Mickiewicz University; Center for the Study of Demographic and Economic Structures in Preindustrial Central and Eastern Europe, University of Białystok) - Poniat, Radosław (Center for the Study of Demographic and Economic Structures in Preindustrial Central and Eastern Europe, University of Białystok) - Łokas, Edyta (Department of Mass Spectrometry, Institute of Nuclear Physics Polish Academy of Sciences) - Diaconu, Andrei (Department of Geology, Babes, -Bolyai University) - Miecznik, Magdalena (Department of Nuclear Physical Chemistry, Institute of Nuclear Physics Polish Academy of Sciences) - Kołaczek, Piotr (Climate Change Ecology Research Unit, Adam Mickiewicz University)

Abstract format: Oral

We explored past environmental history of Kazanie fen (N-W Poland), in historically sensitive location between main early Piasts centres. We carried out pollen, plant macrofossil, micro- and macrocharcoal as well as non-pollen palynomorph (NPP) analyses continuously in a 1-cm resolution supported by archaeological data and historical written sources. Last ca. 1200 years of the environmental history of the Kazanie fen has been supported by a dense accelerator mass spectrometry (AMS) radiocarbon (¹⁴C) dating resolution: 19 dates per 172 cm of the profile. A very high average temporal resolution (7 yrs) enabled comparison palaeoecological records with historical events.

Despite the deforestation close to natural oak-hornbeam forests in 1035 cal. CE, according to the palynological data, no oak timber shortage and associated total deforestation in the early Piast statehood were recorded near the site as suggested by previous research.

However, Czech invasion in 1038 associated with mass depopulation and the domestic crisis reported in historical sources near the site is tentative in palaeoecological record because of probable over-representation of *Alnus* and *Betula alba* pollen. Socio-economic factors, not climate was the main catalyst of environmental changes, which intensification has started in the 14th century, as documented by historical and paleoecological data.

The prosperity period was halted by a noticeable socio-economic collapse (from 17th to 19th century) causing depopulation (by ca. 67.5%) and arable land decline by 35% near the site. Paleoecological data indicate a clear socio-environmental threshold mirrored in the decline of all anthropogenic indicators at that time. This caused rapid forest regeneration and occupation of abandonment land, however, with the dominance of pioneer pine as the main stand. Palaeoenvironmental data reported rapid landscape transformation from the beginnings of the 19th century, associated with pastures, meadows, and arable land increase, as well as microcharcoal influx from ca 1950 related to intensified industrial production.

19 SOIL MACROFOSSILS AS A LAND-USE MARKER: A CASE STUDY FROM NORTHERN LADOGA, RUSSIA

Abstract author(s): Salova, Julia (Kazan Federal University) - Belsky, Stanislav (Peter the Great Museum of Anthropology and Ethnography - the Kunstkamera) - Ponomarenko, Elena (University of Ottawa)

Abstract format: Oral

The criteria of selecting a place for the new burial ground in the forest zone by ancient populations remain poorly understood. It could be a result of a special clearing at some distinct geomorphological settings or using a previously deforested area, such as a former settlement, for instance. Theoretically, the problem could be solved by the comprehensive stratigraphical study of the multi-layered sites, but in some specific conditions, like in the North-Western Russia with very shallow soils, it seems way too complex. Meanwhile, a study of soil macrofossils may be a clue for understanding the stages of the site utilization.

We applied this approach in the study of the Kylälahti Kalmistomäki burial ground, Northern Ladoga. The site was attributed as a 14th-15th c. local parochial necropolis of the Novgorod Republic.

The excavations also revealed an underlying horizon with peculiar stone structures, belonging to an earlier period. Based on the artifact distribution, the researchers interpreted it as a cremation burial ground of so-called polttokenttäkalmisto type, partially destroyed by later burials, and dated it to the 10th-13th c.

The analysis of macrofossils from the early stage of the Kylälahti, however, discovered the composition rather typical for an occupation layer, than for any kind of a burial site. It includes numerous sherds, partially sooted, fragments of calcified and weathered bones, fish scales, charred and eroded barley grains, ergot, spikelet forks of cereals, *Chenopodium*. According to the results of the microscopy study, the economy of the local population was based on a combination of cereal farming, fishing and livestock. Thus, the period of 10th-13th c. is likely associated with the habitation site, since it indicates a fairly long-term production activity of people directly in this area. A less likely explanation might be in specific rituals used when the polttokenttäkalmisto burial ground was forming.

PYROGENIC ARCHIVES OF THE CULTURAL LAYERS ON THE TERRITORY OF THE MEDIEVAL CITY OF YAROSLAVL

Abstract author(s): Engovatova, Asya (Institute of Archaeology Russian Academy of Sciences) - Golyeva, Alexandra (Institute of Geography RAS)

Abstract format: Oral

One of the information resources on the nature and anthropogenic impacts on the city territories in the past are coals of different origin, confining in the soil, – a pyrogenic archive. Types, dimensions and rates of carbonated pieces discovered enable to establish natural fires' regularity and character. Concerning the human modified soils, they reveal anthropogenic impact on soil and landscape during the city life. One more aspect established is the set of local wood species. Carbonaceous inclusions gained during the archaeological excavations in the historical center of the medieval city of Yaroslavl, located in the center of the East European Plain, were studied as well (city layers of 1220-1238, early 13th century, mid 12th century and arable horizons of 8-10th centuries, Early Iron Age). As background markers we used samples from underlay natural soil horizons. That made possible to reveal the coal volume input into natural soils during due to economic activities. Soil samples of the Early Iron Age coming from arable horizons confine less coal than those from house infill. Anyway, differences between the samples just mentioned are little comparing to the consecutive arable horizons. The burnt bone presence in the early 13th century pyrogenic fraction is typical for cultural layers as well. The set of wood species established nearly corresponding with the middle taiga zone Yaroslavl to be located in. The oak coal pieces from those cultural layers appear to be remains of imported wood. The Early Iron Age arable horizons confine less coal impurities as compared to those Medieval. Probably, that is due both to the less usage of wood coal in fertilizing and pieces' poor preservation because of natural destruction. The culture layers traditionally confine more pyrogenic material as compared to the arable horizons, the part of larger pieces being higher (probably, the result of plowing).

A. SOCIETAL RESPONSE TO VOLCANIC ERUPTIONS: HAZARDS IN THE LATE ANTIQUE, MIGRATION PERIOD AND THE BRONZE AGE

Abstract author(s): Alinezhad, Khadijeh (Independent researcher)

Abstract format: Poster

The Late Antique in Central Europe and the subsequent Migration Period between the 5th and 7th centuries C.E. were a time of insecurity and conflict. Potential hazards driving this societal instability include political atrophy, an unfavourable climate (Late Antique Little Ice Age), pest epidemics (Justinian Plague), and abrupt climatic events such as the large volcanic eruptions in 536/539 C.E. (Oosthoek, 2013; Büntgen et al., 2016; Peregrine, 2020; Gunn and Ciarini 2021). Volcanic eruptions as a natural disturbance have frequently degraded human-environment relationship in prehistoric and historic periods (Sigl et al., 2015; Rao et al., 2017). This study will present a high temporal resolution investigation (~800 years) of a laminated lake sediment record from Kleiner Tornow Lake (Brandenburg, Eastern Germany) using a multiproxy approach: palynology, varve micromorphology, XRF geochemistry, varve counting and 14C-AMS dating.

The vegetation and climate reconstruction, specifically detecting anthropogenic pollen indicators (API) and micro-charcoal data, will enable us to feature the societal processes around the event of 536/539: In order to apply the model to Bronze Age abrupt transformations and to compare the situation between these two time sections.

As the first result of the ongoing PhD- project, our poster will elucidate human resilience during the crisis situation of this time in the form of abandonment and reforestation, transformation and adaptation in the economy, as well as human migration.

SOCIAL NETWORKS OF NON-URBAN SETTLEMENTS DURING THE EARLY AND HIGH MIDDLE AGES IN EUROPE

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Rácz, Tibor (Ferenczy Museum Centre; Pázmány Péter Catholic University) - Ødegaard, Marie (University of Oslo, Institute for Archaeology, Museum of Cultural History) - Makarov, Nikolai (Archaeological Institute, Russian Academy of Science) - Heinonen, Tuuli T. (University of Helsinki, Department of cultures, Archaeology) - Fedorina, Anastasia (Archaeological Institute, Russian Academy of Science)

Format: Regular session

This session explores the potentials of the archaeology of small finds and the built environment for the study of social networks and social organisation in Medieval Europe. Large-scale excavations, intensive field surveys and recently, professional use of metal detectors allow us to examine settlement networks on a regional level or on an even larger scale. Changes in these networks, either continuous or sudden, very often originate in changes to the social pattern.

Artefact distribution and typology of objects may be used as a research tool for understanding social patterns and networks. While the mapping of luxury objects may highlight the distribution of power and welfare in medieval societies, small finds, treasure finds or large assemblies of pottery may make equally relevant contributions to our comprehension of the social organisation of past societies. Social and hierarchical relations between and within settlements are also manifested and communicated in the built environment. Therefore, the examination of space and place can be employed to analyse the emergence, continuity and changes in

socio-cultural ideas and traditions. That way, the built environment can also be used in studying local and regional settlement patterns, reflecting the complexities of cultural contacts, the transmission of ideas and social change. This session will examine the problems and potentials of this topic. Are there any markers of social stratification in the material culture of rural communities, and what conclusions can be drawn from their spatial distribution? Can residential patterns reflect social structure and in what way? What sort of data can be employed to delineate the hierarchy of medieval settlements?

For this session, we invite speakers with new data on and approaches to material culture, settlement forms and landscape organisation to reveal the vivid and intricate social patterns of medieval communities.

ABSTRACTS:

1 (RE)ASSEMBLING THE LOCAL? HIERARCHIES AND / OR COMMUNALISM IN RURAL COMMUNITIES IN THE MIDDLE AGES IN SCANDINAVIA

Abstract author(s): Svensson, Eva (Karlstad University) - Pettersson, Susanne (Byantikvaren i Oslo)

Abstract format: Oral

Two major thought collectives are dominating the historical descriptions on social structure and organisation of rural societies in the middle ages in Scandinavia. With each thought collective usually claiming to be new research, whereas the other is old research.

The first thought collective emphasise hierarchies and social stratifications with dominating, but competing, elites, and subaltern groups such as slaves. Key in this cohort of narratives are the emergence of kingship, with allied and competing elite families and institutions such as the catholic church and the nobility, and the exploitation of various resources and people for their enrichment. Peasant are in these contexts mostly reduced to passive objects, and often victims. The second thought collective stress the importance of active and competent peasants, and play down the importance of the elites in everyday life. In this context, commons and communalism are often forwarded as key for peasant organisation.

In this paper it will be suggested that it does not have to a question of either thought collective, but that it was rather a question of both being relevant, but with differences in scale and geography.

However, as will be argued in this paper, communalism networks, and access to commons, should not be interpreted as signs of an egalitarian society. There were complex ways of imposing hierarchies, and inclusion and exclusion practices also in peasant dominated rural communities in Scandinavia during the middle ages. There were also examples of feudal initiatives within the peasant dominated rural communities.

2 TRACES OF VILLAGES, SETTLEMENTS, GRAVEYARDS, CHURCHES AND FORTS OF EARLY ÁRPÁDIAN AGE IN THE MOSON PLAIN

Abstract author(s): Czuppon, Tamás (Hansagi Museum, Mosonmagyaróvár; Pázmány Péter Catholic University) - Takács, Miklós - Langó, Péter (Research Centre for the Humanities, Eötvös Loránd Research Network)

Abstract format: Oral

The aim of our presentation to show and introduce a big settlement project, begun in December 2019. The main questions: how have affected the material culture of the analysed region the formation of the Western border of the Hungarian Principality in the 10th c. and the formation of the Hungarian Kingdom in the 11th c? From comprehensive analyzes of the Moson plain sites we expect an explanation on the questions of the alteration of the western frontier zone. This process including both traditional archaeological analyzes and archeometric examinations to get a more thorough picture about the Moson plain material culture of this era, as a region of the border area.

On the Lébény – Bille-domb settlement site ceramic classification is made for a comprehensive analysis and radiocarbon measurements are made on the chronologically relevant find to clarify the material culture of a village like settlement, not only within the ceramic making practices but also traces of trade connections in a small regional unit on the western border of Hungary.

The archaeological evaluation of the Moson stronghold will include the creation of databases of the material for structural division and internal chronological changes of the features of the excavated site and use the data of archaeozoological investigations for the reconstructing the environmental history of the Moson stronghold.

Detailed archaeological evaluation of Lébény - Kaszás-domb cemetery bring new evaluation of the cemetery based on the analysis of the archeometrical examinations and new periodization of the cemetery base on the data of the radiocarbon-measurements. The analyses will make an overview of the framework of connections to be detected in the grave goods of the western part of the Carpathian basin.

3 DYNAMICS OF NETWORKS IN A SELF-SUBSISTENT ECONOMY: THE CASE OF MEDIEVAL RURAL MOUNTAINOUS ALBANIA

Abstract author(s): Agolli, Esmeralda (Tirana University)

Abstract format: Oral

In the archaeological query, research over networks has highlighted an insightful background that attempts to explain various issues related to the control of resources, modes of production, distribution, specialization, exchange, prosperity, trade and so on. It goes without saying that the intensity and nature of networks do define some crucial dimensions to understand that beyond simple routes of communications, others factors including the movement of goods, connection with market, or the character of exchange contribute a great deal to explain the socio-economic dynamics of any given society. By taking into account this potential, against the socio-economic backdrop I discuss the nature of networks in the pre-urban communities of rural medieval mountainous (14th -19th century) Albania.

By focusing on ethno-historic sources, I seek to analyze what kind of social and economic parameters establish the models of networks in these communities. How do communities in self-subsistence, deeply dependent from the sources of their environment and in a steady demographic growth perceive 'the connections' beyond the borders of their kin. To what extent a social custom such as blood feud remains a focal indicator to establish any kind of social and economic network both inside and outside.

I argue that patriarchal ties and extensive loss of human resources through blood feuds keep these communities to a highly isolated setting. By constantly and intensively developing an internal conflict among each other they increasingly a weaken any potential socio-political cohesion or interconnections. In the economic spectrum, for over five centuries, they do not overcome the level of a self-subsistent economic model with limited exploitation of natural resources, household production and only develop casual connections with the regional markets. Both these dynamics define limited and sporadic networks leaning mostly towards an increasing degree of self-isolation.

4 CHRISTIAN METALWORK AT THE RURAL SITES OF SUZDAL' REGION, UPPER VOLGA: NEW EVIDENCE ON CONVERSION AND IDENTITY

Abstract author(s): Makarov, Nikolaj - Zaytseva, Irina (Institute of Archaeology Russian Academy of Sciences)

Abstract format: Oral

Medieval cross-pendants, reliquary crosses and other categories of metalwork with Christian visual motifs constitute an important cluster of archaeological records which is under discussion in connection with the problems of identity and Conversion of Rus'. Rapid growth of this group of artefacts with the broader use of metal detectors in field research puts on the agenda re-examination of the aspects of the scale of their production, their spread, cultural attribution and ritual use. The paper explores Christian metalwork from the sites of Suzdal' region, which represents one of the largest regional collections of the objects of personal devotion in Rus' with more than 300 artefacts, accumulated mostly during the two recent decades through the fieldwalking at the rural sites. Recent statistics indicate that Christian objects of the XI-the-XIII-th cc should be regarded as one of the most numerous categories of metalwork, equally common at the rural sites (finds were recorded at 56 sites) and in the towns of Suzdal' region. The scale of their production and use appears to be much wider, than it was previously believed.

Pectoral crosses and reliquary crosses were first introduced to Suzdal' region in the first half of XI-th c. and became widespread in the XII-th c. Find context and artistic character of the artefacts reveal that they were spread among considerably wide groups of population, not limited to the elite or clergy. Examination of the spatial and chronological distribution of the artefacts, provides significant new data on the cultural identity of the rural communes and the Conversion of the region which formed the far periphery of Christian Europe in the XI-XII cc.

Research was supported by the Russian Foundation for Basic Research, № 17-29-04129.

5 THE CHALLENGE OF CLASSIFICATION AND SOCIAL INTERPRETATION OF HIGH AND LATE MEDIEVAL METAL FINDS. THE CASE OF PEST COUNTY, HUNGARY

Abstract author(s): Rácz, Tibor (Ferenczy Museum Centre)

Abstract format: Oral

The intensive application of the metal detector device and the growing number of metal finds delivered to the local museums in the last decade has gradually led to the creation of a new database, complementing the data of earlier field surveys and large-scale excavations. The systematic, complex evaluation of these finds has not yet begun; research has dealt in detail only with the analysis of particular objects or several object types.

In my presentation I'll seek to evaluate the metal finds of about forty medieval settlements of the Pest Plain and the Gödöllő Hills lying in Pest County, Hungary. Some of them yielded a few dozen, others several hundred metal finds from the High and Late Middle Ages.

Even assuming the accidental character of the sampling, the large amount of medieval finds is suitable for analysis and a plastic picture of the village network system can be drawn at a regional level. The analysis is prepared by defining and grouping the finds (costume elements, agricultural equipment, household items, liturgical objects, etc.), dating and summing up the numerical data. By

investigating merely on the level of objects, I'll try to answer the following questions: What were the typical, widespread metal finds of medieval settlements? What counts as rare, or exceptional, especially valuable, how often they appear in rural setting, and what kind of social network can they be embedded into? Is it possible to draw conclusions on the size, richness and hierarchical status of a settlement by qualitative and quantitative evaluation of metal objects? Can we delineate on the map the centres and peripheries of the region? To what extent can we correlate our conclusions to excavation data and current state of historical research?

6 RECONSTRUCTING THE RURAL-URBAN NETWORKS IN THE MEDIEVAL AURAJOKI RIVER VALLEY, FINLAND

Abstract author(s): Pellinen, Hanna-Maria - Immonen, Visa (University of Turku)

Abstract format: Oral

The Aurajoki River Valley in South-Western Finland belongs to the northernmost regions of medieval urbanism. The development of the town of Turku, founded around 1300, is relatively well known, but its surrounding rural settlement has remained poorly understood. In this paper, we will present the new archaeological project that surveys and evaluates the non-urban settlement pattern in the river valley and its dynamics with the urban area. The rural settlement organized into villages began in the river valley in the 5th to 13th centuries, but in the 13th and 14th centuries, a denser village structure and the open-field system emerged. This occurred at the same time as the establishment of the first inter-regional authorities, i.e. the Church, and the Kingdom of Sweden in Finland, and founding of the town. So far only one of the rural villages has been excavated thoroughly, but our project is the first attempt to survey the remaining traces of medieval village in detail, and select some of them for further archaeological inquiry. Presently, the reconstruction of the medieval settlement pattern can be based on the preliminary results of the survey, which can be compared with early modern taxation records. Moreover, the recent boom in amateur metal detecting has discovered new evidence of rural life. The assemblage of metal finds forms an interesting, but challenging contrast with previous archaeological scholarship on the medieval Aurajoki River Valley as it has been mainly based on the distribution of imported and local ceramics in known central sites. In our paper, we will discuss the problems and possibilities of combining the different kinds of sources and evaluate what they can reveal about the rural-urban networks in the Aurajoki River Valley.

7 FARMER, PRIEST OR NOBLEMAN? NEW AND OLD FINDS FROM DROWNED MEDIEVAL TERPS IN THE WADDEN SEA (NORTH FRISIA, GERMANY)

Abstract author(s): Blankenfeldt, Ruth (Zentrum für Baltische u. Skandinavische Archäologie, Schloss Gottorf) - Kloß, Stefanie (Archäologisches Landesamt Schleswig-Holstein) - Majchczack, Bente Sven (Christian-Albrechts-Universität zu Kiel; ROOTS Cluster of Excellence) - Hadler, Hanna (Johannes Gutenberg-Universität Mainz) - Wilken, Dennis (Christian-Albrechts-Universität zu Kiel)

Abstract format: Oral

During the great storm surge of 1362, large parts of a flourishing cultural landscape in the coastal marshlands of North Frisia (northern Germany) were devastated.

While some parts of the settlements were preserved and agricultural land could be reclaimed after the flood, other parts sank permanently into the sea. Remnants of the lost terp-sites and their farmland are preserved beneath the present-day Wadden Sea surface. Archaeological research of these terp areas has a long tradition, especially in the vicinity of "Hallig Südfall". However, for over a century, the documentation of settlement features and the collection of finds has been based on random exposure through the morphodynamics of the tidal flats. Currently, a more systematic approach with regular surveys, using drone photography, field-walking, and metal detection aims to get the bigger picture behind the find sites. Magnetic prospecting and geoarchaeological drilling complement the insight into the settlement patterns of the terps.

This paper focuses on a settlement territory called "Reventlow-area" which yields a large spectrum of outstanding finds from the 12th-14th century. Local and imported pottery as well as metal objects including pilgrim badges, brass bowls and bronze tripod skillets together with folding scales and weights indicate the participation in extensive trade and communication networks. Comparison with finds from other sunken terp sites in the area show a high level of conformity in material culture throughout the region.

In addition, the find material provides a broad basis for the discussion about the status of the inhabitants: numerous swords and parts of sword belts as well as objects with liturgical appearance and valuable vessels seem to exceed the spectrum of objects that would be expected for a farming community. This raises the question of whether the North Frisian marsh dwellers held an exceptional social status.

8 MEDIEVAL RURAL COMMUNITIES THROUGH THE SPACE AND FINDS. TOUCHES TO THE PICTURE

Abstract author(s): Fedorina, Anastasia (IA RAS)

Abstract format: Oral

The corpus of narrative sources on Medieval Rus' shows, though vaguely, how swiftly the social structure changed from the "Viking Age" to the "High Middle Ages." That means the increase of social groups and property groups that have a name of their own. They

are mentioned in chronicles and legal documents, as we can see that they were not equally protected by law. For now, urban social structure is researched more or less. It is especially true for Novgorod Velikiy. As for the rural communities of Northern Rus' of 10-14 centuries, they are objective reasons for them to be less researched.

Dealing with archeological data, we have to assume that one's property status indirectly correlates with one's social position. So, could we use archeological data to estimate property (if not social) status in rural communities? It is important to see if we can mark how the welfare of separate households and their owners differ from each other and estimate the diversity of social communities.

During the last decades, Suzdal Opolie has produced vast material that characterizes rural settlements and can be looked upon as a basis for a search for such criteria and research tools.

Cultural layer of a significant part of these sites has been considerably disturbed by ploughing-up. Nevertheless, using the spread of ceramics and other artifacts, we can, with a certain degree of conditionality, mark the boundaries of separate estates and

reveal the principles of use of the built-up area. Therefore, we can compare material culture of different households and their expected property status. Another aspect that might reflect the changes in the structure of social community could be the change in the settlements layout itself.

9 WISKIAUTEN/MOKHOVOYE – FOUR RURAL SATELLITES OF A TRADING CENTRE

Abstract author(s): Sirkin, Annika (Centre for Baltic and Scandinavian Archaeology)

Abstract format: Oral

In a dissertation completed in 2020, four settlement areas were analysed which seem to be closely related to an as yet undiscovered local Early Medieval trading centre. The research area is located near the Baltic Sea coast and the Curonian lagoon in Kaliningrad oblast, Russia (former East Prussia). Since the mid-19th century, numerous investigations have been carried out in a nearby burial site known as Kaup. It contains around 500 burial mounds and valuable objects of Scandinavian origin, as well as flat Prussian double-layer graves with rich horse equipment and horse offerings.

The settlement studies in Wiskiauten/Mokhovoye were carried out from 2005 to 2011 by Timo Ibsen (Schleswig). Due to its size and the interdisciplinary research, this site is considered to be the best researched of the region. It yielded a large number of small finds with imports e.g. from Scandinavia and the Rus'. Especially the silver coins (dirham, denier and Byzantine miliaresia) and weights indicate amber trade. Besides the increase of activities in the Early Medieval Time two of the village-sized settlements provide proof of a long lasting settlement continuity.

In the sum of the evidence, it seems obvious that an Early Medieval port of trade must have existed somewhere in the North of the Sambian peninsula, to which the settlements acted like satellites. Since the building structures were badly affected by agriculture, it is difficult to reconstruct the social hierarchies between the four settlement areas. However, the extraordinary amount of more than 130 14C-data gives a good insight into the timeline of the settlement network in the region. Thus the current study sheds new light on the social dynamics and the trading mechanism between the supposed trading port and its hinterland. Furthermore, a new interpretation of geological data gives hints on the supposed location of this trading centre.

10 UPLAND VILLAGE NETWORKS: FUTURE PERSPECTIVES FOR THE ANALYSIS OF THE LANDSCAPE IN THE 5TH-9TH CENTURIES UPPER ARLANZA BASIN (BURGOS, SPAIN)

Abstract author(s): Domingo Ribas, Guillem (Newcastle University) - Medina Gordo, Sonia - Álvaro Rueda, Karen - Travé Allepuz, Esther (University of Barcelona)

Abstract format: Oral

The numerous archaeological sites on the mountain area between the headwaters of rivers Arlanza and Duero (Burgos), in Northern Spain, have drawn the attention of researchers since the 1970s. All of them are known for their rock-cut graves on the sandstone soil, at least dating from the 6th century onwards, arranged around a little church, chapel or hermitage with a foundation carved on the rock floor. Although certain aspects remain partially unexplained, these cemeteries were the main concern of archaeological research. Moreover, between the aforementioned centuries, settlement patterns in the Iberian Peninsula were heterogeneous, manifested significant microregional differences, and entail a complex analysis with scarce written and archaeological sources. Altogether, this led to limited landscape narratives due to a lack of information regarding the habitat, as well as its relation to the funerary areas.

Therefore, in order to properly assess the influence of these communities and their funerary practices on the territory, it becomes vital to create a detailed archaeological record. In this regard, six excavations at the site of Revenga (Burgos) and different archaeological surveys have been carried out over the last years and provide essential information to address the configuration of the landscape, and its underpinning social organisation. Thus, our work intends to complement the archaeological register with data about the natural and geographical aspects of the territory. GIS technologies will be employed in conjunction with quantitative methods to analyse the individual characteristics of each site, which will be linked with the general properties of the settlement network. This will be aimed to identify spatial patterns at various scales, the existence of territorial hierarchies, or any peopling processes. The final archaeological record will contribute significantly to understand the settlement patterns, the establishment of early medieval villages and the development of the Christian landscape in the Upper Arlanza Basin.

11 RURAL SETTLEMENTS ON THE SITE OF MONASTERIES IN THE REGION OF MEDIEVAL NOVGOROD

Abstract author(s): Kudryavtsev, Andrey (Institute of Archaeology Russian Academy of Sciences)

Abstract format: Oral

Already in 12-13 centuries numerous monasteries were founded in the district of Novgorod. As in the rest of Ancient Russ, these connecting centers of Christian culture played a significant role in the social organization of the city and the city district. As shown by archaeological researches of some Novgorod monasteries, it did not arise on an empty place. In general, the monasteries were preceded by unfortified rural settlements, which appeared already in the X century – the initial period of the urban history of Novgorod.

Studying of the topography and material culture of these settlements adds lots of new data to the field of research of the Novgorodian rural district. The exploration of the processes of transformation of rural settlements into monastic ones is the most important case, especially in the framework of stratigraphic observations. These processes immediately raise a number of unresolved issues: how (much) does the cultural layer of a rural settlement differ from that of a monastery? how are the living area and the necropolis subsequently divided?

The next point of the research is the identification of complexes related to the monastic period. It includes an analysis of things belonging to the circle of Christian antiquities and marking the daily life of the inhabitants of monasteries; amphorae, items of personal piety, pilgrimage items.

Today, the rural Novgorodian region is insufficiently studied, but such researches will allow us to analyze its formation and development. The study of the subsequent process of the foundation of monasteries on the site of rural settlements, the initial period of their history, poorly covered by written sources, has a great potential for exploration. Comparing the urban environment of Novgorod and the isolated spaces of monasteries in the region of medieval Novgorod will give very important results for its urban development history.

12 FINDS FROM THE RECENTLY DISCOVERED PRUSSIAN MEDIEVAL SETTLEMENT INDICATE CONTACTS BETWEEN THE INHABITANTS OF KIEVAN RUS' AND THE OLD PRUSSAINS

Abstract author(s): Prassolow, Jaroslaw Aleksei (Centre for Baltic and Skandinavian Archaeology - ZBSA; Institute of Archaeology of Russian Academy of Sciences - IA RAN) - Skvortsov, Konstantin - Khokhlov, Aleksandr (Archaeological Institute of the Russian Academy of Sciences - IA RAN)

Abstract format: Oral

Before the WWII, the former East Prussia was one of the best archeologically studied regions in Europe. The emphasis of research was placed on burial mounds, rich cemeteries and to a lesser degree hillforts. Open settlements, on the contrary, remain insufficiently studied even despite the intensification of their research in the last decades. It is difficult to overestimate the importance of their studies both for the reconstruction of the local settlement structure and that of the material culture and contacts of the Old Prussians.

Of great interest is a recent discovery of an unfortified settlement of Privolnoye (former Gunthenen), Kaliningrad region of Russia, which is preliminary dated into the 11th-12th centuries. The results of the first archaeological studies testify to the unordinary character of the monument. Stone pavements in its central part represent the remains of residential and outbuildings. A large number of bronze ingots, bronze and silver smelts and trimmings, weights and casting molds, numerous items indicate presence of a manufacturing center in the settlement. Of particular interest is a stamp for silver lunula plates, which full analogues are known only in the territory of modern Latvia. Finds of coins of the 10th-11th centuries Arab and European rulers indicate a high social and prosperity of the settlement inhabitants. A unique find in the Old Prussians area is an old Russian hanging seal of the Novgorod and later Pskov prince Vsevolod Mstislavich (c. 1095 - 1138), which was originally fastened to a scroll. This find is the first reliable material evidence not only of the assumed contacts between the inhabitants of the region and those of the Kievan Rus' principalities in the 12th century, but also a direct evidence of physical movement of people and objects between the principalities in question and the lands of the Old Prussians.

13 RURAL NETWORKS OF MEDIEVAL STONE MASONS IN EASTERN NORWAY

Abstract author(s): Reinfjord, Kristian (University of Bergen)

Abstract format: Oral

How were networks of Medieval stonemasons distributed in rural Norway, and how can they be read in an archaeological material of the built environment? By studying the stone technology behind the rural parish church, one gets a glimpse into the social networks of masons. The introduction of stone architecture in Norway in the 12th century laid ground for a new social group of craftsmen, changing building traditions from wood to stone. Established at the cathedrals' building huts, foreign masons were unfamiliar with Norwegian social structures, but developed regional knowledge from the early- to high Middle Ages. The proposed paper study how rural networks of masons distributed and developed in networks of eastern Norway. Meteorologically, this is done by mapping non-human actors such as particular stone quarries, tool marks and architecture, as found as artefact distribution of ashlar, moulded portals, and windows from the central cathedral to the rural parish churches of Eastern Medieval Norway. Architectural dis-

tribution, as seen in stone technological features, further mirror how spatial distribution of parish settlements was used by church builders in consolidate the bishopric.

14

THE ROUND BUILDING FOUND IN TATABÁNYA-DÓZSAKERT

Abstract author(s): Némethi, János (Pázmány Péter Catholic University, Institute of Archaeology, Budapest)

Abstract format: Oral

Pit dwellings with round layouts have been a long-debated topic in the archaeology of the early Magyars. In the late 19th century, scholars thought that the conic shaped river cane huts of Hungarian herders came from conquest era buildings, and were related to traditional finno-ugrian round lavvu tents. Proper archaeological investigation of Árpád-age rural buildings began in the 1950's by István Méri, rewriting these theories. However, the few dwellings with round layouts that do exist – and their possible relations to the nomadic yurt – remain an interesting topic. One of the most unique ones was found in Tatabánya-Dózsakert by Gábor Vékony. The building had Wattle and daub walls and most likely a thatched roof.

Some other Árpád-age round buildings have also been excavated in the Carpathian basin. Among these, the dwelling of Tatabánya represents a rather rare version. Eastern analogies can also be found, the closest are from the Don and Donets region (Krimskoje Gorodische, the left bank Cimljansk fortress, Novalimarivska, Dmitrievskoje).

Finds in the round building of Tatabánya mostly consist of pottery sherds typical of the 10-11th century. One fragment, however, is the shell-shaped handlepiece of a clay cauldron, which has analogies both in the late Avar period of the Carpathian basin and in the Saltovo culture. This find may suggest that some remains of the late Avar population were present within the common folk of the 10-11th century Hungarian state.

The function of round buildings in early medieval rural settlements in Eastern Europe still cannot be decided for sure. What we know for sure is that if they were present, there was only one or a few in a settlement. Different researchers have thought them to be storage houses or pices for the hand mill. In some cases they were definitely used for living.

340

IMPR - PHYTOLITHS AS A PROXY FOR PALAEOENVIRONMENTAL RECONSTRUCTION

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Peto, Ákos (Hungarian University of Agricultural and Life Sciences) - Kirleis, Wiebke (Kiel University, Institute of Pre-historic and Protohistoric Archaeology)

Format: Regular session

Worldwide, phytoliths are used as a proxy to identify changes in vegetation and environments through time. These changes may reflect ecological processes, climatic shifts and/or anthropogenic activities useful to understand the past of human societies and landscapes. Thanks to their resistance to degradation, phytoliths usually preserve well also where other kinds of organic remains are lacking. They can be found in very old deposits (up to 60 million of years), but also have been used to characterize modern ecosystems. Often phytolith studies are carried out in multiproxy palaeo-environmental investigations. For instance, being well representative of grassland ecosystems, they are complementary proxies to charcoal and pollen analyses, and are useful for the reconstruction of forest history.

The session "Phytoliths as a proxy for palaeoenvironmental reconstruction" invites contributions that use phytoliths for paleoecology, paleoclimatology, and paleobiogeography. According to different sets of archives, e.g. from lake sediments to soil sequences, phytolith studies that are carried out in natural settings and/or in relation with archaeological sites or cultural developments are welcome without any chronological and geographical restriction. Studies where the phytolith record is associated and compared to other palaeo-environmental proxies are also very welcome.

This session is part of the 12th International Meeting for Phytolith Research, or IMPR, the official scientific conference of the International Phytolith Society.

ABSTRACTS:

1

PHYTOLITHS AS PALAEOENVIRONMENTAL INDICATORS IN AFRICA AND EARLY HUMAN EVOLUTION: THE GOOD, THE BAD, AND THE UGLY

Abstract author(s): Barboni, Doris (CEREGE - Aix Marseille University, CNRS, IRD, INRAE, Coll.France)

Abstract format: Oral

The first phytolith studies on the African continent were undertaken in the 1990s. Since then, different approaches have furthered the taxonomic interpretation of phytolith morphotypes, others have improved the ecological and climatological interpretation of phytolith assemblages, while some have contributed to our understanding of the silicon cycle in the tropics. So now, some 30 years later where do we stand? I propose here to look at the positive aspects, the negative ones and the things that could or should have been done better, but were not, regarding the study of phytoliths to document paleovegetation at hominin sites. Three cases studies will be presented: (1) The success story of palm phytoliths in tracing oases in the drylands of Africa (featuring the Aramis and Olduvai sites) (the good); (2) The possibly silent phytolith record of Ethiopian montane forests (featuring the Melka Kunture sites)

(the bad); and (3) the poorly known phytolith signal of Amaranthaceae and other abundant herbaceous taxa in eastern Africa (the ugly). This lack of knowledge is an issue given that herbaceous plants other than Poaceae and Cyperaceae may have contributed significantly to the increase of C4 biomass recorded in eastern Africa over the last 10 million years and which is perhaps wrongly interpreted as an expansion of C4 grasslands.

2

EARLY GRASS PALEOECOLOGY IN THE PALEOCENE-EOCENE OF THE SAN JORGE BASIN, ARGENTINE PATAGONIA

Abstract author(s): Stiles, Elena - Strömberg, Caroline (University of Washington; Burke Museum of Natural History and Culture) - Erra, Georgina (CONICET - Museo de La Plata, Geociencias) - Gelfo, Javier - Goin, Francisco (CONICET - Museo de La Plata, División Paleontología Vertebrados) - Kohn, Matthew (Boise State University, Geosciences) - Madden, Richard (University of Chicago, Org.Bio./Anatomy) - Traylor, Robin (UC Merced, Natural Sciences) - Bauza, Nicolas (CONICET - Museo de La Plata, División Paleontología Vertebrados; Universidad Nacional de La Plata) - Gallaher, Timothy (University Of Washington, Biology; Bernice Pauahi Bishop Museum)

Abstract format: Oral

Modern grasses in the family Poaceae exhibit exceptional taxonomic and ecological diversity, with grassland-dominated habitats covering about 40% of Earth's land surface. Grasslands today occur in a range of temperate to tropical ecosystems, spanning low to high altitudes and wet to arid climates. However, because of the scant fossil record of grasses before the global Oligocene-Miocene spread of grasslands, the ecology of early grasses and their environmental affinities remain poorly understood. To address this gap, we analyze phytolith assemblages extracted from sediment samples collected at the Estancia Las Violetas locality to reconstruct the vegetation of the late Paleocene - early Eocene Rio Chico Group in the San Jorge Basin of Argentine Patagonia. The coastal low-land deposits of the Las Violetas and Las Flores formations of the Rio Chico Group, dated from 57.9±1.1 Ma to <50.6±0.8 Ma, produced phytolith assemblages comprising among the oldest occurrences of grass phytoliths in the fossil record of South America. Preliminary results of phytolith analyses suggest that early grasses in the Paleocene and Eocene of the San Jorge Basin occurred in low abundances in palm and dicot dominated forests. Further analyses of the studied phytolith record will allow us to (1) reconstruct the vegetation and, thus, the ecological context of early grasses, and (2) test for broad floristic changes across the Paleocene - Eocene transition in southern South America, contributing to our understanding of the impact of this period of extreme global warming on terrestrial ecosystems in the Southern Hemisphere.

3

PALEOECOLOGICAL FUNCTIONS OF SHAFTS OF THE DYAKOV CULTURE (EARLY IRON AGE) IN THE MOSCOW REGION (RUSSIA)

Abstract author(s): Golyeva, Alexandra (Institute of Geography RAS) - Koval, Vladimir (Institute of Archaeology RAS) - Syrovatko, Aleksandr (Archaeological centre of Kolomna, Moscow region)

Abstract format: Oral

Several ramparts of fortified settlements of the Dyakovo culture, located in the southeastern part of the Moscow region, were investigated. It was revealed that all the ramparts were built using significant amounts of household waste. In all cases, there are layers situated within the ramparts showing high total phosphorus content and microbiomorphs (mainly phytoliths and diatoms). This means that these organic matter layers, presumably deriving from manure or household waste were always present in the studied embankments. Consequently, the observed difference of the composition of the embankments is not accidental. Moreover, each shaft has an independent alternation of enriched and depleted organic layers, i.e. there was no single scheme for creating the shaft. Thus, the ramparts of the Dyakovo type settlements were multifunctional. They had both fortification and ecological significance, being a place of discharge of mud and manure accumulated at the place of settlement. The rampart itself was always built on anthropogenically modified soil, and not on the surface of the natural zonal soil.

4

PALEOENVIRONMENTAL RECONSTRUCTION OF CONDITIONS RELATED TO THE OCCURRENCE OF STONE LINES IN PARAÍBA DO SUL VALLEY, SOUTHEASTERN BRAZIL

Abstract author(s): Coe, Heloisa Helena (University of the State of Rio de Janeiro; Fluminense Federal University) - Seixas, Amanda (Fluminense Federal University) - da Silva, André Luiz (University of the State of Rio de Janeiro) - Lepsch, Igo Fernando (University of the State of São Paulo) - Parolin, Mauro (University of the State of Paraná) - Macario, Kita (Fluminense Federal University)

Abstract format: Oral

The Paraíba do Sul River Valley, located between São Paulo and Rio de Janeiro, the two largest cities in Brazil, comprises a highly altered area with weathered and eroded soils, which emphasizes the need for studies aimed at understanding its evolutionary and environmental dynamics. In this area, the original composition of the Atlantic Forest is currently represented only by small mosaics on a landscape of extensive pasture. This study aims to reconstruct the paleoenvironmental conditions of the Middle Paraíba do Sul River Valley in the late Quaternary and to infer possible changes in climate and vegetation, associated with the occurrence of stone lines. The methodology was based on phytolith, isotopic, soil and 14C-AMS analyses. Some variations in tree density were identified. In the period prior to 9,000 years cal BP, the vegetation was predominantly sparse, in a drier environment, and with lower average temperatures than the current, after which the environment became more humid and the vegetation more arboreal. In the period between 9,000 and 8,200 years cal BP, when the formation of stone lines occurred, it was drier than the previous period, but from

2,900 years cal BP, the environment became progressively more humid and similar to the current environment. The hypothesis of the genesis of the stone lines is one of short distance colluviation linked to periods of concentrated rainfall, with the ability to transport coarser material, since the analysed pebbles are angular and subangular, indicating little reworking.

5 PALAEOENVIRONMENTAL RECONSTRUCTION OF THE PARAÚNA RIVER BASIN, MINAS GERAIS, BRAZIL, THROUGH PHYTHOLITS

Abstract author(s): Dias, Raphaella (Universidade Federal Fluminense) - Coe, Heloisa (Universidade Federal Fluminense; Universidade do Estado do Rio de Janeiro) - Vasconcelos, Alessandra (Universidade Federal dos Vales do Jequitinhonha e Mucuri) - de Carvalho, Alex (Universidade Federal de Minas Gerais) - Chueng, Karina - Macario, Kita (Universidade Federal Fluminense)

Abstract format: Oral

This study aims to investigate paleoenvironmental conditions and infer possible climate and natural landscape changes, in association with geomorphological and fluvial processes in the Paraúna River basin, Southern Espinhaço Mountain Range, Minas Gerais, Brazil. Soil samples were collected in 6 profiles. Throughout the Quaternary, fluvial processes, conditioned by climate, lithostructure, neotectonic movements, and, more recently, by anthropic activities, have contributed to the sculpting of landforms and the development of Phyto physiognomies in this basin. Plants respond to changes in the water table level, soil, and water availability or seasonal flooding, course of rivers, erosion, and transport. The amount of organic carbon and phytoliths in the soil has varied trends, according to the fluvial deposition and erosion processes. In some profiles, phytoliths are well preserved, but phytoliths are also destroyed and corroded in areas subject to direct river action. The predominant phytolith types were TRACHEARY, POLYHEDRAL, ELONGATE, BILOBATE, BLOCKY, and BULLIFORM FLABELLATE, in addition to PAPILLATE in flooded environments. The tree density index was always low and varies according to migration and displacement of the rivers, indicating that the tree coverage was denser when the river was displaced, suggesting that the limiting factor for vegetation in these areas is not the climate but mainly the availability of water. The dates ranged from 17,360 to 1,790 years cal BP. Elementary phytolith, carbon and nitrogen analyses have shown to be very promising in the understanding of geomorphological evolution and environmental changes, especially when associated with other indicators, such as granulometry.

6 PALEOENVIRONMENT AND CLIMATE EVOLUTION RECONSTRUCTION FOR THE LAST 11KA YEARS ON THE COASTAL PLAIN OF SOUTHERN BRAZIL THROUGH MULTI-PROXY ANALYSIS

Abstract author(s): Trein Salgado, Eduardo - Pimentel Mizusaki, Ana Maria (UFRGS) - Ferreira Chueng, Karina (UFF) - Gomes Coe, Heloisa Helena (UFF; UERJ) - Cardoso Pacheco Evaldt, Andréia - Girardi Bauermann, Soraia (ULBRA)

Abstract format: Oral

Butiazal is a native palm grove ecosystem that occurs in southern Brazil, Uruguay, and Argentina. It is characterized as savanna dominated by palm trees from the Butia genus, which are threatened by monoculture and livestock farming. The Butiazal de Tapes (30°31'39.86"S, 51°21'31.02"W) region is located in southern Brazil on the western shore of the Patos Lagoon and is a remnant of this ecosystem. In this region there are outcrops of Pleistocene coastal deposits, which have been exposed to the Holocene climate and the influence of coastal dynamics. It is therefore an excellent location for palaeoclimatic and palaeoenvironmental reconstruction of the past 11,000 years, in order to understand how this unique ecosystem evolved during this time frame, and which factors were most important in this evolution. For such a reconstruction, analytical tools such as bioindicators (phytoliths and palynomorphs), charcoal particle counting, X-ray diffractometry analysis, total organic matter content determination, granulometry analysis, and carbon-14 AMS dating were performed on a 2 m sediment core. Indications of the presence of Butia in the region from at least 11,125 to 10,751 yr cal BP were identified, along with the importance of the climate during its formation and expansion. Although the climate changes in the analysed interval were not expressive, it was possible to divide the profile into 4 zones according to plant cover and observe the influence of sea-level shifts during the Holocene on the evolution of the palaeoenvironment in the region, along with the evident human influence on vegetation evolution. The data obtained on the butiazais, which are not previously published in Brazil, are relevant for understanding the evolution of the region's climate and environments and for the environmental preservation of its native ecosystems.

7 PALEOENVIRONMENTAL RECONSTRUCTION OF THE NORTHERN COAST OF RIO DE JANEIRO, BRAZIL, THROUGH SILICA BIOMINERALIZATIONS

Abstract author(s): Coe, Heloisa Helena (University of the State of Rio de Janeiro; Fluminense Federal University) - Gomes, Jenifer (Fluminense Federal University) - Gomes, Emily (University of the State of Rio de Janeiro)

Abstract format: Oral

The delta plain of the Paraíba do Sul river, on the northern coast of the state of Rio de Janeiro, Brazil, is an important area for paleoenvironmental studies, although studies on vegetation through silica biomineralizations are unprecedented in this region. The evolution of that delta plain gave rise to several lagoons formed under different regimes of sea level and climate variations. This region is also heavily influenced by disorderly occupation that has removed much of the original vegetation cover, replacing it with large sugar cane plantations and pastures. Given the importance of these coastal areas for ecosystems, and due to their vulnerability, this paleoenvironmental reconstruction through silica biomineralizations contributes to the understanding of current and past dynamics in the area. Four geological cores were collected and analyses of phytoliths, sponge spicules, and diatom frustules,

sediment granulometry, shell identification, and 14C-AMS dating were carried out. Areas with distinct environmental characteristics were identified. Some were associated with phases of a more continental environment, with finer granulometry and a predominance of terrestrial indicators. In all the cores, the continental or estuarine phase was replaced by a greater presence of liquid surfaces, probably associated with the maximum of the Holocene transgression, about 5,000 years BP. In the most superficial zone of all the cores, a coastal environment was identified, with predominantly herbaceous terrestrial vegetation and flooded areas, and a significant presence of aqueous bodies of fresh water and strong marine influence. This phase is probably linked to a period of marine regression from 4,000/3,700 cal years BP. More recently, human activity has also greatly contributed to changes in the region's vegetation and drainage system. Multi-proxy analysis contributed to a better understanding of the depositional environment dynamic, evolution, and complexity on this part of the Rio de Janeiro coast.

8 PHYTOLITH ANALYSIS INDICATES GRASS COMMUNITY CHANGE BETWEEN THE MIDDLE MIOCENE AND THE EARLY PLIOCENE IN THE CENTRAL ANDEAN ALTIPLANO (PERU)

Abstract author(s): Crifò, Camilla - Bremond, Laurent (Institut des Sciences de l'Evolution de Montpellier - ISEM, EPHE, PSL Research University, Université de Montpellier, CNRS, IRD) - Jaramillo, Carlos (Smithsonian Tropical Research Institute; Institut des Sciences de l'Evolution de Montpellier - ISEM, EPHE, PSL Research University, Université de Montpellier, CNRS, IRD) - Strömberg, Caroline (Department of Biology and Burke Museum of Natural History and Culture, University of Washington)

Abstract format: Oral

The Tropical Andes belong to the world's biodiversity hotspots, yet our knowledge of the evolution of Andean ecosystems is limited. Palynological evidence from the Amazonian submarine fan, and a marine core in the Ecuadorian Pacific suggests that Andean treeless, high-elevation vegetation (Paramo and Puna) occurred at least by the late Miocene. Palynological evidence from the Descanso Formation in the CAP suggests that a Puna-like ecosystem replaced a mixed vegetation characterised by tropical lowland and montane families around 4.8 Ma, shortly after the Andes had risen to near-modern elevations. It is further thought that Andean uplift caused major changes in climate patterns, resulting in the opening of new ecological niches likely favouring colonisation by grasses. Indeed, grasses are a major component of the modern Puna biome. Yet grass communities of the Descanso Formation are poorly known due to the paucity and low taxonomic resolution of the Poaceae macrofossil- and palynological record.

We analysed phytolith assemblages from Member B (18.7-9.1 Ma) and C (~4.8-3.9 Ma) of the Descanso Formation to reconstruct the evolution of grass ecosystems in the CAP. Our data show a major shift in grass communities between the two members. Thus, most of the dominant grass silica short cell phytoliths (GSSCP) in Member B are entirely absent in Member C, indicating floral and ecological turnover, in agreement with previous vegetation reconstructions. Furthermore, dominant GSSCP in Member B could not be linked to any known extant grass taxon, although their morphological features suggest a putative affinity with the subfamily Bambusoideae. Similar GSSCP have been reported from Eocene-Oligocene strata of Patagonia, Argentina, in non-analog vegetation types. We hypothesise that these grasses belonged to an extinct clade related to bamboos with unclear ecology. The ongoing study of modern plant and soil phytoliths from the CAP will help elucidate the origin of these grasses.

9 FLABELLATE PHYTOLITHS IN AQUATIC AND TERRESTRIAL ENVIRONMENTS: AN EXPLORATION OF MORPHOLOGY, MORPHOMETRY AND ENVIRONMENTAL ASSOCIATIONS

Abstract author(s): Cordova, Carlos (Oklahoma State University)

Abstract format: Oral

Flabellate silica phytoliths form in the bulliform cells on the adaxial surface of leaves of grasses and other monocots. Their variations in shape, size and abundance have been the subject of many studies characterizing wild and domesticated grasses. Although they have received much less attention than other grass phytoliths, a few studies have linked them to particular taxonomic groups while others to particular environments and climatic conditions. This study explores the shape, size of flabellate bulliforms and their abundance in relation to other grass phytoliths in two different sequences in aquatic environments, and one modern transect in terrestrial environments.

In a stratigraphic sequence in a wetland in Azraq (Jordan) flabellate phytoliths vary from a smaller size in the LGM to a larger size into the Holocene, suggesting changes in evaporation possibly related to summer insolation. At this locality, shapes are predominantly fan-shaped and closely associated with Phragmites grasses. In a lacustrine stratigraphic section from Lake Ngami (Botswana), shape and abundance vary along a 17,000-year sequence. Flabellate sizes tend to be less variable across the profile, but abundance and shape vary considerably. Finally, along a sequence of modern surface samples across South Africa, variations occur in shape and size in relation to temperature and precipitation of the wettest month, as well as in relation to precipitation seasonality, which points also to annual evapotranspiration changes, and possibly also to taxonomic variability of grasses along the transect. These three studies suggest that more tests on the environmental importance of flabellate phytoliths are needed for use in paleoecological and paleoclimatic reconstructions.

10 MARINE PHYTOLITH: PAST, PRESENT AND FUTURE

Abstract author(s): Thilakanayaka, Vidusanka (Key Laboratory of Ocean and Marginal Sea Geology, South China Sea Institute of Oceanology, Innovation Academy of South China Sea Ecology and Environmental Engineering, Chinese Academy of Sciences; University of Chinese Academy of Sciences; National Institute of Fundamental Studies; Department of Oceanography and Marine Geology, Faculty of Fisheries and Marine Sciences and Technology, University of Ruhuna) - Chuanxiu, Luo (Key Laboratory of Ocean and Marginal Sea Geology, South China Sea Institute of Oceanology, Innovation Academy of South China Sea Ecology and Environmental Engineering, Chinese Academy of Sciences; University of Chinese Academy of Sciences; Southern Marine Science and Engineering Guangdong Laboratory) - Madella, Marco (Department of Humanities - CaSEs, University Pompeu Fabra; ICREA; School of Geography, Archaeology and Environmental Studies, The University of the Witwatersrand) - Herath, Dileep B. - Bandara, Gayan (Key Laboratory of Ocean and Marginal Sea Geology, South China Sea Institute of Oceanology, Innovation Academy of South China Sea Ecology and Environmental Engineering, Chinese Academy of Sciences; University of Chinese Academy of Sciences; Department of Oceanography and Marine Geology, Faculty of Fisheries and Marine Sciences and Technology, University of Ruhuna)

Abstract format: Oral

Phytolith studies in marine environment are scarce, more specifically, the studies addressing mechanisms of phytolith incorporation into marine sediment (e.g. transporting and deposition). Among the available 24 publications which have studied marine phytolith, 17 studies are done using the sediment from the Atlantic Ocean and 7 studies are from Pacific Ocean, Indian Ocean, South China Sea and the Rose Sea, Antarctica. Most of the Atlantic Ocean studies are done in the vicinity of arid land masses (Sahara, Namibian and Kalahari), where aeolian flux dominates. Hence the aeolian flux is considered as the phytolith transporting mechanism in consensus.

Recent study on Indian Ocean sediment (higher clay, silt and lower sand) shows that there are ~2 to ~40 tonne of phytolith in a deep Bay of Bengal 1cm thick 1km² sediment layer in deep BoB which are mainly transported via fluvial systems. Paleovegetation results derived from these data well represent the global paleovegetation in the region. Phytolith observation done using the sediment (high sand particles) near the Irrawaddy river mouth, indicated very low absolute abundance of phytolith, a result which could be attributed to the abrasion of phytolith by sand particles. Care should be taken during phytolith identification in marine sediments as fragments of radiolarian, diatoms and sponge spicules could be misidentified as phytoliths.

Phytolith in marine sediment render new scopes for reconstructing regional paleovegetation and paleoclimate especially in areas where the sediment supply is dominated by fluvial sources. In contrast phytoliths, which are found in areas where aeolian flux subjugates, could be used as a proxy for paleowind patterns and aridity. Sediment which contains higher amount of clay and silt have higher chances to contain abundant, well preserved phytolith, especially in areas where riverine sediment inputs is prominent such as the sediment fans of Ganges/Brahmaputra, Yellow (Huangho). Yangtze, Irrawaddy, Magdalena, etc...

A. PHYTOLITH (MICROBIOMORPHIC) ANALYSIS IN THE CURONIAN LAGOON (SOUTHEASTERN BALTIC) BOTTOM SEDIMENTS STUDY

Abstract author(s): Druzhinina, Olga (Herzen State University; Institute of Oceanology RAS) - Golyeva, Alexandra (Institute of Geography RAS) - Napreenko, Maxim (Institute of Oceanology RAS) - Napreenko - Dorokhova, Tatiana - Sosnina, Irina (Institute of Oceanology RAS; Immanuel Kant Baltic Federal University)

Abstract format: Poster

Lacustrine deposits are valuable palaeoecological archives due to the diversity of information contained in lake sediments and the continuity of the sedimentation process.

In the last decade, the phytolith analysis having great potential for the reconstruction of local vegetation attracts more and more attention of palaeolimnologists. In 2018, a research of the Curonian Lagoon sediments (southeastern Baltic) started, aimed at the palaeoenvironmental and paleoclimatic reconstructions. The 0.9 m long bottom sediment sequence representing the middle and late Holocene (the earliest date: 6,839 – 6,891 cal BP; IGAN-AMS-6841) was studied by a complex of 9 methods, including pollen, diatom, and phytolith (microbiomorph) analyses (31, 16, 12 samples accordingly). The latter aimed not only to provide extra information on the vegetation development but also to assess the informativity of the method in application to the study of the temperate lakes/lagoons sediments. The analysis was performed according to the standard sample treatment technique (Golyeva, 2008). All samples were found to be suitable for investigation, with a sufficient number of microbiomorphs. The results confirmed that the application of the phytolith analysis in the study of the lagoon bottom sediments contributes to a deeper understanding of the complex dynamics of the coastal and water ecosystems. Thus, the obtained data indicated several intervals in the sediment sequence, which point to the existence of aerial conditions and soil-forming processes on the study location during certain time intervals. That makes phytolith analysis an essential factor in the discussion concerning water level fluctuations and the origin of the Curonian Lagoon.

Acknowledgments. Fieldwork was supported under the state assignment of the IO RAS (topic No. 0149-2019-0013); phytolith, palynological, and diatom analyses were performed with the support of the RSF (grant 18-77-10016), geochronological data obtained with the support of RFBR (grant 18-05-80087).

B. PALEOENVIRONMENTAL RECONSTITUTION OF THE HEADWATERS OF THE ARAÇUAÍ RIVER, SOUTHERN ESPINHAÇO MOUNTAIN RANGE, MINAS GERAIS, BRAZIL

Abstract author(s): Machado, David (Universidade Estadual de Campinas, Instituto de Geociências, Programa de Pós-graduação em Geografia) - Chueng, Karina (Universidade Federal Fluminense, Instituto de Geociências, Programa de Pós-graduação em Dinâmica da Terra e dos Oceanos) - Coe, Heloisa Helena (Universidade Federal Fluminense, Instituto de Geociências, Programa de Pós-graduação em Dinâmica da Terra e dos Oceanos; Universidade do Estado do Rio de Janeiro, Faculdade de Formação de Professores, Departamento de Geografia) - Silva, Alexandre (Universidade Federal do Vales Jequitinhonha e Mucuri, Faculdade de Ciências Agrárias, Departamento Engenharia Florestal) - Costa, Camila (Universidade Federal do Vales Jequitinhonha e Mucuri, Faculdade de Ciências Agrárias, Departamento de Produção Vegetal)

Abstract format: Poster

The Southern Espinhaço Mountain Range, in Minas Gerais, presents predominantly quartzite lithologies that characterize a relief with variations of dissected altitude interspersed with flat surfaces, forming undeveloped soils, associated with a high-altitude tropical climate and the formation of water sources and patchy forests in the Cerrado biome. These environmental dynamics lead to the formation of peat bogs, which, besides being important reservoirs of water and carbon, are also a record of paleoenvironmental changes with evidence of paleovegetational and paleoclimatic changes during the Quaternary. The aim of this research is to contribute to the paleoenvironmental reconstruction of the region of the headwaters of the Rio Preto, in the Southern Espinhaço Mountain Range, using silica biomineralization studies associated with other indicators (multi-proxy analysis). As a peat bog, an environment with low intensity erosive processes, even in the deepest and oldest layers, there was a large amount of well-preserved phytoliths. It was possible to infer that there were no changes in the vegetation type during the analysed interval (from 23,330 to 22,833 years cal BP). However, 4 periods were observed that characterize oscillations from a colder, drier environment in the Upper Pleistocene, to a gradually warmer and wetter environment as the Holocene progressed. When associated with paleovegetation studies in the Cerrado area that used other indicators to reconstruct a regional scenario, despite some differences, the main regional trends were confirmed. Regarding global-scale climatic events, such as the Last Glacial Maximum and the Younger Dryas, the results were very satisfactory.

C. PALEOENVIRONMENTAL RECONSTRUCTION OF THE ARCHAEOLOGICAL AREA OF SERRA NEGRA, ESPINHAÇO MOUNTAIN RANGE, MINAS GERAIS, BRAZIL

Abstract author(s): Chueng, Karina (Federal Fluminense University) - Coe, Heloisa Helena (University of the State of Rio de Janeiro; Federal Fluminense University) - Fagundes, Marcelo - Vasconcelos, Alessandra (Federal dos Vales do Jequitinhonha e Mucuri University) - Ricardo, Sarah (Nacional Museum Rio de Janeiro Federal University) - Machado, David (Campinas State University)

Abstract format: Poster

The Espinhaço Mountain Range (SdEM) has been intensively studied by archaeologists, producing significant knowledge on the regional indigenous history. However, it is also necessary to know the paleoclimatic conditions and environmental context in which such occupations occurred. This work intends to contribute to research developed by the Archeology and Landscape Studies Laboratory of UFVJM in the archaeological area of Serra Negra, located on the eastern side of the Southern Espinhaço Mountain Range, between the Jequitinhonha and Doce river basins. The aim of this study is paleoenvironmental reconstruction of the region using phytoliths. Sediments were collected from the Cabeças 4 archaeological site, in Felício dos Santos, which was occupied during a chronological period between 7,225 and 480 years cal BP. In addition, a sample was collected from each horizon of an organosol profile near the archaeological site. Phytoliths from grasses and palm trees predominate in the samples from the Cabeças 4 archaeological site. These results corroborated with the morphotypes found in the soil profile, which are preserved and homogeneously distributed in the profile. Therefore, the phytolith analyses were promising for inferences of climatic variations and for improving knowledge on the environment in which the regional archaeological occupation occurred.

D. PALEOENVIRONMENTAL RECONSTRUCTION THROUGH PHYTOLITH ANALYSIS IN THE CASA DA PEDRA SHELLMOUND ARCHAEOLOGICAL SITE, SÃO FRANCISCO DO SUL, SANTA CATARINA, BRAZIL

Abstract author(s): Machado, David (Universidade Estadual de Campinas, Instituto de Geociências, Programa de Pós-graduação em Geografia) - Coe, Heloisa (Universidade do Estado do Rio de Janeiro, Faculdade de Formação de Professores, Departamento de Geografia; Universidade Federal Fluminense, Instituto de Geociências, Programa de Pós-graduação em Dinâmica da Terra e dos Oceanos) - Bandeira, Dione (Programa de Pós-graduação em Patrimônio Cultural e Sociedade - Universidade da Região de Joinville; Museu Arqueológico de Sambaqui de Joinville) - Souza, Rosa (Universidade Federal Fluminense, Instituto de Física) - Rasbold, Giliane (Centro de Energia Nuclear na Agricultura - CENA - Universidade de São Paulo - USP) - Chueng, Karina (Universidade Federal Fluminense, Instituto de Geociências, Programa de Pós-graduação em Dinâmica da Terra e dos Oceanos) - Dias, Raphaela (Universidade Federal Fluminense, Instituto de Geociências, Programa de Pós-graduação em Dinâmica da Terra e dos Oceanos) - Ferreira, Jessica - Voss, Celso - de Sa, Julio Cesar (Programa de Pós-graduação em Patrimônio Cultural e Sociedade - Universidade da Região de Joinville)

Abstract format: Poster

Shellmounds are artificial accumulations built by groups of fishermen-hunter-gatherers, consisting of food remains, sediments, artifacts, and vestiges of daily life and funerary rituals. These archaeological sites contain remains of groups of organisms represent-

ative of the fauna and flora existing at the time the sites were formed, enabling the recovery of paleoenvironmental aspects related to species biodiversity and biogeography; studies with 14C dating; and the inference of changes in patterns of marine biodiversity and ocean circulation. This study uses the Casa de Pedra shellmound under rock, located in São Francisco do Sul, Santa Catarina, to infer aspects of the paleoenvironment through the analysis of phytoliths extracted from the archaeological matrix of the site. The material presents a good quantity of well-preserved phytoliths and sponge spicules. Among the phytoliths, those from grasses predominate, with the presence of some trees and palms, with no variation in vegetation type during the period of site occupation, between 5,470 and 4,460 cal years BP. Despite the stability of the vegetation, a small increase of the tree cover was identified from the base to the top, which may be related to an increase in humidity, in agreement with other paleoenvironmental studies carried out in the Southern Region of Brazil.

E. PALEOENVIRONMENTAL CONDITIONS OF THE MARICÁ COASTAL PLAIN, SOUTH-EASTERN BRAZIL, DURING THE HOLOCENE THROUGH SILICA BIOMINERALIZATIONS

Abstract author(s): Santos, Cátia - Coe, Heloisa - da Silva, André Luiz (Universidade do Estado do Rio de Janeiro) - Osterieth, Margarita (Universidad Nacional de Mar del Plata) - Parolin, Mauro (Universidade Estadual do Paraná) - Pamplona, Fábio (Universidade Federal Rural da Amazônia) - Souza, Rosa - Macario, Kita (Universidade Federal Fluminense)

Abstract format: Poster

This study aims to contribute to the deepening of knowledge on the paleoenvironmental conditions of the Holocene coastal plain of Maricá, south-eastern Brazil. Analyses of silica biomineralizations (sponge spicules, diatom frustules, and phytoliths), granulometry, organic matter, carbon content, and 14C-AMS dating were performed. Analysis of the bioindicators enabled identification of three phases with distinct paleoenvironmental conditions related to the evolution of this plain. The first phase (8,500-6,500 years cal BP) corresponds to a wetter period with a predominance of dense shrub/tree vegetation occupying the slopes and coastal plain. The marine bioindicators (sponge spicules, diatom frustules, and bivalves) indicate the existence of an ancient lagoon with shallow waters, connected to the sea by an intermittent tidal channel, in an environment of low hydrodynamic energy. The second phase (6,500-3,000 years cal BP) suggests a period of lower humidity, with a dominance of herbaceous vegetation and increased hydrodynamic energy, possibly caused by wave transposition events and coinciding with the beginning of the lagoon silting process. The third phase (after 3,000 years cal BP) was characterized by a new period of higher humidity with a return to shrub/tree vegetation, as in the first phase, but with lower density, once again corresponding to an environment of low hydrodynamic energy. A decrease in the quantity of sponge spicules demonstrates the reduced water line of the lagoon and the filling of the same. More recently, this process has culminated with anthropic interventions of urban expansion on the coastal area.

F. PALEOBIOGEOCLIMATIC RECONSTITUTION THROUGH PHYTOLITH ANALYSIS OF THE MONTE CRISTO CAVE, MINAS GERAIS, BRAZIL

Abstract author(s): Chueng, Karina (Federal Fluminense University) - Coe, Heloisa Helena (University of the State of Rio de Janeiro; Federal Fluminense University) - Vasconcelos, Alessandra (Federal dos Vales do Jequitinhonha e Mucuri University)

Abstract format: Poster

This study aims to contribute to the understanding of paleoclimatic variations in the Espinhaço Mountain Range, Minas Gerais, Brazil, during the Quaternary. The Monte Cristo cave is formed in quartzite. Two profiles were collected, the first being an Organosol outside the cave and the second consisting of mostly sandy material inside the cave, in layers that vary in colour between light and dark tones. The results showed that both profiles present a high stock of phytoliths. The phytoliths are well preserved; with a predominance of Spheroid echinate and Spheroid ornate types, besides the presence of Bulliform flabellat, Cross, Bilobate, Rondel and Trapezoid. The tree density index (D/P) is between 0.19 and 0.36, indicating open vegetation. The values of the Bi% index (32.8 to 53%) indicate moderate water stress, similar to previous studies in nearby regions. The Ic (climatic) index showed variation in plant adaptation at lower temperatures, with a predominance of C3 grasses, while the Pa/P index (palm tree density) indicated the presence of palm trees along both profiles. The ages obtained through 14C-AMS in the organosol were from 4,440/4,230 to 2,740/2,430 years cal BP, and the sandy material within the cave from 1,000/920 to 660/550 years cal BP. The phytoliths found inside the cave may be an indication that this material has an allochthonous origin, probably having been carried by flooding in periods under different hydrogeomorphological conditions, which is one of the hypotheses that will continue to be investigated. The vegetation type remained stable during the analysed period, being characteristic of rupestrian fields with the presence of woods in more humid environments.

341 WIDE HORIZONS - NO LIMITS? DYNAMICALLY FORMULATING THE BOUNDARIES OF ARCHAEOLOGY

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Lindstrom, Torill Christine (Department of Psychosocial Science, Faculty of Psychology, University of Bergen; SapienCE CoE, Faculty of Humanities, University of Bergen) - Zubrow, Ezra (Dept. of Anthropology, University of Buffalo)

Format: Discussion session

The theme of EAA-2021 is: Widening Horizons. – Are there indicators that the horizon limits are being approached? What characterizes the widening? And what characterises the limits?

There is a Norwegian expression: «forstrekke seg», literally meaning: stretching too far, so that muscles and joints hurt, and the expression has the symbolic meaning: To try to encompass and include too much, which may lead to «a gap» in the middle, and ultimately: a falling apart.

Has this happened to archaeology lately?

It has embraced and enrolled DNA-research, anthropology, gender-studies, psycho-neurology, experimental and experiential elements, sensory archaeology, psychological analyses of prehistoric people, art in archaeological imagination, video games, materiality of living memory, urban waste, litterscapes in the present anthropocene, archaeology of popular music, archaeology used to understand homelessness and migrant death along present borders – and much more.

Is there a danger of archaeology losing its identity because the horizons are too wide? It has been defined as the science of material remains and objects from the past. These objects were produced and used by living people in prehistory, so their objects may tell us something about them, their institutions, and practices. By comparison and analogies, they may even tell us something about ourselves. And indeed, in archaeological method and theory today, there is a tendency towards archaeologies of the contemporary.

How far into our own times and lives can we go, and still call our discipline “archaeo-logy”?

How easily do we risk projecting ourselves too much into the prehistorical analyses?

This session invites papers that are concerned about the limits of widening the horizons of archaeology.

ABSTRACTS:

1 EMPHASIZING THE BOUNDARIES--ARCHAEOLOGY VS BIOANTHROPOLOGY

Abstract author(s): Smith, Elizabeth (State University of New York University at Buffalo)

Abstract format: Oral

This paper speaks directly to the symposium abstract: “Is there a danger of archaeology losing its identity because the horizons are too wide?”. It also examines the question of the possible future separation between bioanthropology and archaeology. Bioanthropology is a rapidly expanding subdiscipline, in fact, it is expanding more rapidly than archaeology. The boundaries of bioanthropology might be said to be incorporating more of archaeology than archaeology is of bioanthropology. This paper focuses on what happens as this occurs in the present, and it also focuses on possible future outcomes if these processes continue at the present rate. Will there be ‘separation anxiety’ as this change takes place, and what forms might this take? Are there commonalities in the separation processes which make it impossible to understand the different kinds of information paradigms in these two present subfields. Finally, it makes some suggestions about a way forward for both archaeological bioanthropologists and bioanthropological archaeologists.

2 SHIP OF THESEUS – UNTIL WHEN CAN WE SAY IT IS HIS BOAT?

Abstract author(s): Ribeiro, Artur (Christian-Albrechts-Universitat)

Abstract format: Oral

One of the most interesting thought-experiments in philosophy is the Ship of Theseus. In this thought-experiment, Theseus’ ship undergoes repairs, and a piece of the ship is renewed every time it goes to harbour. After several years of repairs, the original parts of the ship are completely replaced, and the question this thought-experiment raises is whether we can still call it Theseus ship, even though none of its parts are original anymore.

It seems uncontroversial to say that as time goes by, archaeology requires replacing some older methods for better and/or more advanced ones. The world changes and archaeology must change with it. And this change is good – while some other disciplines languish in outdated methods or close themselves off to change, archaeology has managed to maintain some relevancy due to its changes. In order to stay afloat for decades to come, archaeology needs to have fluidity. At the same time, archaeology should stick to tried and true methods that give it its core-identity. In this discussion, I wish to present a hot-take: there should be two archaeologies: a core-archaeology based on data-recovery, natural scientific techniques, Big Data, and deductive-inductive methods; and a fluid-archaeology, which relies on the social/human/Geistes sciences, intermingles with the arts (e.g., literature, music, film), makes use of methods from history, ethnography, and sociology, and utilizes abductive methods.

3 UNDERFUNDED OR SIMPLY OVEREXTENDED? ARCHAEOLOGICAL HERITAGE MANAGEMENT IN AUSTRIA

Abstract author(s): Karl, Raimund (Universität Wien)

Abstract format: Oral

In the explanatory report to the to the Austrian Monuments Protection Law (DMSG 1999), it says: ‘The DMSG always assumed a clear limitation by considered scholarly selection. Only through this, monuments protection can be conducted with the efficiency that would be lost if too much were scheduled. Thus, it is one of the most difficult tasks of the Federal Monuments Agency (BDA) to select that amount which is necessary from the scholarly perspective and manageable from the administrative one.’ (RV 1999, 39).

That makes necessary a law ... which simultaneously invests the BDA with the necessary powers, but also sets it sufficient limits ...' (RV 1999, 30).

The BDA employs 15 FTE professional archaeologists for protecting all archaeological monuments in the 83,879 km² which make up the territory of the Republic of Austria. The annual operational budget of its archaeology department is approximately € 5 Million, also known in professional jargon as 'peanuts'. Just as a comparison, the annual expenditure by the BDA for protecting (mainly catholic) churches, monasteries and cathedrals is – roughly – 10 times as much. By 2020, just about 1,050 archaeological sites in Austria were scheduled.

Clearly, the archaeology department of the BDA is seriously underfunded! Or is it?

It maintains that any work at any archaeological site, whether it is scheduled or not – of which there are an estimated 1.05 Million in Austria –, falls under its jurisdiction; despite the fact that there is considerable amounts of Supreme Court judicature to the contrary, and none that concurs. So maybe it isn't underfunded, but that it is overextended, and as a result fails in the main duty assigned to it by § 1 (1) DMSG: the protect those archaeological monuments of such significance that their preservation is in the public interest.

4 BORDER AND BOUNDARY CONDITIONS OF ARCHAEOLOGY: ARCHAEOLOGICAL LIMITS

Abstract author(s): Zubrow, Ezra (University of Toronto; University at Buffalo)

Abstract format: Oral

This paper provides points and context to consider regarding the border and boundary conditions of archaeology. Should the borders be permeable? And if so how and who, if anyone, should control the permeability? Are the boundary conditions of archaeology determined from the inside out or from the outside in? Are they static or dynamic? Should they be one or the other? And if the latter are the temporal aspects controlled or not? Are they reflective or non-reflective?

Boundary conditions place limitations on the domains and impact the range of problems that may be considered as well as the types of theory, models, propositions and perhaps most important the data that limit our research. Do they prevent the dialectic (in the Kuhnian sense) change in the discipline? What is the impact of boundary conditions on innovation in archaeology? In short, what is the relationship between the boundaries and the limits of archaeology?

5 MULTIPLE “REALITIES” OF ARCHAEOLOGICAL BORDERLANDS

Abstract author(s): Diachenko, Aleksandr (NAS of Ukraine, Institute of Archaeology of the NAS of Ukraine)

Abstract format: Oral

The relativity of explanation and interpretation in archaeology is often discussed in the framework of paradigms, each approaching data from its specific theoretical viewpoint. A number of recent studies, such as the works of Ch. Perreault, R.J. Rivers and others, refocuses the issue of the discipline's limits to the statistical quality of archaeological record. Basing on the examples of empirical evidence and results of mathematical simulations, this paper discusses the grounds of uncertainty of archaeological explanation and reasons for the current relativism at different scales of understanding of the prehistoric past. More specifically, the examples of debates on Neolithic Central and South-Eastern Europe are provided in order to contribute to the discussion of the “forstrekke seg” issue raised by this session organizers. These examples illustrate how the archaeological borderlands, where our aims met our possibilities, reshape prehistoric reality into “multiple realities” of explanations and interpretations. The outcomes of this discussion are considered in frames of the ongoing “Third Science Revolution in Archaeology” (after K. Kristiansen).

6 STRETCHING OUTSIDE OF THE BOX, OR JUST REINFORCING THE WALLS? ARCHAEOLOGY AND MULTI-DISCIPLINARITY IN THE ERA OF THE NEO-LIBERAL ACADEMY

Abstract author(s): Nilsson Stutz, Liv (Linnaeus University)

Abstract format: Oral

“Archaeology is Anthropology or is nothing.” Lewis Binford's famous words from the era of New Archaeology made the case for an archaeology that reaches outside of the confinements of the discipline itself. Even before the 1960, archaeology always operated outside of its disciplinary boundaries, but with New Archaeology, the horizons widened and they have kept on expanding. This has resulted in a vibrant, creative and exciting field that is difficult to pin down to the point of no longer being recognizable to people outside of the field itself. While there is a movement in status and resources flowing across the multi-disciplinary field, between the natural sciences and the humanities, and back again to the natural sciences (with the current third science revolution as a case in point), long term these “reaches” provide intellectual debate and contribute to our understanding of both the past and the present.

From an intellectual point of view, this creative expansion has been thrilling, creative and enriching. However, it would be a mistake to think that this creativity is not also harnessed by traditional power networks and neoliberal agendas. This paper takes a critical look at the conservative currents below the progressive surface to discuss how power networks, publication strategies, reward systems and flock mentality within our field contributes to upholding power structures and hold back truly creative and innovate thinking.

7 WHAT ABOUT ARCHAEOLOGY?

Abstract author(s): Pyrgaki, Marie (Paris I, Pantheon-Sorbonne; Hellenic Open University)

Abstract format: Oral

This paper examines archaeology, as a discipline that has reinvented itself multiple times. A discipline that incorporating new methods and theories, branches across multiple new disciplines and across academic boundaries between the natural sciences, the social sciences and the humanities. What means archaeology? Do we really understand each other when we say 'archaeology'? Is the way of perceiving the past limited to the relationship between space and time? Or it actually involves other aspects of our associated life, of our psychology, of our anthropological condition in the present? How archaeology as an academic discipline that, through its expertise about the past, and about human societies broadly, contributes to contemporary debates and solutions? Is continued collaboration a key direction fostering open dialogue and recognition that the human past provides a roadmap for how we got to the present and signposts for where we would like to go in the future?

342 IMPR - MICROSCOPY SESSION: PHYTOLITHS IN SOIL THIN SECTIONS

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Polo-Diaz, Ana (Department of Archaeology, University of Sheffield, Sheffield) - Devos, Yannick (Maritime Cultures Research Institute (MARI) - Department of Art Studies and Archaeology, Vrije Universiteit Brussel, Brussels) - Khamnueva-Wendt, Svetlana (Institute for Ecosystem Research Kiel University, Kiel)

Format: Workshop

The present session is structured as a microscopy workshop in relation to the study of phytoliths in archaeological soil and sediment thin sections. As such, the workshop is related to the session “Phytoliths in geoarchaeology and micromorphology”.

We aim to an informal meeting with a focus on the exchange of ideas and experiences in this arena in a practical way. Hands-on microscope work will provide an opportunity for participants to discuss relevant questions regarding methodological approaches, analytical tools and interpretation of results.

The overall goals of the workshop are: to raise awareness among phytolith specialists and micromorphologists / geoarchaeologists on the potential of applying phytolith analysis to archaeological thin sections and promote its practical integration to address archaeological questions.

Participants are welcome to bring their own research materials. Additionally, thin sections related to the presentations of the session “Phytoliths in geoarchaeology and micromorphology” will be made available during the workshop.

This session is part of the 12th International Meeting for Phytolith Research, or IMPR, the official scientific conference of the International Phytolith Society.

343 THE RISE OF PATRIARCHY. AN ARCHAEOLOGICAL VIEW [AGE]

Theme: 6. Material culture studies and societies

Organisers: Koch, Julia (Keltenwelt am Glauberg) - Montón-Subías, Sandra (Pompeu Fabra University Barcelona) - Berseneva, Natalia (Ural Branch of Russian Academy of Sciences Chelyabinsk) - Matic, Uroš (Austrian Archaeological Institute Vienna) - Hjørungdal, Tove (University of Gothenburg)

Format: Regular session

Social injustice and environmental destruction are linked to patriarchal capitalist societies in the current global social discourse. Some decolonial feminists have even claimed that patriarchy did not really exist outside Europe before the advent of modern colonialism. Such discourse usually ignores archaeological research demonstrating that patriarchal systems appeared in different regions of the world long before the modern era. Gerda Lerner's famous book 'The Creation of Patriarchy' situated its emergence in ancient Mesopotamia and made use of archaeological and written sources to support her thesis. Since then, other archaeological and anthropological works have provided explanations for the emergence of patriarchy and documented its presence in prehistoric and/or oral societies with the help of material culture.

We contend that archaeology has much to offer to the current debate on patriarchy and welcome discussions and case studies from all over the world that include (but are not limited to) one or more of the following issues:

- What is patriarchy and how can we identify it using material culture? How can developments in different regions be recorded and reconstructed using archaeological methods?
- Are there regions where turning points in the formation of patriarchy are recorded?
- Are there cases where patriarchy existed without a material correlate that can be identified archaeologically?
- How are patriarchy and material culture inter-related?
- What is the relationship between patriarchy and gender? How does patriarchy create and sustain gender norms? How do people go work around them and what are the consequences? How are masculinity and femininity constructed under patriarchal systems?
- Are unequal gender systems always patriarchal? Are there non-patriarchal unequal societies? Are there unequal socie-

ties without unequal gender?

ABSTRACTS:

1 THE RISE OF THE SOCIAL CONSTRUCT “PATRIARCHY”. AN INTRODUCTION

Abstract author(s): Koch, Julia (Keltenwelt am Glauberg)

Abstract format: Oral

Besides an introduction to the questions of the session, the paper will mainly provide an overview of the most common definitions of the term “patriarchy”. Starting point was the “Mutterrecht”-publication by J. J. Bachofen, with which he created the opposing pair of matriarchy/patriarchy. Some other scholars followed with their essays and studies. The spectrum ranges from classics such as Max Weber and Pierre Bourdieu to feminist authors such as Maria Mies.

The beginning of patriarchal societies was often transferred in nebulous prehistoric periods. But studies on the development of patriarchal structures such as Gerda Lerner’s book have remained rare on the archaeological side. Thus, in his summary of world history, Yuval N. Harari has only state that most societies worldwide were “patriarchally” organised since historic times, but that neither the pathway to inequality nor the causes of the development had been understood so far.

The paper wants to open the discussion in the session if and how we could identify patriarchal structures by archaeological methods. The question is also how we can avoid transferring our own ideas about patriarchy into the past and how we obstruct our view of the past by too rigid ideas about those very prehistoric conditions.

2 WHAT CAN ETHNOGRAPHY TELL US ABOUT GENDER INEQUALITY IN THE PAST? CASE STUDIES FROM THE CHALCOLITHIC SITE OF VALENCINA, SPAIN

Abstract author(s): Cintas Peña, Marta (Department of Prehistory and Archaeology, University of Seville; Department of Anthropology, University of Iowa) - Lillios, Katina (Department of Anthropology, University of Iowa) - García Sanjuán, Leonardo (Department of Prehistory and Archaeology, University of Seville)

Abstract format: Oral

There is no one definition of the term ‘patriarchy’. Depending on the factor that we focus on – authority, political power, status, coercive capacity and violence, religious influence – several descriptions of the concept are employed in the scholarly literature. However, all are grounded in a common condition: gender inequality. Therefore, to address patriarchy means that we need to understand the historical conditions that give rise to gender inequality in both the present and past by comparing the lives and experiences of women and men, and other potential genders in non-binary systems.

However, gender inequality and patriarchy are matters of degree rather than of presence versus absence. To complicate matters further, we would argue that the fields of archaeology and anthropology have themselves been patriarchal, and that taken-for-granted categories employed (such as ‘biological sex’) and the knowledge produced in these disciplines are the outcomes of profoundly patriarchal systems.

Given these complexities, how can we work toward dismantling a patriarchal system at the same time as gain insights into the emergence of patriarchy in the past? Our paper will explore the implications of these epistemological realities in both archaeology and anthropology in our understanding of gender inequality in the Iberian prehistoric past. We then present an analysis of those variables that correlate with gender inequality, according to cross-cultural ethnographic studies, and compare these to the evidence recovered from two exceptional tholos burials at the mega-site of Valencina de la Concepción, Spain: Montelirio and tomb 10.042-10.049, dated to the 3rd millennium BCE.

3 MALE DOMINANCE AND THE GENDERED CONTEXT OF DRINKING IN THE EUROPEAN COPPER AGE

Abstract author(s): Turek, Jan (Center for Theoretical Study, Charles University, Prague)

Abstract format: Oral

Such as in the case of warfare and social power, alcohol production and consumption has traditionally been traditionally related mainly to the male world. However, in most pre-industrial societies, it is women who monopolize the production of alcoholic beverages and dominate their distribution systems. It is probable that the manner and level of alcohol consumption were also defined by social norms that could be described as patriarchy. The gendered context of drinking could be formally expressed in the gender-specific decoration of some ceramics, such as the drinking handled cups of the Bell Beaker Period in Central Europe. Gender differentiation is also evident in the capacity of bell beakers from funerary context in Great Britain and Ireland. The largest beakers came from the graves of men, the medium size from the graves of women, and the smallest beakers were in the graves of children. The reflection of alcohol consumption in the burial rites of the 3rd millennium BC therefore probably included both main gender categories, including children, but this perhaps speaks more about the relationship to the ancestors and the world of the dead and it is not clear to what extent public drinking by women and children in the living society can be expected.

It is possible that even in European prehistory women commonly consumed alcohol, but perhaps not publicly and ceremoniously, like men. In many traditional cultures of the world the consumption of alcohol and other stimulants is mainly related to the male world and

these substances are available to women only to a limited extent and often only under male control. This sexist archetype survived in Western civilization until the time of women’s emancipation in the 20th century.

4 PATRIARCHY, MATRIARCHY, OR SOMETHING ELSE? EARLY NOMADS OF THE SOUTHERN URALS

Abstract author(s): Berseneva, Natalia (Institute of History and Archaeology, Ural Branch of RAS; South-Ural State University)

Abstract format: Oral

The study concerns the Early Nomadic cultural groups (the Sarmatians). They are currently dated from the end of the 6th to the 2nd centuries BCE and the sites are located in the steppe part of Eastern Europe and the Urals. The economy was based on mobile livestock breeding, and there are numerous traces of war activities in the necropolises.

Cemeteries mostly consist of kurgan mounds. The people were buried in a supine position and accompanied by various grave goods including animal sacrificial deposits. Some of the nomadic burial mounds are impressive in their size and wealth.

Sarmatian women are often associated with the ancient «Amazons», and some scholars even suppose this society to be matriarchal. However, the archaeological context is rather ambiguous and it is an area that requires a good deal more attention and study.

This paper has two purposes. The first goal is to investigate the context of male vs. female burials. The second is to answer the question whether there is archaeological evidence of patriarchy/matriarchy/other gender systems in the Sarmatian burials.

5 ‘HAD THE WOMEN BEEN GOOD THEIR TOMB WOULDN’T BE DUG UP TO THEIR THROAT’: DYNAMICS OF DEATH RITUALS IN ALBANIA

Abstract author(s): Agolli, Esmeralda (Tirana University)

Abstract format: Oral

The first part of the title cites the expression of a local woman from Dibër district during an interview on an ethnoarchaeological research of death rituals around Albania. Beyond this individual account, however, over many other interviews with rural locals around the country, this striking gender contrast occurs commonly while establishing the depth of the tomb pit. The tomb of women goes as deep as the height of their shoulders as opposed to that of men which goes up to the waist. Even currently more sparsely, the ritual is yet encountered in each of the four religious’ groups (suni muslims, christians {catholics and orthodox}, and bektashi). In this presentation I look closely to this practice and see what interpretations and rituals do accompany it. Beside the individual accounts, I see its distribution and origin and how a patriarchal society that maintains exclusive patrilineal ties even at death give women an undermining and prejudicial status. Furthermore, I seek to explain how this evidence could contribute much largely to understand gender roles, and what constrains the actions of women at a patriarchal society.

6 BODY AND MATERIAL CULTURE IN THE MAKING OF FEMALE SUBORDINATION: GUAM 900-1769 AD

Abstract author(s): Monton-Subias, Sandra (ICREA; UPF)

Abstract format: Oral

In this paper I will subscribe a wide understanding of patriarchy — as any system where there is a domination of women by men — in contradistinction to more narrow uses that restrict the label to the presence of patriarchs or circumscribe it to the modern world. Class, race and gender are today imbricated in the construction of inequality, oppression and discrimination. I contend, however, that they have different historical genealogies which we should not dismiss if we are to understand what is both peculiar and transcultural in female subordination. Archaeology has much to offer to burgeoning debates on these issues since patriarchy is enrooted in our deepest past where both the body and material culture were fundamental to its emergence and maintenance.

I will frame these reflections within the ABERIGUA project, which investigates the impact that modern colonization had on native oral Chamorro in Guam (Mariana Islands, western Pacific). As in many other places of the world, colonial fracture promoted a patriarchal turn on the island. However, how do we need to interpret this turn? As a novelty? Or as an expansion of a pre-existent trend? Pre-colonial Latte Chamorro bodies and material culture have much to say in answering these questions.

344 HOW MANY PEOPLE? ARCHAEOLOGICAL APPROACHES TO THE STUDY OF PAST DEMOGRAPHY

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Fernandes, Ricardo (Max Planck Institute for the Science of Human History; Oxford University; Masaryk University) - Fernández-Götz, Manuel (University of Edinburgh) - Vander Linden, Marc (Bournemouth University)

Format: Regular session

Demography is one of the main topics of interest in the study of past human societies. While many scholars are sceptical of attempts to estimate past population sizes, such assessments constitute important contributions when it comes to discussions on the rate of population growth/demise and of the causal mechanisms underpinning them, socio-economic parameters including production and consumption, human environmental impacts, or the nature of internal and external conflict. With the rise of processual archaeology, attempts to systematise the reconstruction of past population figures gained popularity, and the last two decades have witnessed a renewed interest in these questions. Traditional demographic estimates include the use of settlement (e.g. number of domestic contexts, settlement sizes) and funerary data (e.g. mortality curves, temporal estimates of number of graves). In re-

cent years, there has been an increasing interest in demographic models based on the statistical assessment of radiocarbon dates and of a wider variety of other potential proxies (e.g. pollen studies to determine farming intensity). This session invites papers that employ archaeological approaches to the study of past population size. We welcome contributions with a theoretical-methodological perspective, discussing the potential and limitations of a range of traditional and novel demographic proxies and data modelling methods, as well as papers that present specific case studies.

ABSTRACTS:

1 BIG DATA AND BAYESIAN APPROACHES TO THE STUDY OF ANCIENT POPULATION DYNAMICS

Abstract author(s): Fernandes, Ricardo (Max Planck Institute for the Science of Human History; University of Oxford; Masaryk University)

Abstract format: Oral

Accurate and precise reconstruction of past population sizes are key element to our understanding of historical developments. When such information is combined with the reconstruction of other past phenomena within multiple spheres (e.g. socio-economic, cultural, technological, environmental) it becomes possible to employ sophisticated modelling methods to identify past causal mechanisms that underlay population dynamics.

In this presentation, two main aspects concerning the study of past population dynamics and of how these relate to other past phenomena will be discussed: 1) data collection efforts as part of the Pandora Big Data initiative for the study of the human past. Pandora's philosophy, organization, and infrastructure will be presented; 2) the development of novel modelling tools, particularly those based on a Bayesian approach, to generate spatiotemporal estimates for a variety of historical phenomena. Such as the spread and speed of spread of human dispersals and the dynamics of population growth and decline. The discussion will also include approaches to taphonomic effects.

Illustrative cases studies from across different regions and cultures will be presented that show-case the research potential of combining large datasets and Bayesian modelling to investigate population dynamics and its underlying historical causes.

2 REASSESSING IRON AGE DEMOGRAPHY: METHODS, APPROACHES AND CASE STUDIES

Abstract author(s): Fernández-Götz, Manuel (University of Edinburgh, School of History, Classics and Archaeology)

Abstract format: Oral

This paper will explore the possibilities and limitations of approaches to Iron Age demography. For this period, different sources of evidence can be used in an attempt to estimate past population sizes. In addition to cemeteries, which represent the most commonly employed source of information, settlement evidence at well-excavated sites as well as occasional written sources can provide indications about how many people lived in a certain settlement or region, and how population size changed over time. However, it should be noted that each source of information needs to be critically assessed in a contextual manner in order to acknowledge possible biases and limitations. For example, funerary data are often inadequate since in many regions and periods they would only be representative of a rather small segment of the living population, whereas population figures named in written sources could often be exaggerated for political purposes. The need for a contextual approach is exemplified through two specific case studies that include the results of recent research: 1) the Early Iron Age site of the Heuneburg in southwest Germany; 2) and the Late Iron Age necropoleis of Central Spain.

3 BOOM AND BUST - AGGLOMERATION AND DISPERSAL AS A DEMOGRAPHIC PATTERN IN PREHISTORY?

Abstract author(s): Mueller, Johannes - Bilotti, Giacomo - Laabs, Juliane - Kerig, Tim - Müller-Scheeßel, Nils (Institute of Prehistoric and Protohistoric Archaeology Kiel)

Abstract format: Oral

The study of Neolithic and Chalcolithic settlement regions can be described as follows: certain core settlements emerge, experience an extreme demographic increase and finally disappear relatively abruptly.

Archaeo-demographic methods, such as 14-C SPD (summed probability densities), site/house counts or carrying capacity estimations, are used to reconstruct relative and absolute population sizes on different spatial and temporal scales. Often, those approaches result in the findings of quasi cyclical boom-bust events that seem to be related to major demographic changes. Further, when the settlement patterns are concerned it occurs, that the boom phases correlate with periods of settlement agglomeration and high population density. This phase is succeeded by a dispersal of settlements and assumed lower population densities. Those developments can be witnessed throughout prehistoric Europe in different amplitudes and with regional colorit (e.g. LBK Slovakia and Hungary, Bronze Age Central Europe or Calcolithic Ukraine). The pattern of population growth-stability/settlement agglomeration followed by a population decline/settlement dispersal, followed by growth-stability/settlement agglomeration, etc. we propose is a reoccurring structural feature of prehistoric societies and socio-political networks.

Archaeo-demographic methods are used to reconstruct relative and absolute population sizes of settlements and their hinterlands. In our paper we would like to examine models that explain the "failing" of larger socio-political entities to persist over a longer time span during the Neolithic to Bronze Age in most parts of Europe. Further, we like to stress the non-environmental factors and set ups

(e.g. economy, politics, ideology or communication/exchange) which may lead to instability, perhaps reorganization or even collapse of the studied societies or communities.

4 POPULATION CHANGE AND FIRE HISTORY DURING THE HOLOCENE IN THE IBERIAN PENINSULA

Abstract author(s): Sweeney, Luke (School of Archaeology, Geography and Environmental Science - SAGES, University of Reading) - Vander Linden, Marc (Institute for the Modelling of Socio-Environmental Transitions, Bournemouth University) - Harrison, Sandy (School of Archaeology, Geography and Environmental Science - SAGES, University of Reading)

Abstract format: Oral

In recent years archaeology has witnessed a renewed interest in population history, linked to the development of new techniques, including Summed Probability Distributions (hereafter SPDs). Despite the need for methodological precaution, these approaches provide a first quantitative window on fluctuations in population size the past. In addition to investigating palaeodemographics as such, information on changes in population size is important in order to investigate anthropogenic impacts on the environment. The nature and extent of anthropogenic land-use, reflected in population size and distribution, has a demonstrable impact on modern fire regimes. Reconstructions of past population changes are needed in order to investigate when this influence was first felt. Here, we reconstruct past population size fluctuations, as inferred from SPDs, and compare them to sedimentary charcoal records of changes in fire regimes during the early and middle Holocene in Iberia. Our analyses confirm previous results that identify a marked episode of population growth parallel to the onset of farming in Iberia, but reveal subsequent finer-scale temporal and spatial variation in population size. Changes in fire regimes correlate broadly with known Holocene climate fluctuations, but the charcoal record also indicates finer-scale temporal variation which may be linked to anthropogenic activity. In addition to analyses of the temporal correlations between the two data sets, we consider whether there are distinct geographic patterns that could provide additional insights into the relationship between human activities and fire across Iberia.

5 PEOPLE, HOUSES AND SETTLEMENTS: SMALL-SCALE DEMOGRAPHIC APPROACHES IN THE STUDY OF NEOLITHIC AND BRONZE AGE NORTHERN EUROPE

Abstract author(s): Bilotti, Giacomo (Christian-Albrechts-Universität zu Kiel)

Abstract format: Oral

The aim of this paper is to reassess the demographic potential of houses and settlements in Northern Central Europe and Southern Scandinavia during the Neolithic and the Bronze Age. It will be structured in two main sections: firstly, I will review how past demographic studies have addressed the topic, highlighting the strengths and the weaknesses of the adopted methods; secondly, I will propose some methodological and practical insights aimed to improve the methodological and theoretical framework. My assumptions will rely on some selected case studies from the aforementioned area and chronology.

In particular, I will evaluate the relationship between settlement data, the traditional backbone for absolute demographic reconstructions, and demography, using proxies such as: house size and structure, house density and the number of houses within the settlements, the area of the settlements and their total number in the different study areas.

In this paper, I will give a greater importance to the micro and meso-regional level, rather than the regional, frequently preferred in palaeodemographic studies. The fundamental questions concerning population size and structure and their change through time will hold, but they will be addressed from a different perspective. In fact, I will try to show the beneficial effects of a "small-scale" approach in our understanding of the effects of local peculiarities in household and settlement organisation and the impact of some processes (e.g. environmental variation, emergence of inequality, adoption of new technologies, interconnectedness, etc.) in the demographic change of local communities.

Finally, this more thoroughly understanding of household and settlement dynamics will help to better correlate the observed demographic transformation and the "global" phenomena often discussed in the literature (environmental change, migration, etc.), possibly allowing a greater confidence in our conclusions.

6 FROM POINT TO PATTERN, AND PATTERN TO POPULATION - A DIACHRONIC STUDY OF POPULATION DYNAMICS IN SOUTHEAST SCOTLAND

Abstract author(s): Cowley, Dave (HES Historic Environment Scotland; Department of Archaeology, University of Ghent)

Abstract format: Oral

This paper presents a diachronic settlement and landscape archaeology-based study of population in southeast Scotland. Focusing on the Iron Age, with an analysis of settlement and territorial patterning, an explicit approach to considering outcomes of multiple scenarios is adopted. This recognises the impacts of many known unknowns and unknown knowns on modelling ancient populations, such as the reliability of archaeological datasets, the difficulties of establishing contemporaneity of occupation, and the complexity of defining patterns of inhabitation. Situating the available evidence in a settlement and landscape framework allows long-term perspectives to be developed on the division of the landscape into settlement and non-settlement zones. These provide a building block for a discussion of multiple scenarios for the densities, patterning and dynamics of population. The outcomes of the discussion of Iron Age population dynamics are compared with settlement and census data from the 1750s, which date to the cusp of the demographic transition. The analysis of this data identifies the persistence of aspects of landscape organisation, settlement

patterning and territorial frameworks, with implications for the assessment of the Iron Age scenario modelling. The long-term perspective highlights the enduring relationships of pre-industrial populations and their landscapes, and provides a framework within which to consider how population dynamics have changed across space and time.

7 A CENTURY IN THE LAND OF ICE AND FIRE: THE SETTLEMENT OF ICELAND

Abstract author(s): Cartwright, Rachel (University of Minnesota)

Abstract format: Oral

Iceland before the Viking Age migrations was an uninhabited landscape with dense forestation, volcanic activity, and glaciers. In the late 800s AD this all changed with relatively large migrations causing drastic changes in the landscape of the island. Literary sources about the settlement of Iceland, although written down much later, help to shed light on the process of settlement, which is said to have begun around AD 871. In addition to written sources, this paper examines archaeological evidence based on settlement and funerary data, also utilizing aDNA and isotopic studies previously performed in order to understand who was settling in Iceland and the demographic scale of the migratory process. Environmental data also plays a pivotal role in this discussion, with pollen cores showing evidence for the intensification of deforestation and agriculture. Utilizing these different sources in tandem, this paper seeks to develop a model for estimating the population growth throughout the first century of settlement in Iceland.

8 PEOPLE AND HOUSEHOLD IN TERRAMARA SETTLEMENTS. A FLOOR AREA APPROACH REVISED

Abstract author(s): Vicenzutto, David (Università degli Studi di Padova. Dipartimento dei Beni Culturali: Archeologia, Storia dell'Arte, del Cinema e della Musica)

Abstract format: Oral

Demographic estimates using the ratio between the floor area and the population have had a long development and mixed fortunes. Since Naroll's paper at the beginning of the 1960s, many constants have been calculated in order to define the living space of an individual and therefore how many people can live in a given floor area. The difficulty of applying this method - especially in prehistoric archaeology - lies in the fact that we are often not able to distinguish human living spaces from those shared with animals or assigned to other activities. Another obstacle is the lack of large dwelling plans, large enough to estimate the whole population of a settlement. In this paper, I will propose potential and limits of estimates methods based on floor area through the case study of the Terramare, fortified settlements of the Po river Valley, in Northern Italy, that developed between the Middle Bronze Age and the Recent Bronze Age. Specifically, I will discuss on one hand the choice of the living space constants and how they have been calculated, and on the other hand the value of the dwellings plans as potential patterns of settlements living areas. Moreover, in order to calculate the population in settlements without house data, I will focus on the elaboration of other constants based on dwellings patterns. Finally, I will try to trace the demographic variation of Terramara settlements through time, both in terms of people and household numbers.

9 THE INTERPLAY OF DEMOGRAPHY AND POLITICAL ECONOMY: ASSESSING THE IMPACT OF THE EGYPTIAN LATE BRONZE AGE DEPORTATION POLICIES

Abstract author(s): Langer, Christian (Peking University)

Abstract format: Oral

Demographic data are integral in gauging the organization of societies beyond population sizes and the consumption. This paper discusses the interplay between research into demography and political economy and raises the question whether archaeological modelling can capture or trace the dynamic reality of migration, in this case the Egyptian deportation of the Late Bronze Age between 1500 and 1100 BCE. A review of population estimates for the Egyptian, Nubian and Southwest Asian societies marks beginning, combined with the related estimates of the size of the Egyptian workforce needed to sustain the population. Then the Egyptian deportation policies are introduced alongside their supply chain and geographic scope. The analysis of the impact of the Egyptian policies on adjacent societies as well as the Egyptian merges demography and political economy: only population estimates allow us to assess that impact, enabling further research questions about demographic and interregional dynamisms. In this sense, the data suggest that especially the southern Levant was hit hard by the deportation policies that targeted primarily younger individuals capable to work in Egyptian agriculture; resulting in a continual - albeit seemingly low - population loss that aggravated over several generations and probably led to or exacerbated intra-regional conflict. This scenario makes one wonder whether the Egyptian policies did contribute in any way to the so-called Late Bronze Age collapse, e.g. by making societies less resilient due to an unfavourable demographic change. In turn, Egypt itself cemented its position as the eminent great power in the long term through wealth accumulation by dispossession. Raising these issues is only possible thanks to populations estimates and quantitative approaches to Egyptian deportations. The questions is whether archaeological modelling can a) confirm the scenario outlined above and b) assess its impact leading up to the Late Bronze Age collapse.

10

AN ATTEMPT TO ESTIMATE THE POPULATION SIZE OF SARMIZEGETUSA REGIA, THE CAPITAL OF THE DACIAN KINGDOM

Abstract author(s): Petan, Aurora (Study Centre of Dacica Foundation)

Abstract format: Oral

Sarmizegetusa Regia was the capital of the Dacian Kingdom from its foundation in the middle of the 1st century BC until the Roman conquest of Dacia in 106 AD. The site is located in a mountainous area of southern Transylvania (Romania), at a maximum altitude of about 1200 m. It is assumed that the capital, which had obvious urban characteristics, spread over an elongated hill of almost 4 km and had 4-5,000 inhabitants at its peak, but this number is just a guess.

The aim of this paper is to make an estimate of the population size of the Dacian royal city based on archaeological data. The task is hindered by some important issues as the unclear relationship between the central site and the surrounding settlements, the small percentage of excavated surface, and the absence of graves. However, the site has a unique peculiarity that is useful for a demographic investigation: because of rough terrain, the houses were built almost exclusively on artificial terraces cut into the hillsides. The area was inhabited only in Dacian times and consequently, the landscape has remained almost entirely unaltered, except for slight soil erosions. Therefore, in my presentation I intend to 1. question the extent of the city, 2. present an inventory of man-made terraces and discuss their functionalities, and 3. analyse the types of buildings and estimate the average number of inhabitants per household.

11

A COMPARISON OF THE RELATIONSHIP BETWEEN SUBADULTS AGE-AT-DEATH AND LONG BONE GROWTH FROM MEDIEVAL ENGLISH URBAN CITIES

Abstract author(s): White, Sina (University of Kent, School of Anthropology and Conservation, Skeletal Biology Research Centre) - Newman, Sophie (University of Sheffield, Department of Archaeology) - Primeau, Charlotte (University of York, Department of Archaeology) - Deter, Chris (University of Kent, School of Anthropology and Conservation, Skeletal Biology Research Centre)

Abstract format: Oral

Many medieval English towns that were known for being a defence or Christian religious centre flourished into urban areas. People felt safer and protected living in these areas, which caused the population to increase. Highly populated cities are known to have experienced issues with sanitation due to poor waste management and inadequate food supply which could have led to dietary deficiencies. The skeletal development of children who migrated to, or were born in, an urban city may have been affected by poor diet and pathological conditions. Therefore, the aim of this research is to identify if age-at-death and long bone lengths differ significantly, indicative of growth disruption, between subadult individuals living in various medieval English towns.

The London Atlas of Human Tooth Development and Eruption was used to reconstruct age-at-death for subadults recovered from St. Gregory's Priory and Cemetery (11th to 15th century AD), The Black Gate Cemetery (8th to 12th century AD), and All Saint's Church (11th to 14th century AD). Subadults from Raunds, a rural cemetery, (10th to 11th century AD) were also included as a comparative sample to identify possible differences that can be attributed to urbanisation. Individuals were placed into one of two age groups: birth to 11 years or 12 to 17 years age groups. The humeri, radii, ulnae, femurs, tibiae, and fibulae were measured using an osteometric board. Possible differences in age-at-death and long bone lengths between subadults from medieval Canterbury, Newcastle, York, and Raunds were assessed using a Kruskal-Wallis H test. This analysis provides an understanding of the relationship between age and long bone lengths, and by proxy subadult health, in different urban environments in Medieval England.

A.

POPULATION DYNAMICS IN THE WESTERN SCHELDT BASIN FROM THE MESOLITHIC PERIOD TO THE IRON AGE: SPDS AND SETTLEMENT DATA

Abstract author(s): Van Maldegem, Elliot - Crombé, Philippe (Ghent University)

Abstract format: Poster

The western half of the Scheldt drainage basin has been a dynamic region since at least the Mesolithic period. The area has been extensively studied during the preceding decades leading to the discovery of increasing amounts through developer-led archaeology. The total number of sites exceeding several hundreds in western Belgium and Northern France, a large part of which have been extensively dated.

The high amount of radiocarbon dates present opportunities of reconstructing paleo-demographic dynamics through the use of summed radiocarbon probability distributions and site counts. Both methods have proven popular and successful tools for understanding population dynamics, yet both have inherent flaws. The use of both proxies allows for the comparison of the results and testing of the validity of both methods.

After careful critical selection of the data we utilize MCMC- and KDE-models of the radiocarbon data and raw count and aoristic weighing of the settlement data to form a preliminary model of demographic evolutions within the study area.

MORTALITY, MATERIALITY, AND MEANING – EMPLOYING ARCHAEOLOGICAL MATERIAL SCIENCE FOR THE RECONSTRUCTION OF FUNERARY AND RITUAL PRACTICES

Theme: 6. Material culture studies and societies

Organisers: Fundurulic, Ana (Sapienza University of Rome; University of Évora, HERCULES Laboratory) - MacRoberts, Rebecca (University of Évora, HERCULES Laboratory)

Format: Regular session

Developing analytical methods, from microscopic analysis and molecular-based approaches, organic residues, ancient DNA to chemical structures and isotope ratios, allow us to study mortuary practices in a more detailed and inclusive way. As an intentional and direct deposition, the material evidence produced by treatments of the human body after death, and the rituals that surround them, hold a great investigative potential, reflecting the social context, identity and dietary habits of the living, as well as their relationships towards death and afterlife. Furthermore, specific burial conditions can offer a better preservation to more sensitive materials like those of organic nature that are more susceptible to decay and biological oxidation, including the body itself, food and beverages, textiles, raw and construction materials, natural products, and manufactured substances, among others. However, if those remains are not detectable by the naked eye, valuable information could be overlooked and excluded from the interpretation of burial practices. That is why synergetic research, including aspects of archaeological material science, is beneficial for the integral understanding of funerary rituals through time. Examining the materiality of burials on a microscopic and atomic level enables the exploration of a wide spectrum of subjects central to mortuary archaeology allowing a more subtle reconstruction of all the processes involved in dealing with death. This session welcomes researchers, regardless of the study region or chronology, to share the methods and results of their interdisciplinary projects focused on material remains from funerary spaces. Therefore, studies involving advanced techniques for the analysis and reconstruction of funerary and ritual behaviour are encouraged.

ABSTRACTS:

1 EXPLORING THE QUANTITATIVE WEALTH OF PAST PEOPLE. A CASE STUDY FROM SULTANA-MALU ROȘU CEMETERY (ENEOLITHIC, ROMANIA)

Abstract author(s): Radu, Valentin (University of Bucharest) - Mărgărit, Monica ('Valahia' University of Târgoviște; 'Vasile Pârvan' Institute of Archaeology) - Lazăr, Cătălin (University of Bucharest)

Abstract format: Oral

The Sultana-Malu Roșu cemetery is a typical Eneolithic extramural cemetery that was used by two communities belonging to the Boian and the Gumelnița cultures, that covers the whole 5th millennium BC and the beginning of the 4th millennium BC.

The archaeological research in this cemetery is an ongoing project, with 106 graves discovered until the present. One of the most spectacular graves discovered until now was Grave no. 92. It was identified in the foundation trench of C1/2014 construction that cut this earlier grave. The pit was typical, oval shape, and it contains a young female skeleton, oriented E-W. Grave no. 92 was the most richly funerary feature of all the graves investigated here until now. Its funerary inventory includes over 3200 pieces. The beads were made of exotic raw materials, as Spondylus shells, and bone, stone, Lithoglyphus naticoides shells, bone, marble, malachite, clay and red ochre. The personal ornaments show use-wear on their surface proving that they have been worn before being deposited in the grave. Moreover, the pieces have different degrees of use-wear what illustrates that the broken or lost items were replaced and thus, they were accumulated at different time intervals.

The aim of the current paper is to explore the particular ritual practices used in case of young women buried in grave no. 92 in order to identify some social, ritual or economic meanings of this kind of deposition.

This work was supported by a grant of the Romanian Ministry of Education and Research, CNCS - UEFISCDI, project number PN-III-P4-ID-PCE-2020-2369.

2 CANOPIC JARS OF THE ALTAI MUMMIES

Abstract author(s): Ochir-Goryaeva, Maria (Kalmyk Research Center Russian Academy of Sciences)

Abstract format: Oral

At present the scholars have at their disposal a number of well-preserved mummies recovered from kurgans of the Pazyryk culture. Every one of them has been examined with the help of scientific methods. As a result of studies conducted for many years it has been established that the Pazyryk population subjected to mummification not only their noble but also commoners. But the question—what the procedure was concerning the storing and keeping of the removed entrails, including the brain, heart and abdominal organs—has remained open so far. The article discusses sets of dishes originating from Gorny Altai burial sites of the Pazyryk culture dating back to the Scythian epoch. A close examination of their arrangement in the tomb allows the present author to make a conclusion that a set of three vessels: ceramic, horn and wooden were strictly for individual “use”. Of great importance is the fact that each of the three vessels—round bottomed horn and wooden ones and even the flat-bottomed ceramic one were put on the ring pads stitched together, which were sometimes joined to the mat on the pit floor. Moreover, in some of the burials these three vessels and the buried humans were tied together with a woolen rope, its two ends tied to the little finger of the deceased. In view of

this evidence, the author assumes that the three vessels were used as canopic jars, i.e. they contained the entrails of the deceased removed on their mummification. In search of a parallel the author refers to the Egyptian canopic jars put tightly together in a special box beside the mummies.

Funded by government grant No. 075-15-2019-1879.

3 FOOD AND BEVERAGES AT THE FUNERARY BANQUET OF VILLANOVAN VERUCCHIO (RN, ITALY): FIRST RESULTS OF CONTEXTUAL AND BIOMOLECULAR ANALYSES

Abstract author(s): Patrizi, Giulia (Laboratory of Analytical and Isotopic Mass Spectrometry, University of Salento)

Abstract format: Oral

Verucchio (RN, Italy) is one of the most important Villanovan sites of the Final Bronze-First Iron age. It is situated on the top of a hill that dominates the Marecchia Valley and about hundred kilometres from the Adriatic coast.

Although the settlement area has not been investigated yet, four nucleus of cremation burials, called Lavatoio, Moroni-Semprini, Le Pegge and Lippi, have been found over the hillslopes around the village. Thanks to their excavation, it has been possible to collect interesting data useful for understanding the symbolic representation of the banquet during the funerary ritual. The latter appears filled of meanings and complex symbolism difficult to decode. For this reason, a multidisciplinary approach is necessary to comprehend both the functions of the excavated materials and the relevant actions of the funerary practice.

The present communication will illustrate the integration of the contextual analyses, which involved the revision of the published material and the ex novo documentation of the ceramic vessels, with the biomolecular analysis.

The analysis of ceramic pottery has allowed to distinguish, identify and quantify both the finds related to the funeral ceremony of the living for the deceased, both those placed as personal equipment of the dead.

The results obtained from the analysis of organic residues, although preliminary, showed a remarkable degree of lipid preservation, both in the defunctionalized ceramic and in the one accompanying the deceased. Different types of food offerings have also been identified, some connected to the dietary habits of the living, other strictly related to the death, and overall permitted to understand the function of the vessels and the connected actions.

4 NEOLITHIC STONE CIST GRAVES OF THE AOSTA VALLEY (NORTHERN ITALY). CLARIFYING THE 5TH MILLENNIUM BC CHRONOLOGY OF WESTERN ALPINE CEMETERIES

Abstract author(s): Steuri, Noah (Department of Prehistory, Institute of Archaeological Sciences, University of Bern) - Martinet, Francesca - Raiteri, Luca (Regione autonoma Valle d'Aosta, Dipartimento Soprintendenza per i beni e le attività culturali) - Milella, Marco (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Szidat, Sönke (Department of Chemistry and Biochemistry, University of Bern, Switzerland; Oeschger Centre for Climate Change Research - OCCR, University of Bern) - Löscher, Sandra (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Hafner, Albert (Department of Prehistory, Institute of Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research - OCCR, University of Bern)

Abstract format: Oral

Research on the Neolithic cist graves of the Chamblandes type mostly focused on sites around Lake Geneva and the upper Rhone valley in Switzerland. For the cemeteries of the adjacent Aosta Valley (Italy), only few information is available and mainly a lack of radiocarbon dating is responsible for that research gap.

However, this situation is deceptive about the scientific potential of this region: Within the framework of a Swiss National Science Foundation supported research project, we identified about 120 stone cist graves from ten different sites in the Aosta Valley. However, due to the lack of distinctive grave goods and missing absolute dating, their chronological position was unclear until now.

Here we present the first extensive series of radiocarbon dates from Neolithic stone cist graves of the Aosta valley. A total of 26 human bone samples from 19 graves were analyzed at the LARA radiocarbon laboratory of the University of Bern. 14C data point to unexpected early dates for the two largest cemeteries of Villeneuve (4800-4550 BC) and Vollein (4500-4350 BC). This result identifies the cist graves from the Aosta valley belong to the oldest known Chamblandes type graves ever discovered. Altogether, our study provides new evidence about the evolution of this burial practice and intra-Alpine relations.

5 FUNERARY ACTIVITY IN THE CAVES OF THE WESTERN PYRENEES DURING THE LATE PREHISTORY: NEW RADIOCARBON DATES OF HUMAN REMAINS

Abstract author(s): Cubas, Miriam (Universidad de Alcalá; Sociedad de Ciencias Aranzadi) - Peyroteo-Stjerna, Rita (Uppsala University; UNIARQ, Centro de Arqueología, University of Lisbon) - Quevedo-Semperena, Izaro (University of Valladolid; Sociedad de Ciencias Aranzadi) - Tapia, Jesús (Sociedad de Ciencias Aranzadi) - Armendariz, Ángel (Instituto Internacional de Investigaciones Prehistóricas de Cantabria-Universidad de Cantabria; Sociedad de Ciencias Aranzadi) - Rios-Garaizar, Joseba (CENIEH-Centro Nacional de Investigación de La Evolución Humana) - Santamaria, Urko (High Yield Research Group of Prehistory, Universidad del País Vasco/Euskal Herriko Unibertsitatea) - López-Onaindia, Diego (Université de Bordeaux) - Gómez-Olivencia, Asier (Dpto. Geología, Facultad de Ciencia y Tecnología, Universidad del País Vasco/Euskal Herriko Unibertsitatea; Sociedad de Ciencias Aranzadi; Centro UCM-ISCIII de Investigación sobre Evolución y Comportamiento Humanos)

Abstract format: Oral

Caves have been often used as funerary space through most European Prehistory, although the frequency of the mortuary events are highly variable over the time. This is clearly visible in the archaeological record of the Western Pyrenees, a territory with a large number of caves. Human remains have been mostly documented on the surface of the caves in apparent association with other elements of the material culture, and thus the chronology of these funerary events has been traditionally based on typological association. However, it is difficult to establish robust associations between archaeological materials recorded on the surface. The ambiguity of these contexts has resulted in generalistic interpretations, described as collective funerary events attributed to the “Eneolithic”, “Chalcolithic” o “Bronze Age”.

In this contribution we present the chronological analysis of the funerary use of caves in the Western Pyrenees based on new and previously published dates obtained of human bone collagen. Chronological models have been elaborated to examine and understand the funerary phenomenon in this region. The results suggest that this phenomenon is recorded since the Mesolithic and it persists until the Bronze Age, although the frequency and characteristics of this funerary use changed during this long time period.

6 ONE REGION, TWO RITUALS, SAME POPULATIONS? ARCHAEOLOGICAL-ANTHROPOLOGICAL REMARKS ON THE MEDIEVAL BURIALS IN THE ROMANIAN PLAIN

Abstract author(s): Vasile, Gabriel - Ionita, Adrian (“Vasile Pârvan” Institute of Archaeology, Romanian Academy)

Abstract format: Oral

The Romanian Plain is a large geographical unit, with silvo-steppe features, located in the southeastern part of Romania. In this region, during the 11th-14th centuries, interesting funerary phenomena were identified, respectively two main funeral horizons, both of them characterized by inhumation. From the first horizon, about 35 burial mounds were investigated, most of which contained deposits consisting of horse skeletal remains, weapons, military equipment pieces and harnesses. The second funerary custom is represented by several necropolises and groups of flat tombs, totalling about 90 individuals, with an austere inventory, usually ornaments or clothing accessories. In this presentation, we will compare the burials from the two approximately contemporary funerary horizons, located in the same geographical area, but different as a ritual. The chronology of the graves was established both by the traditional analysis of the funeral inventory and some radiocarbon data.

The standard ritual for the first horizon is characterised by: secondary burial in the olds tumuli; rectangular pit; supine position; arms stretched alongside the body; legs stretched; West-East orientation; horse skull and the extremities of the horse’s legs; inventory – bit, knife, arrowheads, iron strike-a-lights, flint, buckle, stirrups, worked bone plates.

The standard ritual for second horizon burials consists of: flat graves; inhumation; rectangular pits; no interior arrangements and no coffin; supine position; arms placed on the chest, abdomen or stretched alongside the body; West-East orientation; a poor or absent inventory.

From the point of view of the funeral standard, the differences are obvious, but the situation is much more complex from an anthropological perspective. We osteologically analysed a sample of about 50 individuals, most of them from necropolises. A series of morphometric, epigenetic and some pathological features were used to compare the two funeral customs.

This work was carried out within the postdoctoral project BioArchMed, funded by UEFISCDI (code: PN-III-P1-1.1-PD-2019-0351).

7 HUGGING IN DEATH: A CASE OF AN UNUSUAL GRAVE FROM THE LATE ANTIQUITY SITE OF GRMUŠINA KOSA (SERBIA)

Abstract author(s): Djukic, Ksenija (Laboratory for Anthropology, Faculty of Medicine, Belgrade) - Jončić, Nenad (Faculty of Humanities, University of Primorska) - Milenković, Petar (Laboratory for Anthropology, Institute of Anatomy, Faculty of Medicine, University of Belgrade; Institute of Oncology and Radiology of Serbia - National Cancer Research Center) - Živković, Maja (Institute for the Protection of Cultural Monuments Pancevo) - Nikolić, Veda - Pavlović, Tamara (Laboratory for Anthropology, Institute of Anatomy, Faculty of Medicine, University of Belgrade)

Abstract format: Oral

The archaeological site Grmušina Kosa is located on the peripheral of the Bant loess terrace, on the left bank of the one of the old Danube stream, at about 76m above sea level. Located near the village of Skorenovac and 6km away from the city of Kovin, this site

geographically belonged to the South Banat District. During the second half of 2019 the site was explored as a part of the protective campaign of archaeological excavations on the route of the main gas pipeline.

Among excavated graves, the grave with skeletons of two children differs from others in unusual position of skeletal remains in situ. The children skeletons in situ laid on the left side in a half-bent position, and it looks younger child embraced the older. Such positioning of children’s skeletal remains represents a unique case in Serbian archeology. They were buried without grave goods, however according to unpublished archaeological records this grave is dated in the Late Antique period, attributed to the Sarmatians.

Anthropological analyses revealed that the older child was 5 to 7 years of age at the moment of death, while youngest child was 2 to 3 years old. Both children showed numerous lesions on the internal and external laminae of their skulls, orbital roofs and long bones. The observed lesions were characterised as traces of metabolic disease. The left humerus of the older child showed signs of a possibly healing greenstick fracture with the most probable differential diagnosis of osteoid osteoma.

The aim of this paper is to discuss the archaeological and bio-anthropological context of this unique grave, and also to present possible reasons for the children’s unusual skeletal positions.

8 THE POPULATION GROUP OF CALLE DINAMARCA (VALENCINA DE LA CONCEPCION). A SOCIOCULTURAL AND ARCHAEOLOGICAL APPROACH

Abstract author(s): Morillo León, José Miguel (Institut für Ur- und Frühgeschichte/Christian-Albrechts-Universität zu Kiel) - Pajuero Pando, Ana - López Aldana, Pedro (HUM949. Grupo de Investigación Tellus. Prehistoria y Arqueología en el sur de Iberia Departamento de Prehistoria y Arqueología) - Gavilán Zaldúa, Maria - Serrano Castilla, Beatriz - Rojas Aledo, Violeta (Independent)

Abstract format: Oral

During the excavation of a plot in the emblematic site of Valencina de la Concepción in 2009, a group of three sepulchres belonging to an early phase of this site were discovered. The archaeological excavation was conducted up to the levels reached by the construction project, uncovering approximately 100 individuals, of which up to a minimum of 68 were recovered. The funerary structures discovered consisted in two hypogea and one funerary pit, and the human remains were extracted with the sediment attached, consolidated using paraloid.

Approximately ten years after, 44 of the skulls were selected to sample them for genetic and isotopic characterization in the framework of the European Project Towards a New European Prehistory.

The chance of studying a coherent social group that undoubtedly shared a sort of link offered relevant perspectives in terms of kinship and social relations within the members of a subsidiary group, in the context of Chalcolithic site characterized by its own social complexity. Even more, during the microexcavation of the skulls prior their sampling, 18 individuals showed diverse grades of traumas.

Additionally, in the graphic register of the excavation, it was possible to identify a possible arrow wound in young male.

Finally, a hippopotamus ivory towa idol and a patella shell, together with possible evidences of body decoration were found.

Here it is our intention to expose the preliminary social conclusions of our study, awaiting genetic and isotopic results that will conclude with the information about mobility, diet and kinship that will offer an extremely relevant information about an intermediary group in a pristine complex society in the South West of the Iberian Peninsula during the Chalcolithic.

9 ROMAN FUNERARY PRACTICES IN AUGUSTA EMERITA: DIFFERENTIATED SUBADULT BURIALS FROM 2ND TO 4TH CENTURY (AD)

Abstract author(s): García-Moreno, Carlos (EcoPast - GI-1553, Faculty of Biology, University of Santiago de Compostela) - Andújar Suárez, Ana (Roman Cities Research Group, Faculty of Geography and History, Complutense University of Madrid) - Murciano-Calles, José - Sabio González, Rafael (National Museum of Roman Art, Mérida)

Abstract format: Oral

The roman city of Augusta Emerita (Mérida, Badajoz), founded in 25 BC., is one of the most important colonies in Hispania as the provincial capital of Lusitania. Although its main necropolises are known, the state of conservation and archaeological works reveal important remains. A funerary area has recently been excavated in recent work carried out in a new area of the National Museum of Roman Art (MNAR). We have studied the 118 individuals buried there between the 2nd and 4th centuries AD. This study has consisted, on the one hand, in registering the characteristics of the tombs and the composition of the grave goods. On the other hand, in the detailed anthropological analysis of individuals to estimate their age. Among these, 33% correspond to subadult individuals (<20 years). The large number of cases is very significant compared to other burial areas of the same period in Hispania. In addition, among the infant graves, different ritual practices applied to these individuals have been detected. These data require a reading of the possible causes that motivated this concentration of individuals treated ritually in a heterogeneous way. Among these specific rituals, the finding of remains of lime in two of the tombs stands out. This intentional practice is not widely documented at this time for any age group. In order to explain this and interpret these practices, we have contrasted the data from the study funerary area with those from others about the same period and territory. Stable isotope analyzes (paleodiet and mobility) and paleopathological analyzes are important in our research in process on these subadult individuals. On the other hand, archeometric analyzes on the aforementioned lime remains are essential. With all these data, we can get closer to the way of life of these small inhabitants of the city.

IDENTITY AND MORTALITY: RECONSTRUCTING ORIGINS OF A MEDIEVAL ISLAMIC POPULATION IN SANTARÉM, PORTUGAL THROUGH AN ISOTOPIC STUDY OF SKELETAL REMAINS

Abstract author(s): MacRoberts, Rebecca (HERCULES laboratory- University of Evora) - Teixeira, João (Australian Centre for Ancient DNA, School of Biological Sciences, The University of Adelaide) - Liberato, Marco (Centro de Estudos de Arqueologia, Artes e Ciências de Património) - Valente, Maria João (Faculty of Human and Social Sciences, University of Algarve) - Relvado, Cláudia (Interdisciplinary Center for Archaeology and Evolution of Human Behaviour, University of Algarve) - Barrocas Dias, Cristina (HERCULES Laboratory, University of Évora; School of Technology Sciences, Department of Chemistry, University of Évora) - Matos Fernandes, Teresa (Research Centre for Anthropology and Health - CIAS, University of Coimbra; School of Technology Sciences, Department of Biology, University of Évora) - Barros, Filomena - Vasconcelos Vilar, Herminia (School of Social Sciences- CIDEHUS, University of Évora) - Maurer, Anne-France (HERCULES Laboratory, University of Évora)

Abstract format: Oral

The excavation of the site of Avenida 5 de Outubro, Santarém, Portugal uncovered a necropolis containing the remains of the Islamic population who occupied the city from the 8th/9th to the 11th century. There is evidence of two waves of Islamic settlement in Santarém, a theory suggested by the presence of two distinct grave orientations in the site, in some cases one superimposing the other. A previous dietary study of the Santarém population using carbon and nitrogen stable isotopes from the bone collagen of selected individuals (presented in EAA 2020 Virtual Meeting) indicated less variable diets in the apparent earlier population than the later one. Using these results, along with archaeological evidence as a guideline, the mobility of medieval Santarém Muslims has been subsequently assessed by measuring sulphur stable isotopes from bone collagen and strontium radiogenic isotopes from tooth enamel, selected from individuals with both earlier and later grave orientations. Results of this research will provide clarity to the archaeological theory that the earlier graves belonged to the initial post-conquest Islamic population who migrated to Iberia from Africa. Additionally, we sequenced complete mitochondrial genomes for six individuals in order to further disentangle their genetic ancestry and geographic origins. The funerary practices of this population and their changes over time (i.e. grave orientation), mirror the cultural and religious identity of the Islamic population adapting to life in the Iberian peninsula through generations. The origins and identity of the population will be supported by the geochemical data obtained from their skeletal remains.

This research is part of the project "TRANSCULTURAL (POCI-01-0145-FEDER-031599)".

CHILDHOOD, DIET AND RELIGION: THE STUDY OF BREASTFEEDING AND WEANING PATTERNS IN TWO MEDIEVAL PORTUGUESE POPULATIONS

Abstract author(s): Relvado, Cláudia (Interdisciplinary Center for Archaeology and Evolution of Human Behaviour, University of Algarve) - MacRoberts, Rebecca (HERCULES Laboratory, University of Évora) - Fernandes, Teresa (Research Center in Anthropology and Health, University of Coimbra; School of Science and Technology, Department of Biology, University of Évora) - Umbelino, Cláudia (Research Center in Anthropology and Health, University of Coimbra; Department of Life Sciences, University of Coimbra) - Dias, Cristina (HERCULES Laboratory, University of Évora; School of Science and Technology, Department of Chemistry, University of Évora) - Maurer, Anne-France (HERCULES Laboratory, University of Évora)

Abstract format: Oral

Children's diet, namely the Breastfeeding and Weaning Patterns (BWP), have a strong impact on survival of non-adults and health during adulthood. Analysis of $\delta^{13}C$ and $\delta^{15}N$ values of skeletons can help in estimating BWP of archaeological populations, which depend on cultural factors, and which may help in understanding the general health conditions prevailing in the past.

This study analyses bone collagen stable isotope data ($\delta^{13}C$, $\delta^{15}N$) from 38 non-adults from the Medieval Christian necropolis of São Miguel de Odrinhas (SMO) (11th-15th centuries) and 27 non-adults from one Medieval Islamic necropolis of Santarém (9th-12th centuries). Data obtained from children are compared to those from female adults and interpreted regarding environmental baseline (fauna) for both sites. This study is part of the TRANSCULTURAL project (POCI-01-0145-FEDER-031599).

Demographically, the Islamic necropolis presents a larger proportion of younger individuals (<3 years) as opposed to the Christian necropolis. BWP are also quite different between both necropolises. The Islamic individuals of 0-3 years old show the expected increase in $\delta^{15}N$ values related to breastfeeding. Some of those non-adults display an increase in $\delta^{13}C$ values in relation to the adult average higher than expected (between 1‰ and 2.8‰), which may be related to different female diet during pregnancy and breastfeeding and/or to the addition of supplementary food products to the children's diet. In the Christian necropolis the increase in $\delta^{15}N$ values is not so visible, and some individuals seem not to have been breastfed at all. Weaning was complete at the age of four in both case studies. Also, in these necropolises, the older non-adults yield slightly lower $\delta^{15}N$ values than adults, which may be related to different diets or to their own growth.

BWP and diet of children of these Medieval communities are very different, which may be related to different socio-cultural, socio-economic, and geographical factors.

STABLE CARBON AND NITROGEN ISOTOPES OF SKELETAL REMAINS AS EVIDENCE OF DIET IN MEDIEVAL SANTARÉM (PORTUGAL)

Abstract author(s): Leite, Adriana (Research Centre for Anthropology and Health, Department of Life Sciences, University of Coimbra) - Maurer, Anne-France (HERCULES Laboratory, Chemistry Department, University of Évora) - Relvado, Cláudia - Umbelino, Cláudia (ICArEHB, University of Algarve; Research Centre for Anthropology and Health, Department of Life Sciences, University of Coimbra) - Silva, Ana Maria (Research Centre for Anthropology and Health, Department of Life Sciences, University of Coimbra; UNIARQ, University of Lisbon; CEF, Department of Life Sciences, University of Coimbra)

Abstract format: Poster

When applied to the study of ancient human populations, stable isotope analysis can be considered as a tool used to examine past ways of life, such as diet, migration, breastfeeding and weaning strategies, socioeconomic and biological restraints. Due to its geographic and strategic position, Santarém was considered one of the most important cities of Portugal during the Middle Age. This chronological period is of great relevance because of the Christian conquest of Santarém, which induced structural and socioeconomic changes that may potentially reflect a differential access to the available food. This study aims at reconstructing the diet of medieval individuals unearthed from the Necropolis of Rua dos Barcos, Ribeira de Santarém (Santarém), and at exploring possible sex and age-at-death differences. Anthropological, historical, and archaeological evidence suggest a Christian occupation of the site. Carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) isotope ratios were measured in bone collagen of 27 individuals, 15 non-adults and 12 adults. Historic evidence states that the Portuguese medieval diet consisted of staple cereals and wine supplemented with meat, aquatic resources, and vegetables. In line with these historical sources, $\delta^{13}C$ (mean = $-16,6‰ \pm 1,9$; n=24) and $\delta^{15}N$ (mean = $11,0‰ \pm 0,8$; n=24) values of human bone collagen suggest that the staple diet was predominantly based on a consumption of C3 plants and animal protein with a possible input of C4 plants and/or aquatic protein intake (e.g. low-trophic level fish). No age-at-death and sex statistic differences were observed in human bone collagen $\delta^{13}C$ and $\delta^{15}N$ values. Representing the first palaeodietary study of Ribeira de Santarém, this research increases our knowledge of dietary habits in Medieval Portugal.

PUBLIC AND COMMUNITY ARCHAEOLOGY IN A (POST-)COVID LANDSCAPE (PUBLIC ARCHAEOLOGY)

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Westmont, V. Camille (University of the South) - Benetti, Francesca (Historic Environment Forum)

Format: Session with presentation of 6 slides in 6 minutes

Public and Community Archaeology practices often involve direct contact with the public, something strongly discouraged during the COVID-19 pandemic. Changes brought about by COVID-19 have affected heritage stakeholders in a variety of ways. As volunteering and in-person meetings ceased, heritage organisations were forced to find other ways to connect with the public, leading many of them to use the digital environment in new ways. While many heritage organisations have struggled with closures and quarantines, the pandemic has provided some communities with greater opportunities to enjoy their local heritage due to the decline in tourism. Moreover, the duty to work from home and avoid transport and travel has encouraged people to take more walks in their local area, discovering their place and connecting to the landscape more deeply. As COVID-19 had and continues to have a huge impact on the entire archaeological and heritage sector, this session aims to explore: How have experiences in Public and Community Archaeology adapted to the new conditions? How can Public and Community Archaeology projects kickstart the recovery? What are the medium- to long-term impacts the pandemic is expected to have on the activities and projects? What challenges did you have to face and how did you minimise the risks? What lessons have you learned and which you will keep in a (post-)COVID-19 world?

ABSTRACTS:

RECHARGING BRITISH ARCHAEOLOGY: CREATING NEW OPPORTUNITIES FOR PARTICIPATION

Abstract author(s): Corkill, Claire - Redfern, Neil (Council for British Archaeology)

Abstract format: Oral

Local archaeology groups and societies across the UK provided valuable opportunities for the public to participate in archaeology, sharing knowledge, skills and creating opportunities for people to explore the stories of their place and deepen their connections with their communities. Covid-19 has had a significant impact and with the inability to meet in person many groups have found it challenging to continue to engage with their members.

Through the Historic England funded Recharging British Archaeology project, the CBA has provided support for these groups throughout the pandemic to help them overcome some of the challenges they have faced, celebrate their successes and provide training so they feel better equipped with the skills and confidence to embrace new methods of delivery. By listening to and working with these groups we have identified a range of opportunities to help them become more resilient and capable of creating an even greater impact on their communities in the future. In our 6 minutes we will set out the key lessons we have learnt from this work and how we will be implementing them moving forwards.

2 REFLECTIONS ON RUNNING COMMUNITY ARCHAEOLOGY PROJECTS IN SOUTH EAST ENGLAND DURING COVID 19

Abstract author(s): Mayfield, Andrew (Kent County Council) - Adams, Sophia (University of Glasgow)

Abstract format: Oral

At the beginning of 2020 we had a busy programme of community archaeology planned for the year. Once the pandemic struck, we had to postpone all in person activities and devise new ways of engaging with the public and volunteers. This involved creating remote activities, strengthening methods of communication and planning how we could safely deliver community archaeology activities post lockdown. Each of the three distinct projects we were working on had their own set of challenges from connecting with new volunteers to managing the expectations of regular participants.

Through my voluntary role leading the local Young Archaeologists Club (YAC), I also worked with our volunteer team to find creative ways to engage children with archaeology at a time when so much of their learning had shifted online. This presentation will reflect on 2020, the issues we faced with projects in Kent and the lessons we learned. As we look forward to a post-Covid world, how can we do things differently? What lessons can we learn from our experience of remote community archaeology in 2020?

3 THE EFFECTS OF THE COVID PANDEMIC ON ARCHAEOLOGICAL SITES MANAGED WITH A BOTTOM UP APPROACH IN NAPLES, ITALY

Abstract author(s): De Vivo, Caterina (Centro Studi Interdisciplinari Gaiola Onlus - Progetto Museo)

Abstract format: Oral

In the last few years many private-public partnerships have been established in Naples, Italy, with a bottom up approach in order to manage archaeological sites and make them more accessible to the public. Many of these cases are considered national best practices and models to re-think the State approach to the management of cultural heritage sites. These sites have been strongly impacted by the COVID-19 crisis and many limits of the management model have been recognized. In fact, the pandemic made clear how most of these sites cannot survive without the tourism industry.

Moreover, the crisis made clear how, without any public fund, the private organizations managing archaeological sites with a bottom-up approach cannot deal with the responsibility of taking care of the sites/museums.

This paper is aimed at analyzing the problems that the pandemic raised in a wide perspective to underline what lessons we have learned and what should be changed to make the system more sustainable.

4 WAYS OF TELLING STORIES OUTSIDE DURING LOCKDOWN

Abstract author(s): Paulsen, Charlotte (Museum Skanderborg)

Abstract format: Oral

During lockdown of Denmark in the spring of 2020, the citizens of Skanderborg as in many other places turned to walks in their local area. Museum Skanderborg had to cancel numeral sold out guided tours, as groups were not allowed. Instead, the museum developed other ways of telling outside stories. This paper presents two examples as ideas for others to follow on ways of telling stories in Covid-19 and post Covid-19 times.

In the city of Skanderborg, a cooperation with the Municipality of Skanderborg resulted in 10 wooden benches along the main shopping road with historic photos, and a website where you could read about the people on the photos. The benches provided sitting spots for walkers and decoration in the street as well as a good story along the way. The benches were a re-use from another event. The only cost was the new pictures and a truck to put them in the streets. The benches were only a temporary concept and were removed before winter, but the museum and the municipality are using the knowledge of the project in further development of the city center.

In a forest and close to the city, we also wanted to provide stories for walkers. As we did not want people to walk around looking at their phones instead of nature, we did not want to make it digital. There was not budget to make proper signposts, but 20 old fashioned laminated posters were tied around big trees for people to read along their walks. People responded positively to the posters and went looking for them all. The posters were taken down in the autumn, as the string and the posters were worn out after the summer. The Municipality of Skanderborg has now decided to make the posters in to proper signposts.

5 ARCHAEOLOGY AT A PINCH: HOW A COVID-DRIVEN COLLABORATION IS FUELING A SUSTAINABLE COMMUNITY ARCHAEOLOGY PROJECT IN TENNESSEE, USA

Abstract author(s): Westmont, V. Camille (University of the South)

Abstract format: Oral

After the University of the South's (Tennessee, USA) undergraduate archaeology field methods course in summer 2020 was cancelled due to COVID, two archaeologists decided to carry out excavations on their own. However, we were soon inundated with requests from regional organizations seeking outdoor opportunities for local youths. Given low COVID case counts in the surrounding area and the rural nature of the site, we elected to work with the AmeriCorps VISTA program to provide job opportunities for five local youths (ages 18-22) during summer 2020. Strict COVID policies were implemented that have helped us redefine how we will

do in-person public engagement in the future. Additionally, although archaeology had never before been part of the VISTA program's job placement program, after the success of the summer work, we have developed an on-going collaborative relationship with the organization, including providing digital opportunities for as many as 14 local youths during fall 2020 and winter 2021. In this case, COVID opened doors to new collaborations and opportunities that neither party had previously considered.

6 HOW TO DO COMMUNITY ARCHAEOLOGY WITHOUT COMMUNITY? EXPERIENCES FROM RURAL GALICIA (SPAIN)

Abstract author(s): Ayán, Xurxo (NOVA University of Lisbon)

Abstract format: Oral

Since 2016 we have been developing Community Archaeology projects in the rural region of the Ribeira Sacra in Galicia (Spain). On March 13, 2020, the government of Spain decreed the first total confinement of the population to combat the COVID-19 pandemic. This communication aims to show how our work team has adapted to the different stages that we have experienced since then, between the successive waves: total confinement (March-June 2020), de-escalation between the first and second waves and semi-confinement (since December 2020). The strategies adopted have allowed us to continue with the excavation of two emblematic archaeological sites (San Lourenzo and Os Conventos) at a time when the declaration of the Ribeira Sacra as a World Heritage Site by UNESCO was decided. We will try to show how a committed archaeology, flexible and willing to take risks (always obeying the health authorities) has become an effective tool to overcome the feeling of ruin installed in people and to generate optimism within this new reality full of uncertainties. The examples of the archaeological project of the San Lourenzo hillforts and 'Adegas da Memoria' can inspire other colleagues to seek alternatives and not paralyze ongoing projects. After years of effort, we all know that a hiatus in an Community Archaeology project can lead to its final disappearance. COVID-19, like other pests of the past, will not destroy either these peasant communities or the community of archaeologists.

7 THE BEST-LAID PLANS OF MICE AND MEN – ADAPTING THE ARCHAEOLOGICAL SIDE OF THE LIVE PROJECT DURING THE COVID-19 PANDEMIC

Abstract author(s): Moeller, Katharina (Prifysgol Bangor University)

Abstract format: Oral

The Llŷn IVeragh Eco-museums (LIVE) project was designed to enable coastal communities to promote their natural and cultural assets, as well as to create opportunities for sustainable tourism. An important aspect of LIVE is the generation of new knowledge in cooperation with these communities to support them in engaging more deeply with their local environment and culture. Where the archaeological heritage on the Llŷn peninsula is concerned, this was supposed to be done through Bangor University's excavation at the late Bronze Age/Iron Age double ringwork enclosure at Meillionydd, which has always welcomed volunteers from all over the world. However, due to the COVID-19 pandemic, neither the excavation nor the associated outreach activities could take place in 2020 and 2021. Instead, alternative means to reach the public were developed in line with the strict COVID guidelines in Wales. This includes a series of digital and non-digital resources to enable the public to learn about the archaeological heritage of the Llŷn, as well as socially-distanced activities and virtual site visits. This paper will look at the changes the archaeological aspect of the project had to undergo to be deliverable during the pandemic and the future plans for the time post-COVID.

8 VIRTUAL HERITAGE AND WELLBEING

Abstract author(s): Sayer, Faye - Luck, Amy (Manchester Metropolitan University)

Abstract format: Oral

The 'Virtual Heritage and Wellbeing' pilot project was launched in response to the COVID pandemic and the negative impact it had on global wellbeing. Closures and social distancing measures due to the pandemic resulted in heritage organisations increasing their online presence and a 40 per cent upsurge in online visits. Virtual heritage became the main method by which the public engaged, learnt, and connected with their past, and provides a potentially cost effective, sustainable, resilient, and safe way for heritage organisations to engage with audiences.

This project, supported by heritage organisations and the What Works Centre for Wellbeing, applied public health accredited methods, including Positive and Negative Affect Schedule and the Modified Wellbeing Scale to measure the impact of virtual heritage on user wellbeing. Results demonstrate that engagement with virtual heritage had a positive impact on user wellbeing. This study provides evidence for heritage organisations to consider virtual strategies as sustainable and resilient mechanism to engage with audiences and have a social impact.

9 TANGIBLE ARCHAEOLOGY IN THE DIGITAL ENVIRONMENT: EXPERIENCES IN AN ARCHAEOLOGICAL MUSEUM

Abstract author(s): Aalto, Ilari (University of Turku; Aboa Vetus Ars Nova Museum)

Abstract format: Oral

Aboa Vetus Ars Nova Museum (Turku, Finland) houses archaeological remains of several medieval stone houses that were excavated in the 1990s. Since its opening, Aboa Vetus Ars Nova has had a strong emphasis on the museum pedagogy: audience engagement

and educational programs. The museum has an especially strong expertise in organising educational activities and participatory programmes in the field of mediating archaeological heritage. The museum continues archaeological excavations in the museum area regularly. Conducting archaeological research and sharing and applying its results form the basis for the museum's participatory activities.

Medieval ruins form a tangible historical environment, and the COVID-19 pandemic has forced the museum to find new ways of translating physical experiences to the digital environment. Features such as three-dimensionality, weight, texture, surface temperature or even smell are all part of the so-called "sensory engagement" with a physical object. Also being physically present and spending time in the museum spaces or archaeological sites is an empowering experience for the visitors.

These aspects are often missing when engaging with museum objects or archaeological topics in a digital space. This paper discusses some of the ways used to give audiences a fulfilling learning experience using archaeology as a starting point in the online environment.

348 DERIVATIVES OF THEIR MEN? ALTERNATIVES TO THE "WOMAN PROBLEM" IN MORTUARY ARCHAEOLOGY [AGE]

Theme: 6. Material culture studies and societies

Organisers: Stanton, Emily (University of Wisconsin-Milwaukee) - Pope, Rachel (University of Liverpool)

Format: Regular session

During a vigil in honor of the late Ruth Bader Ginsburg, Judge Diane Goodstein of South Carolina noted that the "Notorious RBG" was a dauntless champion of women's rights and gender parity in the United States and one of the main reasons that "today, women are no longer derivatives of the men in their lives." While this idea has gained traction in the present day, many archaeological interpretations of women's lives in the past tend to be androcentric by default.

For example, the elite women of late Hallstatt Central Europe were often buried with splendid sets of personal ornamentation such as ring ornaments, hairpins of bronze or gold, and belt ensembles decorated with thousands of intricate bronze staples. A persistent interpretive model for these items is that they represented the wealth of the woman's husband; she wore these ornaments as a walking display of the economic status of the men in her life. This perspective presents the great women of the past as mere derivatives of men, with little or no agency. The work of Judith Butler (1990; 1993) refers to this idea as the Woman Problem, while Fraser (1988:107) dubbed it the Appendage Syndrome which views women "as an extension or prolongation of the rule of a particular great man."

But why must this be the case? The idea that powerful women in prehistoric societies were an anomaly reflects a biased over-generalization of the complexities of women's lives in the past (Nelson 2004, 2006). This session will explore the issues inherent in the Appendage Syndrome or Woman Problem from a pan-European archaeological perspective while suggesting possible alternatives to this interpretative lens. We welcome papers that examine this issue across multiple time periods and geographic regions, especially those with a focus on gender and mortuary archaeology.

ABSTRACTS:

1 WOMAN OF THE HOUSE? FUNERARY DRESS AND FEMININE POWER IN IRON AGE CENTRAL ITALY

Abstract author(s): Prew, George (University of Glasgow)

Abstract format: Oral

Theories of how urbanism occurred across Iron Age Italy have traditionally revolved around the concept of elite classes comprising masculine leaders. Tombs, particularly richly-furnished 'princely' tombs of the eighth and seventh centuries BCE, have provided the main material evidence for these elevated men. However, scholarship has focused disproportionately on this richest subset of tombs and their occupants (often assumed male by default), skewing understandings of power and gender in ancient Italic communities and under-representing the role and power of women as separate from their male relations. Through new sensory and material analyses of around 1,400 published graves from sites across central Italy (Osteria dell'Osa in Latium; Fossa and Bazzano in the Abruzzo), this paper presents new insights into gender and the power of women within Iron Age central Italic societies, as well as frameworks for gender study in tombs throughout history and prehistory.

Sensory, material, categorical, and associative analyses of dressed bodies in graves provide multiple lenses through which to build a composite picture of the deceased, their constructed identity in the grave, and the communities in which they lived. Applying osteological sex estimations to the patterns that emerge from these graves then allows a picture to emerge of the place of women in early Italy not as an adjunct to men, and, through intersectional study of apparent age, social class, and other reconstructable identity markers, not only as women. By applying these methods to cemeteries across early Iron Age central Italy, new conclusions and greater nuance can emerge beyond narratives of male rulers, and of women valued primarily for their ability to produce male rulers. Osteologically-visible sex then appears, contrary to prevailing narratives in ancient Italic scholarship, as an integral part of funerary identity, but without any imposed gendered hierarchy.

2 WOMEN IN THE MACEDONIAN KINGDOM DURING THE 6TH C. BCE: BOTTOM-UP VS TOP-DOWN VIEWS OF THE FUNERARY EVIDENCE

Abstract author(s): Saripanidi, Vasiliki (Université libre de Bruxelles)

Abstract format: Oral

Macedonian necropoleis from the 6th c. BCE have yielded a series of lavishly equipped female burials that find no parallels in the archaic Greek world. Systematically overlooking their archaeological context, interpretations of these burials have relied on a preconceived dichotomy between male/public/power and female/domestic/subordination. Thus, those grave goods that evoke dressing and grooming practices, such as jewelry and perfume flasks, have been considered as "typically female" and assigned a biographic function. On the other hand, artifacts that allude to the public sphere, such as feasting accessories and wagon models, have been either completely disassociated from the biographies of the deceased or identified as insignia of the only imaginable authoritative female role, that of a priestess. In any case, the high status ascribed to certain women upon their death, and even their assumed right to priesthood in life, have been understood as mere reflections of the status of the powerful fathers and husbands of these women. Following a reverse, bottom-up, approach, this paper will demonstrate that, while the aforementioned interpretations may already raise suspicions on theoretical grounds, they actually find little support in the archaeological record. It will be further shown that, although the Macedonian funerary evidence from that period does, indeed, testify to certain gender distinctions, at the same time it suggests that such distinctions did not permeate all social action spheres nor were they always underlain by male-dominated hierarchical relations. Stressing that Macedonian burials attest to more pronounced hierarchies within rather than between gender groups, the paper will finally argue that, within the archaic Macedonian society, access to networks of power was neither exclusively nor always primarily conditioned by perceptions of gender.

3 BRAZEN WOMEN? RECONSIDERING INTERPRETATION OF MALE AND FEMALE ELITE BURIALS (LATE BRONZE AGE- LA TÈNE B, IN NORTH ALPINE COMPLEX)

Abstract author(s): Trémeaud, Caroline (TRAJECTOIRES UMR 8215; Cellule Archéologique des Ardennes)

Abstract format: Oral

In February 1953, the rich grave of "The Lady of Vix" was excavated; the funeral deposit is particularly impressive, including a golden torc, and bronze and silver vessels (including the famous krater) imported from the Italian and Greek world. But the grave contained no weapons, which lead to fifty years of papers debating the sex and status of the deceased; the conclusive identification of female sex was only established in the early 2000s.

In October 2014, the excavation of another rich burial at the site of Lavau revealed several similarities: another gold torque, bronze vessels, and imported goods. As with analysis of the Vix burial 61 years prior, the question of the deceased's sex was raised. Osteological analysis concluded that the individual was male, thus removing the doubt that this individual was high-ranking member of the social elite, "a prince".

Despite 60 years of research in archaeology, including gendered issues in interpretation, the question of the sex is always raised in the same way:

- a rich female burial raises the issue of her status, whereas a rich male burial is thought to be that of an elite member, probably a political chief, a so-called "Celtic prince"
- a typical starting point in interpreting the burial as male or female is whether the burial contains weapons.

However, current analysis (Trémeaud 2014, 2018) based on a corpus of more than 800 elite graves in the North Alpine Complex, from late Bronze Age to La Tène B, has characterized the elite burial phenomenon and highlighted the significance of feminine burials. The presentation of this study and the results will pose challenges to the traditional interpretation of women's position among the elite. The aim of this presentation is to offer new interpretations on both male and female elite burials.

4 DIVERSITY OF MALE IDENTITIES IN EARLY AND MIDDLE LA TÈNE CEMETERIES

Abstract author(s): Ramszl, Peter (University of Vienna, Institute of Prehistory and Historical Archaeology)

Abstract format: Oral

Discourse on male identities in the Iron Age has hitherto been dominated by thoughts about warrior identity. However, only a fraction of male bodies are laid out as warriors in their graves, prompting questions such as: What roles did men play in society? What roles did men without weapons play in "warrior societies"? In a 2016-2018 SASPRO-project "Male identities in La Tène period cemeteries in the middle danube area in Nitra, Slovakia, I studied a large corpus of La Tène period graves and cemeteries in the area of Slovakia, east Austria, and Moravia to attempt and answer these questions.

In this paper I seek evidence of different subgroups within the large group of graves with anthropologically male skeletons, which does not automatically mean that these individuals had been seen as "male" in their own times. First of all, different life-stage identities shall be analyzed – namely, "boy identity", "adult identity", and "old man identity." Additionally, a number of "special identities" have emerged in the last few years, such as males with "female" rings or costume or females with weapons, also suggest the idea of multiple male identities. Other special identities can also be observed in La Tène period cemeteries, including "Druid identities," "craftsmen identities" and "poor man identities." Above all, past societies were by no means as simple as schoolbooks sometimes portray. Thus, the group of anthropologically male remains includes "special identities" that cross the borders of standard inter-

pretive models. Male skeletons with otherwise typically “female” markers like special jewellery or “male” markers that are used in a non-standard way suggest other interpretive models beyond the simple male/female dichotomy. The field of gender archaeology has begun to exert a very important impact on our scientific research and the ways in which we envision people in the past.

5 THE ROLE OF WOMEN IN THE AVAR EMPIRE (CA. 568-800 AD): A REVIEW

Abstract author(s): Bühler, Birgit (Vienna Institute for Archaeological Science - VIAS, University of Vienna)

Abstract format: Oral

The Avars, equestrian nomads of predominantly Central and Inner Asian origin, were present in eastern Central Europe from the year 568 to around 800 AD. The Avar male elite, in particular in the 6th-7th century AD, were renowned for their skills in mounted combat. However, the role of women in Avar society is a topic that merits further research: In general, Avar material culture, predominantly grave goods, indicates that the daily life of women in Avar communities in the Carpathian Basin tended to focus on the domestic sphere, with textile-production activities such as spinning and sewing documented by the grave goods. However, there are a small number of elite “female equestrian graves” (female burials including horses) from the Avar Period: Although no weapons occur in these burials, grave goods associated with domestic activities such as spinning and sewing are usually missing from female equestrian graves. Due to a lack of written sources from within the Avar Empire, we have no information about many aspects of life in the Avar period. Historical records concerning the Avar Empire are all “external”, written by historiographers from neighbouring cultures, such as Byzantium, China or the Frankish Empire. The scarcity of relevant historical sources can make it difficult for archaeologists to decipher “the cultural code” inherent in Avar burials. However, the historical record of other equestrian nomadic cultures, such as the Mongolian Empire in the Later Medieval Period, may be helpful in providing analogies for gender roles in Avar society. Furthermore, bioarchaeological research can assist the interpretation of Avar burials, by providing information on activity patterns, lifestyle and general health. The aim of this paper is to review the state of research on the role of women in the Avar Empire (568-800 AD) and to suggest future directions for interdisciplinary research on this topic.

6 CHANGING PERSPECTIVES – OVERCOMING ANDROCENTRISM AND THE « WOMAN PROBLEM » IN FRENCH MORTUARY ARCHAEOLOGY OF THE EARLY MIDDLE AGES

Abstract author(s): Clara, Blanchard (Paris I - Arscan)

Abstract format: Oral

In the late twentieth and early twenty-first century, French archaeological research on the early Middle Ages has not engaged deeply with the insights established in gender studies. The perspective of French archaeologists has been predominantly androcentric and male-focused; it is rare that gender stereotypes of the dead are questioned. It is assumed, for instance, that there was a strong dichotomy between the “male” and “female” funerary artefacts unearthed in early medieval graves. The study of women, mostly thought of as ornamented representatives of the power and wealth of male warriors, has particularly suffered from those expectations, and insufficient work has been done on the characteristics of female identity. However, by introducing new methodology and approaches through the prism of gender and by moving beyond the traditionally gendered typology of objects, the symbolic application of artefacts and the diversity of the expression of female attributes can be reevaluated. Benefitting from a rich funerary material culture, more reliable determinations of sex via osteology, the problematization of the gendered nature of traditional assumptions in early medieval archaeology, and the most recent approaches in gender theory, we will soon understand much more, no doubt, about the varied incarnations of female experience in the early Middle Ages in France.

7 THE FICTIONAL ARCHAEOLOGIST: FEMALE EDITION

Abstract author(s): Annis, Karissa (University of Wisconsin-Milwaukee)

Abstract format: Oral

Women in archaeology have historically been underrepresented in most, if not all, aspects of archaeological work. It has been a male dominated field for most of its existence, and it is only recently beginning to change. The presence of women in representations of archaeology have fared little better. This presentation focuses on the presence or lack thereof of women in fictional archaeological representations. In the past, this was often limited to being a side character to the male protagonist, such as Elsa Schneider in Indiana Jones. Other times, this was a character such as Lara Croft, who was a rare female lead but often overly sexualized for the male gaze. This presentation will compare these past examples to recent fictional female archaeologists to determine whether or not the representations are becoming more popular and diverse, or whether they remain sparse and stereotypical. Moreover, there will be a discussion as to whether these women are, in fact, derivatives of or written for men, or whether these women stand on their own as characters and as women. This presentation will also endeavor to examine what this means for the field as a whole, as popular representations often reflect or inform academic’s perceptions as well.

350 KEEPING APART AND COMING TOGETHER: MOBILITY RESTRICTIONS AND CONFINEMENT AS HEALTH PRACTICES IN A LONGUE DURÉE PERSPECTIVE

Theme: 2. Pandemics and climate change: responses to global challenges

Organisers: Cianciosi, Alessandra - Zaneri, Taylor (University of Amsterdam) - Paziienza, Annamaria (Ca’ Foscari University of Venice)

Format: Regular session

This session focuses on two key questions: how did past societies, especially after Antiquity, use strategies of mobility and spatial knowledge to overcome or to prevent climatic, environmental and epidemic catastrophes? How did human actors link these strategies to the promotion of human, animal, and environmental health? Pre-modern communities have always faced dramatic and sometimes severe crises, such as environmental devastation, failure of crops, pollution, the proliferation of disease in both humans, animals, and non-animals. Archaeology and history tell us that these crises have prompted shifts in the ways that people inhabited their settlements and surrounding landscapes. Mitigation of negative impacts and pre-emption upon of these events by careful planning often required changes grounded in movement and in use of space. Thus mobility and spatial thinking were connected to maintaining and fostering health and safety, triggering social and cultural changes of short or long duration, not only from a reactive but also from a proactive perspective. Such actions could include physically isolating or creating barriers to sick individuals, moving communities from resource poor locations to resource dense locations, constructing specific zones or facilities for waste removal, or conversely regulating or protecting sources of water and food. Therefore promoting health required the ability to recognize the risks contained or intrinsic to a place, and to implement solutions which removed, separated or mitigated the potentially harming matter.

The main aim of this session is to bring together scholars who can build on their chronological, geographical as well as disciplinary expertise to examine common patterns and dissimilarities in the ways that different societies coped with negative impacts of disease and climatic crises, especially through changes in mobility and in space organization. We particularly welcome interdisciplinary papers which involve the integration of different scientific methods (archaeology, history of science, anthropology, climatology).

ABSTRACTS:

1 VILLA ESTATE AGRICULTURE AND MALARIA IN ROMAN CENTRAL ITALY: A DIACHRONIC STUDY OF AN UNFOLDING ENTANGLEMENT

Abstract author(s): Pickel, David (Stanford University)

Abstract format: Oral

In describing the risks faced by Roman farmers, the agronomist Varro explains that on pestilential land “where the reckoning is with death, not only is profit uncertain, but also the farmer’s life.” What follows this statement, however, is perhaps more revealing. Varro continues: “And yet this risk can be lessened by science. While granting it is not in our power but in that of nature, as the healthiness of land is drawn from climate and soil, still it depends greatly on us, because we can, by care, lessen this harm” (de Re Rustica, 1.4.4). One of the most consequential pestilences which Romans faced was malaria. Wherever prevalent malaria increases mortality and morbidity rates, depresses economic growth, and reinforces inequalities. It is therefore surprising that little work has been done regarding malaria’s impact on and interaction with individual Romans and Roman society overall, especially considering that a wealth of evidence makes clear that the disease was present across the ancient Mediterranean. In this presentation I take seriously Varro’s words to better understand malaria’s epidemiology in Roman central Italy – its spatial and temporal dimensions, and the agents, processes, and ideas caught up in its transmission. Inspired by the tenets of entanglement theory, I study how the materiality of villa estate agricultural infrastructure, in tandem with the environment and human practice, affected the risk of malaria’s transmission through time. Through this analysis it becomes clear that the Romans, although unaware of malaria’s etiology, were able to incidentally reduce the risk of its transmission. At the same time, this analysis also indicates that malaria’s entrenchment within Italy, lasting until its elimination in the middle 20th century, may have in part been a consequence of the abatement and breakdown of those very same artifacts and practices which, for a time, curtailed its transmission.

2 ENVIRONMENTAL DETERMINISM AND MOBILITY PRACTICES IN EARLY MEDIEVAL EUROPE: PRELIMINARY NOTES

Abstract author(s): Paziienza, Annamaria (Ca’ Foscari University, Venice; University of Nevada, Reno)

Abstract format: Oral

The association of the incidence and transmission of disease to particular landscape types or attributes is one of the most essential principles of modern landscape epidemiology; in fact the importance of the environmental as a critical factor in health has been recognized since pre-modern times.

As far back as Classical Antiquity and throughout the middle Ages, indeed, several thinkers established a link between landscapes and human diversity of appearance and way of life on one hand, and disease and/or health risk on the other. Although these early associations were based on assumptions revolving around erroneous philosophical and religious beliefs (e.g. the humoral theory and the climate zonal theory), it is clear that people in the past perceived these associations as having an impact on human behavior.

Indeed, which landscapes and climates they viewed as healthy or prone to disease determined how they used land and its resources, how they moved across space, and which physical and environmental barriers, once crossed, they regarded as risky or good for health, (Metzler, 2009; Ziegler 2016).

This paper intends to look at the reception by early medieval Christian authors, such as Bede, Isidore and Paul the Diacon, of classical medical and environmental knowledge (from Hippocrates to Macrobius) and to investigate to what extent this knowledge affected daily mobility practices specifically related to health promotion and prevention, for instance, as regards the planning of journeys and temporary seasonal residential changes by travelers and other subjects.

3 “PRO MAIORE SANITATE HOMINUM CIVITATIS...ET BORGORUM”. HYGIENE IN THE LATE MEDIEVAL CITIES OF EMILIA ROMAGNA

Abstract author(s): Sabbionesi, Lara (Soprintendenza Archeologia, Belle Arti e Paesaggio per la città metropolitana di Bologna e le province di Modena, Reggio Emilia e Ferrara)

Abstract format: Oral

In the late Middle Ages the population density in cities increased significantly, and filth became an unavoidable problem. Citizens and legislators had a pragmatic approach to the question: a dirty city was perceived not only as objectively ugly, but also unhealthy and not very functional to the economy. The urban statutes from the thirteenth century are quite explicit in this sense. Of course, the concept of hygiene was evolving and what was deemed acceptable changed over time and space. Regarding the late medieval centuries and the Emilia Romagna region, one of the crucial hygienic concepts was miasma, in other words, corrupted matter or vapours, i.e. excrements, stagnant water, and decaying organic material, which were considered unhealthy and illness causing, and had to be eliminated and removed from the city.

Statutes contain rules for safeguarding urban environment and its hygiene; however, they deal exclusively with public spaces. The result is a total absence of laws that were concerned with the habits and strategies in the private sphere, making those behaviours that characterized domestic environments invisible.

The statutes were quite precise in prohibiting certain public behaviours, such as the abandonment of waste in streets and squares, the presence of latrines on the public road, and the pollution of water supply sources. In addition the statutes also regulated the cleaning of common spaces, and organized services such as waste collection and street cleaning, yet strangely they did not care about how private citizens managed their waste, or about the hygienic conditions inside their homes. Basically, as long as streets, porticos and squares were kept clear, people were essentially left free to privately manage the filth. Therefore only a careful examination of the material sources made available by archaeology helps to understand these aspects in the private sphere.

4 MANAGING MOVEMENT AND PUBLIC HEALTH IN MEDIEVAL BOLOGNA

Abstract author(s): Zaneri, Taylor (University of Amsterdam)

Abstract format: Oral

Medieval Bologna was a vibrant and dynamic city with hundreds of artisans, craftsmen, students, government officials (and other professionals), as well as animals, all sharing the same streets, neighborhoods, and waterways. As this paper will show, medieval officials were highly concerned with keeping their city and its environs, safe and healthy, during times of stress as well as prosperity, and devoted significant amounts of time and resources to achieve these goals.

Using Bologna as a case study, and by mapping in GIS, historical and published archaeological data relating to urban infrastructure, hygienic regulations, and population demographics, this paper will examine, what were the public health strategies – in other words, how did officials regulate and enact health on a city-wide level, and what were the consequences of these strategies? This research will demonstrate that medieval officials in Bologna employed a spatial logic as they created health regulations and oversaw the construction and maintenance of urban infrastructure. This spatial logic was grounded in an understanding of movement and an awareness of how, where, and when people, animals, goods, water, and waste flowed through the city. To this end, knowledge of space and movement were critical aspects of public health strategies which officials deployed to maintain a healthy and working city.

5 PAVING STREETS TO PURGE MEDIEVAL CITIES FROM FILTH, TRAFFIC CONGESTION AND TO FAVOUR HUMAN MOBILITIES (GHENT, XIVTH-XVTH CENTURIES)

Abstract author(s): Hermenault, Léa (Universiteit van Amsterdam)

Abstract format: Oral

During the late Middle Ages, as written sources become more prevalent, there are increasing references to street paving in western European cities. Growing studies (Hermenault 2015; Béghin 2017; Coomans 2019; Rager 2020) have recently shown that urban governments tended to invest more and more money in the paving of street during the XIVth and the XVth centuries. This paper aims to explore how urban governments used the paving of streets to facilitate mobility as a cure against the public health woes which resulted of various kind of congestions in their cities.

I will first use medieval prescriptive documentation to show how laying pavement was conceived as a way to avoid the accumulation of filthy mud in the streets (which was considered to be at the origin of disease in the medieval culture) and to ease the cleaning of streets by the flows of rainwater. I will then focus on the case study of Ghent (Belgium) and compare in a Geographical Information

System (GIS) environment the paving expenses made by the Ghent's government, with archaeo-environmental data, and an analysis of the streets attendance (based on a network analysis) to show how paving was used to favour human mobilities and avoid traffic congestion, within parts of the city which came under frequent flood issues and strong attendance of passers-by.

6 THE USE OF QUARANTINE IN THE INDIAN OCEAN WORLD DURING THE NINETEENTH CENTURY: AN ARCHAEOLOGICAL APPROACH

Abstract author(s): Cianciosi, Alessandra (University of Amsterdam; Stanford University)

Abstract format: Oral

The practice of quarantine, sadly spotlighted by the global Covid-19 emergency, is arguably one of the most widespread health practices implemented throughout history, or at least from the Middle Ages onwards. The word 'quarantine' has often been defined as a place deliberately chosen for the separation and isolation of diseases. This can be applied to all disease vectors, whether goods or animals, or people.

Archaeologists can investigate quarantine sites from different perspectives, such as the use of different quarters and buildings, their diachronic and functional transformation, and their spatial role in landscapes (for example 'lazarettos' near towns) and sea-scapes (for example maritime quarantine stations). This paper aims to present a comparative analysis of the spatial organization of some stations, used during the nineteenth century in the European colonies of the Indian Ocean region, with particular reference to French and English overseas territories. During this century, the construction of maritime quarantine stations intensified in conjunction with the escalation of trade, migratory flows, and the consequent outbreak of epidemic diseases. The archaeological investigation of each site has started from the analysis of the distribution of buildings and infrastructure in connection with social segregation between sick/healthy people, males/females, officials/travellers, and Europeans/non-Europeans. In some cases, it has been possible to compare the planned drawings of the station with their realization in the field, which indicates an adjustment to a specific landscape and potential improvements for sanitary purposes.

This study clarifies how much the materialisation of quarantine in the 19th century was influenced by the concepts of disease and disinfection, the persistence of 'miasmatic theory', and how social segregation was applied to specific communities and social groups.

7 POTENTIALITIES IN USAGE OF HISTORICAL SOURCES FOR ANALYSING HEALTH CRISES IN MAURITIUS THROUGH A LONGUE DURÉE APPROACH

Abstract author(s): Deerpaul, Yadhav (Department of History, Iowa State University)

Abstract format: Oral

Dr Laurent Musango - the WHO Representative in Mauritius - mentioned in the Mauritius Management and Prevention of COVID-19 Report (October 2020) that the island's success in tackling COVID-19 also stemmed from its previous experiences in dealing with communicable diseases such as malaria, dengue and chikungunya. There have also been structures and experiences which helped in tracing and treating COVID-19 cases. But how far can history be used to explain responses to contemporary health crises?

While it is not within the scope of the paper to do a comparative analysis through a longue durée approach, it will discuss the potentialities of such a study which could employ archival sources to support archaeological researches. Material and immaterial structures which could have had an impact on the responses to such global pandemics can be discerned over a long stretch of time.

For instance, the report of the 1882 Sanitary Commission which relied extensively on the works of Dr Charles Meldrum discussed the impact of construction processes on water drainage which exacerbated the spread of malaria. Deforestation had a considerable impact and there were even proposals to replant trees. The social inequalities pertaining to the disease were also discussed. The Creoles were much more affected by the disease than the other groups of the population.

Le Cernéen, a major anti-abolitionist newspaper of the French colonists during the nineteenth century British Administration of the island, also revealed how news on health crises circulated alongside the local responses to such diseases. When combined with the detailed colonial reports, such historical sources can be used to support archaeological researches. Analysing them over space and time can help explain not only on the evolution of the material and immaterial structures but also demonstrate the complexities of employing lessons from the past.

351 BETWEEN STYLE AND FUNCTION: THE TECHNOLOGY OF NEOLITHIC POTTERY FINISHES IN SE EUROPE

Theme: 6. Material culture studies and societies

Organisers: Burke, Clare (OREA, Austrian Academy of Sciences) - Amicone, Silvia (Mathematisch-Naturwissenschaftliche Fakultät, Eberhard Karls Universität Tübingen)

Format: Regular session

During the Neolithic in SE Europe we see widescale adoption of ceramic production and consumption as ceramics play a larger role in the daily lives of communities. This increasing importance of pottery is paralleled by technological advances displayed through

the use and development of various surface treatments and pigments, which show the remarkable skill and knowledge obtained and shared by Neolithic craftspeople.

Whilst there exists excellent and thorough typological and stylistic research which has provided the foundation for the various chronological and cultural schemes developed in SE Europe, the technological “know-how” behind such developments still lacks systematic and detailed investigation. Importantly, there is a great need to bring typo-stylistic and technological approaches together as it is only through the integration of different methods to the study of pottery that we will be able to build narratives around interaction, innovation, and knowledge exchange. Therefore, the session will bring together a broad range of expertise from archaeology, experimental work and the natural sciences, to present research on various approaches to, and understandings of, slips, pigments and surface treatments across the Neolithic period in SE Europe.

The session aims to develop an interdisciplinary conceptual and methodological approach to the study of Neolithic pottery surface finishes that goes beyond traditional binary narratives of functional vs. decorative. It will also bridge the dichotomy between typo-stylistic and archaeometric approaches to better understand and explain characteristic finishes from a technological and functional point of view, and to examine their role in the wider chaîne opératoire of pottery production and consumption more broadly.

Key themes are the raw materials and technologies used for paints and slips, skeuomorphism and the imitation of other materials (e.g. metal or basketry), and the function and meaning of different pottery styles and treatments including elements such as residue analysis and formal stylistic approaches.

ABSTRACTS:

1 AESTHETIC CHOICES? POTTERS' VALUES IN THE NEOLITHIC OF SOUTH-EASTERN EUROPE

Abstract author(s): Spataro, Michela (British Museum)

Abstract format: Oral

Early and middle Neolithic ceramics of south-eastern Europe include a wide range of surface finishing, from plain, to polished/burnished, slipped, painted, incised, impressed, and with barbotine application.

This paper will focus on the technology of surface finishes in Starčevo/Starčevo-Criş/Körös pottery from the central and eastern Balkans and Hungary, based on a detailed macroscopic, microscopic, mineralogical and chemical analyses of polished and slipped ware from more than 20 sites (Spataro 2019).

Research over the last twenty years on the absolute chronology of the Starčevo culture (Biagi/Shennan/Spataro 2005; Meadows 2019) supports its typo-chronological subdivision into phases on the basis of pottery shape and decorative patterns, despite the lack of development in pottery fabrics. Some surface treatments changed over time: white pigment was used for the early decorative motifs, barbotine surface treatment began in the second phase, and red and black paint were used for late Starčevo linear and geometric motifs, whereas polishing was applied in all phases. The technology of surface treatments did not vary geographically. The results show a consistent chaîne opératoire, which appeared with the first arrival of the early farmers in the region.

- Biagi, P., Shennan, S., and Spataro, M. 2005. Rapid rivers and slow seas? new data for the radiocarbon chronology of the Balkan peninsula. In Nikolova, L., Fritz, J. and Higgins, J. (eds.) Prehistoric Archaeology & Anthropological Theory and Education. Reports of Prehistoric Research Projects 6-7: 43–51. Salt Lake City/Karlovo.
- Meadows, J. 2019. Radiocarbon dating and Bayesian chronological modelling. Pp.34-44 in Spataro (2019).
- Spataro, M. 2019. Starčevo ceramic technology: the first potters of the Middle Danube Basin. Universitätsforschungen zur prähistorischen Archäologie 341. Neolithikum und Chalkolithikum in Südosteuropa 4. Bonn: Rudolf Habelt.

2 CAN YOU JUDGE A POT BY ITS COVER? STARČEVO POTTERY FROM THE SITE OF SVINJARIČKA ČUKA, SERBIA

Abstract author(s): Burke, Clare (Department of Prehistory and WANA Archaeology, ÖAI)

Abstract format: Oral

Early-Middle Neolithic Starčevo pottery assemblages are characterised by a specific range of surface treatments and finishes, with early research often focusing on characteristic designs in relation to defining and understanding both chronological and cultural boundaries. The stylistic coherence between Starčevo assemblages is striking, and work by authors such as Spataro (2019) has demonstrated that this stylistic coherence is also reflected in technological elements related to raw material choices.

This paper will add to current understandings of Starčevo pottery by presenting technological and typological analysis of pottery finishes found at the site of Svinjarička Čuka in southern Serbia as part of the FWF Funded NEOTECH project. The planned programme of interdisciplinary analysis includes macroscopic, petrographic and scanning electron analysis to understand the chaîne opératoire of choices that Starčevo potters were making. The paper will discuss the preliminary results so far which suggest a correlation between technological choices, particular surface finishes and vessel types, including their potential function.

- Spataro, M. 2019. Starčevo ceramic technology: the first potters of the Middle Danube Basin. Universitätsforschungen zur prähistorischen Archäologie series 341. Bonn: Rudolf Habelt.

3 BETWEEN STYLE AND PRACTICE: PAINTS AND PAINTING TECHNIQUES IN THE EARLY AND MIDDLE NEOLITHIC OF THE CENTRAL BALKANS

Abstract author(s): Bajcev, Olga (Institute of Archaeology, Belgrade)

Abstract format: Oral

In the area of the Central Balkans, painted pottery is a recognizable characteristic of the Early and Middle Neolithic (6200-5400 BC), ie the Starčevo culture. What's more Early Neolithic in this area is sometimes called an „EarlyNeolithic culture of painted pottery“. Archaeological interest in painted pottery dates back to the very beginnings of research and the first works on the relative-chronological systematization of the Early and Middle Neolithic of the central Balkans. However, the archaeologists were mostly focused on typo-stylistic analysis, because ornaments were considered chronologically sensitive, and the “developmental path of ornamentation” from simple rectilinear to complex curvilinear motifs was observed. Painted pottery styles were viewed as something independent that evolved over time. In this paper I want to deconstruct previously defined styles of painted pottery and see them as a combination of different practices: the use of different paints and painting techniques. I will also explore relationships between these practices and ornament structures. The research is based on macroscopic observations of painted pottery from five sites in Serbia: Starčevo-Grad, Grivac, Tečić, Pavlovac-Gumnište, and Pavlovac-Čukar. The results show different variability of paints, techniques, and style between settlements that could indicate a different degree of experimentation or social control between different communities of practice. The new insight into old material challenges some stylistic categories and asks for systematic analysis of paints and pigments to investigate these issues further.

4 SURFACE TREATMENTS AND NEOLITHIC POTTERY: CASE STUDIES IN SERBIA AND MONTENEGRO

Abstract author(s): Manem, Sebastien (CNRS, UMR 7055 - Préhistoire et Technologie)

Abstract format: Oral

Surface treatments are related to the modification of the superficial layer of ceramics. European Neolithic pottery can reveal a wide variability of surface treatments due to cultural traditions, but also to functional factors since they affect the permeability of ceramics and their resistance to abrasion.

Surface treatments can be classified in two categories: techniques by friction and by coating. Each of these categories involves several techniques. Beyond identifying surface treatment techniques on prehistoric sherds, the question is to understand how this step fits into the chaîne opératoire, a series of operations that transform raw material into finished product as defined by Cresswell.

In this paper, some results from the ERC project EUROFARM will be discussed and based on Neolithic pottery from Montenegro and Serbia illustrating several cultural choices in the Balkans. The focus will be on the observed techniques inventory as well as on the last identified hydric state of the clay paste – leather-hard state or wet state – before the modification of the superficial layer of ceramics in order to understand if the potters continue with the same hydric state or if they modify it during the different stages of the chaîne opératoire from one population or social group to another.

5 STYLE BELOW THE SURFACE: TECHNOLOGICAL VARIATION IN CERAMIC SURFACE TREATMENTS IN NEOLITHIC SE EUROPE AND W ANATOLIA

Abstract author(s): de Groot, Beatrijs (The University of Edinburgh)

Abstract format: Oral

Decorations and surface treatments on early Neolithic ceramics continue to play a key role in models of the spread of farming to Europe. ‘Waves’ of ceramic styles such as dark-faced-burnished ware and red-monochrome ware have been used as chrono-typological guide-fossils, contributing to still active discussions concerning the location of migration routes and networks. Recent research has looked more closely at the techniques to produce the red slip layer of Early Neolithic monochrome ware in the Balkans, revealing technological variation within the same types of surface treatments (e.g. Spataro 2016, de Groot 2019). Determining the spatio-temporal variation of different techno-styles further can contribute to understanding the processes of imitation, experimentation, learning and interaction that underpin visual similarities in material culture.

This talk provides an initial theorisation of how variation in techniques underpinning ‘similar’ decorations and surface developed during the Neolithic in western Anatolia, the Aegean and the Balkans. By drawing on a number of case-study sites, it will consider the spatio-temporal of techno-styles within dark-faced burnished ware, red-burnished ware, and calcareous encrusted decorations and discuss how future research can complement current views on social interaction, technological change and creativity underpinning the development of similarities in Neolithic ceramic styles.

References:

- de Groot, B. 2019. Clay Recipes, Pottery Typologies and the Neolithisation of Southeast Europe A Case Study from Džuljunica-Smārdeš, Bulgaria. Amicone, S., Quinn, P. S., Marić, M., Mirković-Marić, N., & Radivojević, M. (Eds.) Tracing Pottery-Making Recipes in the Prehistoric Balkans 6th–4th Millennia BC. Archaeopress Publishing Ltd., Oxford: 54-64.
- Spataro, M. 2016. Playing with colours: understanding the chaîne opératoire of the earliest red monochrome and white-on-red painted ware of the Central Balkans. In: Bacvarov, K. and Gleser, R. (Eds.) Southeast Europe and Anatolia in Prehistory, Essays in Honour of Vasil Nikolov on his 65th anniversary. Verlag Dr. Rudolph Habelt GmbH, Bonn: 167-174.

6 WHITE-ON-RED PAINTED POTTERY IN THE EARLY NEOLITHIC: INTERREGIONAL INTERACTIONS BETWEEN SOUTHEASTERN EUROPE AND WESTERN ANATOLIA

Abstract author(s): Alpagut, Canay (University of Tuebingen)

Abstract format: Oral

Over the past decades, interaction between Southeastern Europe and surrounding areas has been discussed intensively. It is widely agreed that Neolithic populations spread to Southeastern Europe from Anatolia and the Aegean coastal regions at the turn from the 7th to the 6th millennium calBCE. Among other features, these early farming communities are strongly connected with the first appearance of pottery. Within these emerging networks, pottery production shows great variety from one region to another. The present study therefore focuses in the detection of networks of decoration styles and their connections to specific vessel shapes, with a particular focus to be placed on interregional interactions. Within this context, white-on-red painted pottery (WRPP) plays a central role as it is one of the distinctive characteristics of the Early Neolithic in the Balkans.

The first part of the paper will focus on WRPP in the Aegean. Vessel forms and decoration styles of WRPP from sites like Nea Nikomedeia and Mavropigi-Filotsairi in Western Macedonia, as well as Argissa and Achilleion in Thessaly will be classified. The results will be studied with comparative analysis of the WRPP from sites like Hacilar and Bademağacı in Southwest Anatolia, and Çukuriçi in Central-West Anatolia. In the end, the hypothesis of Anatolian influences in the Balkans through WRPP will be re-evaluated on the basis of statistical analysis.

The second part will concentrate on the area of modern day Bulgaria. Pottery from EN sites like Kovachevo in the Struma River Valley, Karanovo in the Thracian Plain and Dzhulyunitsa-Smardesh in the Lower Danube Basin will be reassessed in order to identify the distribution of the WRPP in different geographic locations. The presented analyses offer a new insight in regional peculiarities and interactive relations of EN pottery in the influential regions of Anatolia, the Balkans and the Aegean.

7 GRAPHITE PAINTED POTTERY FROM THE NEOLITHIC/CHALCOLITHIC BALKANS: AN ARCHAEOMETRIC AND EXPERIMENTAL APPROACH

Abstract author(s): Amicone, Silvia (Competence Center Archaeometry-Baden Wuerttemberg, University of Tübingen; Institute of Archaeology, University College London) - Solard, Baptiste (Competence Center Archaeometry-Baden Wuerttemberg, University of Tübingen; Institute for Natural Scientific Archaeology, University of Tübingen) - Tsirtsoni, Zoi (CNRS-UMR 7041 Archéologies et Sciences de l'Antiquité. Maison d'Archéologie et d'Ethnologie R. Ginouvès) - Malamidou, Dimitra (Ephorate of Antiquities of Serres) - Grebska, Malgorzata - Todorova, Nadezhda (Regional Museum of History, Blagoevgrad) - Berthold, Christoph (Competence Center Archaeometry-Baden Wuerttemberg, University of Tübingen)

Abstract format: Oral

Graphite decoration on ceramic vessels is a distinctive phenomenon spread over most of the Balkans during the 5th millennium BC and became a dominant trait for Neolithic and Chalcolithic material cultures in the region for over 1000 years.

Given the vast spatial and chronological distribution of graphite decoration, the technological knowledge connected to this technique must have travelled via channels of interaction that resonate on a wide temporal and geographical scale. Therefore, the study of such a phenomenon is of enormous importance to the understanding of mechanisms governing the diffusion of ideas that catalyse the formation of shared material cultures. At the same time, as a rare naturally occurring substance the use of graphite by potters across such a wide region could indicate that they participated in or benefitted from specialist networks that would be very important to trace.

However, mostly due to the lack of systematic technological investigations that include not only a wider range of sites, but also employ a variety of modern analytical methods, the emergence and development of this decorative technique for pottery remains unclear to this day. An interdisciplinary approach employing macro-observations and analytical methods including thin section petrography, XRPD, micro-XRD, micro-Raman and SEM analysis was applied to a selection of experimental and archaeological specimens. The experimental ceramic samples were produced both under controlled conditions in the laboratory and in the field within an actualistic framework. The archaeological samples come from different areas of the Balkans with a focus on the Struma Valley and cover the full chronological development of this technique. The results enabled us to trace the craft network and technological tradition behind this decorative phenomenon giving important information about the procurement and processing of raw materials as well as essential insights into the pyrotechnology related to graphite painted pottery.

8 WHERE 'POTTERY STYLES' INTERTWINE: DECORATIVE APPROACHES AND SURFACE TREATMENTS ALONG THE NEOLITHIC STRUMA RIVER (BULGARIA)

Abstract author(s): Kulow, Malgorzata (Regional Museum of History-Blagoevgrad) - Dzhanezhova, Tanya (University of Oxford)

Abstract format: Oral

The hidden technical decision-making behind specific 'decorative styles' can usually be uncovered. However, the meaning of style or tradition is not necessarily always clear. Interpreting stylistic variations and surface finishes may thus be excitingly challenging in areas (or even at individual sites), where 'pottery styles' intertwine. This refers to a spectrum of phenomena where traditions meet and boundaries blend; where new styles emerge or old ones gradually transform, leading to ever greater complexity, and so forth.

We tackle the topic by analysing Early Neolithic painted pottery in hand specimens, thin sections and by using scanning electron microscopy. Within the extended region of the Struma River valley (southwestern Bulgaria), we focus on those cases where several Neolithic 'decorative styles' are present within specific micro-regions or even at one and the same settlement.

We highlight the variable surface treatment approaches, as well as the different raw materials, pigments and colorants used in pottery production. Examined are various types of clays, organic and inorganic substances that are major constituents when shaping the surface finish procedures. Interpreting these within multi-layered context helps widen the research horizons and reach well beyond the traditional techno-typological approaches, especially in regions where various 'styles' intertwine.

9 TECHNOLOGY OF POTTERY FINISHES IN NEOLITHIC GREECE

Abstract author(s): Bonga, Lily (unaffiliated)

Abstract format: Oral

The ceramic assemblage of Neolithic Greece is characterized by wide range of surface treatments and technologies, some with narrow chronological duration and limited geographic range. Importantly, the technological trajectory of pottery finishes is not a linear development. Pigments were used before and after firing on burnished or unburnished vessels. Both mineral and organic pigments were used, sometimes on the same vessel. Burnishing was often used as a surface finish in its own right as a highly polished surface, or, depending at which stage the vessel was burnished, as "pattern-burnished" motifs created by the selective differential burnishing of leather-dry vessels or as "ripple-burnished" patterns and motifs made on damper vessel bodies. Different firing techniques were also used to create desired surfaces, such as the combination of smudging and iron reduction firings to produce "black-topped" pottery.

This paper presents a diachronic overview of the types and technology of pottery finishes in Neolithic Greece, focusing on the types of pigments (e.g., ferruginous, bitumen), at which stage they applied to the vessel (e.g., pre- or post- firing), if, when, and how the vessel was burnished, and the firing conditions used. Since the existence of the same raw materials and technologies were available to potters throughout the Neolithic period, it seems that cultural and social pressures dictated the choices the potters employed. Both clear innovations and influence from external interactions can be detected. The mechanisms by which technical knowledge of pottery production was developed and transmitted will be revisited in order to help to bridge the typo-stylistic and archaeometric dichotomy of traditional ceramic analysis.

10 DEFINING THE BOUNDARIES OF CLAY SURFACES: SURFACE TREATMENTS AND MATERIAL EXPRESSIONS OF THE POTTERY FROM NEOLITHIC DISPILIO, MACEDONIA, GREECE

Abstract author(s): Voulgari, Evangelia (School of History and Archaeology, Aristotle University of Thessaloniki) - Sofronidou, Marina (Ephorate of Antiquities of Drama) - Kotsakis, Kostas (Professor Emeritus of Prehistoric Archaeology, School of History and Archaeology, Aristotle University of Thessaloniki)

Abstract format: Oral

The Neolithic Dispilio in Lake Kastoria is the first wetland settlement excavated in Greece and has been systematically investigated since the 1990s' by the Aristotle University of Thessaloniki. In parallel to morphology and technology, pottery study has been focused on restoring as many vessels as possible. The result is a large corpus of whole pots and profiles, an amount unique in the neolithic ceramic assemblage of Northern Greece, which opens new possibilities in understanding pottery's role in the social practices of the neolithic communities. In the last two years, Aristotle University's participation in the ERC-funded EXPLO Project has supported the study's continuation.

In this paper, we examine typology, size, surface treatments, decoration techniques of pots during the development of the habitation from the mid-6th to the early 5th millennium BCE. By selecting material covering this long period, it is possible to define variations in the vessels' morphological, stylistic and functional parameters through time and assess pottery production and consumption in the neolithic settlement's successive phases.

A distinct category in the ceramic assemblage is a group of zoomorphic, anthropomorphic and boat-shaped pots. Their short presence may suggest that neolithic pottery expanded at some point its domain, constructing new meanings and relationships. Based on spatial distribution, we can assume that the neolithic inhabitants used them in various practices and locations but never in "unusual" or "special" contexts. Although their role probably might have been of some symbolic significance, they were still containers with use wear similar to those of other clay vessels, decorated or not.

11 THE SKEUOMORPHISM OF THE CERAMIC CONTAINERS' DECORATION IN THE CHALCOLITHIC

Abstract author(s): Gheorghiu, Dragos (National University of Art; ITM Macao)

Abstract format: Oral

Viewed from an ethnoarchaeological perspective, the significance attached to the decorative elements of some prehistoric pottery may have had an apotropaic and prestige conferring role, and therefore, should be investigated as representing a material surface with value. From this perspective it is important to consider the role of some ceramic decoration as skeuomorphic, just as the shape of some ceramic containers suggests the imitation of containers made in other materials.

This paper will present analysis of the skeuomorphic elements within the decoration of Vădastra and Cucuteni ceramic containers, two geographically separate Chalcolithic traditions which possess different decorative styles but whose techniques for decorating ceramics (incision and painting), provide insights into both the materiality of copied objects and of the materials positioned around containers. Additionally, data gained from experiments performed with different materials to reproduce the decorative patterns identified has provided more detailed insights and hypotheses about the functionality of these decorated containers, whilst the analysis of the decorative patterns within these ceramic groups has revealed common elements, supporting a similar axiological concept for decorative patterns relating to skeuomorphs, despite differences in technique and style.

12

PAINTING AND PIGMENTS IN THE CHALCOLITHIC OF EASTERN ROMANIA. CASE STUDY: CUCUTENI CULTURE POTTERY

Abstract author(s): Drob, Ana ("Alexandru Ioan Cuza" University, Interdisciplinary Research Institute, Science Department, Arheoinvest Research Center, Iași.) - Bolohan, Neculai ("Alexandru Ioan Cuza" University, Faculty of History, Iași) - Vasilache, Viorica ("Alexandru Ioan Cuza" University, Interdisciplinary Research Institute, Science Department, Arheoinvest Research Center, Iași)

Abstract format: Oral

This interdisciplinary study uses a range of analytical methods to examine Chalcolithic Cucuteni Culture pottery and pigments. The methods employed include macroscopic (form, color, wall thickness, firing and inclusions types, distribution, form and sorting), optical microscopy (texture of the paste, surfaces and inclusion details), SEM-EDX (elemental composition), and μ FT-IR (chemical compounds).

The analyzed pottery fragments come from several newly discovered settlements in eastern Romania and were analysed to investigate different raw material and technological elements. Analysis of ceramic paste has provided information about the raw materials and production technology, inclusions, finishes, firing temperature and functionality of the vessels, complimented by analysis of the red, black, and white pigments used in the painting of Cucuteni Culture pottery. The results will provide data about their nature, the preparation methods used, and the source of the raw materials.

Although there are a number of studies that have focused on the pigments of the Cucuteni Culture, they remain in a small number comparable to the large area it covered. Through this study we want to contribute to the expansion of current data and understandings, with new technological information about painted ceramics from eastern Romania.

13

ARCHAOMETRICAL INVESTIGATION OF THE WHITE COLOUR INLAID ON EARLY ENEOLITHIC POTTERY FROM SOUTHERN ROMANIA

Abstract author(s): Opris, Vasile (Bucharest Municipality Museum) - Simion, Corina - Mirea, Dragos (Horia Hulubei National Institute for Physics and Nuclear Engineering) - Bartha, Cristina - Rostas, Arpad - Sava, Florinel - Secu, Mihail - Vlaicu, Mihai (National Institute of Materials Physics) - Matei, Elena (National Institute of Materials Physics) - Dimache, Madalina (Gumelnita Civilisation Museum)

Abstract format: Oral

The aim of our paper is to present preliminary results obtained by complementary archaeometric methods applied on 39 samples of white pigments inlaid on Boian tradition pottery, Vidra phase (c. 4900-4700 cal BC). The pottery came from three Early Eneolithic settlements from southern Romania (Sultana, Vidra and Vlădiceasca respectively). The samples submitted to the study were selected by taking into account that they belonged to decorated vessels produced in three approximately contemporary sites, located close to each other in the south of the Romanian Plain. Archaeometric investigations consisted of the application of XRF, in air-PIXE and EDX methods for chemical composition determination, XRD and FT-IR for mineralogical determinations, RES for the characterization of paramagnetic centers, DSC for thermal transformation analysis and SEM for microstructure observation. The questions we asked and for which we come up with answers were: (1) what is the nature of the compounds in the composition of the pigments? (2) how to identify the samples from the point of view of the chemical and mineralogical composition? (3) what pigment preparation technologies and recipes were used? (4) what are the possible sources of raw materials? (5) what regional traditions and local particularities can be identified? (6) how do the new results fit into the general picture of the white pigments inlaid on Early Eneolithic pottery produced in the Lower Danube area?

352

EMPOWERING THE VOICELESS. THE ROLE OF THE RURAL POPULATION IN STATE BUILDING AND CHRISTIANISATION IN EAST-CENTRAL EUROPE

Theme: 6. Material culture studies and societies

Organisers: Vargha, Maria (University of Vienna; Charles University, Prague) - Stefan, Ivo (Charles University, Prague) - Rácz, Tibor (Ferenczy Museum Center)

Format: Regular session

The proposed session aims to bring together researchers from Europe, who are dealing with different, and yet connected affairs of the archaeological heritage of the networks of state and church, and especially, religious changes in the Middle Ages. In the last decade, interest in the research of Christianisation has been growing. Diverse approaches in history were observable; still, researchers have investigated the process primarily focusing on the higher levels of the ecclesiastic network, mostly due to the availability of

sources. By applying new, comprehensive methods, with regional and interdisciplinary cooperation on the investigation of neglected sources and the often-overlooked rural population, new narratives will become available on the state formation and Christianisation processes of East-Central Europe.

The session aims to examine how and why state politics have interfered in diverse religious affairs, such as the process of Christianisation and the development of the local church system in the early Middle Ages, the promotion and support of certain cults, religious orders, or particular places of pilgrimage to the later Middle Ages. The aim of the session is to give a Longue-durée perspective on the matter, by bringing these processes together.

The session welcomes papers focusing on the early and high middle ages, within the range of the following topics:

- early rural churches, churchyards and field cemeteries
- problem of transitional cemeteries and burial practices
- connection between early state power centres and the ecclesiastical network
- monastic networks and Christianisation
- material culture connected to Christianisation

ABSTRACTS:

1

SACRIECE – THE EXAMPLE OF HUNGARY

Abstract author(s): Vargha, Maria (Charles University, Prague)

Abstract format: Oral

This introductory abstract showcases SACRIECE (State And Christianisation in East-Central Europe), a research project at Charles University, Prague, funded by the PRIMUS grant scheme. The project focuses on Christianisation from the point of view of the archaeological heritage of the rural population. Christianisation in the examined region was a crucial agenda of state formation; however, the impact of the largest segment of the society, the rural population is seldom examined. The project aims to create a digital database of those archaeological features connected to this process; early churches, cemeteries, rural and ecclesiastical power centres. The digital, geospatial database allows the data to be contextualised, analysed, and compared at a regional level, processing data that has never been investigated at such scale. By applying new methods on neglected sources and creating an extensive, regional, comprehensive digital database, the project aims to provide new narratives about East-Central Europe's Christianisation, and in this case, the results of the analysis will be shown by the example of Hungary.

2

CHRISTIANIZATION OF RURAL COMMUNITIES AS A NEGOTIATION PROCESS: THE CASE OF THE CZECH LANDS, 10TH - 13TH CENTURIES

Abstract author(s): Stefan, Ivo (Department of Archaeology, Charles University Prague)

Abstract format: Oral

Everywhere across early medieval Europe, written sources focus primarily on the Christianization of the highest elites. The long lasting process of Christianization of rural communities is usually seen as a passive top-down enforcement of Christian norms. However, it should rather be seen as a complex mutual negotiation between the demands of the church and (although) conservative, yet changing local communities. Furthermore, the countryside was not socially homogeneous. Some local kin groups were involved in elite networks and could act as agents of the new cultural code. The paper tries to formulate basic questions, possibilities and limits of the archaeological study on the adaptation of Christianity in the Central European countryside and is mainly based on the Czech lands case study. We can detect the influence of the primary power/church centres on their surroundings and the gradual founding of local churches, which later merged into the parish network. The responses of the rural communities reflect on changes of funeral customs. The comparisons between respective regions of Central Europe enable to reveal the common trends and differences.

3

QUALITATIVE DATA – NEGLECTED DATA OR ANOTHER PIECE IN THE MOSAIC?

Abstract author(s): Janovský, Martin (Czech University of Life Sciences; Charles University)

Abstract format: Oral

There is a common assumption that only higher levels of the ecclesiastical network carry information about the process of Christianisation. The possible approaches to the processing of qualitative data in the context of lower ecclesiastical network during Early Medieval Ages will be discussed further on.

The project translates archaeological sites connected to this process as point data, which allows to interpret and assign values to them that were not explored before; their place in the landscape and their context in it. The initial analysis of these points concerned the nature of their arrangement – where and why can clusters appear? How do they relate to different natural, sociopolitical, or other features? This approach allows to categorize the data using clustering and hierarchical methods. More sophisticated analyses could be created using additional attributes. Another option was to use multiple correspondence analysis to define similar groups and find a relationship between variables. Furthermore, diverse forms of site-catchment analysis can help understand how the local churches worked as a network, and what factors have influenced its formation.

A vital aim of the project is to create an extensive database covering the territory of the Czech Republic, part of Poland and Hungary, and the publishing of the result of our analysis in the form of an interactive web-based map. This presentation will show the database model we have created that allows the investigation of various qualitative data and examines the options for presenting the data including OpenAtlas, GitHub or R and JavaScript libraries DT (data tables) and leaflet (interactive maps).

Acknowledgment:

- M.J. was supported by project "Geochemical insight into non-destructive archaeological research" (LTC19016) of sub-program INTER-COST (LTC19) of program INTEREXCELLENCE by Ministry of Education, Youth and Sport of the Czech Republic.

4 THE EMERGING PROCESS OF THE LATE MEDIEVAL PARISH NETWORK

Abstract author(s): F. Romhányi, Beatrix (Károli Gáspár University of the Reformed Church)

Abstract format: Oral

Rural churches appeared in the medieval Kingdom of Hungary parallel to the church organisation, from the eleventh century on. However, the real parish network did not emerge before the end of the thirteenth century, although its earliest examples appeared as early as in the mid-twelfth century. The first written evidence documenting the fully established system is the papal tithe register compiled between 1332 and 1337 that has been analysed recently from a quantitative, statistical point of view. Based on that analysis and on its comparison to similar European documents, mainly from England and France, the paper aims to clarify the demographic and economic background of the organisation of the parish system. The results will be compared with the results of archeological and architectural research of the late Árpadian (parish) churches, as well as with recent results on the impact of the Mongol Invasion (1241-1242) for to better understand the long-term process.

5 CHRISTIANIZATION OF MEDIEVAL BOHEMIA IN THE PERSPECTIVE OF ARCHEOLOGY

Abstract author(s): Cechura, Martin (The Museum of West Bohemia, Pilsen, Czech Republic)

Abstract format: Oral

The beginnings of Central European states and their Christianization belong to the progressive themes of European archeology. New archaeological research as well as a new interpretation of older finds bring new perspectives on these complicated processes. The paper will pay attention to the relationship between early and high medieval cemeteries and their connection with the emergence of the church network. Taking into account written sources, hypotheses about the circumstances and the course of their foundations are considered. Older and current historical concepts are newly evaluated.

Compared to the supposed discontinuity between older row burial sites and church cemeteries, it appears that in many cases there was a direct spatial connection. The churches were founded in places of older settlement, as well as in places of older cemeteries. Archaeological research has documented wooden buildings and stone architecture too. In several cases, spatial and functional links to residences have been explored. In many cases, a greater age of churches was proved. Some churches were preceded by an older sacral building. The position of some churches on important roads and borders indicates their symbolic role. The results of archaeological research formulated to questions who were the builders of these churches and what was their role in medieval society. Thus, the view of the early Christianization of the early medieval population and the individual conversion of the elites are fundamentally changing.

6 THE GREAT MORAVIAN HILLFORT BOJNÁ-VALY AND ITS SURROUNDING

Abstract author(s): Robak, Zbigniew (Slovak Academy of Sciences)

Abstract format: Oral

The author aims to present most recent findings concerning the Bojná-Valy hillfort—located in today's Western Slovakia—changing the cognitions of its function and chronology. The conclusions have been drawn based on the newest findings of archaeological research and the investigation of relations between the centre and its vicinity—nearby settlements, early feudal manor houses, cemeteries and Nitra as one of the main centres of Great Moravia.

Previously, both scientific and popular literature presented the Bojná-Valy hillfort as a seat of the Slavic elite and one of political, cultural and economic centres of Great Moravia. However, recent findings do not corroborate the view. Specifically, despite the intense archaeological research, we were unable to identify traces of a burial ground or sacral facilities in the hillfort or in its close vicinity. There are no traces of elite seats either. Instead, the archaeological research suggests that the hillfort served as a primarily military object.

Interestingly, in the area of the hillfort, there are two sacral facilities (rotundas) that could be dated back to the same period as the hillfort. The rotundas are related to archaeological sites known as the earliest feudal manor houses in the area. Furthermore, in the area with open settlements, there are burial grounds contemporary to the hillfort with graves of warriors. Why, then, there was no manor house, church or chapel and traces of any burials at the hillfort? It seems that the absence of such features corroborates the view that the Bojná-Valy hillfort was not a political centre but merely a military camp. Furthermore, contrary to laymen beliefs, recent research supports the hypothesis that the hillfort should not be dated back to the times of Pribina (beginning of the 9th century) but rather to the times of Svatopluk instead (turn of the 9th and 10th century).

7 LIFE AND DEATH ON THE RIVERBANKS: 'DEVIANT' BURIAL PRACTICES FROM MEDIEVAL RURAL CEMETERIES IN THE IRON GATES REGION

Abstract author(s): Parvanov, Petar (Department of Medieval Studies, Central European University)

Abstract format: Oral

From the early 12th century onwards one of the most contested frontier zones in medieval East-Central Europe was the Danubian region of Braničevo and the Iron Gates. The strategically critical area witnessed a prolonged political and military efforts by multiple states to seize and maintain control. Even more, the interregional confrontation involved Catholic (the Kingdom of Hungary) and traditionally Orthodox (Byzantium, Bulgaria, and Serbia) powers. The shifting political allegiance of the principal centres in the region was the most permanent factor in the high-level processes well until the Ottoman conquest.

Conspicuously, contemporary rural cemeteries show a significant concentration of grave disturbances and unusual treatment of the deceased (a.k.a. deviant burials). They are often perceived as long-lasting pagan reminiscences in popular Christianity practiced against harmful spirits and revenants. However, recent approaches also link them to periods of social unrest and transformation.

The current presentation will use examples on both sides of the Danube from sites like Trnjane, Ilidia, Vajuga-Pesak etc. The available evidence gives an opportunity to examine long-term processes and individual agency within marginalized social groups in the past. Arguably, power structures existing in local communities were reinforced through funerary display and supplement, sometimes even replace the direct influence of distant power centres.

8 KNIGHTS HOSPITALLER AND CONSOLIDATION OF CHRISTIANITY: INDICATIONS OF RELIGIOUS CHANGES AND SOCIO-POLITICAL PROCESSES IN THE ARCHAEOLOGICAL RECORD

Abstract author(s): Belaj, Juraj (Institute of Archaeology) - Sirovica, Filomena (Archaeological Museum in Zagreb) - Karbić, Marija (Croatian Institute of History)

Abstract format: Oral

Archaeological excavation at Stari grad (Castle) site in Ivanec, a small town in north-western Croatia, yielded evidence of cemetery continuously used from the end of 11th to the 17th century. The cemetery was initially formed around the Romanesque church which was later replaced with an adjacent Gothic church, built by the Knights Hospitaller. A total of 326 graves were excavated at the site and divided into five chronological phases, distinguished by clear changes in the burial practice. Analysis of both the recorded elements of each phase and documented differences apparent through the centuries implies not only changes in religious practices of local communities but also deeper socio-political transformations in the area. This is especially evident in the graves of the second phase which are and marked by the appearance of certain, previously not recorded characteristics. Approximately dated to the 13th century, they sometimes contain animal teeth and knives, i.e. artefacts usually considered as elements of certain pre-Christian funerary practices. Sometime during the same period, the area fell under the administrative authority of the Knights Hospitaller who in the 14th century, built the new Gothic church of Saint John the Baptist. Around the church, a new cemetery formed attributed to the third phase and characterized by a complete lack of small finds and other earlier elements. Consideration of the documented phenomena shows that although it is not always possible to delineate meanings of certain reoccurring characteristics, combined analysis of archaeological and historical data can enlighten the relationship between material remains, religious practices and socio-political processes.

354 THE PLANT STORY. CULTIVATION AND USE OF PLANTS IN THE NEOLITHIC AND EARLY BRONZE AGE IN THE CENTRAL AND EASTERN EUROPE

Theme: 7. From global to local: Baltic-Pontic studies

Organisers: Sobkowiak-Tabaka, Iwona (Faculty of Archaeology, Adam Mickiewicz University, Poznań) - Rennwanz, Joanna (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Poznań) - Kočár, Petr (Institute of Archaeology Academy of Sciences of the Czech Republic, Praha) - Vostrovská, Ivana (Department of History, Faculty of Arts, Palacký University, Olomouc)

Format: Regular session

Since the dawn of history, plants have accompanied humans in providing them food, fuel for fires, building materials and clothing. However, it was only in the Neolith that the domestication of plants had begun. The sedentary way of life was related to plant cultivation and livestock breeding, and, as a result, people started to live in larger groups and constructed permanent settlements. Domestication as well as the subsequent spread of plant cultivation had revolutionized the course of prehistory.

The session aims to explore the importance of plants of the Neolithic and Early Bronze Age populations. We would like to discuss the problem of the potential regional variety of cultivation, ways of harvesting and plant foods storage, as well as processing plants to prepare food. The debate on the plant-based diet will be of particular interest to us, especially in relation to the recently intensified isotope research. Furthermore, the use of wild plants is also a significant issue for medicinal purposes, diversification of diet and for technical purposes. We, too, would like to discuss the use of plants for the production of pottery and clay objects as well as for the construction of residential houses and economic buildings. Moreover, we also aim to consider the traces of plants on flint and stone tools.

An application of sampling strategy as well as flotation on local archaeological sites are also noteworthy issues that we would like to go over. We intend to show the impact of a method on the results of analysis on specific examples and evaluate the value and validity of analytics of the archival materials. Technique applied to a dry archaeological context is rare, however, numerous finds of water wells, throughout the Europe, yielded an unusual insight into the Prehistoric economy and environment.

ABSTRACTS:

1 USE AND PROCESSING OF PLANTS IN EARLY NEOLITHIC CENTRAL EUROPE. WELLS – A SPECTACULAR ARCHIVE OF THE PAST HUMAN-PLANT INTERACTIONS

Abstract author(s): Vostrovská, Ivana (Palacký University Olomouc) - Kočár, Petr (Czech Academy of Sciences)

Abstract format: Oral

Water wells and their sedimentary fill represent one of the richest Prehistoric archives of various sets of environmental and cultural proxy data. In our study, we offer an insight into Early Neolithic plant husbandry as reflected by analyses of water-logged plant macro- and micro-remains from otherwise dry sites in Czechia.

Prehistoric wells are rarely found archaeological structures. To date, just a little over 100 wells have been documented at 53 Early Neolithic European sites. Recently excavated three wells from Czechia – Uničov in Moravia, Velim in central, and Ostrov in eastern Bohemia – were systematically sampled for plant remains. Despite relatively small sediment volumes studied, each well yielded tens of thousands of plant macro-remains of over 100 taxa.

By an in-depth quantitative and qualitative analyses and correlation of pollen and macro remains data we in this paper present new information on ways of plant cultivation and gathering and their processing for food, medicine, fibres, and textiles. We also bring notes on the character of Early Neolithic east-central European landscapes and the ways humans shaped them.

2 THE IMPORTANCE OF EDIBLE AND TENDED WILD PLANTS IN THE PREHISTORIC SUBSISTENCE OF ROMANIA

Abstract author(s): Brasoveanu, Casandra (Arheoinvest Research Centre, Science Department, Institute of Interdisciplinary Research, Alexandru Ioan Cuza University of Iasi) - Danu, Mihaela (Faculty of Biology, Alexandru Ioan Cuza University of Iasi) - Bodi, George (Institute of Archaeology, Romanian Academy - Iași Branch)

Abstract format: Oral

For thousands of years, humans all over the world have depended on edible wild-growing plants, but the usage of these resources implied special cultural knowledge, in order to harvest, prepare, cook or perform any other form of processing. Thus, when identified within an archaeological context, wild taxa help improve the existing knowledge regarding the plants that might have been used in alimentation or other purposes (e.g.: medicinal uses) by specific groups of people, but also can provide important considerations regarding the social component of the communities studied. The archaeobotanical studies conducted on the findings belonging to Romania's prehistorical sites have consisted, mostly, of carpological determinations. Lately, technological and methodological advances have allowed the identification of many more cultivated and wild plants through the study of pollen grains. Archaeobotanical results, as well as archaeological data, allow us to corroborate the possibility of culinary and / or medicinal uses by the prehistoric communities. For this research, we synthesised and interpreted the carpological and palynological data obtained from the research of prehistorical sites of Romania, along with the results of the analysis of natural sedimentary sequences from different Quaternary stations. Wild plants, such as *Cornus mas*, *Sambucus nigra*, *Vicia sativa*, *Rumex crispus*, *Rumex acetosella*, *Geum urbanum*, *Lithospermum officinale*, *Polygonum aviculare*, *Galium spurium*, *Thlaspi arvense*, *Phragmites australis*, *Viburnum lantana* etc., have been identified in Romania's archaeological contexts dating back to the Neolithic and Bronze Age. Thus, the analyses of archaeobotanical remains allow us to better understand the floral diversity, in terms of wild species that would have been present in the prehistoric territory of Romania, and also the connection between groups of people and the environment inhabited.

3 HEALING OR MAGIC? TRACES OF PLANT USE BY THE FUNNEL BEAKER CULTURE COMMUNITIES IN POLAND

Abstract author(s): Rennwanz, Joanna (Institute of Archaeology and Ethnology of the Polish Academy of Sciences) - Sobkowiak-Tabaka, Iwona (Faculty of Archaeology, Adam Mickiewicz University, Poznań)

Abstract format: Oral

From prehistoric times, healing treatments have played an important role in the life of ancient communities. However, they are also an extremely hard-to-grasp element of the archeological context. Traces of healing treatments are most often visible on the bones or teeth of the discovered skeletons (surgical interventions), but it is especially difficult to find evidence of the use of plants. Manifestations of the medicinal use of plants are a subject of intense scientific discussions and sometimes are even denied (i.e. Shanidar Cave from northern Iraq).

This paper will present the finds from the settlement of the Funnel Beaker Culture in southern Poland, as they were a reason for taking up the topic of using plants for healing and magic purposes in the Neolithic period in Poland. The equipment that had survived in the feature indicates a highly specialized activity (profession) of its user, and some finds confirm the knowledge of the properties

of plants. Particular attention will be paid to the use of tar, i.e. wood tar, obtained as a result of dry distillation, and one of the oldest therapeutic methods, which was the use of cataplasms, i.e. hot compresses on the body. Moreover, the topic of using preparations for magical purposes, with a focus on the apotropaic area, will also be discussed.

4 PLANT MACROREMAINS AND THE EARTHEN LONG BARROWS: WHAT FOLLOWS FROM THE ARCHAEOBOTANICAL EVIDENCE FROM NEOLITHIC SITES IN MUSZKOWICE (SOUTH-WESTERN POLAND)

Abstract author(s): Przybyl, Agnieszka (Institute of Archaeology, University of Wrocław) - Kofel, Dominika (Institute of Archaeology and Ethnology, Polish Academy of Sciences)

Abstract format: Oral

Archaeological excavation, conducted at two Neolithic monumental burial sites with several earthen long barrows of the Funnel Beaker culture in Muszkowice (the Polish Sudeten Foreland) in 2018-2019, provided us a significant number of soil samples that were used in the archaeobotanical study. In the presentation we are going to outline some results of recent analysis of plant macroremains retrieved by flotation from the soil samples that were collected from the barrow No. 3 at Muszkowice site 18 and barrow No. 1 at Muszkowice site 45.

As the researchers of the first burial mound recognized at Muszkowice site 18 in the early 2000s reported, former attempts to obtain palynological data from the barrow did not bring positive results. Unfavorable soil conditions resulted in almost complete decomposition of organic matter and the lack of preserved pollen. This time, after another sampling in the field, the archaeobotanical study of charred plant macroremains was conducted. Thus several species have been identified, belonging to both, cultivated and wild plants taxa. After the taxonomical identification some of the plant macrofossils have been subjected to radiocarbon dating.

The data undeniably confirmed cereal agriculture. But as a result, some further questions arose, e.g. about the function of the plants identified here, in the Funnel Beaker culture burial context: whether the charred plant macroremains were related to the funeral rituals and activities, and consequently, they could be associated with the time of the burial mounds construction, or whether they predate it and reflect the past of the place where the earthen long barrows were erected. We will briefly discuss these questions in the presentation.

The studies presented were conducted with the financial support of the National Science Centre, research project No. 2017/25/B/HS3/01442.

5 ENOUGH IS AS GOOD AS A FEAST – SAMPLING STRATEGY AND A REPRESENTATIVENESS OF ARCHAEOBOTANICAL ASSEMBLAGES

Abstract author(s): Kapcia, Magda - Moskal-del Hoyo, Magdalena - Korczyńska, Marta (W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków)

Abstract format: Oral

Sampling in archaeobotanical research is a crucial factor, which has an impact on the knowledge about plant usage in prehistory. This is especially important for the so-called dry archaeological sites, in which only a small part of plants used by prehistoric people are preserved mainly due to environmental conditions. From that type of archaeological sites, mainly charred plant materials can be gathered for studying the great variety of uses of plants by ancient societies and learning the history of local flora. In order to show the importance of sampling strategy for palaeoethnographic and palaeoenvironmental studies we will present data from loess-mantled areas of southern Poland coming from recently excavated Neolithic archaeological sites (i.e. the Linear Pottery culture site of Biskupice 18; the Lengyel-Polgar culture of Spytkowice 26; the Funnel Beaker culture site of Mozgawa 1-3) and Middle Bronze Age sites (i.e. the Trzciniec culture site of Lipnik 5). Different strategies of sampling were tested at these sites starting from sampling of selected layers only, through collecting samples randomly distributed in pits, until normalized sampling in the standardized grid, analysed with geostatistic tools permitting to obtain spatial information of the data. The results will be discussed in the context of the type of archaeological features and their possible function. In addition, plant macro-remains obtained from these sites will be compared with other contemporary archaeobotanical assemblages known from the regions to discuss the optimal sampling strategies applied to different types of archaeological features.

6 OLD DATA - NEW INTERPRETATIONS. SUBSISTENCE STRATEGIES OF FUNNEL BEAKER CULTURE POPULATION

Abstract author(s): Sobkowiak-Tabaka, Iwona (Faculty of Archaeology, Adam Mickiewicz University, Poznań) - Rennwanz, Joanna (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Poznań) - Diachenko, Aleksandr (Institute of Archaeology of the National Academy of Sciences of Ukraine)

Abstract format: Oral

This paper presents the reassessment of the empirical evidence on the proportion of different crops, which were grown by the Funnel Beaker Culture (TRB) populations at the territory of modern Poland. The critical analysis will focus on the methods of sampling and the evaluation of their influence on the obtained results. Additionally, analyzes of archival materials, their reanalysis and the current methodological approach in archaeobotany will be taken into account. Moreover, we will present the evidence of some regional

differences in the TRB crop structure. We will also discuss whether this is the result of the local natural and cultural conditions of the TRB community or the adopted strategy of sampling and data analysis at the archaeological site. As on the one hand, there is a noticeable repeatability of the ratio of cultivated plants, on the other hand, some differences in this respect are observed locally.

The obtained results make possible new conclusions on their diet, subsistence strategies, and catchment areas, and also raise new questions on the economy of the Neolithic populations of Central Europe. The proposed methodology may be further used for the analysis of agricultural activities of different archaeological populations.

355 COMMUNITY ARCHAEOLOGY AND CLIMATE THREAT RESPONSE

Theme: 1. Widening horizons through human-environment interconnections

Organisers: McGovern, Thomas (CUNY Graduate Center and Hunter College) - Dawson, Thomas (School of History U St Andrews Scotland)

Format: Discussion session

Climate changes pose a worldwide threat to the archaeological record and the heritage of local and global communities. Experience gained by climate change response initiatives thus far have underlined the key role of community-based archaeology in mobilizing and providing effective response to the dire challenges we now face. In multiple world areas, from Caribbean to Greenland, archaeologists (many indigenous) and local communities have formed partnerships to assess, prioritize, record, and rescue rapidly disappearing science and heritage. The growing realization that archaeological deposits represent a "distributed observing network of the past" of great value to modern resource managers and sustainability planners is increasingly tied to the recognition of deep local expertise in resource management and sustainable commons management. Partnerships across communities of knowledge are being enhanced and accelerated by innovative applications of new technology and techniques, and formal inclusion of professional digital media producers to create new tools for recording and wider communication of results are now becoming widespread. We are learning new ways of co-producing knowledge while mobilizing in the face of climate threats. This session will bring together projects and practitioners from multiple teams and communities and will work to share ideas and best practice approaches while connecting broadly across world regions. This session is sponsored by the Integrated History and Future of Humans on Earth (IHOPE) program and draws upon expertise from SAA and EAA climate impact communities.

ABSTRACTS:

1 CLIMATE CHANGE THREATS TO HERITAGE IN ALASKA-WORKING ON AN ORGANIZED RESPONSE

Abstract author(s): Jensen, Anne (University of Alaska Fairbanks)

Abstract format: Oral

Alaskan archaeological sites, especially those in permafrost areas and those along the coast or rivers, are being threatened by climate change. There have been a number of projects which have dealt with specific sites which are threatened with damage or obliteration, but there is no wider organized response. This leaves many sites at risk. While community members are often very concerned, often they are dealing with threats to current community infrastructure, like houses and water plants, which must take priority.

Attempts are beginning to organize some type of trained rapid response capability, to at least be able to document what is exposed accurately and rapidly, and to gather samples and document diagnostic artifacts, before the next storm or flood removes them altogether. Due in part to the size and nature of Alaska, this has proven to be somewhat of a challenge. This paper will describe the current state of this quest.

2 CANCARE: THE CANADIAN COASTAL ARCHAEOLOGY RESCUE EFFORT

Abstract author(s): Betts, Matthew (Canadian Museum of History)

Abstract format: Oral

The destruction of archaeological sites due to sea level rise and climate instability has been characterized as a global heritage crisis. With the longest coastline and freshwater ecosystem in the world, Canada sits at the apex of a looming catastrophe. While Canada was initially a global leader in rescue-archaeology, the decentralization of heritage legislation changed the way archaeological sites were protected and mitigated. These changes led to the development of a robust cultural resource management (CRM) industry that protects sites from development. Unfortunately, no such robust system was developed to protect sites from destruction by natural causes. As the pace of sea-level rise has increased with global warming and climate instability has increased storm-linked erosion, the destruction of archaeological sites has reached a critical point. In collaboration with Indigenous experts, provincial and territorial archaeologists, academics, and knowledge holders, the Canadian Museum of History has been attempting to build a new infrastructure to address this issue with a program that is national in scope, but community-based in practice.

3 PROTECTING THE PERIPHERIES - COLLABORATIVE ARCHAEOLOGY, STEWARDSHIP, AND PRESERVATION AT TWO 'FRONTIER' SITES

Abstract author(s): Victor, Megan (Queens College, CUNY)

Abstract format: Oral

Community-based and collaborative archaeology stand as key strategies in staunching the deleterious effects of climate change on archaeological sites. Partnerships formed between local communities, scholars, and – at times – government agencies can lead to substantive responses to climatic threats in the form of documentation and preservation. This is most crucial in locations distanced from the steady gaze of passersby, for the threats to these locales became equally secluded, often leaving the sites' vulnerability unnoticed. This paper discusses two projects in the United States where such peripheral places were protected, thanks to the diligent efforts of community-driven, collaborative archaeology. The excavations at former fishing village of Smuttynose Island at the Isles of Shoals – off of the Maine /New Hampshire Border in New England – took place through the Shoals Marine Laboratory in partnership with the community-based Smuttynose Island Stewardship Program. The excavations explored climate change at the Isles of Shoals, with an eye to current conditions, while also seeking to record and protect the site before the sea could strip it from the island's shore. At Highland City, Montana, high in the Rocky Mountains, the Highland City Project worked with the local descendant community and the Forest Service to record the boundaries of the site threatened by ice and fire. Changing winter conditions and prolonged forest fire seasons have both posed considerable challenges to the continued preservation of the once-thriving gold town. Both projects found ways to record, excavate, and – where possible – preserve these archaeological locations with input from the communities whose heritage are most tied to them. The excavations at Smuttynose Island and Highland City represent two ways of approaching climatic threats to remote archaeological sites.

4 CULTURE, HERITAGE AND IDENTITIES: IMPACTS OF CLIMATE CHANGE IN NORTH WEST EUROPE (CHICC)

Abstract author(s): Kerr, Sarah (Aarhus University)

Abstract format: Oral

Anthropogenic climate change is threatening the heritage of North West (NW) Europe, particularly through increased incidence of storm activity impacting the coasts of Ireland, Scotland and Denmark. Heritage loss or damage has an impact on the lives of local communities. It may impact their livelihoods, their sense of place and belonging, and their perception of climate change; therefore, heritage loss impacts their cultural identities. This paper will introduce and discuss CHICC, an MSCA-funded project which explores the impact of climate change-driven heritage loss on communities' cultural identities.

CHICC involves the comparative compiling of long-lens narratives of three damaged or partially lost heritage sites in Denmark, Ireland and Scotland. In this paper, I will provide an overview of the methodology; in particular, the co-creation of an open-access, on-line resource in the form of a deepmap. Deepmapping allows the creation of environmental and cultural histories with temporally and spatially mapped content showing site development, climate change impact, and contemporary response. Crucially, CHICC's deepmap utilises a Citizen Science approach which allows for the co-production of knowledge free of disciplinary boundaries and top-down steering. The aim of this is to create a deepmap which is, at once, a research tool through which cultural identity can be examined; and an output allowing a digital experience of a site no longer physically accessible. The paper will summarise the shifts in cultural identities, as a result of climate change-driven heritage loss, detectable through this methodology.

5 DONOP: MAKING SPACES FOR INDIGENOUS VOICES IN CLIMATE CHANGE RESEARCH

Abstract author(s): Newsom, Bonnie - Kelley, Alice (University of Maine)

Abstract format: Oral

Understanding the intersection between human behavior, the environment, and climate change in the past enhances our capacity to address contemporary climate change issues. Archaeological sites are important data sources which inform such understanding and provide insight into the human/animal/environment dynamic over time. The Distributed Long-term Observing Networks of the Past (DONOP) was conceived as a way to elevate the value of archaeological sites as data sources for global change research (Hambrecht et al 2018). While archaeological sites can provide invaluable information for understanding changing climate, it is important not to reduce archaeological sites to mere data sources. In North America, most sites falling within the scope of this network represent Indigenous heritage spaces that carry socio-cultural meaning for contemporary Indigenous groups. As such, Indigenous stakeholders should have a role in determining how archaeological data sets are collected, used, and managed. This paper discusses efforts underway in Maine to elevate Indigenous voices in archaeological practice, specifically as it pertains to coastal shell heap studies and climate change impacts. Here we showcase two case studies centered on the role of Indigenous stakeholders in shell heap management and research in Maine, one working in a field school setting and the other involving a citizen science effort.

6 THE ALLUITSOQ PROJECT: A COMMUNITY-BASED ARCHAEOLOGICAL RESEARCH PROGRAM AT A THREATENED MISSION STATION IN SOUTH GREENLAND

Abstract author(s): Turley, Cameron (The Graduate Center, City University of New York) - Bendtsen, Aká (Ilisimatusarfik) - Coleman, Wendi (The Graduate Center, City University of New York)

Abstract format: Oral

Archaeological heritage at the former Moravian mission of Lichtenau in South Greenland (established in 1774) is presently threatened by rising sea levels, coastal erosion, and rising ground temperatures. Project directors Turley (City University of New York) and Bendtsen (Ilisimatusarfik) launched the Alluitsoq Project in 2019 with goals to simultaneously rescue imminently endangered archaeological deposits and to develop productive, long-term partnerships with Alluitsoq's descendant community for capacity building and knowledge co-production. Three working seasons which have included excavations, ethnographic fieldwork, school lectures, and numerous site visitors have produced large collections, early progress on valuable datasets, and growing community partnerships. While we provide a summary of fieldwork and analysis results which remain in-progress, our primary focus in this paper is the project's foundational community-based practice. From the perspectives of both Kalaallit and foreign researchers we reflect on the privilege and responsibility of working with and for this community, some failures, successes, and lessons learned, and where our community partners' knowledge and needs are driving interpretation, leading to new research questions, and expanded designs for mutual participation. This work takes place within a still broader context. As a members and collaborators with the North Atlantic Biocultural Organisation, Integrated History and Future of Humans on Earth, and Bifrost Environmental Humanities, the Alluitsoq Project is one element of a transnational effort to build productive community-based praxes for capacity building and knowledge co-production.

7 BOSTON HARBOR ISLANDS ARCHAEOLOGY AND CLIMATE IMPACT PROJECT

Abstract author(s): West, Catherine (Boston University) - Bagley, Joseph (Boston City Archaeology Program) - Albert, Marc (National Park Service)

Abstract format: Oral

The Boston Harbor Islands Archaeology and Climate Impact Project represents a collaborative effort among groups from around the Commonwealth of Massachusetts to examine and mitigate threats to archaeological sites in the Boston Harbor Islands. The project is headed by the City Archaeologist of Boston in partnership with the Massachusetts at Ponkapoag tribe, the National Park Service, Boston University, and other partners. The Boston Harbor Islands Archaeological District is listed on the National Register and represents the most intact and complete archaeological record of the region's history, with continual intensive use for thousands of years to the present. Most of the archaeological sites are located along the shore, where many are threatened by active erosion. Despite the importance of the archaeological district and their vulnerable coastal location, many of the sites have never been documented and there has never been a system of monitoring in place. This project will document archaeological sites at risk of loss due to climate change and other threats on the Boston Harbor Islands: first, we will create the framework for determining site location and risk through a collaborative approach that combines data from known archaeological sites, potential archaeological sites, Indigenous perspectives, and existing climate and harbor science. Second, we will apply the framework to an island in Boston Harbor for an island-wide Sensitivity, Risk, and Management Plan (SRMP). Finally, we will begin risk mitigation by creating a community science shoreline monitoring program to actively track erosion at archaeological sites and conduct archaeological surveys to document the most at-risk sites before they are lost.

8 PRESERVATION THROUGH TRANSLATION? CO-PRODUCING A MODERN ECO-HOME BY INTEGRATING INTANGIBLE ARCHITECTURAL HERITAGE

Abstract author(s): Romankiewicz, Tanja (University of Edinburgh, School of History, Classics and Archaeology)

Abstract format: Oral

My architectural analysis of later prehistoric houses along the North Sea littoral has identified a dynamic concept of domestic architecture, where permanency is created through place not through structure, where houses adapt and transform to changing needs, and where homes metamorphose into byres, byres into gardens, and gardens into homes. This reflects a cyclical concept of architecture, both sustainable and sustaining. It reflects a definition of architecture beyond walls and roofs that encompasses a holistic understanding of how a house sustains a household.

Such architectures, however, create only ephemeral archaeological evidence, and are by their nature already hard to preserve; so, how can we preserve the theoretical concept behind them? Their sustainability relies on re-usable, compostable, renewable materials, which if applied today could reduce the carbon footprint of modern housing. Metamorphosing houses can also adapt to modern dynamic lives and changing family situations, much easier than a concrete box. But how can we translate such ancient, intangible, architectural concepts into modern ones, beyond imitation or pastiche, or ending up having to live under Bronze Age conditions? Are such concepts best preserved via wide but broad dissemination and education, or by individual, practical engagement that has a deep reach instead. Can we preserve these concepts not by communicating something old, but by translating it into something new? How much do we gain and lose in this way, and where do the challenges lie? And how can such deep impact be multiplied and expand its reach?

I propose to discuss this idea of preserving intangible heritage through modern translation by introducing a case study from the Netherlands, where we (an archaeologist, a traditional builder/archaeologist and a local resident) started designing a cyclically metamorphosing "home-place", inspired by ancient architectural concepts but translated into a new, modern setting, with all its chances and challenges.

9 COASTLINES, COMMUNITIES AND CLIMATE CHANGE

Abstract author(s): Dawson, Tom (University of St Andrews)

Abstract format: Oral

Natural processes threaten thousands of heritage sites around the globe. One area where destruction can be seen happening before our eyes is at the coast. Much of the damage is caused by slow and steady erosion, but storms and hurricanes occasionally destroy entire sites overnight. Either way, the result is the same, the irreversible loss of vital heritage information. With no developer to pay for expensive survey or excavation, new ways of working need to be found.

The key is partnership working, with important roles for heritage agencies, researchers and local community members. For the past twenty years, archaeologists in Scotland have been working with local communities, testing new ways of recording heritage sites threatened by natural processes. Coastal surveys have been followed by practical projects, where locally-valued sites have been prioritised for action. In addition to excavation, other types of action have been selected by the local groups, ensuring that something is saved of sites before they are destroyed.

Much has been learned over the years and this presentation will highlight the positive benefits of partnership working.

359 FOOD CULTURES IN ANCIENT SOCIETIES

Theme: 6. Material culture studies and societies

Organisers: Kubiak-Martens, Lucy (Biax Consult, Zaandam) - Kirleis, Wiebke (Kiel University)

Format: Regular session

Food is a fundamental link that connects people across cultures and generations. Research into food cultures has long since become a key topic of ever increasing importance in social archaeology and cultural anthropology, supported by innovative natural scientific approaches on nutritional values and metabolism. Food production, processing, distribution and consumption are the pre-conditions for the existence of human life. They shape subsistence on different spatial, temporal and social scales with culinary traditions being one important expression of human livelihood that reflects social identities and social practices.

This session addresses the economic and social relevance of food and food procurement in ancient societies. It aims at exploring the links between the diversity of food choices and changes therein with trends and tendencies in agrarian production and advances in agrarian technology. The session will also focus on past dietary habits in the light of the interaction between humans and food, behavioural variability, social inequality and identity.

We invite contributions that consider different bioarchaeological and food analysis methods, likely combined with studies on the specific expressions of the material culture related to food procurement and food processing, molecular and SEM analyses, micro-wear and microfossil analyses of archaeological artefacts used in food preparation (flint and stone tools), ethnographic studies and experimental archaeological approaches. As food cultures often vary regionally, contributions from all geographic regions and all archaeological periods are welcome. This session is intended to bring together specialists who are using various highly sensitive methods in our search for a better understanding of different food cultures and culinary traditions hidden in the archaeological record.

ABSTRACTS:

1 INTRODUCTION TO THE SESSION 359: FOOD CULTURES IN ANCIENT SOCIETIES

Abstract author(s): Kirleis, Wiebke (Kiel University) - Kubiak-Martens, Lucy (BiaxConsult)

Abstract format: Oral

Food is a fundamental link that connects people across cultures and generations. Research into food cultures has long since become a key topic of ever increasing importance in social archaeology and cultural anthropology, supported by innovative natural scientific approaches on nutritional values and metabolism. Food production, processing, distribution and consumption are the pre-conditions for the existence of human life. They shape subsistence on different spatial, temporal and social scales with culinary traditions being one important expression of human livelihood that reflects social identities and social practices. What is the economic and the social relevance of food and food procurement in ancient societies? Are diversity of food choices and changes therein linked with trends and tendencies in agrarian production and advances in agrarian technology? How do interactions between humans and food and behavioural variability influence past culinary practices? Do past dietary habits reflect social inequality and identity, and if so, how? The bringing together of multiple approaches and lines of evidence is the tool to get a better understanding of different food cultures and culinary traditions hidden in the archaeological record.

2 UNRAVELLING HUNTER-GATHERER FOOD TRADITIONS IN NORTH-EAST EUROPE: RESULTS FROM THE INDUCE PROJECT

Abstract author(s): González Carretero, Lara (The British Museum; Museum of London Archaeology - MOLA) - Courel, Blandine (The British Museum) - Lucquin, Alexandre - Bondetti, Manon - Robson, Harry - Craig, Oliver (University of York) - Heron, Carl (The British Museum)

Abstract format: Oral

Food traditions involving food processing, preparation, cooking and ultimately consumption have generally been hidden to the eye of the archaeologist. Traditional archaeobotanical and zooarchaeological analysis, although being greatly successful at identifying the procurement and presence of plant and animal ingredients, have often lacked the means of providing insights into culinary habits and cuisine. This paper presents results from the INDUCE (The Innovation, Dispersal and Use of Ceramics in NW Eurasia) project funded by the European Research Council (ERC), with a focus on the combined approach of biomolecular (isotopes, GC-MS) and microscopic analysis (Digital Microscopy and SEM) of absorbed residues and charred food residues or 'foodcrusts' preserved in pottery vessels from Mesolithic communities in North-East Europe. This paper shows the latest finds from selected sites in the study area in addition to presenting some of the latest methodological advances in the identification of plant and animal ingredients as well as potential food recipes.

3 STABLE ISOTOPIC AND MOLECULAR ANALYSES OF SURFACE AND ABSORBED RESIDUES FROM A YEAR-LONG EXPERIMENT REVEAL MULTIPLE TIMESCALES OF COOKING HISTORY

Abstract author(s): Swift, Jillian (Bishop Museum) - Miller, Melanie (University of Otago; University of California, Berkeley) - Whelton, Helen (University of Bristol) - Hammann, Simon (Friedrich-Alexander University Erlangen-Nürnberg) - Cramp, Lucy - Evershed, Richard (University of Bristol) - Hastorf, Christine (University of California, Berkeley)

Abstract format: Oral

Chemical analyses of organic residues recovered from archaeological pottery can provide insights into ancient culinary practices and resource use. However the processes of residue formation, including the timescales captured by the chemistry of surface and absorbed pottery residues, has been understudied. Our team designed a year-long cooking experiment where we cooked 7 recipes that included mixtures of C3 (wheat and deer meat) and C4 (maize) foods in unglazed pottery, and at the end of the experiment we changed recipes for a few final cooking events. We utilized stable isotope analysis and lipid residue analyses to study the chemical composition of the resulting residues and their relationship to our known ingredients over the experimental period. Over the course of the experiment, three different residue forms could be distinguished in the vessels: two surface residue forms (larger charred macro-remains and a thin-layer organic patina) as well as the absorbed residue within the pottery fabric itself. Their chemistry reflected different timelines of cooking events from the pot's use history. The larger, superficial charred macro-remains had bulk stable carbon and nitrogen stable isotope values which reflected the final foods cooked in the vessel. Thin-layer patina residues accumulated over time and were found to contain chemical markers of previous cooking events but were skewed to the chemistry of the final foods prepared in the pot. Finally, the absorbed lipid residues were slower to change and primarily reflected foods cooked earlier in the experiment, with little chemical evidence of the final ingredients that were cooked. These findings suggest that careful comparison of multiple types of archaeological pottery residues can provide more detailed insights into the full course of a vessel's life history.

4 LATE BRONZE AGE DIET IN THE EASTERN BALTIC: AN EXPERIMENTAL APPROACH TO THE STUDY OF ORGANIC RESIDUES IN POTTERY

Abstract author(s): Podenas, Vytenis (Lithuanian Institute of History) - Luchtanas, Aleksiejus (Vilnius University) - Šapolaitė, Justina (Center for Physical Sciences and Technology) - Micelicaite, Viktorija (Lithuanian Institute of History) - Butkus, Laurynas - Ežerinskis, Žilvinas - Skipitytė, Raminta - Garbaras, Andrius (Center for Physical Sciences and Technology)

Abstract format: Oral

Ancient economic progress is widely reflected by the changes in food culture. Recently, Late Bronze Age in the Eastern Baltic has been distinguished by the active development of farming and the diminishing role of fishing in subsistence strategies. $\delta^{13}C$ and $\delta^{15}N$ values of charred organic residues in pottery indicate a shift towards terrestrial food sources. On the other hand, an interpretative challenge to study beyond the "terrestrial vs. aquatic" level accompanies the perpetual problem of different product representativity in the archaeological record. Therefore, an understanding of the foodstuff carbonization process in archaeological pottery helps to assess the accumulated corpus of stable isotope data. Most of which is measured in the charred macro remains that according to several experimental studies represent only the foodstuffs used in the final cooking event. However experimental data still lack tests of higher ingredient variety and the implications of their mixing process. Paper presents first results of a recently launched experimental study in which we have performed 10 cooking cycles in 11 replica pots. A variety of possible Late Bronze Age foodstuffs were used in the experiments to test the impact of C4 plant admixture, pulses effect on expected $\delta^{15}N$ values as well as investigated the implications of sampling in different parts of the vessel. Overall, the paper presents 178 measurements of bulk carbon and nitrogen stable isotopes as well as the results of the absorbed organic residues that were extracted after the 10 cooking cycles were finished. The experimental study confirms the previous observations on macro-remains representing only final foodstuffs in plant-based recipes, however, the lasting bias were measured up to 2-3 cycles in cases of cooking fish and meat. Last-

ly, the study confirms the hypothesis that pulses diminish the $\delta^{15}N$ values significantly, however they do not overshadow previous aquatic bias to an undetectable extent.

5 COPROLITES: A RECORD OF FOODS CONSUMED AND THEIR PROCESSING

Abstract author(s): Scott Cummings, Linda (PaleoResearch Institute)

Abstract format: Oral

Coprolites provide an opportunity to look at diets on both the populational and personal levels. Multiple studies of coprolites from the Ancestral Puebloan cultural area in southwestern Colorado have provided the opportunity to combine assessment of the pollen, phytolith, and macrofloral records of people living in multistoried villages. Each of these proxy records provides a slightly different vision of the diet and also food preparation or processing. Many foods are represented in only one or two of these proxies, indicating the value of using multiple proxies to build a record of past diet. Examples of food consumption and preparation are varied. Consumption of green beans (*Phaseolus*), probably as dried, stored beans, was documented by recovery of phytoliths. Maize (*Zea mays*) was ubiquitous in all three proxies, while some native or gathered foods such as goosefoot (*Chenopodium*) were ubiquitous in only the pollen and macrofloral proxies. Cleome (beeweed) is ubiquitous in the pollen record, but absent in other records, suggesting collecting this green after it began flowering, which is typical of dual use as both a pottery paint and a green vegetable that could be cooked, stored, reconstituted, and fried.

6 NEOLITHIC DIET AS HIDDEN IN HUMAN COPROLITES FROM THE SWIFTERBANT SITES IN THE NETHERLANDS

Abstract author(s): Kubiak-Martens, Lucy (BIAX Consult, Biological Archaeology & Environmental Reconstruction)

Abstract format: Oral

Commissioned by the Cultural Heritage Agency of the Netherlands (RCE), BIAAX Consult Biological Archaeology & Landscape Reconstruction is leading the project 'Neolithic human diet' based on studies of human coprolites from Swifterbant sites in the Netherlands excavated before 2007. A group of specialists from BIAAX Consult, Delft University of Technology (NL), Newcastle University (UK), Universitat Autònoma de Barcelona (Spain), and ArchaeoBone (NL) are working together, incorporating their research methods.

The coprolites are in fact the missing links in our knowledge of the prehistoric diet, as they offer evidence for dietary diversity, preparation of food, and consumption. The study of coprolites gives a unique opportunity to reconstruct the most complete spectrum of foods that were consumed, both cooked meals and (plant) foods that were eaten raw. This contribution focuses on human faecal remains from two sites of primary interest in this project, S3 and S4. Both sites are located on small natural levees in the creek landscape of the Swifterbant area. They are dated to the classic phase of the Swifterbant culture (c. 4300-4000 cal. BC). At both sites, many human faecal remains were found in the refuse layers. The approached methodology is based on the integration of traditional and scanning electron microscopy. The main research questions of this project are concerned with the dietary diversity of the Swifterbant culinary tradition, with attention to both plant and animal components. The evidence for the consumption of plant foods in general, and cereals in particular, are of great interest. The questions about the crucial shift, the introduction of cereals to the Swifterbant diet, and the actual role of cereals versus wild plant foods are to be more accurately answered.

7 PLANT PROCESSING IN TIGRAY DURING PRE-AKSUMITE AND AKSUMITE PERIODS (>800 BCE-700 CE): PRELIMINARY RESULTS OF STARCH ANALYSIS FROM GRINDING STONES

Abstract author(s): Ruiz-Giralt, Abel (CaSEs - Complexity and Socioecological Dynamics Research Group. Departament de Humanitats, Universitat Pompeu Fabra) - Nixon-Darcus, Laurie - D'Andrea, Catherine (Department of Archaeology, Simon Fraser University) - Biagetti, Stefano (CaSEs - Complexity and Socioecological Dynamics Research Group. Departament de Humanitats, Universitat Pompeu Fabra; School of Geography, Archaeology and Environmental Studies - GAES, University of the Witwatersrand) - Madella, Marco (CaSEs - Complexity and Socioecological Dynamics Research Group. Departament de Humanitats, Universitat Pompeu Fabra; School of Geography, Archaeology and Environmental Studies - GAES, University of the Witwatersrand; ICREA) - Lancelotti, Carla (CaSEs - Complexity and Socioecological Dynamics Research Group. Departament de Humanitats, Universitat Pompeu Fabra; ICREA)

Abstract format: Oral

In this paper, we explore plant processing activities during Pre-Aksumite (>800-50 BCE) and Aksumite periods (50 BCE-700 CE) in NE Ethiopia. We analysed plant microremains from grinding stones recovered at two archaeological sites: the Pre-Aksumite rural site of Mezber (ca. 1600 BCE-1 CE) and Ona Adi (ca. 600 BCE-700 CE), an urban center occupied continuously from the Late Pre-Aksumite period to the fall of the Aksumite kingdom. Both sites are located in the historic province of Tigray and, together, they cover the whole chronology of Pre-Aksumite and Aksumite cultural horizons - two of the most notable socio-political entities of recent African prehistory.

Both sites are being investigated in the framework of the Eastern Tigray Archaeological Project (ETAP). Archaeobotanical, zooarchaeological and isotopic evidence at Mezber document a fully developed agropastoral economy, with an early presence of Near Eastern imported wheat, barley, lentils, flax and livestock such as cattle, sheep, goat and donkey. At Ona Adi, ETAP began extensive excavations in 2014 and in-depth analyses of ceramics and lithics, as well as animal and plant remains, and radiocarbon dating are currently ongoing. Here, we present the first results of the starch analysis from grinding stones recovered throughout the complete

chronocultural sequence of both sites. 58 samples from 33 grinding stones were studied, recording a total of 2010 grains of starch. Multiple starch morphologies were identified at both sites, including C3 and C4 cereals, as well as legumes and tubers, though more specific taxonomic identification is still ongoing. Overall, these preliminary results point to the use of a wider range of plant products than what has been identified in previous carpological studies. They also seem to attest for the presence of small-seeded C4 species in earlier chronologies than previously recorded. Further analysis (e.g. phytoliths) are ongoing in order to confirm these hypothesis.

8 DIGGING IN THE SHADOWS. EXPERIMENTAL USE OF TOOLS FOR USO'S GATHERING

Abstract author(s): Lopez-Bulto, Oriol (Autonomous University of Barcelona - UAB) - Berihuete-Azorin, Marian (Institut Català de Paleoecologia Humana i Evolució Social - IPHES)

Abstract format: Oral

Wooden digging sticks have ethnographically and archaeologically identified as a common tool between hunter-gatherer societies, being root recollection one of the main functions. Underground Storage Organs (USO's) are indeed a very valuable food resource, predictable and reliable because of their seasonality, as well as relatively easy to gather and process. Their use and consumption are known from a variety of ethnographic and ethnobotanical investigations and literature suggests that they were widely used as food by recent hunter-gatherers. However, the use of these resources in the past has been to date undervalued for multiple reasons such as recovery issues, identification difficulties, but also due to the difficulty to identify tools involved in its gathering process.

In this work, we present an experimental program designed to corroborate the efficiency of this type of tools in the USO's gathering process with experimental digging sticks as well as their use-wear analysis as a reference collection for future archaeological identifications.

9 A CASE STUDY ON PLANT FOOD STORAGE AND SURPLUS MANAGEMENT OF THE FIRST AGRICULTURAL SOCIETIES OF SE EUROPE

Abstract author(s): Marinova, Elena (Landesamt für Denkmalpflege am Regierungspräsidium Stuttgart, Laboratory for Arc) - Takorova, Dessislava (National Institute and Museum of Archaeology, Bulgarian Academy of Sciences) - Demeulenaere, Eline (KU Leuven) - Nikolov, Vassil (National Institute and Museum of Archaeology, Bulgarian Academy of Sciences)

Abstract format: Oral

Storage practices are a vital element of the subsistence strategies of the early agricultural societies as such facilities are securing food resources on a long term and precondition for sustainable demographic growth. Recent excavations at the Early Neolithic (6100- 5850 cal BC) settlement horizons of Slatina, one of the largest settlements situated on one of the Neolithization route between the Aegean littoral and the Danube Basin, revealed abundant storage structures in several buildings. In the current paper we present the archaeobotanical finds from over 70 storages in their detailed archaeological context majority (ca. 50) preserved at least partly in situ. In the most of the intact storage vessels the staple crops are found as pure concentration of one species and very few have mixed character. Some of the plant concentrations were found not associated with clay vessels, most probably stored in perishable containers. The majority of the uncovered storages of cereals were found in unrushed state (together with the chaff), but few of them contained clearly processed (grinded or broken) cereals, showing also intermediate stages of food preparation which took place in the household. Apart of annual crops (mostly hulled wheats, lentil and pea) also ca. 6 concentrations of gathered from the wild plants (like Cornelian cherry, plum and apple/pear) were found and they confirm clearly the importance of the wild plant resources in the Early Neolithic economy of the site. Due to the good preservation, it was possible to estimate the approximate (preserved) volumes of the stored plants and estimate relative importance of each group in the different buildings, and therefore to give detailed quantitative information on the past plant husbandry of an Early Neolithic site and to explore its diversity of storage facilities and plant food resources.

10 RECOGNIZING FOOD PRACTICES IN THE LATE NEOLITHIC VINČA SETTLEMENTS: THE QUESTION OF SCALE AND SPACE

Abstract author(s): Obradovic, Djurdja - Dimitrijevic, Ivana (Institute of Archaeology, Belgrade)

Abstract format: Oral

In this study, we combine compositional and contextual evidence to recognize different food related activities inside the Late Neolithic (Vinča culture) settlements. We will focus upon storage and preparation of plant- and animal-based food, as well as disposal of food refuse. The study is based on the data from the Late Neolithic settlements in the region of Central Pomoravlje (Serbia), primarily from the sites of Drenovac and Pavlovac-Gumnište. Both sites have large faunal and botanical assemblages; the Late Neolithic settlements were inhabited for several centuries (5300-4600 cal BC), relatively large (15h and 40h), and enclosed by the ditches. At the site of Drenovac, a significant portion of the central part of the settlement was excavated, including more than 10 houses. Investigation of houses and their immediate surroundings enabled the comparison of inside and outside space use; furthermore, it gave an insight into possible rites after the house collapse and abandonment. Excavations at Pavlovac – Gumnište site revealed the large portion of the peripheral part of the settlement with numerous pits, open-air hearths, ovens and ditches, which gave us a unique opportunity to study the use of outside space for cooking activities and refuse disposal.

By considering both archaeobotanical and archaeozoological data we were able to obtain a comprehensive insight on diet and different ways of food processing, as well as to consider different scales of food practices, i.e. the ones resulting from activities of a smaller (i.e. household) or a larger group of people. Detailed spatial analysis of food practices indicated variations in space use and activities between the central and peripheral parts of the settlements.

11 AN INVESTIGATION OF EARLY BRONZE AGE PLANT FOODS FROM ARCHONDIKO GIANNITSON, NORTHERN GREECE

Abstract author(s): Petridou, Chryssi - Valamoti, Soultana Maria (Lira Laboratory, Department of Archaeology, School of History and Archaeology, Aristotle University of Thessaloniki; Center for Interdisciplinary Research and Innovation - CIRI-AUTH, Aristotle University of Thessaloniki)

Abstract format: Oral

In the end of the 3rd millennium B.C. a fire destroyed a series of buildings at Archondiko Giannitson in northern Greece. The built space excavated at Archondiko revealed a wide range of ceramic vessels ranging from cups, serving jars, storage and cooking jars, as well as a wealth of clay thermal installations, including a specific type of a complex hearth that could be linked with sophisticated culinary practices, like beer preparation. Detailed sampling of the burnt destruction layer has yielded a wealth of archaeobotanical remains that reveal the range of plant food ingredients stored and processed for food or other purposes. A wide range of cereal crops, oil plants and plants harvested from the wild have been identified in rich concentrations. Cereal remains dominate the archaeobotanical assemblage, indicating the cultivation of a variety of cereals at Archondiko: glume wheats include einkorn, emmer, new glume wheat type T. timopheevii and spelt wheat, while the presence of free-threshing wheat (bread/durum wheat) and hulled barley is also prominent. Besides cereals, linseed and Lallelantia sp. are also found in rich concentrations, while three species of pulses, grass pea, lentil and bitter vetch, are encountered in smaller amounts. Together with the variety of stored crops, the site has also yielded a wealth of cereal food remains that reveal complex culinary practices, which are presented for the first time in a comprehensive, contextual way. This presentation offers an overview of the range of plant food ingredients used at the settlement and discusses plant foods of the 3rd and early 2nd millennia BC in the wider context of food choices and identity in Bronze Age southeastern Europe.

12 DELICACIES FOR THE KAMI: SACRED FOODS IN JAPANESE PROTOHISTORY

Abstract author(s): Fernández, Irene Minerva (Independent researcher)

Abstract format: Oral

Food is an essential issue within cultural research. Way of life, religion, taboos, and beliefs are reflected in the different dietary habits, together with some aspects of the physical environment and relationships with other food-exchanging groups of the human communities.

Within the regular consumption foodstuff, a reduced group of foods are part, not only of the daily diet, but as well of the sacred realm. These foods began to be consumed in ritual contexts for different reasons: their physical/chemical traits, their socio-economic production implications, their association with different mythological passages or religious beliefs, or the physical effect that its consumption produces in the organism. Sometimes, these foods also reach the status of “foodstuff worthy of being consumed by the gods”, either in the form of an offering, either through the act of commensality.

This work's aim is to analyze the characteristics of ritual use foodstuff during Japanese Protohistory, specifically during Yayoi (1000/900 BC- 250/300 CE) and Kofun (250/300 - 710 CE) eras, although it will be essential to carry out an exhaustive review of consumption habits of such foods during other different periods, with the purpose of elucidating whether the ritual consumption of the studied food has a long tradition in the Japanese archipelago and, that being the case, determining the context of the origin of the ritual consumption.

13 DIETARY PRACTICES IN ITALY: A DIACHRONIC RECONSTRUCTION FROM THE NEOLITHIC TO THE BRONZE AGE

Abstract author(s): Cortese, Francesca (Prehistoric Archaeology Laboratory. University of Rome Tor Vergata) - Achino, Katia (Prehistoric Archaeology Laboratory. University of Rome Tor Vergata; Quantitative Archaeology Lab, Department of Prehistory, Autonomous University of Barcelona; Institute of Archaeology ZRC SAZU) - De Angelis, Flavio (Centre of Molecular Anthropology for Ancient DNA Studies, University of Rome Tor Vergata) - Gatta, Maurizio (Prehistoric Archaeology Laboratory. University of Rome Tor Vergata, Italy; University of York, Department of Archaeology) - Scorrano, Gabriele (Lundbeck Foundation GeoGenetics Centre, GLOBE Institute, University of Copenhagen; Centre of Molecular Anthropology for Ancient DNA Studies, University of Rome Tor Vergata) - Silvestri, Letizia (Prehistoric Archaeology Laboratory. University of Rome Tor Vergata; Durham University, Department of Archaeology; Sovrintendenza Capitolina ai Beni Culturali) - Rickards, Olga (Centre of Molecular Anthropology for Ancient DNA Studies, University of Rome Tor Vergata) - Rolfo, Mario (Prehistoric Archaeology Laboratory. University of Rome Tor Vergata)

Abstract format: Oral

Food procurement has always been a critical human concern. Diachronic studies regarding dietary practices and a synergetic approach between Archaeology and Biology permit to understand the transforming subsistence strategies of human communities. In

this context, Carbon and Nitrogen stable isotope analysis are useful to reconstruct reliable food and subsistence habits of ancient populations.

This work aims at analysing Italian archaeological bioremainds to provide a diachronic human diet reconstruction from the Neolithic to the Bronze Age, exploring the importance of food in the social structures. The first part of the research involves an interpretative exploration of Italian dietary habits during the Prehistory by analysing stable isotope data from published works. The second part of the work focuses on Mora Cavorso Cave, located in Central Italy and characterised by a human frequentation from the Neolithic to the Bronze Age. The cave presents a burial deposit of at least 28 individuals dated to the Neolithic period, a single Copper Age burial, and a large Bronze Age faunal assemblage. The stable isotope analyses carried out on the human and faunal bones points out similarities and differences in the subsistence strategies between the people that attended the cave in different times. Mora Cavorso data will be compared with those available in literature to achieve a more reliable reconstruction of food relevance in Italian contexts.

Diachronic comparisons show that Italy was a striking crossroads of dietary shifts and technological innovations. The Neolithic is a crucial moment due to the transition from an acquisitive to a productive economy. The data obtained from Mora Cavorso Cave allowed us to place this site in the Italian scenario, highlighting the diversity of food choices, trends, and technological advances in farming activities developed throughout Italian Later Prehistory.

14 PLANT AND ANIMAL CONSUMPTION IN NORTHWEST IRAN DURING THE BRONZE AGE: AN INSIGHT FROM ALIABAD TEPE AND QALEH SARDAR BUKAN

Abstract author(s): Douché, Carolyne - Decaix, Alexia - Decruyenare, Delphine (Muséum national d'Histoire naturelle, AASPE) - Fathi, Homa - Davoudi, Hossein (University of Tehran) - Berthon, Rémi - Tengberg, Margareta (Muséum national d'Histoire naturelle, AASPE) - Djamali, Morteza (Institut Méditerranéen de Biodiversité et d'Ecologie, IMBE) - Hassanzadeh, Yousef (National Museum of Iran) - Mashkour, Marjan (Muséum national d'Histoire naturelle, AASPE)

Abstract format: Oral

This presentation aims to explore cooking activities in two Bronze Age sites. Excavations at Aliabad Tepe (Early Bronze Age) and Qaleh Sardar Bukan (Middle/Late Bronze Age) were carried out in the modern city of Bukan by YH (ICHHTO). The plain of Bukan is located at 1590 m asl near the Samineh rud. In both sites, archaeobotanical remains were collected. In Aliabad, cereals were found in a jar together with wild taxa, allowing discussion about agricultural and storage practices. In Qaleh Sardar, the jar contained charred grains of emmer and chickpea deposited in a domestic cooking space. Animal resources were also found in the two sites and both indicate highly specialised economies based on the exploitation of sheep and goat followed by cattle. We have the opportunity here to integrate archaeobotanical and archaeozoological results. With the two case studies, we address entangled agro-pastoral practices related to cultivation and consumption of cereals on one side and on the other herd management and consumption of animal resources within rural communities of North-West Iran, 4500 years ago. We also aim at presenting the parallels between past and modern traditional agro-pastoral systems, consumption and cooking practices. On a regional scale, we will examine the links with Uruk and Yanik cultures, the influences of which are documented in Aliabad and Qaleh Sardar archaeological material.

15 FOOD PRODUCTION, LANDSCAPE-USE AND THE DIVINE AT THE BRONZE AGE HILLFORT HÜNENBURG NEAR WATENSTEDT, LKR. HELMSTEDT (1200-650 BC)

Abstract author(s): Uhlig, Tobias - Heske, Immo (Georg-August-Universität Göttingen) - Grefen-Peters, Silke (Braunschweig)

Abstract format: Oral

The Hünenburg near Watenstedt, Lkr. Helmstedt lies in the hilly plains north of the Harz Mountains in Northern Germany. The hillfort with its contemporary extramural settlement dates to the late bronze and early Iron Age. Its location on the western spur of the Heeseberg offers a prominent position controlling the fertile loess-covered plains. Archaeological Investigations between 1998 and 2018 have shown it to be a hub of power, specialist metalwork and exchange with a population density that surpasses the traditional models of single farmsteads by far. Research on the matter of food production, distribution and the utilisation of the surrounding cultural landscape has been conducted on an interdisciplinary scale. A distinct farming strategy is visible that relies on summer- and winter grains. The excellent bone preservation allows a detailed view on Bronze Age animal husbandry. The results obtained from these sources by S. Grefen-Peters, Braunschweig, can be placed in their archaeological context within the settlement. Cattle stands out as the foremost species kept for meat production, followed by ovicaprids and a surprisingly small proportion of pigs. The bone material yielded a vast spectrum of cut and chop marks as well as traces of cooking and roasting, revealing different patterns of food preparation. Meat supply seems to have been managed centrally with hints towards a spatial arrangement of production and procession. The difference between roasted and cooked meats seems very important in its social dimensions. Several depositions of articulated animal bone groups inside the settlement show differing or no dislocation patterns at all, hinting at a different intent. Completely breaking with manipulation and distribution patterns established for the settlement these might be regarded as manifestations of ritual activities and ceremonial meals hinting at a more complex entanglement of Human-Animal-Relations.

16 AN INTEGRATED PERSPECTIVE ON FOOD IN THE BRONZE AND IRON AGE IN THE NETHERLANDS

Abstract author(s): van Dijk, Joyce (Archeoplan Eco) - Theunissen, Liesbeth (Cultural Heritage Agency)

Abstract format: Oral

Food is the basis of our existence but surprisingly little has been written about this topic for the Bronze and Iron Age. Although excavations in the past yielded much data about arable farming, animal husbandry and trade in food products, very little is known about the storage of food products, the preparing and cooking of food or the way in which the meals were enjoyed. In 2019 a group of enthusiastic specialists and archaeologists teamed up to bring together data about food supply, food processing and the preparing of food in the Bronze and Iron Age. This interdisciplinary approach made it possible to create an up-to-date overview of the menu of farmer societies in the first two millennia BC. It is clear these people used all available possibilities to combine the cultivation of crops, the keeping of livestock and their natural environment. The general assumption that the Bronze and Iron Age societies lived with their backs to nature and that gathering, hunting and fishing no longer played a role in the food supply is refuted. In-depth discussions between the specialists and archaeologists not only led to a new differentiated picture of the available nutrients but also to surprising matters, such as everyday meals versus festive dinners, and a lack of 'cutlery' in settlement contexts. As a result of the integrated approach new thoughts on food are put forward which lead to promising research directions in the future.

17 COOKING DEER IN THE 2ND C. BC ON THE SOUTH-WESTERN BLACK SEA COAST: PRELIMINARY RESULTS OF THE MALKOTO KALE PROJECT

Abstract author(s): Morand, Nicolas (Post-doc Fyssen foundation, Royal Belgian Institute of Natural Sciences) - Bastide, Maguelone (UMR 7041-ArScAn - Université Paris Nanterre) - Bogdanova, Teodora (Municipal cultural Centre, "Museum Centre - Sozopol") - Baralis, Alexandre (Musée du Louvre, Department of Greek, Etruscan and Roman Antiquities) - Nedev, Dimitar (Municipal cultural Centre, "Museum Centre - Sozopol")

Abstract format: Oral

Led by M. Bastide and T. Bogdanova, the Malkoto Kale project is carried out in the framework of the French-Bulgarian archaeological mission at Apollonia Pontica (dir. A. Baralis, K. Panayotova and D. Nedev) in collaboration with the Archaeological Museum of Sozopol (Bulgaria). The study focuses on the site of Malkoto Kale, a fortified settlement located 12 km to the South of the ancient Greek city of Apollonia, on a peak about 280 m high, partially excavated during the 1970s. The new excavation campaign of August and September 2020 has provided very interesting results. In sq. P8-Q8, the excavations revealed an important building of the Late Hellenistic period. At its SW corner, near the Southern fortification wall, we uncovered an area where various domestic activities seem to be concentrated : spinning, weaving, grinding and an uncommon way of cooking. Indeed, a fireplace associated with an amphora containing deer bones was discovered in the same area. The archaeozoological analysis proved that the deer was prepared for eating, and probably stored in the amphora. This discovery reveals an uncommon cooking of game products, in a context disturbed by military events. Moreover, the results of faunal remains studies in the city of Apollonia Pontica will enable to compare the eating practices between urban and fortified settlements during the Hellenistic period.

18 SOCIAL ARCHAEOLOGY OF FOOD IN EARLY MEDIEVAL RURAL IBERIA (5TH-9TH C. CE)

Abstract author(s): García-Collado, Maite (University of the Basque Country - UPV/EHU; University of York)

Abstract format: Oral

This paper draws a social history of food in early medieval rural Iberia based on the comparison of dietary patterns in three Iberian regions (Madrid-Toledo, Basque Country, Catalonia) between 5th and 9th c. as revealed by carbon and nitrogen stable isotope ratios on bone collagen. Ten rural populations were subjected to osteoarchaeological analysis for age and sex estimation and palaeodietary reconstruction. They included fifteen human assemblages and eight fauna datasets for a total of 280 human and 115 fauna samples. The isotopic characterisation of domestic herbivores was not only useful for the definition of local isotopic baselines of each ecosystem, but also for investigating agrarian practices. It was revealed that livestock management strategies shared many common features within the same region and the data obtained pointed at the existence of complex agrarian systems. Humans also presented some regional affinity in their dietary patterns, but there were greater differences between populations from the same region and within them. All individuals had terrestrial diets largely based on C3 resources with variable contributions of C4 plants and animal proteins. Age and sex did not stand out as decisive factors in the configuration of diets and only the youngest individuals showed distinct dietary patterns due to breastfeeding. Social status as expressed through grave goods was associated with $\delta^{13}C$ values and crop consumption patterns. Instead, there was no correlation between $\delta^{15}N$ values and grave goods. The location of burials, in terms of exclusion from the community cemetery or proximity to churches, was not linked to diet. All in all, this research allowed to characterise the foodways of otherwise unknown societies as a proxy for the understanding of their productive strategies and internal social organisation.

19 FOOD CULTURES IN COLONIAL SETTINGS

Abstract author(s): Orendi, Andrea (ArchaeoConnect GmbH, Department of Archaeological Sciences, Archaeobotany Laboratory) - Tal, Oren (Department of Archaeology and Ancient Near Eastern Cultures, Tel Aviv University) - Lichtenberger, Achim (Institut für Klassische Archäologie und Christliche Archäologie/Archäologisches Museum, University of Münster)

Abstract format: Oral

Food cultures underwent many developments and changes through time. One aspect within the topic of food cultures in ancient times might be the migration of food and dietary habits through migrating people. One migration process is the colonization of a foreign territory by new settlers, as their cultural identities, such as food, reach the new colonized regions.

Two case studies from the southern Levant will be discussed via food cultures in colonial settings. Tel Iztabba (2nd cent. BCE) located in the Jordan valley was founded by the Seleucids after their occupation of Palestine. The settlement was part of Nysa-Scythopolis (Beth She'an), a major administrative centre in Hellenistic Palestine. The other case study, Arsuf/Arsur is located on the coast of the southern Sharon plain. The Fatimid (9th-11th cent. CE) settlement was conquered by the Crusaders in the early 12th century CE. Due to its occupational history this site offers the opportunity to compare two successive food cultures (the Islamic and the Crusader/Christian) with different dietary laws and habits.

Based on the archaeobotanical data from both sites the paper will discuss possible variations of food cultures at sites with a colonial background. Therefore, various questions arise, such as whether the colonial settlers relied on local plant resources, whether new crops were introduced to the local agrarian resources, and whether variances in the food cultures can be identified in the archaeobotanical records at all.

20 INVESTIGATING BIRTH DISTRIBUTION, LAMBING SEASONS AND LAMB MEAT CONSUMPTION IN MEDIEVAL PROVENCE FROM A ZOOARCHAEOLOGICAL, HISTORICAL AND ISOTOPIC PERSPECTIVE

Abstract author(s): Unsain, Dianne (Centre Camille Jullian, A*MIDEX, Aix Marseille Univ, CNRS, CCJ; LA3M, Aix Marseille Univ, CNRS) - Knockaert, Juliette (Department of Archaeology, University of York) - Burri, Sylvain (TRACES CNRS-Université Toulouse Jean Jaurès) - Magniez, Pierre (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA) - Mocchi, Florence (Centre Camille Jullian, Aix Marseille Univ, CNRS, CCJ) - Walsh, Kevin (Department of Archaeology, University of York)

Abstract format: Oral

The importance of domestic caprine in the of medieval Provence (10th-15th centuries) is no longer in doubt. Both historical and zooarchaeological research place them as the main source of meat in the cities and towns of the region. However, the latest research carried out in central Provence raises questions about the seasonality of animal breeding and their management in medieval times. Indeed, these studies came up against two contradictory visions provided, on the one hand, by zooarchaeology and the natural reproduction cycle, and on the other, by the historical sources and the religious context. The celebration of Easter has been characterised from the very beginning of Christianity (2nd century A.D.) by the consumption of lamb (and young goat) meat. The accounts of Provençal butchers in the 14th century indicate the massive consumption of suckling lamb during spring. These animals were aged between three and six weeks. However, in several elite contexts, in northern France, in England as well as in Provence, zooarchaeology reveals the high consumption of more mature lambs (three to six months). If their birth followed a natural cycle (late winter or spring), these individuals, though numerous, do not fit in with either religious habits or available textual sources. This observation leads us to consider out of season lambing. This communication aims to explore the links between livestock husbandry and cultural / religious backgrounds. For this purpose, zooarchaeology and written records, combined with the estimation of the birth seasons via oxygen isotope analyses, will allow us to discuss (a) the rhythmicity of the caprine meat products availability over the year (b) the adaptation of breeding and/or commercial practices to provide the privileged populations with top-quality products.

21 BUILDING PRODUCTION AND COMMERCIAL STRATEGIES: THE CASE OF THE GREAT AND SMALL PROVENÇAL ELITE (10TH - 12TH CENTURIES)

Abstract author(s): Unsain, Dianne (Centre Camille Jullian, A*MIDEX, Aix Marseille Univ, CNRS, CCJ; LA3M, Aix Marseille Univ, CNRS) - Mouton, Daniel (LA3M, Aix Marseille Univ, CNRS) - Varano, Mariacristina (Université de Rouen, GRHis)

Abstract format: Oral

Since the study of the "peasant knights" of Lake Paladru (11th c.), the complexity of the medieval elite system has raised intense questions among both historians and archaeologists. Medieval Provence - especially in the late Middle Ages - has long raised the interest of historians. Recent advances in elite/rural archaeology and zooarchaeology have led to a certain updating of knowledge related to this context, particularly for the more remote times of the 10th - 12th centuries. Not only do they allow us to consider lords tastes and culinary practices, but they also shed light on social and economic phenomena that are still little known. This contribution will rely on three archaeological sites (rural elite settlements), their zooarchaeological analyses and on history. The results show an astonishing homogeneity in the economic and dietary behaviour of the seigniories. They are characterised by high meat consumption and by a production centred on pig breeding. On the other hand, knights, in charge of the lord lands, demonstrate intense changes in their diet and production systems, associated with the development of commercial strategies. This behaviour could be an attempt to keep the economy afloat but would not always have prevented its decline. In a broader perspective, the

results can lead to (1) discussions on the fate of the medieval elites and their prospects for evolution, and (2) a reflection on the impact of social identity both on diet and on the building of a local economy.

22 CULINARY TRADITIONS BEYOND INGREDIENTS: IDENTIFYING CERAMIC VESSELS USED IN COOKING PRACTICES OF THE SOUTH-CENTRAL ANDES

Abstract author(s): Scaro, Agustina - Musaubach, María (Institute of Andean Ecorregions - CONICET-UNJu)

Abstract format: Oral

Culinary knowledge, traditional dishes, preparation forms and equipment, and commensality practices, within Andean cosmivision, involve a way of understanding the world. They are transmitted from generation to generation, thus constituting the culinary heritage. The study of culinary knowledge and practices, its loss or adaptation provide information about the social, economic and productive life of the communities. Even more, it addresses changes and continuities in communities' lifestyle, as reflected in their food. In the last fifteen years, Quebrada de Humahuaca (North of Argentina) has been the scenario where culinary heritage was re-discovered. Recipes and ingredients found in different Andean environments were highlighted and revalued from traditional to tourist and "haute cuisine" contexts. However, old-style equipment, especially ceramic pots and wooden utensils, have been replaced almost entirely by metal and plastic ones. This paper aims to infer about possible uses given to archaeological ceramic vessels in traditional Andean culinary preparations. We did the survey based on published local cookbooks, ethnographic records of roasted corn/beans and chicha. Morpho-functional and use-alteration study of archaeological vessels were also carried out. The latter were recovered in the south-central sector of Quebrada de Humahuaca. From this multidisciplinary approach, we seek to advance in the understanding of past culinary practices and the role that vessels played in various contexts of food preparation and commensality. Likewise, to revalue traditional knowledge and practices related to the South-Central Andes Culinary Heritage.

A. CEREALS VS PULSES. WHICH IS MORE RESISTANT TO HIGH TEMPERATURES? DIFFERENTIAL CARBONISATION AND ARCHAEOBOTANICAL IMPLICATIONS

Abstract author(s): Tarongi, Miguel - Alonso, Natàlia (Universitat de Lleida)

Abstract format: Poster

The values of frequency and quantity of pulse seeds among the Mediterranean archaeological record are lower values than those of cereals. In spite of always assuming a secondary role in agro-food processes, it is possible that pulses are underrepresented. Although most are charred, they are also found in mineralised or waterlogged states. Numerous experimental studies with current materials have been carried out to identify the changes taking place during the carbonisation process of archaeological seeds. However, no study combining different cereal and pulse species has focused on the changes produced among each under identical conditions of time and temperature.

This study presents the findings of the carbonisation of two cereal species (*Triticum durum* and *Hordeum vulgare*) and six pulse species (*Lathyrus sativus*, *Lens culinaris*, *Pisum sativum*, *Vicia faba*, *Vicia ervilia* and *Vicia sativa*) throughout 16 firings at temperatures ranging between 180 and 420°C at intervals of 6 or 12 hours and in reducing or oxidising atmospheres. In order to quantify the changes in shape and size, each seed was measured and photographed from two viewpoints (ventral and lateral) before and after carbonisation. Subsequently, the outlines of the images were analysed by means of geometric morphometry yielding biometric and morphological data yielding mathematical coefficients using elliptical Fourier transforms.

The results reveal that cereals are more resistant than pulses to high temperatures, a fact that could evidence the over-representation of cereals in archaeological contexts where the remains are charred. This suggests that pulses played a greater role among agri-food processes and in prehistoric diets, a role not reflected by archaeological contexts due to cereal's lower resistance during carbonisation.

B. ARCHAEOLOGICAL RESEARCH ON FISH EATING IN THE YAYOI PERIOD IN JAPAN

Abstract author(s): Shiroishi, Tetsuya (Yamagata University)

Abstract format: Poster

Washoku (Japanese cuisine) is a dish based on rice and fish. In this presentation, I will report on the cooking culture of rice and fish in the era when rice cultivation, which is the origin of Washoku, began. The era when rice farming culture was introduced to Japan from China is called the Yayoi period (10th century BC-3rd century AD). It is the same period as the so-called Neolithic period. During the Yayoi period, Japan changed from a hunter-gatherer society to a food-producing society. Here, we report how rice and fish from the Yayoi period were cooked and eaten. As the analysis method, various methods such as experimental archaeological method, trace of use of pottery, and analysis of earthenware lipid are used. Specifically, the cooking method is estimated from the traces of use of pottery. We also analyze what we were eating from the residual lipids in the pottery. In addition, the results of cooking experiments using the actually restored pottery are shown.

C. DENTAL MACROWEAR VARIATIONS IN CHALCOLITHIC AND BRONZE AGE POPULATIONS FROM NORTH-EASTERN ROMANIA

Abstract author(s): Petraru, Ozana-Maria (“Alexandru Ioan Cuza” University of Iași, Faculty of Biology; Romanian Academy Iași Branch, “Olga Necrasov” Center of Anthropological Research) - Groza, Vasilica-Monica - Popovici, Mariana (Romanian Academy Iași Branch, “Olga Necrasov” Center of Anthropological Research) - Bejenaru, Luminița (“Alexandru Ioan Cuza” University of Iași, Faculty of Biology; Romanian Academy Iași Branch, “Olga Necrasov” Center of Anthropological Research)

Abstract format: Poster

Dental macrowear is the non-pathological loss of hard tissues on the occlusal surface of the teeth. In archaeological contexts, the loss of tooth tissues is often correlated with lifestyles, habits, and with the physical properties of the consumed food - including preparation techniques. This study concerns the dental material (M2 second molar tooth) discovered in Chalcolithic and Bronze Age archaeological sites from North-Eastern Romania. The methodology includes semiquantitative scoring system, quantitative assessment on dentine exposure, image analysis, and multiple regression analysis. The results show an increase of dentine exposure percent (PDE) with age-ranges, but no evidence of wear variation by sex. In the linear regression analysis, the age, and the dentine exposure percent, as variables, were correlated in 20% of cases ($p < 0.0001$). Furthermore, the multiple regression analysis revealed no differences in dental wear between Chalcolithic and Bronze Age periods, as well as between the Bronze Age cultures (i.e., Monteoru Culture and Noua Culture), when dental exposure (DE, mm²) and other variables (e.g., age, occlusal area - OA, mm², and period) may influence the dental wear.

Therefore, apart from age, occlusal area, and period, there may be other factors including an abrasive diet, poorly food-processing techniques, that could be also considered when discussing the loss of tooth tissues in archaeological populations, especially of farmers.

This work was supported by a research grant made with financial support from the Recurring Donor Fund, available to the Romanian Academy and managed by the “PATRIMONIUL” Foundation GAR-UM-2019-II-2.1-16.

ENAMEL HYPOPLASIA AS MARKER OF NUTRITIONAL STATUS IN A LATE BRONZE AGE SAMPLE OF HUMAN REMAINS FROM TRUȘEȘTI (ROMANIA)

Abstract author(s): Groza, Vasilica-Monica - Popovici, Mariana (Romanian Academy - Iași Branch, “Olga Necrasov” Center of Anthropological Research) - Petraru, Ozana-Maria (Romanian Academy - Iași Branch, “Olga Necrasov” Center of Anthropological Research; “Alexandru Ioan Cuza” University of Iași, Faculty of Biology) - Bejenaru, Luminița (Romanian Academy - Iași Branch, “Olga Necrasov” Center of Anthropological Research; “Alexandru Ioan Cuza” University of Iași, Faculty of Biology)

Abstract format: Poster

In this study, the authors present three cases of enamel hypoplasia, identified in a sample of human skeletons dating from Late Bronze Age (Noua Culture, 1300-1100 BC), discovered in Trușești (Botoșani County, Romania).

Enamel hypoplasia is a developmental anomaly caused by perturbations of amelogenesis, representing a nonspecific indicator of health or/and nutritional status in human populations; it is a response of the human body to physiological stress. Enamel defects have been widely used by anthropologists for the investigation of growth disruptions in the past populations, as they are indicators of disturbances during child’s developmental period.

In this study, the enamel hypoplasia was identified in one female subject (40-45 years old) and two males subjects (30-35 years old and respectively 60-65 years old); it is evaluated by stereomicroscopy and radiology. The teeth were analyzed by a Carl Zeiss Stemi 2000-C stereomicroscope with a Canon Power Shot SX70 HS attached. The identified enamel hypoplasia is of linear transversal type, on incisive, canine and premolar teeth.

This work was supported by a research grant made with financial support from the Recurring Donor Fund, available to the Romanian Academy and managed by the “PATRIMONIUL” Foundation GAR-UM-2019-II-2.1-16.

360 ROCK ART TECHNOLOGY: THEORETICAL AND METHODOLOGICAL APPROACHES. PART 1

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Santos da Rosa, Neemias (University of Barcelona) - Zotkina, Lydia (Institute of Archaeology and Ethnography of Siberian Branch of Russian Academy of Sciences)

Format: Regular session

Rock art can be understood as a communication system that, through the representation of images, allows the transmission of specific information to observers who know the norms of the graphic code. Examples of this prehistoric cultural manifestation can be found throughout Europe, both in the depths of Paleolithic caves, as in the Franco-Cantabrian region, and open-air sites, such as those found in the Alps region or in Scandinavia. Since the beginning of rock art studies, in the late 19th century, technology has remained a marginal issue, often being considered as an element linked to the mere description of figures and not precisely as a research problem. Faced with this reality, in this session we intend to discuss technical and economic aspects of technological processes that led to the materialization of rock art, in order to contribute on the construction of consistent theoretical and methodological frameworks applicable to the study of different types of prehistoric visual representations around the world. Since rock

art production is usually oriented towards the elaboration of tools, paint, and images -according to norms deeply related to specific social and symbolic contexts- we intend to present case studies related to all stages of the technological process, from raw materials procurement strategies to the selection of the bedrock and the manufacture, use and discard/abandonment of the elements involved in the various stages of each chaîne opératoire. Thus, submissions will be welcome on a variety of topics, including: archaeometric studies on the provenance and composition of pigments; experimental and/or traceological approaches on the technical procedures of rock art production; discussions on the relevance of landscape in the rock art chaîne opératoire; and ethnographic perspectives on the symbolic aspects of the rock art technology.

ABSTRACTS:

1 THE TECHNOLOGY OF THE NON-FIGURATIVE RED PAINTINGS FROM EL CASTILLO CAVE, SPAIN: INVASIVE AND NON-INVASIVE ANALYSIS

Abstract author(s): Dayet, Laure (Travaux et Recherches Archéologiques sur les Cultures, les Espaces et les Sociétés, UMR5608 CNRS-Université Toulouse Jean Jaurès) - d’Errico, Francesco (PACEA, Préhistoire, Paléoenvironnement, Patrimoine, UMR 5199 CNRS-Université de Bordeaux; Department of Archaeology, History, Cultural Studies and Religion, University of Bergen) - García Díez, Marcos (Department of Prehistory, Ancient History and Archaeology, Complutense University of Madrid) - Pitarch Martí, Africa (PACEA, Préhistoire, Paléoenvironnement, Patrimoine, UMR 5199 CNRS-Université de Bordeaux; Seminari d’Estudis i Recerques Prehistòriques - SERP, Departament d’Història i Arqueologia, Universitat de Barcelona) - Zilhão, João (Seminari d’Estudis i Recerques Prehistòriques - SERP, Departament d’Història i Arqueologia, Universitat de Barcelona; Institució Catalana de Recerca i Estudis Avançats - ICREA)

Abstract format: Oral

With the expansion of archaeometric studies and in situ non-invasive analytical methods, a renewal of technological studies is being observed in rock art. However, in European cave art, the study of paint technology is hampered by conservation regulations. Furthermore, in situ analyses have several limitations that have already been discussed in detail in the literature. The technology of non-figurative red paintings in European cave art thus remains poorly investigated in comparison with other Paleolithic depictions such as black animal representations. Some of the red disks and hand stencils from El Castillo Cave are among the earliest known cave paintings. They constitute a major cultural heritage from the Palaeolithic and are inscribed on the UNESCO World Heritage List. Here, we combined non-invasive and minimally invasive methods to study the composition and the technological features of the red non-figurative paintings of El Castillo. We carried out microscopic, elemental (SEM-EDS) and mineralogical (XRD, Raman spectrometry) analysis of a few micro-samples along with in situ microscopic and elemental (XRF) analysis of a wide range of red paintings. We compared the results obtained with observations derived from experimental replication for methodological and technological inferences. Non-invasive XRF analyses provide minimal information despite the application of several signal processing methods. Fe-based pigments are identified. Fe content is sometimes correlated with As and Mn contents. The analysis of the micro-samples suggest that Mn likely comes from secondary recrystallizations or repaints. SEM-EDS results show that at least two paint recipes were prepared. This difference could relate with ergonomic constraints and suggest that the red disks correspond to an accumulation through time of panels made by different persons who shared neither the same technical know-how nor, very possibly, the same symbolic system.

2 A MULTI-TECHNICAL ANALYTICAL APPROACH FOR THE STUDY OF LEVANTINE AND SCHEMATIC PAINTINGS AT EL CARCHE ROCK ART SITE (JALANCE, SPAIN)

Abstract author(s): Chieli, Annalisa (Fundació Bosh i Gimpera/Universitat de Barcelona//LArCHer, Department of History and Archaeology) - Domingo, Inés (ICREA, Universitat de Barcelona, SERP, Department of History and Archaeology) - Vendrell, Marius - Giráldez, Pilar (Patrimoni 2.0 Consultors)

Abstract format: Oral

In this presentation, we assess the results of the multi-technical non-destructive analysis of several Levantine and Schematic paintings from el Carche rock shelter (Jalance, Spain). Optical Microscopy, Scanning Electron Microscopy coupled with Energy Dispersive X-Ray Spectroscopy (SEM-EDS), Raman Spectroscopy and Fourier Transform Infrared Spectroscopy (FTIR) have been combined to identify the pigments, the pictorial techniques and recipes characterizing the paintings of both Levantine and Schematic motifs sharing this site. Our aim was to identify similarities and differences both between and within each artistic tradition. The analyses conducted on the micro samples both as free fragments and as embedded cross-sections have provided evidence of different paint recipes characterized by the use of diverse raw material. Moreover, the microstratigraphic investigation highlighted the presence of diverse degradation products and external crusts related to rock alteration processes, that also occur and co-exist within the pictorial layer. The current research demonstrates the importance of using several and complementary analytical techniques when investigating highly complex and heterogeneous samples, such as those taken from rock art paintings where, apart from the pictorial layer, other components are usually contained, including the bedrock, biological patinas, alteration products, and crusts. This research has been conducted as part of the ERC CoG LArCHer project (grant agreement No 819404).

3 RED OCHRE OR SOMETHING ELSE? GEOCHEMICAL TESTS ON FINNISH ROCK ART PAINTS

Abstract author(s): Kailamaki, Uine - Holmqvist-Sipilä, Elisabeth (University of Helsinki) - Vajanto, Krista (Nanotechnology Center of Aalto University) - Lahelma, Antti (University of Helsinki)

Abstract format: Oral

Finnish rock paintings can be seen as a part of a larger northern hunter-gatherer rock art tradition. The red paintings depict stylized animals, humans, boats and geometric patterns painted on steep rock surfaces near ancient waterways. They have been preserved by naturally accumulating silica glazes, and based on shore displacement chronology they are typically associated with Subneolithic northeast European Pit-Comb Ware cultures.

In this pioneering pilot study we examined pigment-containing and plain reference samples from two rock art sites in Finland with energy dispersive X-ray fluorescence spectrometer (EDXRF) and scanning electron microscopy coupled with energy dispersive spectroscopy (SEM-EDS). Even though the paintings are commonly designated as 'red ochre rock paintings', actual studies of pigment composition have been few and far between. The presence of some kind of binders is suggested by thickness of paint, but little is known of their nature, and even the prevalence of ochre in the paint remains more an assumption than a demonstrated fact. Our goal was to test feasibility of chemical fingerprinting of these paints with EDXRF spectroscopy, and to gain further insight into their composition with SEM-EDS.

Our results highlight a difference in composition between the red paints used in our two test sites. The painting of Syrjäsalmi in south-eastern Finland is enriched in iron in comparison to the bare bedrock, thus tentatively confirming the red ochre hypothesis in this case. However, the strikingly red paint of the Värrikallio site in north-eastern Finland shows almost no trace of iron in either EDXRF or SEM-EDS results, and in comparison to background bedrock samples it seems to be enriched in potassium and rubidium instead. This suggests that in some cases the red colour may have been achieved without the use of ferric earth pigments, and other reds such as organic dyes may have been used instead.

4 ANOTHER RAW MATERIALS IN RECEIPT OF OCHRE ON ROCK PAINTINGS OF EASTERN PAMIR?

Abstract author(s): Solodeynikov, Alexey (Museum-reserve "Shulgan-Tash cave") - Zotkina, Lydia (Institute of Archaeology and Ethnography SB RAS) - Abolonkova, Irina ("Tomskaya Pisanitsa" Museum-Reserve)

Abstract format: Oral

Working with painted rock art images from Kurteke site, situated in East Pamir, we found, that some results of the Pigment Maps analysis of some images do not answer to our expectations. The Pigment Map analysis is a digital method of revealing of faded images, based on increasing contrast in a very thin area of color data of the image [Solodeynikov, 2005]. When working with Lab system we usually have commensurable signals in different color channels of the color space. For some pictures, from Kurtike we have different situation: signal in b channel is inverted relatively to the signal in a channel. Signals, which are correlated in color channels of the Lab color space, we usually consider to be evidences of quantity disparity between iron oxides and iron hydroxides. But results of our expertise with images such as in Kurteke rock art site make us suppose presence of a large amount of manganese oxides in the pigment as long as we have strong bluish component, while iron hydroxides have yellowish coloration. That would mean that we probably have the paint, which was prepared from another raw materials, than usual ochre. We began series of experiments and analysis in order to proof or to refute this. If our assumption of correlation between chemical composition and results of the Pigment Map analysis is true, then the Pigment Map analysis became an instrument useful not only in revealing faded rock art images, but it can be used for some basic components analysis also. It is important considering that Pigment Map analysis is non-destructive method of research, which doesn't need any expansive special equipment.

Solodeynikov A. 2005. Research on the Recordings of rock paintings in the Kapova cave (Ural). // INORA 43,10-14.

This work is supported by Russian Foundation for basic research, 20-09-00387.

5 TOOLS, PIGMENTS AND BINDERS: AN EXPERIMENTAL APPROACH TO LEVANTINE ROCK ART TECHNOLOGY

Abstract author(s): Santos da Rosa, Neemias (University of Barcelona) - Fiore, Danae (Consejo Nacional de Investigaciones Científicas y Técnicas - CONICET; University of Buenos Aires) - Viñas, Ramon (Institut Català de Paleoecologia Humana i Evolució Social - IPHES)

Abstract format: Oral

Identified in more than a thousand open-air shelters in eastern Spain, the Levantine rock art is a singular cultural manifestation of European prehistory. Since its discovery, several proposals have been elaborated on the technological process that underlies the creation of the images. However, most of them are based on theoretical criteria and on inductive reasoning, which so far had not been rigorously tested. In this context, we have surveyed all these proposals and considered them as hypotheses, which have been tested by means of an experimental archaeology protocol related to the production and use of tools and paints and the creation of images with technical characteristics similar to those of the Levantine representations. During these systematic experiments, we analyzed the efficiency of 112 pictorial recipes made through the combination of 6 pigments and 11 of binders, and 63 paint application tools produced with different types of feathers, hairs, and plants. Besides, we reproduced full-scale replicas of some archaeo-

logical models to understand the technical and economic aspects involved in the production of the images. This paper presents the results of our experimental research and a series of empirically-based inferences about Levantine rock art technology.

6 MICROPHOTOGRAMMETRY APPLICATION TO THE TECHNO-TRACEOLOGICAL STUDY OF ENGRAVINGS. THE CASE OF ATXURRA CAVE (NORTHERN SPAIN)

Abstract author(s): García Bustos, Paula - Rivero Vilá, Olivia (Universidad de Salamanca) - Ríos-Garaizar, Joseba (Centro Nacional de Investigación en Evolución Humana) - Intxaurbe, Iñaki (Universidad del País Vasco) - García Bustos, Miguel (Universidad de Salamanca) - Garate Maidagan, Diego (Universidad de Cantabria)

Abstract format: Oral

Traceological studies in Palaeolithic rock art have focused all their efforts on recognizing the gestures and technology involved in making the artistic motifs. Currently, with the progress of new technologies, it is possible to encode the data obtained through digital photography in three dimensions, analyzing them with greater ease and scientific rigor.

The purpose of this research is to recognize the types of sections of the Upper Magdalenian parietal engravings of the "Ledge of the Horses" in Atxurra Cave, and correlate this data with the lithic tools located in. To do this, we have developed an experimental program, microscopic analysis and the application of the macrophotogrammetric technique, replicating the information in 3D to identify morphological and metric parameters of engravings. The statistical analysis of the results obtained allows associating the characteristics recognized in the incisions with the tools that were discovered in the excavations at the foot of the panel where the engraved animals are.

7 INSTRUMENTS AND WEAPONS OF THE TAGAR CULTURE AS TOOLS FOR PICKETAGE: USE-WEAR ANALYSIS

Abstract author(s): Davydov, Roman (Laboratory of Paleotechnologies, Institute for the Humanities, Novosibirsk State University)

Abstract format: Oral

The Tagar archaeological culture (Southern Siberia, 7-3 centuries BC) is characterized by rock arts made using the pecking technique. One of the areas of research of rock art is technological-traceological study, in particular, the identification of tools. For the Tagar archaeological culture such tools could be not only stone, but also metal.

In the collection of the Minusinsk Museum, bronze tools and some weapons of the Tagar culture were examined. They have traces of use and a shape suitable for pecking. Based on the published data on the Tagar metal composition and technology of casting, 11 replicas of copper and bronze tools were cast: points, hastate chisels, chisels, sagarises, hammers. They were processed with stone and bronze metalworking tools typical for the Bronze Age and the Early Iron Age.

Together with Ph.D. Zotkina L.V. a series of experiments was carried out, which consisted of working with tools on a rock of reddish Devonian sandstone in the techniques of direct and indirect pecking (a total of 36 cycles, including updating the working surfaces).

Traces of wear were obtained on experimental tools. These are flattening with a stone micro-relief on the points and blades, accompanied by metal protrusions along the edges. With indirect picketing, the striking platform is flattened. There are traces of impact stone or metal tools and delamination due to work-hardening. Patterns between blade tilt, deformation of the striking platform and the angle relative to the rock were revealed. The features of wear for each type of metal were captured.

Comparison of the traces made it possible to record the wear from the making of petroglyphs on some pointed universal tools in the form of bronze rods. Such marks are present on some hastate chisels. On sagarises and chisels, wear is of a different origin.

8 THE ROCK ART PRODUCTION IN THE ROMANELLI CAVE (SOUTHERN ITALY)

Abstract author(s): Sigari, Dario (Dipartimento di Studi Umanistici, Sezione Scienze Preistoriche e Antropologiche, Università degli Studi di Ferrara; Geosciences Center, Coimbra University) - Ranaldo, Filomena (Museo della Preistoria di Nardò; Dipartimento di Scienze Fisiche, della Terra e dell'Ambiente, U.R. Preistoria e Antropologia, Università degli Studi di Siena) - Mazzini, Ilaria (IGAG-CNR, Monterotondo - RM) - Forti, Luca (Dipartimento di Scienze della Terra "Ardito Desio", Università degli Studi di Milano; IGG-CNR) - Bona, Fabio (Dipartimento di Scienze della Terra "Ardito Desio", Università degli Studi di Milano) - Mecozzi, Beniamino (Dipartimento Scienze della Terra, Sapienza Università di Roma; Laboratorio PaleoFactory, Dipartimento Scienze della Terra, Sapienza Università di Roma) - Lembo, Giuseppe (Associazione Culturale Archeoldea, Campobasso) - Muttillio, Brunella (Dipartimento di Studi Umanistici, Sezione Scienze Preistoriche e Antropologiche, Università degli Studi di Ferrara; Associazione Culturale Archeoldea, Campobasso) - Sardella, Raffaele (Dipartimento Scienze della Terra, Sapienza Università di Roma)

Abstract format: Oral

During the latest research activities in the Romanelli Cave -a site studied since the beginning of XX Century- in the Salentine Peninsula (southern Italy), 27 new Graphical Units were recorded. Such a record has led to new significant results on the Palaeolithic rock art heritage of this site. The walls and ceiling of the cave had been decorated over a long period of time, during which the morphology of the cave had changed as well. Rock art techniques changed according to the changes of the support properties, showing the artists' skills in choosing different tools depending on the natural features of the rock surface. In the moonmilk, we identified digital flutings, while on other rock surfaces large and thin grooves were possibly produced by different tools or by the same tool used in

different ways. Moreover, the ongoing excavation just below the decorated panels has already brought to light the lithic tools probably used to engrave the cave walls.

In this work we investigate the 'chaîne opératoire' (operational/operating chain) of the Romanelli Cave rock art and its relationship with the inner cave-scape: using an experimental approach to evaluate the connection between the characteristics of the different kind of grooves and the use wear on lithic tools, and considering the properties of both the supports and the tools. In other words, through the analysis of the engraved grooves we move towards an integrated analysis of the cave paleoenvironmental changes and the human interaction with it at the end of the Pleistocene.

9 ENGRAVINGS, ROCKS AND USE-WEAR ANALYSIS: AN EXPERIMENTAL APPROACH

Abstract author(s): López-Tascón, Cristina (Universidad de Oviedo)

Abstract format: Oral

In this communication, I present a study about the experimental reproduction of engravings combined with a use-wear analysis approach. The rock selected for experimentation was Caliza de Montaña, rock present in the walls of most Paleolithic art sites situated spread along the Nalón river (central area of Asturias, North of Spain). Experimentation has allowed checking the hardness of rock, some techniques to reproduce the engravings, the sections produced, and different tools flint employed to engrave. Also, this study presents a use-wear approach to analyse experimental tools used in the reproduction of parietal limestone engravings. The main objective of this study consists of checking if these lithics tools present use-wear traces and if it is possible to characterise and define them.

This study provides a new vision of the tools found in sites with parietal art that must be combined with the traditional interpretations focused on typological and stylistic approaches, and on the analysis of formal aspects and motifs engraved. The method developed helps better understand the relationship between engraved walls and human occupation of caves, rock shelters and open-air sites with parietal art.

10 PIGMENT APPLICATION TECHNIQUES IN PRE-MAGDALENIAN PORTABLE ART FROM PARPALLÓ CAVE, GANDÍA, SPAIN

Abstract author(s): Rosso, Daniela (Departamento de Prehistoria, Arqueología e Historia Antigua, Grupo de Investigación Prehistoria del Mediterráneo Occidental - PREMEDOC, University of Valencia; CNRS - CEPAM UMR 7264, Université Côte d'Azur) - Cantó, Ana (Departamento de Prehistoria, Arqueología e Historia Antigua, Grupo de Investigación Prehistoria del Mediterráneo Occidental - PREMEDOC, University of Valencia) - Roldán García, Clodoaldo - Murcia Mascarós, Sonia (Institute of Material Science - ICMUV, University of Valencia) - Villaverde Bonilla, Valentín (Departamento de Prehistoria, Arqueología e Historia Antigua, Grupo de Investigación Prehistoria del Mediterráneo Occidental - PREMEDOC, University of Valencia)

Abstract format: Oral

Parpalló Cave yielded one of the most important collections of Palaeolithic portable art, consisting of 5612 limestone plaquettes painted and/or engraved with animal figures and non-figurative signs. The plaquettes were recovered throughout the entire sequence, covering a period of 15.000 years, from the Gravettian to the Magdalenian (26.000–11.000 years BP), thus providing a unique opportunity to study the evolution through time of mobiliary art production. In the past few years, portable art from Parpalló Cave has been the object of numerous studies that mainly focused on stylistic or thematic aspects and pigment characterisation. However, little is known about the technological processes involved in their manufacture. Our aim here is to study the techniques used to produce painted figurative motifs (n=81), most of which were found in pre-Magdalenian levels at Parpalló Cave. By contrasting archaeological evidence and experimental data, this study will shed new light on the complexity of painted mobiliary art production at Parpalló Cave, particularly during the pre-Magdalenian period. In the future, this will allow us to compare pigment application techniques used in mobiliary and parietal art during this key period for the development of Palaeolithic art.

11 MANUFACTURING PAINTED PORTABLE ART: AN EXPERIMENTAL APPROACH

Abstract author(s): Cantó, Ana (Dpto. de Prehistòria, Arqueologia i Història Antiga, Universitat de València. PREMEDOC) - Rosso, Daniela Eugenia (Dpto. de Prehistòria, Arqueologia i Història Antiga, Universitat de València. PREMEDOC; CNRS - CEPAM UMR 7264, Université Côte d'Azur) - Roldán García, Clodoaldo - Murcia Mascarós, Sonia (Institute of Material Science - ICMUV, University of Valencia) - Villaverde, Valentín (Dpto. de Prehistòria, Arqueologia i Història Antiga, Universitat de València. PREMEDOC)

Abstract format: Oral

In recent years, experimental approaches to the analysis of Palaeolithic art have been widely developed in the literature. However, few studies focus on pigment application techniques used for the manufacture of painted portable art. Evidence recovered in the Upper Palaeolithic levels of Parpalló Cave, Gandía, Spain, shows that painted plaquettes were produced using a variety of techniques that were never studied in detail. Here we present results obtained during our first experimental sessions. We used different techniques to apply ochre-rich compounds on experimental limestone plaquettes recovered in the surroundings of the cave, focusing on three main phases of the painted plaquette chaîne opératoire: (1) the preparation of the support before the application of pigment, (2) the production of pigment compounds of different densities and textures and (3) the application of pigment compound using a variety of techniques and tools. By using this experimental approach, we will we hope to be able to better understand the complexity and variety of technological processes involved in the creation of painted portable art.

361 ROCK ART TECHNOLOGY: THEORETICAL AND METHODOLOGICAL APPROACHES. PART 2

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Santos da Rosa, Neemias (University of Barcelona) - Zotkina, Lidia (Institute of Archaeology and Ethnography of Siberian Branch of Russian Academy of Sciences)

Format: Regular session

Rock art can be understood as a communication system that, through the representation of images, allows the transmission of specific information to observers who know the norms of the graphic code. Examples of this prehistoric cultural manifestation can be found throughout Europe, both in the depths of Paleolithic caves, as in the Franco-Cantabrian region, and open-air sites, such as those found in the Alps region or in Scandinavia. Since the beginning of rock art studies, in the late 19th century, technology has remained a marginal issue, often being considered as an element linked to the mere description of figures and not precisely as a research problem. Faced with this reality, in this session we intend to discuss technical and economic aspects of technological processes that led to the materialization of rock art, in order to contribute on the construction of consistent theoretical and methodological frameworks applicable to the study of different types of prehistoric visual representations around the world. Since rock art production is usually oriented towards the elaboration of tools, paint, and images –according to norms deeply related to specific social and symbolic contexts– we intend to present case studies related to all stages of the technological process, from raw materials procurement strategies to the selection of the bedrock and the manufacture, use and discard/abandonment of the elements involved in the various stages of each chaîne opératoire. Thus, submissions will be welcome on a variety of topics, including: archaeometric studies on the provenance and composition of pigments; experimental and/or traceological approaches on the technical procedures of rock art production; discussions on the relevance of landscape in the rock art chaîne opératoire; and ethnographic perspectives on the symbolic aspects of the rock art technology.

ABSTRACTS:

1 SCRATCHING THE SURFACE OF SCOTLAND'S ROCK ART: A HOLISTIC, MULTISCALAR ANALYSIS OF LOCATION AND DESIGN THROUGH LOCAL CASE STUDIES

Abstract author(s): Bjerketvedt, Linda - Valdez-Tullett, Joana - Barnett, Tertina (Historic Environment Scotland) - Jeffrey, Stuart (School of Simulation and Visualisation, Glasgow School of Art) - Robin, Guillaume (School of History, Classics and Archaeology, University of Edinburgh)

Abstract format: Oral

The term Atlantic Rock Art (ARA) refers to a widespread open-air rock carving tradition located along the Atlantic seaboard (Bradley 1997; Valdez-Tullett 2019). Broadly dated to the Neolithic and Early Bronze Age, in Scotland these carvings tend to be abstract and geometric, usually taking on circular shapes in the form of cupmarks and concentric rings (known as cup-and-ring motifs), as well as other circular variations. They occur on boulders and outcrops across the country – albeit unevenly distributed – usually on rock surfaces that are flush with the ground or gently sloping. Although this carving tradition is quite homogenous, previous research, based on a detailed analysis of ARA's chaîne opératoire, has shown that there are regional variations in terms of the motifs, their relationship with the rock surfaces, the selected rocks and even landscape locations (Valdez-Tullett 2019). In the course of Scotland's Rock Art Project we have surveyed large areas of the country and have confirmed the occurrence of these local preferences.

This paper will explore ARA's regional variations in Scotland further, focusing on its chaîne opératoire and the reasons that may underpin these patterns of rock art production. We will discuss our multiscalar approach to looking at the motifs, the boulders and outcrops and landscape features, and how these may have impacted decision-making. In our approach we studied a number of cultural and natural variables, from the small details of motifs and carving techniques, to the rock's microtopography and landscape analysis (e.g. viewshed and mobility patterns, relationship with other sites, geology). We applied this approach to five case-studies across Scotland in order to sample the regional variations. This analytical approach provided a better comprehension of the similarities and differences within Scottish rock art, which enabled us to characterise the decision-making underpinning the placement of these carvings within the landscape.

2 ACOUSTICS AND THE CHAÎNE OPÉRAIRE OF ROCK ART PRODUCTION: LEVANTINE ROCK ART AS A CASE STUDY

Abstract author(s): Díaz-Andreu, Margarita (ICREA; Universitat de Barcelona) - Santos da Rosa, Neemias - López-Mochales, Samantha (Universitat de Barcelona)

Abstract format: Oral

The selection of a location in which to paint or carve is a fundamental step in the chaîne opératoire related to the production of rock art. It has been argued that in many cases the geological and topographical features of shelters played a crucial role in the decision of prehistoric artists regarding where to place their visual representations. In this paper we assess whether other factors whose evidence cannot be detected by traditional archaeological methods may also have influenced such a decision. We present the results of the archaeoacoustics fieldwork undertaken at 31 Levantine rock art sites located in Catalonia (Spain) in the framework of the ERC Artsoundscapes Project (www.ub.edu/artsoundscapes). Using the Impulse Response (IR) methodology, a series of monaural and

binaural acoustic parameters were measured. The results have allowed us to examine the possible relationship between specific rock art motifs and particular sonic environments. The statistical analysis of the data indicates that archer figures were painted in shelters with higher Strength (G) values. We discuss how to interpret that shelters where a greater sensorial impact of sound was experienced were chosen to paint masculine figures. Finally, we reflect on what the possible creation of masculine soundscapes may tell us about the chaîne opératoire in Levantine rock art production.

3 FINGER FLUTINGS IN KAPOVA CAVE

Abstract author(s): Solodeynikov, Alexey (Museum-reserve “Shulgan-Tash cave”)

Abstract format: Oral

Kapova cave is situated in South Ural, on the border between Asia and Europe. In 2019 we discovered there some images made with fingers on soft substratum: mondmilch, derated limestone, or some clay deposits. The finger-made images in other caves in France can be figurative, representing some animals, geometrical signs or human’s depictions or they can be just lines, made with obviously non-artistic purpose. Those in Kapova in most cases seem to be representations of animals: horses, aurochs, mammoths, deer. The images in Kapova are made using intricate relief of the rock, which in addition with very thin traces makes them very hard to observe and to document. The finger flutings appear to be the most complicated subject to investigate, as long as there are no contact methods of documenting could be applied. In this report we are going to share our two seasons’ experience in investigating of, probably, the most difficult subject in rock art studies.

4 ABRI DU POISSON: SALMON’S LIFE

Abstract author(s): Zotkina, Lydia (Institute of Archaeology and Ethnography of SB RAS; ArchaeoZOOlogy in Siberia and Central Asia - ZooSCAN”, CNRS – IAET SB RAS International Research Laboratory, IRL2013) - Cretin, Catherine (National Museum of Prehistory - MNP, Les Eyzies de Tayac) - Maury, Serge (-)

Abstract format: Oral

Everyone knows one of the greatest prehistoric art masterpieces in Franco-Cantabrian region the famous fish from abri du Poisson. It is a bit more than 1 m long quite realistic bas-relief representation of male salmon in spawning period. The story of attempt to steal the depiction is well known too.

But what do we know about salmon’s creation and its “life” during thousands of years?

First of all to reconstruct the whole story we must understand the processes that have taken place in the rock shelter. During the excavations in the beginning of the XXth century two archaeological layers (Aurignacien and Gravettian) were discovered on the site. Later in 2018 this data was confirmed by stratigraphy cleaning. That means that most probably the bas-relief was created in one of those periods.

Even if the salmon depiction is the most famous there are other figurative and non-figurative expressions on the site. If we take a look on the vault we can see numerous degraded lines and even sometimes representing partly preserved figures. One of them is still visible under the salmon. Other interesting elements are perforated rings (anneaux percés) which are numerous on the vault and which are represented on the salmon figure as well.

In this paper we are trying to take into account all of these elements and to find convincing arguments to reconstruct the “life-story” of the fish depiction and of other imagery on the site.

5 UNRAVELING SOCIAL INVESTMENT AND COST PRODUCTION IN PALAEOLITHIC ROCK ART

Abstract author(s): Garate, Diego (Universidad de Cantabria) - Rivero, Olivia (Universidad de Salamanca) - Arriolabengoa, Martn (Universidad del País Vasco) - Medina-Alcaide, María (Universidad de Córdoba) - Intxaurbe, Iñaki (Universidad del País Vasco)

Abstract format: Oral

Parietal graphic representations are perhaps the most astounding of all the creations of hunter-gatherer groups during the Upper Palaeolithic. From the point of view of scientific research, the archaeological study of this graphic activity potentially goes beyond artistic creation in itself. The anthropisation of caves with graphic representations undoubtedly goes further than the production of the parietal depictions and encompasses many other kinds of actions, both voluntary and fortuitous, such as the thermal alteration of endokarst surfaces, impressions of anatomical parts or objects, geomorphological changes to the natural space, the extraction of raw materials and the deposition of different kinds of materials. Each of these actions is materialised in the archaeological remains documented in the sites.

The interdisciplinary study of this evidence of human activity inside the caves provides a great deal of information including, among other aspects: the time when the prehistoric groups entered the cave; the appearance of the anthropised karst setting and how they moved through the cave; the fuel used for lighting, its duration and the power it provided; the sex, age or pathologies of the creators of the depictions; the materials they carried and the use they made of them inside the caves; etc.

This comprehensive perspective of rock art can be assumed through the economic value and degree of complexity derived from the symbolic actions, establishing all the different operative chains that intervened in the artistic creation. In this way, we can reconstruct the material, human and time resources devoted to symbolic activity inside the caves by their authors. Ultimately, this

research attempts to appraise the social importance of these activities, as a determining factor to comprehend the structure and organization of Paleolithic societies.

6 RHYTHM, RELATIONAL TECHNOLOGY, AND HISTORY: EXPLORING ROCK ART PRODUCTION IN NORTH-CENTRAL CHILE

Abstract author(s): Troncoso, Andres (Universidad de Chile) - Moya, Francisca (SERP/Departament d’ Historia i Arqueologia, Universitat de Barcelona) - Armstrong, Felipe (Universidad Alberto Hurtado) - Vergara, Francisco (Universidad Austral de Chile - Puerto Montt)

Abstract format: Oral

Archaeological approaches to rock art technology have proven to be a fruitful analytical framework to understand the processes through which rock art emerges. Although these studies have enriched our interpretations and characterization of rock art, they have focused mainly on the identification and characterization of tools in the case of engravings (Álvarez & Fiore 1995; Bednarik 1998) and pigmentarian matters in rock paintings (Chalmin & Huntley 2018). As a result, these studies have scarcely discussed the engagements between technology, rock art production and socio-historical processes. In fact, worlds inhabited by human beings are always historical and technology is a way of worlding. From such perspective, rock art technology is a particular way of worlding which unfolds particular affective and agentive qualities of images, materials and places. Considering the above, we explore rock art technology from a historical perspective, considering two qualities scarcely explored in these kinds of studies: the rhythmic, and relational nature of the making process. Both qualities allow us to understand the historical character of rock art, its particular affective qualities and how rock art unfolded historical worlds through the process of making. To do so, this paper explores three sets of rock art identified for the Elqui and Limarí Rivers basins in North-Central Chile, produced at different times between the Late Archaic Period characterized by hunter-gatherer contexts (ca. 3000 BCE - 500 CE) and the moment of Inka occupation (ca. 1470-1540 CE). This work is part of the FONDECYT 1200276 research project.

7 SOUND, RITUAL AND ARCHAEOLOGICAL ONTOLOGIES: EXPLORING THE SYMBOLIC DIMENSIONS OF ROCK ART PRODUCTION AND USE IN PREHISTORY

Abstract author(s): Santos da Rosa, Neemias (University of Barcelona) - Jiménez Pasalodos, Raquel (University of Valladolid; University of Barcelona) - Díaz-Andreu, Margarita (Institució Catalana de Recerca i Estudis Avançats - ICREA; University of Barcelona)

Abstract format: Oral

For more than a century, rock art research has been carried out mostly according to image-centred Western ontologies, ignoring the importance of sensorial perception for prehistoric societies. The way of being in the world of those who produced and used rock art was based on a very different logic to that on which scholars are positioned. Most likely, in the relational world of ancient communities, images were not the only relevant element in rock art. The development of ritualistic behaviours during art production could make the technological process of creation as symbolic and meaningful as the representations themselves. Sound is a fundamental component of ritual practices and acoustic effects such as resonance, reverberation and echoes may have been effective means to boost perceptual experiences involving speech, dance, and music as well as silence. In this paper, we propose that archaeoacoustics research is an efficient way to obtain empirical evidence about possible ritual activities related to the creation and consumption of rock art in prehistory. We support such a proposal presenting results of our acoustic fieldworks in rock art landscapes of Mediterranean Spain, Baja California (Mexico), and Siberia (Russia). Based on this data, we advocate for the adoption of relational ontologies that allow us to expand the scope of our interpretations not only of rock art but also of the prehistoric technologies involved in its creation.

8 TECHNOLOGICAL FEATURES IN ROCK ART OF MINUSINSK BASIN (SOUTH SIBERIA): ARE THEY INDICATORS OF STYLISTIC TRADITIONS?

Abstract author(s): Zotkina, Lydia (Institute of Archaeology and Ethnography of SB RAS)

Abstract format: Oral

Minusinsk basin is known as one of the greatest rock art regions in Siberia. Stylistic traditions of different periods from Neolithic to Ethnographic times are represented here. Great amount of imagery have been attributed to different cultures with discovering typical examples of depictions in reliable archaeological context, like Okunev (Early Bronze age), Tagar (scythian period, Early Iron age), Tashtyk (Xiongnu, Iron age) cultures. However, there are many petroglyphs that do not have conventional cultural or even chronological attribution, such as the so-called “earliest”. All the researches accept that this rock art is older than Okunev Early Bronze age imagery which is quite specific. But for the moment the “earliest” petroglyphs are still not dated.

When traceology of petroglyphs first appeared as a new field of study one of the main challenges was identification of using lithic or metal tools in creation of rock art. This could be useful for consequential chronological attribution. And as approach it remains applicable. But in some regions, for example in Minusinsk basin, the increased use of metals and, which is important, of high quality metals is occurred in Scythian period. So it is much later than the “earliest” petroglyphs were performed.

That is one of the reasons why we have to concentrate on other technological features which could be significant to identification of different stylistic traditions.

If in flint knapping chaîne opératoire is one of the most stable phenomena in any material culture. Could the technological sequences in rock art be stable too? And if so could we reveal special features which identify different imagery concepts?

The research is supported by Foundation of the President of RF MK-2273.2020.6.

9 PORTABLE ART AND OBJECT-ORIENTED RELATIONS IN THE CULTURAL LANDSCAPE FROM TECHNOLOGICAL PROSPECTIVE: THE CASE OF KAMYANA MOHYLA

Abstract author(s): Radchenko, Simon (New archaeological school; University degli studi di Torino) - Kiosak, Dmytro (Ca' Foscari University of Venice)

Abstract format: Oral

The cases, when the special cultural contexts emerge out of common environmental setting, are well-known for Late Mesolithic societies of Eastern Europe. Those from the Southern Ukraine living on the banks of Molochna River can be an example. The innovative fishing-oriented Late Mesolithic societies that lived nearby the sandstone mound of Kamyana Mohyla found themselves in a special landscape that affected their being from cultural perspective. Since Kamyana Mohyla is the only rock art site in the region, it is clear that the social processes here have been shaped by special landscape conditions, which formed the basis for cultural landscape appearance. The mound full of caves forced the emergence of beliefs later reflected in the parietal art instances here.

Moreover, the desire to communicate with this cultural landscape forced the population living nearby to interconnect with the special things, namely fish-like shaped churingas (portable art objects). The latter were found both inside Kamyana Mohyla caves and in the Hill's surroundings and are simultaneously part of cultural landscape, the objects of human-landscape interaction and things, that interconnected both with Kamyana Mohyla population and the unique cultural landscape; thus, these objects correspond to the basic ideas of object-oriented ontologies. However, their relationship with the human beings is reflected in the engravings and notches on their surface, their shape, size and location. All of these data is the sources of information concerning the technological aspect of object-oriented relations between ancient artists and portable rock art instances from Kamyana Mohyla. Their complex role caused the dialectic kind of relationship between all the actors — the cultural landscape, humans and things — through these things themselves, and was included in technological contexts. Arguing that such instances should be studied in their existential complexity, we approach their understanding through the advances of contemporary philosophy.

10 STYLE AND IDENTITY IN ROCK ART STUDIES

Abstract author(s): Ponomareva, Irina (Griffith University)

Abstract format: Oral

The paper discussed the relevance of the style concept in uncovering prehistoric ethno-cultural identities. Style in rock art studies was in focus of many debates, and researchers in various national archaeological traditions understood it differently. However, the most common and appropriate definition is that style is a manner of depiction of a subject. Notwithstanding its simple characterization, the interpretation of patterns revealed by stylistic analysis is not an easy task. In this paper, I present a case study on Siberian rock art which demonstrates how stylistic patterns can be explained in terms of negotiating and maintaining ethno-cultural identities. In this approach, rock art is understood as an active agent in structuring people's identities. Rock art sites create and maintain a strong connection between people, their past and their land. This means that rock art does not just reflect group or individual identities, but it helps construct them through powerful emotional attachments. Therefore, style changes may be a reaction to major social shifts or threat to cultural continuity, and in this condition, ethnic identity may emerge or strengthen.

362 MOUNDS AND MONUMENTALITY IN BROADER PERSPECTIVES: DIGITAL AND NON-DIGITAL TECHNIQUES TO EXPLORE PAST BARROW LANDSCAPES

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Carrero-Pazos, Miguel (UCL Institute of Archaeology) - Rodríguez del Cueto, Fernando (University of Oviedo) - Szubski, Michał (Cardinal Stefan Wyszyński University in Warsaw)

Format: Regular session

Building from past EAA annual conferences (Barcelona 2018; Bern 2019; Virtual 2020), we present a follow-on session that aims to focus on the archaeological study of one of the most common archaeological remains in Europe, such as the barrow monuments are.

More than 30,000 mounds are still preserved across this territory, remnants of a much higher number which existed in the past. The mounds are, therefore, "ubiquitous" in the world, and this has led to common archaeological problems in the research of barrow landscapes. This session aims to share both historical and methodological problems jointly with solutions provided by digital and non-digital methods, and without any chronological restriction, from prehistoric to modern times. The main goal is to gather specialists from different periods and regions to discuss, through a variety of case studies and methods, the analysis of past barrow landscapes.

The session will accept proposals on the following topics:

- Data acquisition: proposals involving digital and non-digital techniques will show how to get accurate information as a basis for the development of good research practices. Approaches about the automatic detection of mounds will be

very welcome.

- Analysis and Interpretation: proposals involving traditional landscape archaeology and computationally focused research, with presentations on how geospatial techniques are fundamental to get new knowledge from those past social landscapes.

ABSTRACTS:

1 XIX-TH C. MAPS AND TOPOGRAPHIC DOCUMENTATION AS THE SOURCE OF EVIDENCE OF THE DESTROYED BURIAL MOUNDS (SUZDAL OPOLIE)

Abstract author(s): Erokhin, Sergey (Institute of Archaeology, Russian Academy of Sciences) - Krasnikova, Anna (State Historical Museum) - Makarov, Nikolai - Ugulava, Nani - Milovanov, Sergey (Institute of Archaeology, Russian Academy of Sciences)

Abstract format: Oral

The common modern methods of determining the burial mounds' location include predictive modeling and analysis of satellite images, which are sometimes not effective enough in the rural regions of Europe, where intensive centuries-old plowing totally leveled burial mounds. Potential of the XIX-th c. maps, including those, drawn for the archaeological field reports, in the context of present-day search for the burial sites is often underestimated.

More than 7700 mounds were excavated in 1851-1852 in the central region of Northern-Eastern Rus'. Field investigations were accompanied by instrumental topographic survey. 73 known maps can be divided in two groups in accordance with their scale and methods of creation:

- maps of individual necropolis (scales 1:840 or 1:1680) and the location of the groups with reference to other objects (scales 1:21000 or 1:42000) as a result of instrumental or semi-instrumental survey
- general maps, which present the location of burial sites on small scale maps of the region (scales 1:84000, 1:168000, 1:420000).

The location of known sites enables to estimate the potential and pitfalls of this source of information. The crucial aspects are documentation integrity, survival of reference objects in the survey area and maps inconsistency (in generalization from large to small scale). Georeferencing of maps, not affected by the last two problems, indicates that the positioning error is about 100 m for large scale map (Gnezdilovo, 1:21000) and about 200-300 m for small scale (Shekshovo, 1:84000). The geophysical scheme of Gnezdilovo burial mounds matches large scale (1:840) map, revealing its semi-instrumental nature and allowing to evaluate its credibility. Thus, there are cases when the analysis of the XIX-th century topographical documentation can make significant contribution to the search for the invisible mound sites and corresponding cartographic materials are worth georeferencing.

The work was supported by Russian Scientific Foundation grant №19-18-00538.

2 REDISCOVERED MOUNDS IN NORTHERN JUTLAND, DENMARK - A CARTOGRAPHICAL SURVEY

Abstract author(s): Haue, Niels (Historical Museum of Northern Jutland)

Abstract format: Oral

In 1873 the chief curator of the National Museum J.J.A. Worsaae launched a systematic survey of prehistoric monuments in Denmark. This survey was only brought to an end in 1930 where all the ancient monuments in the country were considered recorded. The surveys included all ancient monuments and sites still visible as well as locations of lost monuments still known in local communities. In 1937 a new law for the protection of ancient monuments was approved. The key issue in this law was that all visible monuments now were protected by the law. Whether a monument was visible or not should be determined by the National Museum. In order to do so, all the monuments recorded in heritage archive had to be looked upon again. A task that took 20 years and with some adjustments during the last 80 years, the heritage archive now contains a total of 6.822 burial mounds in the survey area, where 2.970 was listed as protected monuments.

Following the agricultural reforms in the late 18th century large parts of Denmark were measured and mapped. These maps are known as the eldest cadastral maps and were drawn in a scale of 1:4.000 and therefore contain a great number of details, including much useful information for archaeologists: Place names, soil quality, burial mounds etc. These information's were unfortunately not included in the archaeological surveys during the 19th and 20th century.

This paper will present a study that combines a digitalization of these historical maps and the heritage archive. This offers a unique opportunity to re-evaluate the archaeological source material. In the survey area, an increase of mounds by 30% could be obtained. These numbers should furthermore be regarded as a minimum.

3 MORTUARY HOUSE SEEN AS ANOMALY IN MAGNETOMETRY OF A DOUBLE-BARROW. CASE STUDY OF MIDDLE BRONZE AGE CEMETERY OF BUKIVNA (UKRAINE)

Abstract author(s): Romaniszyn, Jan - Niebieszczański, Jakub - Cwaliński, Mateusz (Faculty of Archaeology, Adam Mickiewicz University in Poznan) - Rud, Vitaliy (Institute of Archaeology, National Academy of Sciences of Ukraine in Kyiv) - Radke, Iwona (Department of Quaternary Geology and Palaeogeography, Faculty of Geographical and Geological Sciences, Adam Mickiewicz University in Poznań) - Spychalski, Waldemar (Department of Soil Science and Land Protection, Faculty of Agronomy and Bioengineering, Poznań University of Life Science) - Jarosz, Paweł (Institute of Archaeology and Ethnology Polish Academy of Sciences in Kraków) - Bahyrycz, Cezary (Faculty of Archaeology, Adam Mickiewicz University in Poznan) - Staniuk, Robert (Institut für Ur- und Frühgeschichte, Christian-Albrechts-Universität in Kiel) - Makarowicz, Przemysław (Faculty of Archaeology, Adam Mickiewicz University in Poznan)

Abstract format: Oral

Following presentation is focused on the so-called double barrows of the Komarów culture (Middle Bronze Age) in Western Ukraine. Its aim is to demonstrate the potential of conducting magnetometry prospection and verification procedures (excavations, sedimentological and geochemical analysis and magnetic susceptibility testing) in order to identify the internal architecture of mounds. This particular case study is oriented towards the recognition of a double barrow in Bukivna, which included the so-called mortuary house made of wood and clay. The structure was burnt and it is clearly visible on the magnetometry imagery as a dipolar anomaly. This particular anomaly can be distinguished from the normal distribution of magnetization of a mound-like structure. Interpretation is supported by excavations and geoarchaeological testing of the samples. The contrary example comes from the Pidhoroddia cemetery, where a similar in shape, double mound was recorded, however with no indications of a mortuary house distinguishable in a magnetometry plan.

4 LATE VIKING-AGE BURIAL SITES IN SUZDAL' OPOLIE (CENTRAL RUSSIA): MULTIDISCIPLINARY RESEARCH AT GNEZDILOVO

Abstract author(s): Krasnikova, Anna (State Historical Museum) - Makarov, Nikolai (Institute of Archaeology, Russian Academy of Sciences) - Modin, Igor (Moscow State University) - Erokhin, Sergey - Schevchenko, Vladimir - Ugulava, Nani - Milovanov, Sergey (Institute of Archaeology, Russian Academy of Sciences)

Abstract format: Oral

Gnezdilovo is known as one of the first investigated Late Viking-Age burial sites in the large-scale excavation campaign of the 1851-1854 in Suzdal Opolie, focused on the barrow cemeteries. Since then, plowing completely destroyed all the barrows in Gnezdilovo, and until recent field work burial site was lost, despite the large excavations of the corresponding settlement in 1980-ies an intensive surveys in the local area.

Burial site was re-discovered in 2019, surveys included georeferencing of maps of the 1851 excavations, fieldwalking and metal detecting. Field research, conducted at the cemetery, was based on multidisciplinary approach, previously introduced at Shekshovo site. The borders and the structure of the cemetery were defined by means of geophysical investigations. Electric and magnetic survey enabled to map the individual burial mounds, necropolis borders, and zone of the necropolis with individual flat graves in the pits. Geophysics revealed about 30 barrow platforms, their arrangement and number match the survived XIXth century excavation scheme of burial mounds. Nevertheless, burial mounds distribution at the site requires further investigations: several dozen barrows seem to be too low number for the settlement with the nearly 15 ha area.

Although not all interpretation models from Shekshovo suited the data from Gnezdilovo, the approach showed its efficiency, making it possible to locate, map and investigate the burial mound site structure in short time frame.

The work was supported by Russian Scientific Foundation grant №19-18-00538.

5 INTERPRETING ALS DATA OF HISTORICAL LANDSCAPE IN THE FOREST ZONE OF THE EUROPEAN PART OF RUSSIA. CAPABILITIES, ISSUES AND VISUALIZATION

Abstract author(s): Novikov, Vasily (The Russian Academy of Sciences Institute of Ethnology and Anthropology - IEA; Energotransproekt) - Kainov, Sergey (State Historical Museum, Russia) - Goriacheva-Dorodnix, Svetlana (Energotransproekt) - Goriachev, Ivan (Paleoethnology Research Center) - Sagmanova, Gulnaz (Kazan Federal University - KFU) - Dozorceva, Evgenia (Universita ha-lvrit bi-Yerushalayim - HUJI) - Kurilenko, Dmitriy (Energotransproekt) - Vlasov, Dmitry (Energotransproekt; Moscow State University - MSU)

Abstract format: Oral

ALS, photogrammetry and other 3D-digital collections methods do not provide us an explicit and completely interpretations of affected historical and barrow landscape especially in forest zone of the European part of Russia. Actually, during ALS survey we have a deal with combinations of single mound or barrow groups, which in general cases are differentiating features for historical landscape. Barrows organize the boundaries of archaeological sites and allow to translate ALS data into a meaningful plan for archaeologist.

The interpretation of barrow landscape in Russia built now on experience of collecting data from various sites (ALS is still new method for forested zone of Russia). Obviously, that necropolis contain different burial types such as cremation onsite and on the side, inhumation in burial chamber with or without mound etc. it is necessary to reckon with problems of interpreting of damaged, de-

stroyed ploughed up mounds, excavated and mounds, which were repaired after excavation. Moreover, in reality we need to analyse only mounds and ditch's, which could give us explicit and full-scale information.

Verification ALS data are needed to use a complex of different non-invasive methods, which base on geophysical survey, reviewing of historical aerial images and satellite data and walking reconnaissance.

During 2018 – 2020 years projects of ALS archaeological objects, which included a barrow landscape, were investigated 16 sites in forested zone of Russia (2511 ha). For understanding methods of ALS part of sites with barrow landscape were investigated twice with different altitude and speed. The combination with different non-invasive methods are allowed common principles of understanding historical landscape with different type of burials. For destroyed barrow landscape were used 3D-modelling, landscape reconstruction and immersive AR-visualisation.

6 ACCESSING THE PREHISTORIC TELLS IN THE BALKANS

Abstract author(s): Naumov, Goce (Center for Prehistoric Research / Goce Delčev University)

Abstract format: Oral

Tells were a phenomenon of settlements associated with the introduction of the first farming communities in the Balkans, but also were maintained as residual areas further in prehistory. For a century they are studied with a variety of methods during surveys and excavations and therefore significant data was provided regarding their disposition, spatial organization, site formation processes, chronology and about communities that inhabited them. Although quite a recent practice in its initial developing phase a series of digital methods were applied in order to detect the tells in the landscape and consequently to study the relationship between these mounds and their environment. Furthermore the advanced techniques were employed as well in order to study the disposal of architectonic features and consequently to provide a habitat reconstruction. This presentation will particularly elaborate current research on tells in Pelagonia and emphasize the multidisciplinary approach that enables better understanding of these settlements, their distribution and surrounding, as well as the processes manifested on the site formation and continual residence in particular spots inside them.

7 REDEFINING PAST MOUNDSCAPES IN THE ROMAN-PERIOD GREAT HUNGARIAN PLAIN

Abstract author(s): Masek, Zsófia (Institute of Archaeology, Research Centre for the Humanities, Budapest)

Abstract format: Oral

The remaining mounds of the Great Hungarian Plain have been protected by the law in Hungary for decades, thus preserving the remains of the originous steppe-grasslands as the westernmost biological refugiums of the Eurasian steppe. However, the landscape has been and is widely cultivated, therefore a significant part of the mounds are already completely destroyed or are under constant threat. The presentation deals partly with vanished mounds, and also with well-preserved memorials. Problems of archaeological research may also be due in a measure to these different conditions.

Roman-period barrow graves or kurgans have been reckoned in this region since the mid-19th century. However, research into prehistoric objects has become much more advanced. Study of Roman-period Sarmatian monuments alienated from the interpretation of excavated objects, which were assessed as burials surrounded by ditches. Non-destructive research in recent years has confirmed that we need to interpret memories of different preservation, grave markings and sizes (ca. 5-50 m) in a common system.

The contribution concerns the re-discovering of long-known, lost sites with the use of various datasets, and their confirmation with non-destructive survey. Due to the general encirclement of the barrow graves, it is necessary to study the subsurface phenomena parallel to the micro-relief investigations; besides, morphology of grave markings could advance chronological classifications. The issues raised would be presented through case studies.

Some of the survived grave mounds are mementos of complex Roman-period moundscapes. Based on surveyed cemetery structures, some different reconstructions of social landscapes are to be mentioned. The re-use of the mounds in various respects is continuous to the modern ages. However, special attention is given to the sites, which were used as burial places of early medieval ethnic groups in the following centuries (5th-10th c.), which shows the long-term mental impact of these landscapes.

8 THE VISIBILITY AS A LOCATIONAL FACTOR IN THE MEGALITHS OF SOUTHERN GALICIA

Abstract author(s): Carrero-Pazos, Miguel (UCL Institute of Archaeology)

Abstract format: Oral

The analysis of the visual role of ancient monuments has a long tradition in Archaeology, being one of the most important applications of GIS methods in the current archaeological science. This work focuses on the study of the visibility as a locational factor in the megaliths of Monte Penide and Galiñeiro using GIS and spatial statistics methods. The research aims to analyse if it was the view from the mounds, the view to them, or possibly a joint explanation among both factors, the element which determined the spatial value of the megalithic structures, something that was inspected only up-to-date by fieldwork approaches in the selected region.

The research is structured in four methodological parts. First, we start from the analysis of the landscape where the megaliths were built through the reconstruction of the visual landscapes (visualscapes). Secondly, a study of the view from the monument is carried out through the analysis of the size of their viewsheds, using Monte Carlo simulation as significance testing. The aim is to check if the size of the visual basin of the megaliths converges (or diverges) with the surrounding landscape. Third, the view to the mon-

uments was approached through a combined study of the natural transit network and the visibility of the mounds. As a final step, we studied the particular skyline of the monuments, which allowed us to complement these approaches with more spatial values.

The results point out the complexity of this variable, probably crucial when selecting the specific locations where to build the megaliths. We defend the idea that the homogeneous visual presence of the funerary structures could have been one of the elements that marked the creation of the spatial structures in the Neolithic communities, that is, their territories.

9 ROCKS AND KINSHIP: RECONSTRUCTING THE FUNERARY LANDSCAPE OF EASTERN SUDAN

Abstract author(s): Costanzo, Stefano (Dipartimento Asia, Africa e Mediterraneo, Università degli Studi di Napoli "L'Orientale") - Brandolini, Filippo (McCord Centre for Landscape - School of History, Classics and Archaeology, Newcastle University) - Ahmed, Habab (NCAM - National Corporation for Antiquities and Museums, Khartoum) - Zerboni, Andrea (Dipartimento di Scienze della Terra 'A. Desio', Università degli Studi di Milano) - Manzo, Andrea (Dipartimento Asia, Africa e Mediterraneo, Università degli Studi di Napoli "L'Orientale")

Abstract format: Oral

The funerary landscape of the Kassala region (Eastern Sudan) is a complex palimpsest of raised monuments belonging to different time periods. Such monuments add up to several thousands of elements and are divided in two main categories: early to late 1st millennium CE round stone mounds (tumuli) and medieval Islamic square shrines (qubbas). Despite their huge number, local mounds and shrines remained largely unknown to the international archaeological community until today, mostly due to their geographic and cultural isolation. With this talk, we present the results of a cross-disciplinary study that employs geoarchaeological fieldwork and desk-based digital techniques. A description of the landscape-scale spatial distribution of qubbas was achieved by performing geospatial analysis on a large desk-based dataset of monuments over a geomorphological regional basemap. The interpretation of local-scale aggregations of qubbas was achieved by furthering the analysis to define the occurrence of elusive social dynamics. Our results strongly suggest the presence of a geological/environmental/societal synthesis underlying the choice of monuments' location. At the regional scale, their distribution follows a precise set of rules residing in the concomitant presence of stable, gently rolling slopes and readily available raw stone material; at the local scale, the clustering is conditioned by the presence of older tumuli and by superstructural dynamics that most likely reside in kinship and collective social memory of the local Beja people. The Bejas are a conservative society of semi-nomadic cattle breeders known to have inhabited the region since "time immemorial". Our results suggest that for more than two millennia they seem to have fit their funerary monuments to shifting religious beliefs, yet retaining continuity between tumuli and qubbas through a well coded social behaviour that valued location and kinship over external influences.

10 HERE IS THE BARROW AND WHAT NEXT ...

Abstract author(s): Wawrzeniuk, Joanna (Institute of Archaeology, Cardinal Stefan Wyszyński University in Warsaw)

Abstract format: Oral

How little we know about the cultural heritage hidden in the forests, many researchers has already alarmed and described. However, thanks to new methods, including Airborne Laser Scanning, and using LIDAR visualization, different features previously unknown from surface prospecting can be discovered and researched. However, even the excavation can often bring more questions than answers. An example are the results of field work on a mound on a newly recognized barrow cemetery located in the Ładzka Forest (part of the Białowieża Forest). Wooden construction in the embankment, cremation burial in a vessel, sacrificial pits with stones, burnt bones and wood's pieces. The fragments of pottery from different period were discovered. Some of them are connected with the settlement located under and next to the mounds. The remains of ancient fields are also related with them.

The research was carried out as part of a project financed by the National Science Center entitled: Cultural and natural heritage of the Białowieża Forest, at the Cardinal Stefan Wyszyński University in Warsaw.

11 MOUNDSCAPES OF THE BIELSKA PLAIN – SUMMARY ATTEMPT

Abstract author(s): Szubski, Michal (Cardinal Stefan Wyszyński University in Warsaw)

Abstract format: Oral

The Bielska Plain is the major region located in north-east Poland. Because of one of the oldest forests in Europe, the Białowieża Primeval Forest, located here it is perfect example of anthropogenic impact on prehistoric landscape. One can compare how archaeological landscape preserves in highly protected area and how it was destroyed by modern ploughing and urbanization at rest of the region.

With archival query and usage of LiDAR technology more than 2000 mounds with anthropogenic relief from different chronological periods has been found – among them barrows, tar kilns, charcoal kilns and more. After remote sensing and verification of the region features, next step was to prepare several DTM derivative models to try understand environment and geospatial regularity for mound sites. Also several spatial analysis were conducted for clusters. That allow to investigate this unique moundscape in entirety shape.

After four years of research the paper will try to summary current state of knowledge and application of spatial methods used to investigate mounds of the Bielska Plain.

365

"INVISIBLE PRODUCTS"- SCIENTIFIC ADVANCEMENTS IN IDENTIFYING ANIMAL SECONDARY PRODUCTS AND THEIR CONTRIBUTION TO UNDERSTANDING ANIMAL DOMESTICATION AND HUMAN-ANIMAL RELATIONSHIPS

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Gur-Arieh, Shira (Institute for Prehistoric and Protohistoric Archeology and Provincial Roman Archeology, Ludwig-Maximilians-University, Munich; CaSEs Research Group - Culture and Socio-Ecological Dynamics, Department of Humanities - Universitat Pompeu Fabra) - Madella, Marco (CaSEs Research Group - Culture and Socio-Ecological Dynamics, Department of Humanities - Universitat Pompeu Fabra, Barcelona) - Spiteri, Cynthianne (Institute for Prehistory, Early History and Medieval Archeology, Eberhard Karls University Tübingen)

Format: Regular session

While the identification of meat exploitation in antiquity is relatively straight forward through the study of animal bones, identifying the use of animal secondary products, meaning, products that can be continually harvested during the animals' life without slaughtering it (e.g. milk, wool, dung, eggs, honey, etc.) often requires the use of multi-disciplinary scientific methods. From the study of milk products using microbiology, lipid residues and proteomics to the identification of animal dung exploitation using micromorphology, these kinds of studies not only reveal otherwise almost invisible animal products, but they also provide a better understanding of human subsistence practices and human-animal-environmental relationships. In the last two decades, the adoption of methods from the natural sciences to archaeology has allowed some tremendous advances in the identification of animal secondary products, pushing back in time their utilization by humans and highlighting their importance as a motivation for animal domestication. In this session, we aim to review the latest scientific advancements and discoveries, and importantly, discuss future directions in the study of animal secondary products and how these contribute to our understanding of the socio-economic implications brought about by human-animal interactions.

ABSTRACTS:

1 RETHINKING THE ROLE OF ANIMAL DUNG AS A PIVOTAL ELEMENT IN HUMAN ADAPTATION TO A SEDENTARY LIFESTYLE

Abstract author(s): Gur-Arieh, Shira (Ludwig-Maximilians-Universität München; CaSEs, Department of Humanities, Universitat Pompeu Fabra) - Madella, Marco (ICREA - CaSEs, Department of Humanities, Universitat Pompeu Fabra, Barcelona)

Abstract format: Oral

In studies targeting the Neolithic revolution and the transition from a hunter-gatherer lifestyle to a sedentary one, plant and animal domestication, hence the shift to food production, are the key research foci. Animal dung, on the other hand, is still considered as a secondary by-product to animal domestication, even though the last years have seen a growing body of evidence showing that humans may have recognized its properties, and at times used it prior to, or alongside the process of animal domestication. In this talk we would like to review the role of dung in human adaptation to harsh environments, as it unfolds from historical, ethnographic, and archaeological sources, to suggest a multi-proxy workflow for dung identification, both as a fast-screening method in a field laboratory, and as detailed studies as part of post-excavation analysis processing. The use of animal dung as a proxy for human-animal interactions will be discussed, and future direction in this field of studies suggested.

2 HUMANS AND ANIMALS IN CLOSE PROXIMITY – A STUDY OF THE DUNG FROM AENEOLITHIC MONJUKLI DEPE IN SOUTHERN TURKMENISTAN

Abstract author(s): Ögüt, Birgül (German Archaeological Institute, Oriental Department, Berlin/Germany) - Cereda, Susanna (Universität Innsbruck, Institut für Archäologien, Mikroarchäologisches Labor, Innsbruck/Austria)

Abstract format: Oral

Monjukli Depe, a small prehistoric village in southern Turkmenistan, was inhabited in the Late Neolithic (ca. 6200-5600 BCE) and again in the Early Aeneolithic (ca. 4800-4350 BCE). Analyses of the animal bones demonstrate that sheep, goats, and cattle were all reared and herded by the villagers. Dogs are also attested at the site, by the occurrence of pawprints inside some of the Aeneolithic houses.

In this paper we present the results of new studies that have focused on analysing sedimentary deposits taken from open spaces, uninhabited ruins, and inhabited houses. The integration of phytolith and dung spherulite analyses, together with micromorphology examination demonstrated that the spatial proximity of herd animals and people was much closer than previously assumed, raising new questions about the places where animals were kept or had access to. Furthermore, the new data has prompted a rethinking of human-animal relationships; not only in terms of seasonality, care, husbandry and the exploitation of secondary products, but also of the perceptual and emotional dimension associated with spatial proximity to animals, such as warmth, hapticity, companionship, etc.

3 “ALL WOOL AND NO SHODDY”, AN INTER-DISCIPLINARY STUDY OF CLOTH PRODUCTION AT IRON AGE TELL ES-SAFI/GATH

Abstract author(s): Cassuto, Deborah (Bar Ilan University; Albright Institute of Archaeological Research) - Kolska Horwitz, Liora (Hebrew University) - Maeir, Aren (Bar Ilan University)

Abstract format: Oral

Remains of woven cloth are rare in archaeological sites in the Near East, such that we have little idea as to the raw materials exploited for their production i.e., plant fiber versus animal fiber, or the extent of fabric production that took place in different periods and sites. Consequently, we need to turn to alternative sources of information in order to assess these issues.

The site of Tell es-Safi/Gath, located at the interface between the coastal plain (Philistia) and the Judean Foothills (the Shephelah) in Israel, offers an excellent case study with which to explore this issue, since it has yielded a rich corpus of well-preserved material culture, as well as organic remains, spanning, in addition to earlier periods, the Late Bronze Age, Iron Age I and II (ca. 1500-700 BCE).

In this presentation, we examine the presence and quantity of finds from this site that may elucidate the nature and extent of cloth production carried out on-site. This includes data and various analyses on: architectural installations and tools that traditionally have been associated with textile production - such as stone vats, loom weights, spindle whorls and bone spatulas; the frequency of sheep and goats that may attest to wool production or hair exploitation as well as breed type - and evidence on grazing practices and herd proveniences (based on isotopes). Integration of these data-sets provides valuable information concerning fabric production at this site over a range of periods, and fills a hiatus in our knowledge. Our focus will be on the 9th century BCE material as it contains an impressively large corpus of loom weights (c.600) from diverse contexts, suggesting large-scale production of textiles on-site.

4 THE FIRST EVIDENCE OF WOOL FROM EARLY BRONZE AGE GRAVES IN POLAND (C. 2000 BC)

Abstract author(s): Kurawska, Aldona (Institute of Archaeology and Ethnology Polish Academy of Sciences) - Mrozek-Wysocka, Małgorzata (Institute of Geology Adam Mickiewicz University) - Hychała, Anna (Regional Museum in Hrubieszów) - Sobkowiak-Tabaka, Iwona (Faculty of Archaeology Adam Mickiewicz University) - Włodarczak, Piotr (Institute of Archaeology and Ethnology Polish Academy of Sciences)

Abstract format: Oral

Complex studies and multidisciplinary analyses of shell ornaments found in the Neolithic and Early Bronze Age burials in Poland surprisingly provided direct evidence for the use of sheep wool 2000-1600 BC. Residues discovered on the shell's surface were subsequently identified by using reflected light microscopy and scanning electron microscopy with energy dispersive spectroscopy (SEM-EDS). Sheep fibres were preserved on shells in mineralized form and identified on ornaments from at least six archaeological sites, dated to the Early Bronze Age. The fibres discovered on the surface of shell pendants were identified as remnants of textiles or sheepskin and as threads/strings inside the beads. The analysis indicated the presence of various fibres (kemp, coarse fibres, and fine fibres) typical for primitive sheep. Despite the possible exploitation of sheep for wool in the Late Neolithic period, indirectly indicated by animal remains, spindle whorls, and spools, on the territory of Central Europe wool fibres have not been identified so far. Among the analyzed shell ornaments from the Neolithic context, only remains of plant fibres were discovered.

The analyzed items are the first direct evidence of wool processing in the Early Bronze Age in Poland. Moreover, it was noticed for the first time that ornaments made of shells, in the specific context of inhumation burials, constitute calcium matrices on which mineralized forms of organic materials are preserved. Our research provides important information for understanding the early textiles economy. The potential and significance of the finds, in the study of sheep exploitation for wool, should be further explored.

5 (IN)VISIBLE WOOL IN IN THE PREHISTORIC AEGEAN TEXTILE PRODUCTION

Abstract author(s): Siennicka, Malgorzata (University of Göttingen, Institute of Archaeology)

Abstract format: Oral

Organic materials, e.g. textiles, are hardly ever preserved in the prehistoric Aegean (c. 3000-1200 BCE). Especially from the Early and Middle Bronze Age there are virtually no archaeological remains of woolen or vegetal fibres and fabrics, while from the Late Bronze Age contexts several mineralised textiles came to light. Whereas both vegetal fibres, and animal products, like skins, furs, and hairy wool had been exploited for thousands of years for making clothes, and other household fabrics, the woolly wool, also known as long-staple wool, appeared in the Aegean probably only in the 3rd millennium BCE. Its long fibres could be spun with hand spindles, and then woven on looms. The new textiles had different properties than those based on plant fibres: they were warm, soft, water-repellent, and they could be dyed in a range of colours and hues, which made them look more remarkable. Textiles and textile production have gained a new social and economic significance, as the Late Bronze Age written sources demonstrate. Nevertheless, the spread of the woolly wool in the Aegean must have been a long process. Because of lack of archaeological remains of wool from the EBA and MBA, that could be scientifically analysed, a careful study of textile tools can possibly shed light on the introduction and spread of this innovation. As we know that wool requires different types of spinning tools than those used to prepare plant fibres, it is possible to study potential modifications of spinning tools in order to indirectly trace the use of wool. Specifically, masses and diameters, as well as the shapes of the spindle whorls made of clay, stone and bone, could be informative in that matter. This paper offers an alternative method of studying the use of wool in textile production without scientific analyses of wool remains.

6 “BAA, BAA BLACK SHEEP, HAVE YOU ANY WOOL?” WOOL TRADE NETWORKS EVALUATED THROUGH STRONTIUM ISOTOPE ANALYSES AT BORGUND KAUPANG, NORWAY

Abstract author(s): Smith, Michele Hayeur (Haffenreffer Museum of Anthropology, Brown University) - Dahle, Kristoffer (Møre og Romsdal fylkeskommune)

Abstract format: Oral

The town of Borgund Kaupang, on Norway's western coast, was founded in the late Viking Period and flourished during the Middle Ages. As a regional commercial center, it occupied a poorly studied position linking smaller hinterland communities to coastal networks that linked ports such as Bergen and Trondheim with the North Atlantic Islands and continental Europe. A large, international project organized by the University of Bergen is currently reviewing and revitalizing legacy collections from excavations of the 1950s-1970s at Borgund Kaupang. Textiles are surprisingly well-preserved in its excavated contexts and provide one avenue for examining the roles of local versus imported products in trade and the life of the town. Initial strontium isotope analyses suggest that most of these are of Norwegian origin, rather than imports from the North Atlantic islands or other parts of Europe. This differs from the situation in Bergen and Trondheim, where imports seem to have been more significant. Yet, if this pattern appears strong at Borgund Kaupang, questions remain about whether the woolen textiles found there were produced exclusively in its local hinterland or came from other parts of Norway through internal trade routes competing with or linked to the networks connecting Norway's main ports. Comparative samples of modern wool are helping us to establish strontium baselines for wool from different parts of Norway and will be compared to Borgund Kaupang's archaeological samples. Already, evidence for local production of woolens from the earliest phases of the site raises questions about whether Borgund Kaupang produced specialized cloth for exchange or was a node within internal or local trade networks. Were these textiles produced in Borgund for trade with its periphery or were they produced elsewhere in the periphery to supply early urban centers such as this one?

7 REINDEER AS TRACTION: NEW METHODS FOR IDENTIFICATION OF WORKING REINDEER AND ARCHAEOLOGICAL EVIDENCE FROM NORTHEASTERN FENNOSCANDIA

Abstract author(s): Salmi, Anna-Kaisa - van den Berg, Mathilde - Niinimäki, Sirpa - Pelletier, Maxime (University of Oulu)

Abstract format: Oral

The domestication of the reindeer among the Sámi of Northern Fennoscandia is one of the pressing questions in the archaeology of the area. Although the importance of draught reindeer in early reindeer domestication has been hypothesized, direct archaeological evidence on the matter has been lacking. In recent years, new methodological possibilities, such as analysis of palaeopathological lesions, bone cross-sectional properties, enthesal changes and geometric morphometrics have become available for the identification of reindeer physical activity patterns such as draught use on faunal remains. In this paper, we present some of the new methodological tools available for reindeer physical activity reconstruction. Moreover, we discuss the first archaeological application of these methods to faunal remains from Sámi dwelling sites in Northeastern Fennoscandia.

We present the analysis of palaeopathological lesions and enthesal changes in the faunal assemblages from three Sámi dwelling sites in Northeastern Fennoscandia, dated between ca. 1300-1800 AD. The results suggest that working reindeer were present in the archaeological assemblages likely from 1300 AD onwards. This is the earliest direct evidence of draught reindeer use by the Sámi. It predates the earliest unequivocal historical sources on draught reindeer use dating to the 16th century and confirms the hypothesis that draught reindeer played an important role in early reindeer herding. It also shows that that small-scale reindeer herding was integrated into the subsistence strategy of the Sámi of Northeastern Fennoscandia earlier than previously suggested.

8 RAISING AWARENESS OF THE INVISIBLE: POLYVALENT EXPLOITATION OF THE FIRST CATTLE HERDS IN EARLY NEOLITHIC IN NE IBERIA

Abstract author(s): Miralda, Joaquim - Sierra Sainz-Aja, Alejandro (Archaeozoology laboratory, GRAMPO, Department of Prehistory, Autonomous University of Barcelona) - Tarifa-Mateo, Nàdia (Institut de Chimie de Strasbourg UMR 7177, CNRS, Université de Strasbourg) - Alcàntara Fors, Roger (Archaeozoology laboratory, GRAMPO, Department of Prehistory Autonomous University of Barcelona; Pre-EINA Estudis Interdisciplinaris i Noves Aplicacions en Prehistòria, Jaume I University) - Saña Seguí, Maria (Archaeozoology laboratory, GRAMPO, Department of Prehistory, Autonomous University of Barcelona)

Abstract format: Oral

Knowing which animal products were used in the past is a fundamental question to study the initial animal husbandry practices. However, these products can be often dismissed in archaeological analyses due to their perishable nature. Since a lot of these products or resources become disintegrated, we must find new ways to identify markers of these ancient resources.

In the last decades, many new techniques have been applied to the study of consumption patterns and animal production in the past. The use of organic residue analysis (ORA) to identify the so-called “secondary products” is already common in archaeology. Other methodologies are also continuously being implemented to study animal life conditions and husbandry practices they were involved in. In this communication, we aim to correlate different analyses in an integrated study that can trace back the use of cattle in the Early Neolithic in La Draga settlement.

The study brings together ORA, mortality profiles, biomechanical adaptation, bone microstructure analyses and paleopathology analyses. Taking the cattle mortality profiles as a base reference we will evaluate the potential uses of cattle by bringing together

the evidence of milk exploitation and consumption brought by ORA and the study of osteon conformation. The evidence on cattle loading patterns brought by the biomechanical analysis, the palaeopathological study of cattle remains and the osteon conformation as signs of the management strategies and alternative uses implemented.

Dairy products were detected in four pots from La Draga by ORA supporting milk consumption. Age at death pattern analysis show milk slaughter pattern inclination for cattle as well as osteon conformation supports this hypothesis for specific individuals. Besides, cattle first phalanges biomechanics analysis and osteon examination show a significant amount of stress related to the loading and animal draught exploitation.

9 SECONDARY ANIMAL PRODUCTS IN AFRICAN SOCIETIES. A CASE STUDY FROM THE EARLY IRON AGE SITE OF LYDENBURG HEADS, SOUTH AFRICA

Abstract author(s): Becher, Julia (University of Tuebingen) - Schoeman, Alex (University of the Witwatersrand) - Buckley, Stephen (University of York; University of Tuebingen) - Whitelaw, Gavin (KwaZulu-Natal Museum) - Celliers, Jean-Pierre (Lydenburg Museum) - Spiteri, Cynthianne (University of Tuebingen)

Abstract format: Oral

In the last two millennia people in southern Africa relied on secondary products of domestic stock. While milk products were commonly a staple, domestic stock was mainly slaughtered in ceremonial occasions. Due to high percentage of lactose intolerance within these societies, secondary milk products, such as sour milk, curds and whey, or butter, were generally used instead of fresh milk. People further consumed processed crops, gathered plants and fruits, and supplemented their diet with hunted and snared game. However, there is little direct evidence for the dietary practices during the Early Iron Age (AD 200-900; EIA) in South Africa. In order to investigate subsistence patterns and vessel use through time, organic residue analysis (ORA) was applied to ceramics from the site of Lydenburg Heads, South Africa. The initial seventh century AD occupation of the site was associated with Mzonjani facies pottery, and the ninth to eleventh centuries AD reoccupation contained Doornkop facies pottery. For this study, 40 sherds were sampled (Mzonjani occupation, n=20; Doornkop occupation, n=20). This represents the first ORA study ever conducted in this area and in this archaeological context. Here, we report on the processing of milk through the application of compound-specific isotope analysis (GC-c-IRMS), as well as the detection of coprostanol using a lipid biomarker approach (GC-MS), which implies the application of dung to ceramic vessels. Both findings represent the earliest evidence of its kind within early farming communities in southern Africa.

10 EXPLORATORY ORGANIC RESIDUE ANALYSIS FROM A 4000 BP MULTIPERIOD HABITATION SITE IN THE ZÜNKHANGAI REGION (MONGOLIA)

Abstract author(s): Davara, Javier - Égüez, Natalia (AMBI Lab, Instituto Universitario de Bio-Orgánica Antonio González, Universidad de La Laguna) - Seitsonen, Oula (University of Oulu) - Broderick, Lee (Oxford Archaeology) - Bayarshaikhan, Jamsranjav (National Museum of Mongolia) - Houle, Jean-Luc (Western Kentucky University)

Abstract format: Oral

This paper presents the preliminary results of organic residue analysis from a small set of pottery fragments that were recovered in 2018 in the context of the Western Mongolia Archaeology Project. Excavation of a present-day nomadic winter campsite produced a well deeply stratified profile of 1.60m depth. Radiocarbon dates from the profile cover a continuous and consistent occupation of the site for the last four millennia. The presence of large quantities of animal bones, primarily from sheep/goat, that also exhibited butchery marks associated with primary and secondary butchery, suggest that these two categories of primary domesticates played a major role in the Mongolian herders diet. Pottery fragment samples from several layers were analysed using gas chromatography/mass spectrometry (GC/MS) combined with single compound stable isotope ($\delta^{13}C$) analysis (GC-c-IRMS), to explore diet and ultimately shed new light into food choices and provisioning of the people that occupied the site since the Early/Middle Bronze Age (c. 2000-1700 cal. BC). Analytical methods, interpretative strategies, and anthropological implications will be discussed.

A. THE USE OF DUNG AS FUEL: MICROMORPHOLOGICAL ANALYSIS OF THE ES-1610 STRUCTURE OF THE FORTRESS OF ELS VILARS (ARBECA, SPAIN)

Abstract author(s): Carbonell-Roca, Joan - Bergadà, M. Mercè (SERP. Departament d'Història i Arqueologia, Universitat de Barcelona) - Alonso Martínez, Natàlia (GIP, 3DPatrimoni, Departament d'Història, Fac. de Lletres, INDEST, Universitat de Lleida)

Abstract format: Poster

This work shows the results of a microstratigraphic study about combustions, carried out inside a structure located at La Fortalesa dels Vilars d'Arbeca (Arbeca, Lleida, Spain). Dating from the late 6th century BC, the structure is almond-shaped and is 5 m long and 1.20 cm wide. Located outside the walls, the structure was functioning underground, being buried about 50cm deep, and a drain was attached to its southern end. Without parallels in the Iberian world, its excavation showed a stratigraphy, formed by sedimentary levels and ash levels's layering.

The results of the micromorphological analysis have allowed to characterize the stratigraphic sequence, where the association of ash levels -formed mainly by prismatic calcitic pseudomorphs and some charcoals- and sedimentary levels with traces of thermoalteration stands out. However, we also find excremental aggregates with a high content of faecal calcium spherulites, disarticulated siliceous phytoliths and authigenic phosphate nodules.

All features suggest that combustions took place in situ and that herbivorous excrement were used as fuel. In fact, some other levels outside the settlement -not contemporaneous- have also shown the burning of dung. The use of this type of fuel has been widely discussed in other protohistoric contexts such as the Maghreb and in the Middle East but is not so usual, according to available data, in the Iberian Peninsula. Thus, micromorphology has been shown to be a highly effective tool in the analysis of such contexts, allowing the correct characterization of combustions, especially to identify the primary or secondary deposition of their remains and the fuel sources used.

367 IDEOLOGICAL, TECHNOLOGICAL & ECONOMIC CHANGE IN THE FIRST MILLENNIUM BCE AT THE EURASIAN EXTREMITIES: JAPAN AND BRITAIN IN WIDER CONTEXT

Theme: 4. Globalisation and archaeology

Organisers: Hutcheson, Andrew (Sainsbury Institute for the Study of Japanese Arts and Culture; University of East Anglia) - Mizoguchi, Koji (University of Kyushu) - Matsugi, Takehiko (The National Museum of Japanese History) - Hudson, Mark (Max Planck Institute for the Science of Human History) - Kaner, Simon (Sainsbury Institute for the Study of Japanese Arts and Culture; University of East Anglia)

Format: Regular session

In European archaeology the Bronze Age has been argued to represent an expanding world of proto-globalisation. The following Iron Age, by contrast has been interpreted in terms of more localised societies based around growing state power. However, the transitional period between Bronze and Iron saw new 'global' ideas spread across Eurasia. Although not generally discussed by archaeologists, the term 'Axial Age' has sparked historical, sociological, anthropological and popular interest since it was proposed by the German existentialist philosopher Karl Jaspers in his 1949 book *The Origin and Goal of History*. His Axial Age thesis proposed that between 800BCE and 200BCE religious, philosophical and societal innovations took place across the core of Eurasia. Figures such as Confucius, the Buddha, Zarathustra, Elijah, Homer, and Plato all belonged to this period. Recently the anthropologist David Graeber, in his book *Debt: The First 5000 Years*, argued there was a material basis to these new ideas in the First Millennium BCE, pointing particularly to the development of coinage in Greece, India and China around 600BCE. This session will examine whether the ripples from these changes can be seen across the Eurasian continent. Britain and Japan, at the extremities, saw social and material changes linked to the flow of ideas and material from the continent during the Iron Age and the Yayoi period. Increasing complexity, demographic changes and technological innovations took place. Agriculture based on rice, millet, wheat and barley appeared in Japan with new groups of people and metals. New metallurgical technologies, styles of artefact and coinage made their way into Britain at around the same time. Papers in this session will explore these themes and consider whether such large-scale historical narratives fit with archaeological investigation.

ABSTRACTS:

1 INTERPRETING AXIAL AGES

Abstract author(s): Andersen, Anna-Theres (Institute for Prehistoric and Historic Archaeology, Kiel University) - Nakoinz, Oliver (Johanna Mestorf Academy, Kiel University)

Abstract format: Oral

The axial ages concept, rooting in observations of the 19th century and developed by Karl Jaspers in 1949 gained new attention in recent years (Bellah/Joas 2012; Assmann 2018; Mullins et al. 2018; Peet 2019). On the one hand, it seems accepted that Jaspers original axial ages have some flaws including chronological issues but on the other hand, this theory is still very stimulating and open for a manifold of interpretations and applications which do not follow the canonical form. Following Assmann, we understand the axial age concept rather as a kind of heuristic than a sound theory of history. This paper is intended to offer some thoughts on different interpretations of the axial age concept. We do not discuss empirical evidence for the axial ages and we do not define the content of the axial age transformation but we aim to address a selection of interpretations that offer a specific perspective on the remarkable transitions observable in the First Millennium BC.

This paper starts with a short characterisation of the classical concept of Jasper and continues with some more recent interpretations from Peet (2019), and Assmann (2018). Furthermore, we address the reward system approach from Baumgard/Boyer/Hya-fil(2015) and the multiaxiality approach from Shults (et al. 2018) and Baskin (2019). In addition, we discuss the usage of the axial ages approach as a heuristic and simple temporal development model as well as a complex system approach. Which interpretation is the right one? How are they related? In which way do they guide future research?

2 CIVILIZATION AND BARBARIANS AT EITHER ENDS

Abstract author(s): Kim, Jinoh (Seoul National University)

Abstract format: Oral

In this presentation, I'd like to compare the situation of Korean Peninsula and Japan during the late periods of the First Millennium BC with those of Britain and Western Europe.

During the periods these regions began to make frequent contacts with the Chinese civilization and the Mediterranean World respectively. The civilizations imparted new technologies and cultural objects to the societies of those regions while they left some texts about their contacts with the so called barbarians. The contacts not only affected the ancient societies themselves but also the ways in which today's archaeologists investigate such societies, as the historical texts let us know their names and stories.

The historical texts and the archaeological data suggest that there were military campaigns, colonization and trades in both regions. And I'd like to point out that the contacts with the civilization might have contributed to the prestige and authorities of the local rulers. However, this trend seems to have been more salient at the East End because unlike the Chinese Empires who maintained the tribute system with the barbarians, the Romans conquered and annexed the Gauls and the Britons as provinces in the end.

3 THE BEGINNING OF SYMBOLISM

Abstract author(s): Barrett, John C. (University of Sheffield)

Abstract format: Oral

That material culture is 'symbolic' is something that is widely accepted, whether or not archaeology is able to deal with this aspect of past material worlds. To say that material culture is symbolic is taken here to mean that things can act as a sign for (stand in place of) something else and that the thing therefore requires interpretation. Symbolism is therefore contentious in that we can argue about what things might mean. This paper will argue that symbolism is a relatively late and a marginal development in humanity's treatment of things. In place of the symbolic role of things it will be argued that things are more generally treated by humans as the manifestation of essential qualities. Thus, for example, sacred objects are sacred, in the way that the sacraments at a mass are transformed into the flesh and blood of Christ for some, while it is protestants and non-believers who would treat the bread and wine as being symbolic. From this perspective I will argue that prehistoric communities, and indeed many today, live in worlds that were and are made up of essential qualities manifest in things and not symbols. Consequently, the beginning of symbolism must mark a significant dislocation in the traditional understandings of the world. It is from this perspective that we might begin to understand the origins of philosophies that seek to interpret existence by claiming to know what things really mean (aka The Axial Age), the origins of writing where texts stand for words, and where coinage stands for values. I therefore doubt that these worlds of symbolic things ever permeated the European worlds of prehistory.

4 DRIVERS OF CHANGE: UNPACKING THE CAUSAL FORCE BEHIND CHANGES IN PRODUCTIVITY, WARFARE, INSTITUTIONS, AND IDEOLOGY ACROSS EURASIA WITH SESHAT DATABANK

Abstract author(s): Hoyer, Daniel (Seshat: Global history Databank; Evolution Institute; George Brown College) - Reddish, Jenny (Seshat: Global history Databank; Complexity Science Hub, Vienna)

Abstract format: Oral

The Axial Age concept has had wide influence in historical, sociological, and archaeological narratives since its early articulation in the late 19th century. Since then, a wealth of historical and material evidence has been marshaled to defend and refine the concept, however, no clear picture of what exactly this Age was and how it came to be has emerged. Seshat: Global History Databank provides new tools for examining this topic in social formations across Afro-Eurasia during the first two millennia BCE and first millennium CE, allowing scholars to empirically evaluate the varied and contrasting claims researchers have put forward.

We will discuss ongoing work by the Seshat project to explore how various key social features – from increased agricultural productivity to advances in military weaponry and tactics, the growth of increasingly complex societies, and the development of moralizing and universalizing ideology – spread across Afro-Eurasia. We consider the implications of these findings for regions on the western and eastern fringes of Eurasia. Overall, we find that axiality is a more complex, patchy, widely distributed, and temporally extensive phenomenon than the original advocates of the concept conveyed.

In this session, we will survey the results of an extensive cross-cultural survey of past societies from western Europe to East Asia covering the last 6,000 years which suggest that the ideological and philosophical developments seen as hallmarks of the Axial Age actually arose late in the sequence, contrary to most traditional interpretations of the epoch. These cultural adaptations only became prevalent in societies that had experienced a sharp rise in social complexity, a process itself directed largely by the opportunities and demands of increased agricultural productivity and intense inter-state competition.

5 TESTING THE AXIAL AGE CONCEPT APPLIED TO ETRURIA IN THE CONTEXT OF FAR WESTERN ASIA

Abstract author(s): Stoddart, Simon (University of Cambridge; University of Kiel)

Abstract format: Oral

The paper will examine how Jasper's concept of the Axial Age matches up to the data from Etruria. Etruria conforms in terms of providing a cluster of competing city states (one of Jasper's criteria) in precisely the right period during the first millennium BC. Furthermore, the suggestion by Graeber that coinage may be interconnected with the economic and political changes of the period also appears to hold true. It is, however, very much more difficult to detect in Etruria the much vaunted religious and philosophical changes which are attributed to Greece (and Rome). The literature of Etruria has not been preserved, but the evidence that does exist suggests that Etruscan thought and religion had major differences from those preserved in the generally accepted classical world and from those detected from other Iron Age communities of the same period. The example of Etruria will be set within the

broader context of Iron Age far Western Asia as one tessera in the mosaic of different communities which stretched across the Asian continent in that period.

6 MATERIALS AND IDEAS IN THE SECOND HALF OF THE 1ST MILLENNIUM BCE: COINAGE AND CONCEPTS IN JAPAN AND BRITAIN

Abstract author(s): Hutcheson, Andrew (University of East Anglia)

Abstract format: Oral

During the last half of the 1st millennium BCE, in what are now Japan and Britain, there was a flow of exchanged materials from the continent. This had been the case earlier too. There was also increased agricultural intensification and settlement complexity. In Japan there was mass inward migration and we can see this reflected in the record through material similarities to the Korean peninsula, including burials. In Britain the burial record is very limited with relatively few inhumations. Towards the end of the period there was a mixture of materially rich inhumations with some cremation cemeteries. Burials and cremations, where they do exist, often show a conceptual, and materially direct, connection with traditions on the continent. This paper will examine types of archaeological evidence that may be proxies for complex ideas in these contexts. It will consider whether the connection of materials to concepts that were making their way across large stretches of Eurasia at this time, in what Karl Jaspers termed the Axial Age, can be viewed archaeologically. Did the intellectual developments taking place in China, India, Palestine and Greece touch the extremities of the Eurasian continent? Following Graeber, who extended the Axial Age concept to the development of coinage, noting that this happened in the 'core' locations at around the same time (c. 600 BCE), there is a specific material link to examine. Coinage, along with its associated concepts, moved out from its inception locations, reaching Britain around 200 BCE and Japan from China around the same time. In Japan it was not adopted as a practice until much later in the 8th century CE. There are in Japan other materials that were perhaps used in similar ways. This combination of increasing material complexity can be thought about in terms of Ian Hodder's concept of entanglement.

7 WHAT IS A SHRINE? ARCHAEOLOGICAL PERSPECTIVES FROM YAYOI JAPAN AND IRON AGE EUROPE

Abstract author(s): Kaner, Simon (Sainsbury Institute for the Study of Japanese Arts and Cultures) - Hutcheson, Natasha (University of East Anglia)

Abstract format: Oral

This paper will review the evidence for the emergence of shrines as a distinct category of archaeological feature (or 'heritage asset') in the Yayoi and Kofun periods of the Japanese archipelago and the European Iron Age, and will consider how the concept of enshrinement is coloured in both areas by epistemologies and ontologies heavily influenced by teleological tendencies drawing on analogies with emerging world religions. In both regions sites identified as shrines often undergo considerable modification through processes of rebuilding and restructuring, facilitating the reconstruction of shrine microhistories which in turn enable interpretation at the local level. In addition, the paper investigates the destruction of shrines, and to what extent this form of desecration became a new form of social practice entangled in discourses of ritualized violence. How was the development of the concept of the shrine related to the emergence of the notion of transcendence, one of the cornerstones of the Axial age?

8 ENCOUNTER PROJECT: DEMOGRAPHY, CULTURAL CHANGE, AND THE DIFFUSION OF RICE AND MILLET DURING THE JOMON-YAYOI TRANSITION IN PREHISTORIC JAPAN

Abstract author(s): Crema, Enrico (University of Cambridge) - Bondetti, Manon (University of York) - Brainerd, Leah (University of Cambridge) - Carrignon, Simon (University of Tennessee; University of Cambridge) - Craig, Oliver (University of York) - Kobayashi, Ken'ichi (Chuo University) - Madella, Marco (ICREA - CaSEs, Department of Humanities, Universitat Pompeu Fabra) - Shinya, Shoda (University of York; Nara National Research Institute for Cultural Properties) - Stevens, Chris (University of Cambridge) - Yoshida, Akihiro (Kagoshima University)

Abstract format: Oral

The demic and cultural diffusion event that unfolded within the Japanese islands during the 1st millennium BC is characterised by a substantially diverse set of local responses to the so-called 'Yayoi package', which was brought in by the migrant communities from the Korean peninsula. Archaeological data is indeed increasingly providing evidence of regional variations ranging from swift adoption of the entire package to selective adoption, hybridization, short to long term resistance, and even episodes of reversions. The diversity of these responses eventually led to a forking path that has defined the foundation of the social, economic, cultural, and biological variations in the subsequent centuries. The ERC-funded ENCOUNTER project is currently investigating this pivotal moment in Japanese prehistory by synthesising the available archaeological data through novel computational and statistical approaches and by producing new lines of evidence through biomolecular archaeology. This paper will provide an overview of some of the preliminary outcomes of the project drawing from case studies focused on paleo-demographic reconstructions, crop productivity models, and organic residue analyses.

9 CONNECTIVITY BETWEEN THE JAPANESE ARCHIPELAGO AND MAINLAND DURING AND PRIOR TO THE 1ST MILLENNIUM BC

Abstract author(s): Bausch, Ilona (Leiden University)

Abstract format: Oral

This paper aims to evaluate the potential for cultural transformations and ideological cross-fertilization from the perspective of trade, with a special focus on the social role of ornaments.

In Japan, the 'Axial Age' and globalisation processes that triggered lasting and widespread social change probably truly started during the bronze age of the Yayoi period, due to a great influx of people who brought new technologies and ideas from the Mainland.

However, during the preceding Jomon period, there already existed a special connectivity between hunter-gatherer groups from Northern Kyushu and the Southern Korean Peninsula: long-standing exchange networks featuring raw materials, goods, technologies and ideas. Visible evidence of long-distance exchanges at sites in both regions includes obsidian chunks, finished tools, pottery, clay animal figurines and ornaments.

For instance, HA Insoo has argued that Chulmun hunter-gatherer groups from the Southern Korean Peninsula traded shell bracelets with Jomon groups in return for obsidian from Kyushu. Could—arguably more or less standardised— processed objects such as bracelets have played a role in transmitting value?

Perhaps more importantly, to what extent were practices of bodily ornamentation shared between the Japanese archipelago and the East Asian mainland prior to and during the 1st Millennium BC, and did these exchanges play a role in transmitting ideas and world views?

10 THE LAST 200 YEARS OF THE FIRST MILLENNIUM BCE AS THE "AXIAL AGE" IN PREHISTORIC JAPAN

Abstract author(s): Matsugi, Takehiko (The National Museum of Japanese History)

Abstract format: Oral

The Yayoi period (950BCE-AD250) has long been considered as the first agricultural society in the Japanese archipelago, which gradually developed into a class society in the following Kofun period (AD250-600) characterized by kingly burial mounds. However, recent investigations revealed that the Yayoi period could be divided into two stages entirely different from each other; the early Yayoi before the 3rd century BCE with little metals and non-hierarchical society, and the mid and late Yayoi after around 200BCE with the popularization of iron tools and social stratification.

The epoch around 200BCE is marked by the emergence of chiefly mounded tombs including elite burials, enlarged settlements often with multiple circular moats and a central shrine, inflows of prestige goods such as bronze mirrors, presumably weight and measure and writing system, and coinage from the Chinese continent and the Korean peninsula.

An expansion of the ancient imperial system of the Han dynasty is considered to have promoted the process of increasing social complexity after 200 BCE towards the political integration and early state formation at the end of the Yayoi period.

11 THE SECONDARY PEOPLES' REVOLUTION AND THE RISE OF THE META-BARBARIAN: COMPARING BRONZE AGE JAPAN AND BRITAIN

Abstract author(s): Hudson, Mark (Max Planck Institute for the Science of Human History)

Abstract format: Oral

World systems theory argues that core regions exploit and under-develop their peripheries. While this model was usefully applied to the Bronze Age in the 1980s-90s, the concept of 'bronzisation' and other contributions from globalisation theory have made it hard to continue to accept Bronze Age world systems. New research shows that Bronze Age 'peripheries' in fact played a socially autonomous role in long-distance trade, developing decentralised transcultural features which drew on both centre and margin. Borrowing from James Scott's re-invention of the term 'barbarian' and with a nod to Andrew Sherratt, we might see this period as forming a 'secondary peoples' revolution' (Hudson 2020). This paper will attempt a comparative analysis of Bronze Age 'meta-barbarians' in Island East Asia and northwest Europe with a particular focus on Japan and Britain. Archaeological evidence relating to the globalisation of food, trade in metals and textiles, the organisation of violence, and regional variation will be discussed.

12 THE FORMATION OF COMPLEX SOCIETIES AS SEEN FROM RELIGIOUS PRACTICES

Abstract author(s): Mizoguchi, Koji (Kyushu University)

Abstract format: Oral

This paper investigates the formation of complex societies by examining what changes took place to 'religious' practices in the process. For that purpose, the religious is heuristically redefined in terms of their functional-effective elements thus: religious activities constitute a distinct communicative domain that responds to and processes the uncertainties and risks of the world. Drawing upon this re-definition, this paper adopts a procedure comprising the following units of investigation: A) what uncertainties and risks of the world were generated and differentiated in/by a certain social formation, B) how they were responded to and processed, and C) how the mode of the responding and processing changed as 'social complexity' developed? The pre- and proto-historic periods of

the Japanese archipelago will be investigated as a case, and it will be revealed that the mode of religious practices changed as the spatio-temporal distribution of the sources of uncertainties and risks to be reacted to and processed changed.

368 A DARK GOLDEN AGE. NEW APPROACHES IN THE RESEARCH OF THE CIRCUMALPINE MIDDLE BRONZE AGE

Theme: 6. Material culture studies and societies

Organisers: Schwarzberg, Heiner (Bavarian State Archaeological Collection Munich) - Massy, Ken (Ludwig Maximilian University of Munich) - Chvojka, Ondřej (South Bohemian University of České Budějovice)

Format: Regular session

The Central European Middle Bronze Age is a period often overlooked as a transition between the emerge of bronze metallurgy and exchange and the spectacular features of the Late Bronze Age Urnfield Culture. Nevertheless, it is a period of crucial social, cultural and technical developments.

Even though some regions bear rich archaeological heritage, our knowledge on the Middle Bronze Age is still limited and in a greater extent based on research carried out in the early decades of the 20th century. When trying to get a general and supra-regional picture of the wider circumalpine region in the mid 2nd millennium BC, it becomes evident that despite active archaeological research the overall state of knowledge is still in arrears.

With this session we want to try to widen our horizons on this fascinating period on a broad scale including new chronological results, key finds and socio-economic features. The goal is to bring together researchers providing new scientific and archaeological evidence to deepen our understanding of the Middle Bronze Age in Central Europe - from Eastern France to Hungary and from the Central German Uplands and Bohemia to Northern Italy.

ABSTRACTS:

1 PRODUCER - TRADER - CONSUMER? BRONZE AGE EXPLOITATION, PRODUCTION AND DISTRIBUTION OF COPPER IN THE CENTRAL ALPINE REGION

Abstract author(s): Reitmaier-Naef, Leandra (Deutsches Bergbau-Museum Bochum) - Reitmaier, Thomas (Archaeological Service of the Canton of Grisons) - Schindler, Martin (Archaeological Service of the Canton of St.Gallen)

Abstract format: Oral

The fact that access to natural resources is subject to ongoing transformation depending on socio-economic developments can be seen particularly clearly in the example of the inner-Alpine region. This paper focuses on the change in metal use in the central Alpine region with focus on the transition from Early to Middle Bronze Age. Special attention is given to the archaeological and archaeometrical investigation of finds that have not or only insufficiently been considered so far, such as stone tools of primary and/or secondary metallurgy as well as waste products of metallurgical processes from settlement contexts. These finds may shed light on the role local settlements played in the network of copper producers, traders and consumers.

The change in access patterns can be roughly divided into three stages: During an initial phase (EBA), permanent settlements are already present in the Alpine Rhine Valley, but for the inner Alpine area, a seasonal, resource-oriented land use must be assumed. A second stage is reached at the transition to the Middle Bronze Age: In the central Alpine region, an increasing consolidation of the human presence is becoming apparent. In most alpine valleys a network of permanent settlements is emerging. These are small, often fortified settlements at specific topographical locations. The subsistence strategy seems to be based on a combination of agriculture, animal husbandry, alpine pastoralism and the use of mineral resources. Permanent settlement ultimately also led to the expansion of transalpine trade networks to the south and east. At the same time, the ceramic spectrum of the inner Alpine region shows clear references to the northern Alpine foothills, from where the settlement of the inner Alpine region probably started. Finally, in the course of the Late Bronze Age an economic intensification can be observed, which was reflected in a specialization of individual micro-regions.

2 ON THE POSSIBILITY TO RECONSTRUCT THE BRONZE AGE COSTUME ON THE BASIS OF ANALYSIS OF SURFACES OF BRONZE JEWELLERY

Abstract author(s): Nožinová, Sona - Křišťuf, Petr (University of West Bohemia, Department of Archaeology)

Abstract format: Oral

The poster contribution demonstrates the possibilities of traceological analyses of bronze jewellery while studying the appearance of the Bronze Age costume. It is the jewellery that is one of the main artifact categories of the Bronze age. It can work as a functional piece of clothing, a symbol of belonging to a social group, a means of communicating individual's special traits, etc. As context we use Bohemian Bronze Age jewellery collections that were a part of grave equipment. The aim of this poster contribution is to answer the following questions: Is the studied bronze jewellery used only for the burial rituals or had the deceased used it during his life? And if it was worn during an individual's life in the Bronze Age, do wear marks on the bronze jewellery allow us to reconstruct different clothing pieces forming a costume belonging to a specific social class, such as the cases in northern Europe?

3 BLING FOR ETERNITY – AN EXCEPTIONAL HOARD OF THE MIDDLE BRONZE AGE FROM OBERSTREU

Abstract author(s): Schwarzberg, Heiner (Bavarian State Archaeological Collection Munich) - Büttner, Andreas (Bavarian State Office for Monument Preservation Munich)

Abstract format: Oral

An exceptional Middle Bronze Age hoard deposited in a ceramic vessel was discovered by a detectorist in Lower Franconia but eventually recovered and subsequently excavated under laboratory conditions by authorities of the Bavarian State Office for the Preservation of Historical Monuments. The vessel contained the rich ornate of a woman, approximately dating to the 15th century BC, consisting – among other items – of six hair rings of gold wire, a bronze hair clasp, three large necklaces of amber beads and bronze pendants and rings, two wheel headed pins, several tutuli and ringlets of bronze, a sickle fragment as well as two glass beads and certain animal bones.

This talk tries to follow the various traces of the hoard's items throughout the Old World ranging from the Mediterranean to the Baltic Sea. They shed a light on long distance exchange and ritual beliefs of the Middle Bronze Age in Central Europe.

4 IN THE MIDDLE OF TODAY'S SETTLEMENTS BUT ALMOST INVISIBLE: AN INTEGRATIVE INVESTIGATION OF A MIDDLE BRONZE AGE SETTLEMENT IN SWITZERLAND

Abstract author(s): Joray, Sophia (Ur- und Frühgeschichtliche und Provinzialrömische Archäologie, University of Basel) - Brönnimann, David (Integrative Prehistory and Archeological Science (IPAS), University of Basel; Ur- und Frühgeschichtliche und Provinzialrömische Archäologie, University of Basel) - Maise, Christian (Archaeological Service Canton of Aargau; Ur- und Frühgeschichtliche und Provinzialrömische Archäologie, University of Basel) - Kühn, Marlu - Rentzel, Philippe (Integrative Prehistory and Archeological Science - IPAS, University of Basel) - Röder, Brigitte (Ur- und Frühgeschichtliche und Provinzialrömische Archäologie, University of Basel) - Doppler, Thomas (Archaeological Service Canton of Aargau)

Abstract format: Oral

Prehistoric settlements are not only the location but also the result of culturally determined actions such as everyday practices and special (singular) events. Some of these practices manifest themselves in the archaeological record, e.g. in the organisation of social space, activity areas and architecture; in the waste behaviour; in the use and reuse of resources; and thus in the distribution and preservation of objects.

The integrative research project MAGIA (Middle Bronze Age in the Canton of Aargau Integratively Analysed) aims to analyse Middle Bronze Age settlements in Canton Aargau (Switzerland). The site of Gränichen Lochgasse is a perfect research object for this purpose. Covering an area of about 10,000 m², the recently excavated settlement is the largest Middle Bronze Age settlement in Switzerland investigated to date. Around 1,000 structures were documented and 170,000 finds (mainly pottery sherds) were recovered.

The reconstruction of site formation processes is one of the first tasks that need to be tackled in order to detect and analyse the aspects mentioned above (organisation of social space etc.). For this, the focus is on characteristic settlement features such as pits, potential ovens, postholes, and piles of heat-affected stones. A theory-based, interdisciplinary approach, which incorporates archaeology, geoarchaeology (micromorphology), archaeobotany and statistics, is used. The combined results will provide information on how the settlement was structured; what daily routines were practiced; how the uses of the site developed and changed over time (from a Middle Bronze Age settlement to a probably partially abandoned Late Bronze Age site where certain (ritual) practices continued); and how the settlement was embedded in the landscape. In addition, statistical methods are used to efficiently evaluate large quantities of finds. Using these methods, the project will cast light on the dark but golden period of the Middle Bronze Age in Switzerland.

5 MIDDLE BRONZE AGE LAND USE DYNAMICS IN THE NORTH-WESTERN ALPINE FORELAND

Abstract author(s): Höpfer, Benjamin - Scherer, Sascha - Kühn, Peter - Scholten, Thomas (University of Tuebingen) - Knopf, Thomas (University of Tuebingen; Keltenmuseum Hochdorf/Enz)

Abstract format: Oral

Given that many Middle Bronze Age (MBA) settlement sites have been discovered in many parts of the north-western Alpine since the end of the last century, one of the most striking aspects of this time – apart from the funeral habits – is by now its site density. More specifically, the increase in settlement density does not only show in agriculturally favourable areas but also in harsher landscapes. As these dynamics occurred during a period of climatic deterioration, it seems clear that strictly nature-deterministic models will not be able to provide satisfying explanations.

After outlining the record in the Hegau near Lake Constance and the Western Allgäu, this talk will focus on three sites that were investigated more closely by the Tuebingen CRC 1070 RESOURCECULTURES. Anselfingen, being one of the most completely excavated settlements and an important example in the wider area, supports the notion that there were certain peculiarities in the architecture and organisation of MBA settlements in the region. Archaeopedological, zoological and botanical analyses shed further light on subsistence practices like crop farming, stock breeding and forest management, which seem to exhibit characteristics already known from the Early Bronze Age in the region, while a 2 kg copper cake fragment could be chemically provenanced to the Mitterbergrevier, showing that the area was indeed supplied from the Eastern Alps during the MBA. Around Leutkirch, we were able to confirm the age and character of a small hillfort and found evidence for a contemporary cemetery next to the hilltop, for “regular”

settlements and for subsistence farming in the adjoining valley. They show that this “unfavourable” landscape was properly settled during the MBA – possibly because technological innovations allowed for it, but maybe also because reliable, local infrastructures were a key resource in the consolidation of long-distance trade networks?

6 MIDDLE BRONZE AGE HILLTOP SETTLEMENTS ON THE SWABIAN ALB

Abstract author(s): Spatzier, Andre (Landesamt für Denkmalpflege Baden-Württemberg)

Abstract format: Oral

The Swabian Alb is well known for its burial mounds of the Tumulus culture, but little is known about MBA settlements, although there is evidence of possible habitation sites because of stray finds. Even in the regions south of the Swabian Alb our knowledge remains scarce, regarding both mineral soil and lake side settlements, since the few excavated sites have only been published as preliminary reports and not been studied in detail.

Open settlements can hardly be detected by prospection but are normally found in the course of excavations. In contrary, at fortified sites, particularly in elevated locations, preserved defensive structures and clearly defined areas facilitate purposeful field research.

The topography of the Swabian Alb, particularly its northern fringe, has excellent conditions for protected settlements on promontories and hilltops. Steep slopes provide natural protection on most sides, minimizing efforts to build defensive structures such as ditches and banks. Consequently, many fortifications dating back into prehistory are located here. A number of fortifications have been examined with cross sections since the late 1800s. However, no clear evidence for MBA hilltop settlements have been detected until now.

A project of the State Office for Heritage Management Baden-Württemberg aims to advance our understanding of EBA/MBA hilltop settlements in Southwestern Germany. Recent excavations provide evidence for a MBA fortified site in a “hidden” position neighbouring the Danube valley near Ulm. A cross section at one of the two fortifications structures yielded likely Bronze age sherds; charcoal samples the base of the bank will clarify its dating. Detector finds from the inner area exclusively belong to the MBA, confirming the supposed dating of the site as indicated by find collections mainly from the 1930s. The excavations on this site and other possible EBA/MBA hilltop sites will continue in spring 2021.

7 MIDDLE BRONZE AGE EQUALS TUMULUS CULTURE? - NEW MIDDLE BRONZE AGE BURIALS FROM SOUTHERN BAVARIA

Abstract author(s): Massy, Ken (LMU Munich)

Abstract format: Oral

Southern Bavaria was one of the main areas to define the Middle Bronze Age material culture and burial customs in Central Europe. This also led to the term “Tumulus Culture”, which is still in use today by some researchers to describe the entire Middle Bronze Age. The major issue is that most excavations were carried out in the beginning of the 20th century or before, which also explains the focus on tumuli clearly visible in the landscape. Therefore, reliable archaeological contexts are rare, especially considering the small number of Middle Bronze Age burials being unearthed in the second half of the 20th or the beginning of the 21st century.

Recent discoveries in southern Bavaria, especially in the Augsburg region, challenge the notion of a fully evolved “Tumulus Culture” invading the Early Bronze Age landscape and displace former local inhabitants or entirely replace their burial customs by introducing new beliefs. Many of the burials from the first half of the Middle Bronze Age seem to have been flat graves and not tumuli, but breaking with the habit of crouched burials in sex-differentiated orientation. One of the largest sets of radiocarbon dates in Europe from the Middle Bronze Age shed new light on the absolute chronology of Middle Bronze Age material culture. These results are complemented by ancient DNA and isotopic analyses.

8 THE MIDDLE BRONZE AGE IN SOUTH BOHEMIA: DARK OR GOLDEN PERIOD?

Abstract author(s): Chvojka, Ondrej (University of South Bohemia) - Hlášek, Daniel (Institute of Archaeology CAS in Prague) - Šálková, Tereza - John, Jan (University of South Bohemia)

Abstract format: Oral

The Middle Bronze Age (MBA) was more or less on the fringes of research interest in Bohemia in last decades. In the first place, this situation was caused by the limited occurrence of some types of attractive sites. Compared to the Early Bronze Age and Urnfield period, there are almost no fortifications or hoards of metal artefacts. Second factor was the decrease in number of tumuli graves excavations, which are still one of the main sources of knowledge of that time. In recent years, however, this situation has improved, as shown by a number of examples from the area of the southern Bohemia. In the presentation we will focus on the main issues currently related to this epoch (e.g. chronological definition, settlement structure, subsistence, analysis of metal artefacts and long-distance contacts). Thanks to many rescue excavations and research projects, a number of settlements have been explored in the last 30 years, many of which have provided essential finds important for finer chronology, long-distance contacts, subsistence strategies and the ideological sphere. A detailed evaluation of the artefacts and newly conducted research proved the existence of several MBA hillforts, hitherto dated only to the Early Bronze Age. Several burial mounds were modernly excavated and several hoards clearly from the MBA discovered. Isotopic analyzes confirmed the dominant presence of copper from Alpine deposits. From

the point of view of agriculture, we observe the onset of new types of cereals at this time (millet). According to the current state of knowledge, we can thus rehabilitate the MBA as an epoch with equally important sites, as in other phases of the Bronze Age. Undoubtedly, this is a period of cultural change, but there is no indication that these are changes for the worse.

9 RADIOCARBON DATA MODELS OF THE MIDDLE BRONZE AGE IN MORAVIA

Abstract author(s): Šabatová, Klára (Masaryk University) - Parma, David (Archaeological Heritage Institute Brno)

Abstract format: Oral

Radiocarbon dating makes it possible to bridge temporal and geographical differences and change the view of traditional themes of the Central European Bronze Age, which have long been dominated by cultural and periodization schemes. The challenge is to collect data from time periods that are underrepresented in the archaeological record, as is the case with the Middle Bronze Age in Moravia in the Czech Republic (1600–1300 BC in the local chronology), which is characterized by a change in the nature of the archaeological record. There is a distinguishable shift in the occupation pattern, which is irregular and, compared to the Early Bronze Age, the registered sites have only low representation in the archaeological record.

The objective of this paper is to briefly demonstrate the character of Middle Bronze Age archaeological sources in Moravia and, based on radiocarbon models, synchronize the early and middle stages of the Middle Bronze Age in Moravia with the development of the Carpathian Basin and the Danube Region. The set of new radiocarbon dates obtained from graves associated with the Koszider horizon enables us to describe the process of how the period begins. Sets of radiocarbon dates from settlements make it possible to demonstrate the structural change reflected in the settlement pattern.

10 THE MIDDLE BRONZE AGE IN AUSTRIA - A PERIOD OF CONSOLIDATION AND TRANSFORMATION

Abstract author(s): Krenn-Leeb, Alexandra (Department of Prehistoric and Historical Archaeology, University of Vienna)

Abstract format: Oral

The formation and establishment of the Middle Danubian Hügélgräberkultur may have covered a relatively short period of time. However, it was marked by profound social and societal changes. Among other things, this is primarily visible in the fundamental change from inhumation to cremation. At the same time, however, there is much to suggest a period of stabilisation and consolidation at various levels and structures of social life. A habitus observable beyond the region speaks for a comparable social organisation that must have been successful in creating identity. It will also have been reflected in the political structures. Some of the observed actions and processes were consolidated in the course of the Middle Bronze Age. Ritual practices are definitely part of this and they become part of mental communities. Particularly in the economic sphere, a clear professionalisation can be observed, such as in the organisation of metallurgy, especially in the extraction and processing of the raw material copper, as well as in the obviously routine distribution of the resulting bronze objects.

In the course of the extensive large-scale excavation projects of recent years, several new Middle Bronze Age features were discovered in Austria. Their comprehensive documentation allows a re-evaluation of some well-known and important contexts. On the basis of recently documented and re-evaluated contexts of features, the lecture aims to give broader perspectives on settlement, burial and deposit practices in the Middle Bronze Age in Austria on the basis of social archaeological considerations.

11 DOES THE POPULATION OF THE DEAD REFLECT THE ONE OF THE LIVING? THE CASE STUDY OF OLMO DI NOGARA CEMETERY

Abstract author(s): Cupitò, Michele - Vicenzutto, Daivid (dBC - Università di Padova)

Abstract format: Oral

The Olmo di Nogara cemetery, located in Verona plain and belonging to mid-16th - mid-12th century, represents, as is well known, one of the most important funerary contexts of the European Bronze Age. The increase in data that followed its publication and the many bioarchaeological studies carried out on the exceptional anthropological sample, has marked a turning point in the understanding not only of the funeral ritual, but also of the terramare social organization – in particular the north Po plain ones – in the 400 years of their historical trajectory. Both for reasons of time and, above all, to investigate new issues, the paper does not have the objective to frame the cemetery nor to return to the topic of the social structure. Limiting the analysis to the central phase of the Middle Bronze Age, the paper focuses on how much and in what terms the funeral population of the Olmo cemetery reflects the real structure of a terramara community lived in the chronological horizon mentioned, both in terms of quantities and of the composition by sex and age. Since the settlement referred to the cemetery is not known, the Olmo necropolis will be compared with the Muraiola terramara, also located in Verona plain. This settlement, indeed, is related to a funerary context, which is the Gambaloni cemetery. This necropolis, although only marginally known as it was investigated in the 1800s, presents the same aspects of the Olmo one, at least for the Middle Bronze Age phases. Specifically, the population estimates obtained from the funeral sample will be compared with those calculated from the Muraiola population using the housing areas. Moreover, the population data will be integrated with life tables of pre-industrial agricultural societies of the recent past.

12 SOMETHING OLD, SOMETHING NEW, SOMETHING BORROWED AND SOMETHING IMPORTED!

Abstract author(s): Mavrovic Mokos, Janja (University of Zagreb Faculty of Humanities and Social Sciences Department of Archaeology)

Abstract format: Oral

This title is a great representation of the developments in the Middle Bronze Age of continental Croatia, an area that can be divided into four smaller parts exhibiting different cultural elements. What they all have in common is a pronounced local component and an autochthonous development (something old). Due to the favourable geographical position dominated by three important communication routes, rivers Sava, Drava and Dunav, the influence from neighbouring areas can be seen in the local component (something new), while the exchange of ideas can mostly be seen in the decoration of the ceramic material – the Tumulus culture's nipple like decoration and appliques with a triangular cross-section, as well as the stamped ornament from the Szeremle group (something borrowed). It is important to note that new decorations almost always appear on the local pottery forms. The dynamic of the exchange of goods and the extent and scope of the communication routes that have branched out over the entire central Europe are best exemplified by the imported items. From amber and the Brotlaibidols, metal finds from the Koszider horizon and the Hungarian battle axes, to the imported ceramic material. Even though this is an extremely interesting and dynamic period, there are very few reliable, closed and recently excavated contexts in Croatia. Almost no analyses have been conducted, so the interpretation still depends on the typology of the ceramic material. The presentation will contain an overview of data regarding the Middle Bronze Age of continental Croatia, as well as all the challenges our colleagues face while interpreting segments of that period. The Middle Bronze Age currently seems to be providing more questions than answers. To change this, the presentation will offer ideas for their solution. Besides, science is about asking questions, isn't it?

13 MOMENTS BEYOND DARKNESS — ON THE BORDER OF GOLDEN AGES ALONG THE DANUBE IN THE MID-2ND MILLENNIUM BC

Abstract author(s): Kulcsár, Gabriella - Kiss, Viktória (Institute of Archaeology Research Centre for the Humanities)

Abstract format: Oral

The present paper focuses upon the absolute chronology of sites and social transformations which can be dated to the end of the Middle Bronze Age and the first phase of the Late Bronze Age in Hungary. The Middle Bronze Age 3 phase or the so-called Koszider period in Hungary is traditionally dated between 1600 and 1450 cal BC. This phase is characterised by the uniformisation of distinct MBA pottery styles that can be explained by the increasing intensity of contacts between communities within the Carpathian Basin, as well as by the transformation of identities. The cardinal issue in beginning of the Late Bronze Age – in correlation with the Central European Middle Bronze Age – is the appearance of the new material culture of the Tumulus culture. We can observe the transformation of metal supply, and changes in the settlement system parallel with the abandonment of the tell settlements. In order to examine the processes of the mentioned time period we will make an overview of several recent finds from the central part of Hungary, completed by new AMS radiocarbon dates from closed burial assemblages and settlements.

370 THE TANGIBLE AND THE INTANGIBLE: NEW VISTAS ON CULTURAL HERITAGE DOCUMENTATION AND MANAGEMENT

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Chroni, Athina (General Directorate of Antiquities and Cultural Heritage-Hellenic Ministry of Culture and Sports-Hellenic Republic; National Technical University of Athens-School of Rural and Surveying Engineering-Department of Topography-Laboratory of Photogrammetry) - Silver, Minna (Commission I in Application of Recording, Documentation and Information Management for Cultural Heritage in CIPA Heritage Documentation under ICOMOS and ISPRS; Virtual Archaeology Review)

Format: Regular session

The balance between the tangible and the intangible space, i.e., the physical and the virtual space, has changed in recent decades and especially in last years. This change has been accelerated by the pandemic of COVID-19, leading to a massive implementation of new technologies and approaches concerning cultural heritage management, and, consequently, museums and museology. The application of remote sensing and GIS for defining a location and carrying out monitoring and management of heritage sites using digital data, have led to a model of continuous remote management of cultural heritage, in its primal stage. Proceeding to a second stage, i.e., cultural heritage management under the perspective of its communication to the public, digital methods, including application of virtual dimensions, are also widely applied in museums, forming a framework proved to be effective in unexpected emergency situations, such as that formed by the pandemic of COVID-19, thus maintaining the thread of society's communication with culture even in a lockdown. Would this framework, characterized nevertheless by new possibilities and constraints, be the leading one in the future?

1 INTRODUCTION
Abstract author(s): Chroni, Athina (Ministry of Culture & Sports-Hellenic Republic; National Technical University of Athens) - Silver, Minna (University of Oulu)

Abstract format: Oral

Cultural heritage has an essential role concerning individuals' interaction and social inclusion, as well as economic regeneration. Unfortunately, Covid-19 pandemic crisis had a huge impact on society and economy, leading to the apparent need for reinventing the common values that connect people worldwide, thus becoming a catalyst for positive changes.

The "new normal" as shaped out has made clear that digital technologies show the way out by creating new models for scientific collaboration, developing innovative techniques for cultural heritage management and, also, proposing hybrid methodologies for social involvement.

Remote sensing, GIS, virtual reality, as alternatives for an integrated cultural heritage management system, combined with open access procedures for sharing access to an extraordinarily rich offer of cultural content, form only a part of new technologies' vast universe, the rational use of which could effectively contribute to safeguarding and promoting cultural heritage and its inherited systems of values and cultural expressions as part of the shared commons, while giving it a central role in the life of societies. Cultural infrastructures, such as museums and other cultural facilities, should be used as virtual civic spaces for dialogue and social inclusion, thus fostering social cohesion.

Nevertheless, the aforementioned framework is characterized by new possibilities and constraints as well: people's community has gained indefinite access to the intangible; on the contrary, the society has been deprived of the tangible. Preserving the social fabric and maintaining economic stability, should form our priority in the near future. Widening cultural horizons, invigorating scientific cooperation worldwide, reinforcing and restoring the democratic dimension of culture, should be the ultimate goals.

2 IOANNINA 1430-1913: LINKING THE TANGIBLE TO THE INTANGIBLE. "IASIS"- INTEGRATED SYSTEM FOR REMOTELY MANAGING AND ACCESSING CULTURAL HERITAGE
Abstract author(s): Chroni, Athina (Ministry of Culture/Hellenic Republic; National Technical University of Athens) - Georgopoulos, Andreas (National Technical University of Athens)

Abstract format: Oral

The specific paper forms part of the Postdoctoral Research Project, implemented by A.Chroni and supervised by A.Georgopoulos, focusing on Ioannina city's, Greece, Ottoman period (1430-1913) and its multicultural profile as depicted in buildings, public or private, religious or secular, conventional or more elaborate, i.e., cultural heritage that survived in the collective memory of the city.

Unfortunately, Ioannina has undergone major alterations of its urban web. Tracing the pluralistic physiognomy of the city, studying the osmosis of its three cultures, Christian, Jewish and Muslim, and figuring out the related cultural palimpsest has been the great challenge of the specific research project.

The 3D digital approach for certain landmarks of the city as well as the development of an integrated system for monitoring, documenting, protecting and highlighting cultural heritage have formed the main axis of the project, which, under the perspective of a cultural heritage-open access approach, is offered as an open access digital product, via a participatory interactive web-based platform (IASIS: <https://athinachroni.wixsite.com/my-site-1>), a virtual museum (IOANNINA, 1430-1913: <https://www.artsteps.com/view/5feca5aafe659e68d58a48c8>) as well as via QR tags set at the physical sites where the landmarks used to stand, furnishing information and proposing cultural walks in the city, in order to activate, primarily, the local community in the direction of participation in culture and in matters of preservation of cultural heritage, thus reinforcing and restoring the democratic dimension of culture and, also, proposing innovative techniques for safeguarding cultural heritage, maintaining the thread of society's communication with culture even in extreme situations, like the COVID-19 pandemic, rebuilding our societies and economies and, finally, conveying a message of solidarity, hope, and unity.

3 FROM TANGIBLE COINS TO INTANGIBLE LOST HERITAGE: THE ROLE OF NUMISMATIC EVIDENCE IN RECONSTRUCTING LOST MONUMENTS
Abstract author(s): Denker, Ahmet (-)

Abstract format: Oral

Lockdown situation enforced by the pandemic of COVID-19 has created an unexpected challenge to maintaining the link of society with cultural heritage. The digital technologies have the potential to liberate the historical sites and museums from the strict limitations of unexpected emergency situations like today. The success of the digital technologies in this context depends on their ability in invoking the awe of the real and authentic site. Very relevant to invoking the awe of lost monuments by using digital technologies is the relationship between the ancient architecture and the numismatic images. Ancient coins provide valuable evidence in reconstruction of the lost monuments from which have remained only foundation stones. This paper reflects some reconstruction efforts of the author for which coins were indispensable sources of the superstructures, the most vulnerable parts of the monuments. The

coins to be discussed in detail in this paper were issued by the cities of the Roman Empire in Asia Minor. The importance and fascination of the coins became at once apparent when we try to reconstruct some of the most difficult temples of the Aegean basin: temple of Athena at Troy, temple of Trajan at Pergamum, Temple of Artemis at Magnesia, and finally the temple of Artemis at Ephesus (one of the seven wonders of the ancient world.) The commemoration of these temples on the Roman coinage has left us an impressive inheritance concerning some of the greatest achievements in the history of architecture. The utilitarian function of ancient coins is shown to be worthy of a place in architectural history. Thanks to 3D reconstructions of four lost temples which are presented here, with the help of the ancient coins, the modern viewers perceptually may experience them as the viewers in their hey days.

4 INFORMATION SYSTEM OF IBERIAN POTTERY FOR RESEARCH, TEACHING AND DISSEMINATION
Abstract author(s): García-Fernández, Ángel-Luis (Instituto Universitario de Investigación en Arqueología Ibérica. University of Jaén) - Valero-Domenech, Miguel-Ángel (University of Jaén) - Fuertes-García, José-Manuel - Lucena-López, Manuel-José - Molinos-Molinos, Manuel (Instituto Universitario de Investigación en Arqueología Ibérica. University of Jaén) - Moreno-Padilla, María-Isabel (Departamento de Geografía, historia y humanidades. Universidad de Almería; Grupo Patrimonio Arqueológico en Jaén - HUM-357) - Ogayar-Anguita, Carlos-Javier (Instituto Universitario de Investigación en Arqueología Ibérica. University of Jaén)

Abstract format: Oral

Pottery is one of the most common find types in many archaeological excavations. The analysis of pottery allows us to understand the evolution of the technology or the commercial relationships among cultures, as well as other interesting topics like the eating habits or the relationship with the environment and other issues related to religious and symbolic patterns. The systematic processing of the ceramic materials is therefore of major importance in the archaeological study. In addition, allowing open access to these materials for the general public greatly helps the dissemination of the discoveries.

In this work we present the results of a one-year project intended to develop a web platform to allow researchers, students and the general public to access the Iberian pottery collection from the Research Institute of Iberian Archaeology of Jaén (Spain) without the need to physically be at the Institute facilities. With this tool, users can browse through the pieces, read about their main features, explore images and 3D models, apply filters to their searches and study the spatial distribution of the materials over the archaeological sites where they have been found. Moreover, the system is also intended to promote debate among the academic community, allowing registered users to propose and discuss changes on the record data. This way, the community contributions will greatly help to improve the quality of the information.

One long-term goal of this project is to provide researchers, students and the general public with a unified, well-founded repository of Iberian pottery, freely available for those interested in the topic. Therefore, registered users from all over the world are also allowed to submit new records with pieces from other Iberian archaeological sites.

5 IS DIGITAL ENGAGEMENT THE "NEW NORMAL" OF POST-CRISIS MUSEUMS? REFLECTIONS FROM THE FINNISH MUSEUM LANDSCAPE
Abstract author(s): Hamari, Pirjo (Finnish Heritage Agency; University of Helsinki)

Abstract format: Oral

As the COVID crisis hit the museum community, many institutions were forced to close their doors to visitors. In the absence of audiences on-site, many museums turned to increased digital means in their audience engagement activities. The drive behind such efforts lies not only in the need of museums for continued contact with customers, but also in the more profound need to ensure access to culture, something seen as the fundamental right of all citizens especially in times of crisis.

This paper explores the different scales of approaches museums in Finland selected for their digital outreach activities as a response to museum closures, from simple web presences to more advanced means of presenting digital heritage content. It discusses the added value of the approaches used and considers what these approaches tell us about the capacity of the sector to broaden its audience engagement in the digital dimension. Finally, it reflects on the sustainability and the transformative power of the new digital audience engagement "movement" – is this how the "new normal" for museums looks like?

6 MOVING OUT -THE PUBLIC (RE-)DISCOVERS CULTURAL HERITAGE GEMS
Abstract author(s): Nilhamn, Bonnie (Helsinki University)

Abstract format: Oral

The covid-19 crisis has been hard on the European museums even forcing them to close down temporarily. There are however some museums that have coped better with the situation than others. Many of these are situated far away from the busy cities and located on the countryside. Another feature that they share is that they incorporate the environment around the museum as part of their story which makes it easier to design new, Covid-19 proof, museum products. Not only visiting the museum, but also the surroundings, becomes part of the heritage experience. One good example of this are the Dutch museums that are connected to The Hollandse Waterlijnen HWLs (Old and New Dutch Waterlines), which combined make an 85 km long a military defence line. The lines were constructed between 1629- 1815 and 1815-1940 respectively. The HWL runs from Fort Naarden to Fort Steurgat in the Biesbosch in order to keep out enemies from the administrative and economic heart of the Netherlands - Fort Holland, by controlling flooding of a chain of inundation fields to a depth of up to a metre. This would have been enough deep to fence off horse chariots

and even panzer vehicles but too shallow for ships. The military air force soon outdated the effectiveness of the HWL. Nowadays the area around the fortresses and castles is protected landscape and part of the Dutch Cultural Heritage and nominated for the UNESCO World Heritage. Use of GIS has frequently been part of the strategy to open up the knowledge of the HWL and make it displayable and accessible for the public.

7 SAVING MEMORY BY INDUSTRIAL ARCHAEOLOGY DOCUMENTING AND PRESERVING A CARPENTRY AT THE MUSTIO CASTLE IN FINLAND

Abstract author(s): Silver, Minna (University of Oulu) - Silver, Kenneth (Wallon Society in Finland)

Abstract format: Oral

Memory refers to an intangible concept. Industrial heritage is rapidly disappearing and a lot of memory along with it is vanishing, if we, who are living periodically so near and surrounded by it overlook the importance of its preservation. The field of industrial archaeology entails the study of material industrial heritage using historical, architectural and archaeological inquiries. In Nordic countries mining industry was started by constructing ironworks often associated with a manor and a workers' village. In Finland mining and ironworks were initiated by the King of Sweden, when Finland was under Sweden. Many such sites have been under historical, architectural and archaeological investigation leading to further documentations. The ironworks at Mustio was first established at rapids providing energy in Southern Finland already in the 16th century. The carpentry of the castle producing building materials such as windows and doors is situated in the neighbourhood but its production ceased in the 1950-1960s. The protected industrial building representing Nordic vernacular architecture housed machinery from the late 19th century and the beginning of the 20th century was used as a storehouse but had deteriorated by the 2010s to such an extent that it needed a speedy rescue operation. In 2019-2020 laser scanning, photographing and manual drawing were carried out to document the wooden building and machinery in situ as well as some products. In the same time the roof and the windows of the building were restored following traditional methods. The machinery was donated to be saved at a museum collection, so although in another location, it is tangibly preserved. The paper presents the process of documentation and preservation of the described industrial site conserving it tangibly, and intangibly by laser scanning and image-based methods.

8 INTEGRATED TRITON SHELL USE DOCUMENTATION

Abstract author(s): Chroni, Athina (Ministry of Culture/Hellenic Republic; National Technical University of Athens) - Karali, Lilian (National and Kapodistrian University of Athens; Novosibirsk State University)

Abstract format: Oral

The study of the past is articulated on three main axes: locating and documenting archaeological relics in order to interpret them and their role in past societies. In recent years, digital methods combined with archival procedures and, also web-based platforms have gained an important role in the field of cultural heritage documentation, while open data is becoming more and more the leading scientific trend.

The introduction of IT systems operating at cultural institutions shows the need for harmonization of the different systems to enable communication and data exchange. This is achieved through the use of standardized models and controlled vocabularies that are being developed, often on a global scale, while GIS applications contribute in tracing and interpreting connections between various locations, thus figuring out trading routes and, consequently, economic and political relations.

The large number and typology variety of Triton sp. shells, of various cultural periods, calls for a fast, efficient way of documentation while ensuring the scientific character of the procedure and the possibility of information exchange and communication between the scientific communities.

Under this reasoning, designing a GIS database, for the digital documentation of Triton sp. shell trumpets or other objects of everyday, practical or symbolic use in the Aegean world in antiquity is considered to be indispensable for better comprehending the social, economic, political, symbolic and, also, environmental context of our past, as well as efficiently overcoming unprecedented crisis like the one caused by the COVID-19 virus, by proposing digital technologies for cultural heritage documentation, thus linking the tangible to the intangible and restoring scientific cooperation worldwide.

9 OBELISKS AS GLOBAL HERITAGE? – MAPPING THE OBELISKS OF CHINA

Abstract author(s): Langer, Christian (Peking University)

Abstract format: Oral

This paper introduces the understudied monument group of Chinese obelisks, hitherto ignored by Egyptology due to an inherent western bias. Based on ongoing research into the transmission of the obelisk to China as a concept and form in modern Chinese commemorative architecture, the monuments are framed as both tangible and intangible global heritage. The benefits of remote sensing and GIS for mapping their distribution, posing specific questions to the dataset, and conservational issues are discussed on several levels. First, remote sensing and inputting resulting data in a GIS allows us to gauge the distribution and prevalence of obelisks not only in Chinese landscapes and commemorative culture but also beyond that. Complementing the Chinese and wider eastern Eurasian data with the well-known western dataset enables us to gain an understanding of the truly global prevalence of obelisks and their possibly constituting a global heritage that transcends time and space, where obelisks are both means and ex-

pression of a global exchange of ideas. This leads to a raised awareness of obelisks as a viable category in cultural heritage. Second, remote sensing here constitutes the combination of using various internet resources together with e.g. Google Earth to establish the existence of individual monuments and then locate them, enabling the input of information in a GIS for further visualizations and analyses. Third, GIS can ultimately be used to assess the potential of obelisks to become heritage at risk. Related questions are whether they are worth saving or can be saved at all; questions that will come up in the context of climate change and China's rapid development, for instance in the Pearl River Delta. Such work is advantageous when field research may not be possible during crisis, e.g. due to a pandemic, although data collection also has its limits under such circumstances.

10 “SPHINX”- SYSTEM FOR THE PROTECTION OF HERITAGE. INTANGIBLE AND NATURAL RESOURCES

Abstract author(s): Paraskeva, Dimitra (NTUA)

Abstract format: Oral

The pandemic plague that has spread throughout the world has also affected our society in all levels, among which our correlation with the cultural-archaeological heritage.

In context of my Doctoral Thesis, an attempt was made to create an innovative system called “SPHINX” for the management of intangible and natural cultural heritage implemented in the region of Boeotia in Greece. This system is a particularly valuable methodological project both for the field of research and for any other area where SPHINX will be applied. This research revealed a very important aspect of Boeotia, its global uniqueness, and in particular its cultural virtues, that are clearly incomparable with any other similar global features, i.e., the prominent Lavdakid circle, one of the two pillars of Greek Mythology and Drama.

The process of mapping was used for the development of the innovative SPHINX system. The system is mainly based on superimposing one –or more- maps on top of one another and constitutes a continuous search of landscapes that, as dynamic and timeless fields of cultural inscription and manifestation, seek their enhancement and interpretation within the sphere of meanings and symbols. The process of compiling maps can bring up, through the projected concept of palimpsest, the continuously vibrating images of the boeotic, in this case, landscape through the complexes of multilayered dynamic topological systems and networks inscribed on holographic surfaces.

The possibility of creating an innovative digital database in order for the SPHINX system to be managed by the general public is noteworthy. This will facilitate on-site and remote monitoring of cultural heritage, broadening human prospects due to the fact that SPHINX is an innovative idea that combines the past with the present seeking a bright future with the ultimate goal of widening human horizons.

11 PHYSICALLY CLOSED, DIGITALLY OPENED: THE CASE OF GREEK ARCHAEOLOGICAL MUSEUMS IN COVID-19 ERA

Abstract author(s): Xiradakis, Polyna - Karkazi, Elli - Papatheodorou, Anna - Chourmouziadi, Anastasia (University of the Aegean; Museolab)

Abstract format: Oral

During the last decades, too much discussion and effort took place regarding museums' digital dimension. However, recently, due to the covid pandemic, the digital interaction between museums and their audience was not an option; it was the only way forward. But how did Greek Archaeological museums respond to this crisis? To answer this question, 'Greek Museums Facing Covid-19' research project was launched. The research focused on whether the 131 Greek Archaeological museums were ready to have a satisfactory digital presence during the closure of their physical activities. We examined whether the museums addressed digitally the lack of visitors in their everyday agenda. The paper focuses on what the archaeological museums offered to the public and how they digitally published the archaeological information. For the data collection, the Hellenic National Cultural Portal 'Odysseus', was used. The data were organized in categories in relation to their digital activities (announcements, multimedia, live streaming, etc). The quantitative research results were examined and a correlation between Lockdown-1 to Lockdown-2 was implemented. Was the transition to digital reality enough to create a positive stance towards the publication of archaeological material? Did archeological objects, in their digital entity, function as narrative tools or was there a regression to an outdated exhibition perception? Were digital objects treated as 'distant exhibits' or the new ontological digital transcription was capable of creating a new reality in terms of access, management, and/or interpretation? Maybe, this is the moment for museums to use their digital world not just as a way to advertise their collections, but as a chance to create alternative ways for presenting the archaeological information, focusing on multiple narratives and interpretations of their exhibits. In the digital sphere there is enough free space for all these procedures and for the active participation of the broader audience to take place.

A. GREEK MUSEUMS ADJUST TO DIGITAL REALITY. LEARNING (?) BY DOING

Abstract author(s): Karkazi, Elli - Xiradakis, Polyna - Papatheodorou, Anna - Chourmouziadi, Anastasia (University of the Aegean; Museolab)

Abstract format: Poster

The unexpected covid-19 pandemic crisis called Greek museums to action digitally, as a response to their mandatory closure. Inevitably, rapid adaptations and relative adjustments were imperative. In this climate of dramatic change, Greek museums had the ideal

opportunity to enter the Digitocene Era. Our research is addressing the question of how Greek museums used their digital tools to engage with their visitors, further shedding light on the ways they met the challenge of Covid-19 lockdown. In order to answer the research questions we referred to the Hellenic National Cultural Portal 'Odysseus', which has been developed by the Greek Ministry of Culture. Data have been retrieved from the 'museums unit' of the portal, including 271 Greek museums. We focused on the first covid-19 lockdown period in Greece, namely from March the 20th until May the 4th 2020. On the basis of data retrieved, it has been evaluated whether the pre-existing digital ground was adequately solid and fertile to build up an integrated digital experience, furthermore whether digital content could function independently and self-sufficiently as a substitute for physical visits.

373 SOCIAL INTERACTION IN HERITAGE ENVIRONMENTS

Theme: 6. Material culture studies and societies

Organisers: Scutt, Win (English Heritage) - Wilton, Antje (University of Siegen)

Format: Regular session

This session invites contributions that investigate how people interact with each other and with the material space and objects around them in a heritage environment, both original and reconstructed. These environments can be landscapes or built environments that have been shaped by past societies - such as a ruined abbey, a stately home or a prehistoric field system; or they can include environments that have been reconstructed on the basis of archaeological evidence, such as a roundhouse or a Roman fort.

A number of disciplines and sub-disciplines, including social interaction research, social archaeology, spatial archaeology and landscape archaeology, recognise space and its materiality as a socially relevant dimension. In social interaction research, one of the important tenets is that face-to-face social interaction is situated in the material environment. This so-called 'anchoring' involves actions of co-orientation, co-ordination and co-operation. Any architecturally designed space provides cues to people as to which type of social activity can be, or is likely to be, anchored in it, and people learn to interpret those usability cues as part of their cultural socialisation.

Contributions to this session should help to shed light on how people today interpret the properties of past spaces as a resource for particular types of social interaction. We invite papers that offer case-studies or methodologies for the systematic investigation of social action and interaction in heritage environments. For instance, how do guides and visitors interact with each other, the architecture and the features and objects within? How do modern appropriations of heritage environments inform us about potential past space interpretations and usage? Furthermore, a systematic analysis of social interaction patterns may have applications for the heritage sector in the design and interpretation of heritage spaces.

ABSTRACTS:

1 HERITAGE INDUSTRY, POST-NATION AND MATERIALITY: AN ARCHAEOLOGY OF ARCHAEOLOGY

Abstract author(s): Kulenovic, Igor - Igljic, Sara (University of Zadar)

Abstract format: Oral

There is no shortage of archaeological literature discussing various aspects of entanglement between archaeology and the nation. As a matter of fact, the constitution of archaeology as a specifically modernist discursive formation is impossible to imagine outside the wider processes of modernity. The common approach taken in this body of literature is to demonstrate how past-related discourses were mobilized to achieve various goals ranging from nation-building and claims for authenticity to more extreme examples of territorial claims and extermination of whole populations. In this presentation, I will take a different approach. Rather than concentrating on discursive aspects of uses and abuses of the past, the main focus will be on the very materiality of archaeological remains and how they were mobilized to constitute various subjectivities. Drawing on various strands of more-than-representational theory, I will attempt to demonstrate how archaeology and the affordances of material remains it produces were mobilized in completely different contexts during a span of roughly fifty years. The content of this transformation is that archaeological remains are no longer mobilized to constitute a spatial setting for the constitution of subjectivity based on the modernist liberal consensus but rather now operates in the vague space of heritage industry, oriented almost exclusively towards tourism. The case study used to elaborate on some of these issues will be Zadar, a mid-sized coastal town situated at the Adriatic Sea in Croatia.

2 NEW APPROACHES FOR OLD SPACES. USING 3D RECONSTRUCTIONS AS CONVERSATION TOOLS WITH STAKEHOLDERS

Abstract author(s): Loy, Aida (Leiden University)

Abstract format: Oral

For my thesis project, I created a 3D model that represented the ideal reconstruction of an Iron Age hillfort in Coaña (Asturias, Spain). This model was created after the collection of all the archaeological data from the site and some information from nearby similar hillforts. The measures and decisions were made following the most plausible reconstruction.

With this model, I then approach different groups of stakeholders of this archaeological site to start a conversation about the hillfort.

It was important to get to know the benefits and problems the stakeholders perceived in the creation of these models. And how, they could create a conversation between groups.

With this project I wanted to show the people as many archaeological data about the site as I could within the model, but, at the same time, to know their opinion not only about this model in particular but in the heritage management within this site and other similar to it.

3 EXPLORING A HERITAGE ENVIRONMENT DURING A GUIDED TOUR: A MULTIMODAL SPACE-BASED INTERACTION ANALYSIS

Abstract author(s): Wilton, Antje (University of Siegen)

Abstract format: Oral

This contribution reports on a pilot study as part of a larger project that plans to explore how people socially interact in and with an environment that is characterised by "pastness", i.e. by architectural structures and objects that have been created by a society that is no longer existent or that have been remodelled in the present according to historical and archaeological evidence. The pilot study investigates the relationship between architecture and the interactional space during a guided tour in a Neolithic house model. It draws on three theoretical traditions and fields of investigation which share an interest in the appropriation of space and its materiality as a socially, institutionally and educationally relevant dimension. These fields are social interaction research, archaeology, and museum studies.

The study presented here is a qualitative study with a selected group of people and uses video-based interaction analysis as an observational approach documenting the process of people moving through and interacting in a heritage environment. The architectural structure consists of a Neolithic house in construction on the grounds of a World Heritage Site which is in the process of being turned into an archaeological park.

The analysis shows how participants in the guided tour systematically incorporate the material environment in the sequentiality of their interactions both as a space to be used and a space to be viewed. Furthermore, the data reveals how participants manage to incorporate embodied and sensual experiences in their exploration of the environment, without breaking away from the interactional format of a guided tour that is primarily focused on reflective (cognitive) activities.

4 IMPROVING SOCIAL INTERACTION AND ENGAGEMENT ON HERITAGE SITES

Abstract author(s): Scutt, Win (English Heritage)

Abstract format: Oral

This presentation will examine how a heritage site can be evaluated in terms of its affordances to visitors. An interpretation scheme for a heritage site involves devising an experience for visitors. While many such schemes focus on the visitors' cognitive experience - on what they might learn and understand about the site's archaeology and history - there is also an opportunity to create a social and emotional experience.

The motivation to visit a heritage site is more than just a wish to learn about the past. It can be born of a wish for a day out with friends or family, or to sense physically and emotionally a new environment.

In designing interpretation schemes for heritage sites, it is important to understand how we want visitors to navigate and engage with the site. This does not mean that we must always rigidly control the visitor journey, although this will be desirable on sensitive sites. But we do need to be aware how our scheme will offer opportunities for social and individual experiences.

This paper will summarise a study that aims to assess the potential to improve social interaction and engagement on heritage sites. A methodology is proposed for assessing the opportunities afforded by the pathways and points of interest within a site to different group profiles. Then, we shall apply the methodology to sites in the UK such as Tintagel Castle and suggest how we might alter the design of the sites to afford new embodied experiences.

5 THE ARCHAEOLOGY OF THE POST-MEDIEVAL RURAL HOUSE: CHALLENGES AND APPLICATIONS FOR A CULTURAL HERITAGE IN THE MAKING

Abstract author(s): Bizzarri, Giulia (Università degli Studi di Genova)

Abstract format: Oral

When looking at European approaches to the post-Medieval rural house as cultural heritage, archaeological methods have been involved very differently, going from an integration of archaeology with other disciplines studying the rural house (e.g. cultural anthropology, ethnology, geography) in some research contexts to an almost inexistent contribution in others. Specific aspects to the archaeological study, such as the focus on materiality and context, and the interest for the historical dimension of artefacts (material culture and built environment) allow to delve deeper into researching the specific cultural, social and economic settings within which a house was built, modified or abandoned, and the various ways, through which individuals interacted with these buildings. This contribution will give an overview of different approaches to the heritage management and heritagisation processes of the post-Medieval and late Modern rural house across different European examples. The study will look at historiographical developments concerning the interest toward post-Medieval rural contexts and buildings, providing a background to the approaches to the study of rural houses and their recognition as cultural heritage. The author will then analyse and argue for the specific potential

of archaeological methods within heritagisation processes. Case studies and examples will draw from research and projects from different countries across Central (Austria, Germany), Southern (Italy, Spain) and Atlantic (United Kingdom) Europe, exploring the connections between theoretical approaches, national and/or international policies and public perception of rural built heritage in different contexts (museums, parks, exhibitions). The study seeks to evaluate how the present or absent contribution of archaeological methods has influenced the making of heritage in these spaces, and how differently the wider public, and the various social groups and identities that are to be found within it, has interacted with these contexts, also considering challenges and future possibilities of approaches and responses to this specific cultural heritage.

6 NOTHING TO BE SEEN... FORCED LABOUR ON THE TEMPELHOF FIELD IN BERLIN 1940-1945

Abstract author(s): Misterek, Kathrin (Freie Universität Berlin)

Abstract format: Oral

How do we remember events whose material reminders we do not see? What if other events' material manifestations dominate both the physical and the memory space?

Today, the Tempelhof Airfield in Berlin is a vast recreational area. Since 1722, it had been a parade ground for the Prussian Army, a test ground for military aviation and a civil airport. During the Nazi period, thousands of people from several European countries were imprisoned in three large barrack camps on the airfield and forced to work for the armaments industry. 1945-1993, the airfield was used by the US Air Force and, 1951-2008, as a civil airport as well.

Most people in present-day Berlin remember the airfield as the focal point of the Berlin Airlift in 1948/1949, when airplanes of the Western allies supplied the West-Berlin population, and as the "gate to the free world" during the Cold War. The airfield's Nazi past, however, is barely known. In part, this results from the multiple layers of memory and meaning ascribed to the airfield for its post-war significance, but in part also from the lack of representation and visibility of the Nazi crimes, since the barrack camps were entirely demolished after the war.

During an international workshop with young adults in 2018, we temporarily marked the outline of three former barracks in order to see how reconstructing the physical scale of the barracks may stimulate visitors of the airfield to engage with this forgotten history and foster conversations about the systematic nature, the ubiquity and visibility of Nazi crimes. Based on this workshop, I propose to create a new visibility by building landmarks and to employ the multivocality afforded by the structures still visible today, thus changing the layout as well as the interpretation of the espace perçu (see Lefebvre's "La production d l'espace").

7 THE CHURCH OF OUR LADY OF ITRIA: THE HISTORICAL SPACE AND ITS MATERIALITY IN THE TERRITORY OF SELEGAS (SARDINIA)

Abstract author(s): Soddu, Ottaviana (archeologo libero professionista)

Abstract format: Oral

The objective of this contribution is the synchronic and diachronic reading of the forms of territorial occupation in a portion of the countryside of Selegas (Sardinia, Italy), which is of great historical interest due to the presence of a small medieval church that reuses Roman masonry in opus latericium and opus listatum and for the discovery in 1935 of the largest and most well-known Neolithic female marble statue in Sardinia, "the Mother Goddess of Turriga" exhibited at the National Archaeological Museum of Cagliari.

The church dedicated to Our Lady of Itria, much venerated by the community until the twentieth century, is located outside Selegas town in an area characterized by flat areas and gentle and fertile hills.

The study, conducted through the integration of written and oral testimonies, the analysis of cartography and aerial photos, and surface research, highlighted very numerous archaeological presences, evidence of a territory inhabited and used by people since prehistoric times, particularly including structures and materials from the Nuragic, Roman and medieval periods. The data provided by material culture, landscape, social archeology, documentary and cartographic sources show how people have interacted with each other, with the "historical space" and how the landscape was shaped over the centuries.

375 ARCHAEOLOGY, LANGUAGE AND LANDSCAPE

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Klir, Tomas (Charles University, Faculty of Arts, Department of Archaeology) - Zschieschang, Christian (Serbski institut – Sorbisches Institut, Wótnožka za dolnosorbiske slěženja – Zweigstelle für niedersorbische Forschungen, Chóšebuz – Cottbus) - Jansens, Nicolas (Heidelberg University, Institute of Slavic Studies; Charles University, Faculty of Arts, Department of Archaeology)

Format: Regular session

The investigation of geographic names against a background of archaeological knowledge is an important field of inter-disciplinary research. The toponymic systems of the past and their remnants, as preserved in historical written sources, inform us about many aspects of the life of former human communities within their respective environments; in particular, (i) the language, social system and economy of initial settlers, (ii) the transfer of information about the landscape and economic resources between human groups

in periods of language- and cultural contact, (iii) the meaning of a given landscape for its inhabitants. Linguistic findings pertaining to these aspects can contribute greatly to archaeological research.

We would like to bring together such interdisciplinary research approaches from various parts of the world. Thus, we welcome papers on the issues of colonization of unfamiliar landscapes, settlement expansion and the phenomenology of landscape and language contact, especially if they combine archaeological and linguistic sources.

ABSTRACTS:

1 NAMING HILLS, CREATING LANDSCAPES: AN APPROACH TO THE SOCIAL CONSTRUCTION OF THE MALDONADO HILLS, URUGUAY

Abstract author(s): Aguirrezábal, Diego (LAPPU/FHCE/UDELAR)

Abstract format: Oral

This presentation seeks to show how, from the investigations carried out in the Sosa hill range, in the department of Maldonado, Uruguay, various historical processes of invisibility and concealment are revealed at a political, economic and social level. The results of these investigations, have revealed both tangible and intangible elements of the exercise of power at various levels. The environmental context of the range of hills in the east of Uruguay, is especially particular, for its articulation between chains of hill ranges to extensive plains that are mixed with lowland environments and sea coast. In this context, the Sosa hill range stands out for the development of specific processes for the formation of natural rock shelters, which have been used by human groups for at least 7500 years. This extensive process of occupation and the social construction of this landscape, has material manifestations of a complex heterogeneity, inside and outside the shelters. Despite some approaches made by amateurs at the beginning of the 20th century, this evidence had not been previously taken into account by teams of archaeologists in almost 50 years of development of the profession in Uruguay. This produces an invisibility of certain ways of constructing and controlling this territory, in a material and a symbolic way, despite the important evidence that existed in nearby regions such as southern Brazil, Buenos Aires Province, or Patagonia and the abundant indigenous toponymy. Also, this approach to the occupations of the eastern hill range shelters, allow to interpret other social processes, from the first occupations until the contact with the European empires. The articulation of the archaeological evidence together with ethnohistorical documentation allows us to analyze territorial control strategies and to know the historical and colonialist processes leading to invisibility of the pre-Iberian socio-cultural roots in the region.

2 BETWEEN THE PLACES OF FLORISTS, ARCHERS, FEATHERS AND STONES. REINVENTING THE SIGNIFICANCE OF TETZCOTZINCO IN THE PRE-HISPANIC ACOLHUACAN

Abstract author(s): Prusaczyk, Daniel (Institute of Iberian and Ibero-American Studies, University of Warsaw)

Abstract format: Oral

The study of indigenous toponyms in the area of Mexico is an important element of linguistic studies, especially on the pre-Hispanic Nahuatl language. Mexican place-names are sometimes used in archaeological research and can provide a variety of information about the Mesoamerican history, worldview or religion.

The toponyms occurring in the area of Acolhuacan (the eastern part of the "Aztec Empire") seem to be particularly interesting. The study of place-names in this region is especially important in areas where modern buildings do not allow access to archaeological materials. Analysis of local, indigenous toponyms expands our knowledge about Acolhuacan and helps us understand its history.

The study of such toponyms allows, among others, for a better understanding of the function of the famous site of Tetzcotzinco and its relationship with the rest of the region. Thanks to such analysis, it is possible to understand the archaeologically elusive significance of Tetzcotzinco and other places located within the local network of roads and aqueducts. The study of place-names seems to provide a wealth of information about their pre-Hispanic trade, crafts, landscape and even the history of local rulers. Toponyms can also help us understand the genesis and history of Tetzcotzinco and its relation with Acolhuacan's capital, Tetzcooco.

The main goal of this paper is to present interdisciplinary research on the role of Tetzcotzinco in the pre-Hispanic landscape and an attempt to understand the network of relationships between this place and other settlements in Acolhuacan. The proposed paper will present the results of various studies, including archaeological documentation, studies of pre-Hispanic maps and colonial documents, landscape archeology, and historical and geographical analyzes. As a result of the aforementioned research, we also work on the GIS database which will present a hypothetical network of political, commercial and economic ties around Tetzcotzinco and the city of Tetzcooco.

3 THE ALVA STRA PILE DWELLING: A NEOLITHIC SETTING FOR THE COLLECTIVE FEMALE DEITIES, THE DÍSIR

Abstract author(s): Battaglia, Frank (College of Staten Island/ City University of New York)

Abstract format: Oral

Receiving sacrifices until the 10th century, and giving name to Swedish assemblies until the 13th, dísir were significant Scandinavian deities. Late texts report them as guardians of individuals or families.

Place-names establish their plural-identity and antiquity. Five Disin, 'meadow of the dísir,' place-names of Norway designated a location for prehistoric public worship. All occur in the Oslofjord area, the only Norwegian region with Neolithic megalithic tombs. They may encode a religious system derived from that period's Funnel Beaker culture (FBC), the earliest Neolithic culture of the northern European plain and Scandinavia. Díis- place-names of Sweden also occur in areas where the FBC developed, although Swedish evidence is more complicated. Three different cultures occupy the middle Neolithic of Scandinavia – one or more speaking a proto-Indo-European dialect. At least two and perhaps all three may be involved in Swedish díis- place names.

Disevid in Östergötland provides a dramatic location with megalithic tomb and a remarkable well-studied watery site. On platforms built over a natural spring mire – the Alvastra Pile Dwelling, created while the nearby dolmen was in use – seventeen families from two lineages shared a late summer religious festival during a fifty-year period. Later the dwelling was used for exposure of the dead. If the place-name 'sanctuary of the dísir' should be associated with the pile dwelling – a modern excavator thought local mists give a sense of "sanctity" – it and the nearby dolmen were part of the religious system of the dísir.

The concept of the dísir, I suggest, emerged to represent the ancestors of matri-lineages who built the monumental tombs of the Neolithic, producing over time the idea of powerful female forbears looking out for family trees. This derivation explains congruences with the cult of the matres "or, more precisely, the cult of foremothers.

4 PLACE-NAMES, LANDSCAPE AND ARCHAEOLOGY IN THE RECONSTRUCTION OF THE WEST SLAVIC EARLY MIDDLE AGES

Abstract author(s): Zscheschang, Christian (Sorbisches Institut, Zweigstelle für niedersorbische Forschungen)

Abstract format: Oral

Already for many decades onomastic research has made contributions to the reconstruction of Slavic and German settlement history by indicating certain areas of early settlement. The methodological background expands upon the fact that there are a number of types of place-names that have a rather archaic character. In many cases, these names cluster significantly in certain regions. Such onomastic landscapes can indicate early medieval areas of Slavic settlement. Often, but not everywhere, they correlate with the spread of archaeological finds deemed connected to early Slavs.

This method should not be applied mechanically, but requires careful consideration of extra-linguistic circumstances, and the limitations of statistical significance should be observed. Furthermore, a comprehensive linguistic analysis of the totality of place names is an essential requirement for area studies. Moreover, it is possible also outside of the Slavic language area to chronologically classify place names in a similar way.

Minor place names (or field names) offer still deeper insights into the landscapes of the past. They refer to certain features of the natural and cultural landscape, e.g. to locations of deserted settlements. As a general rule, every analysis of an archaeological excavation or survey should be accompanied by an onomastic study!

All mentioned aspects will be discussed by means of several examples from East Central Europe on the basis of more than 20 years of onomastic research in multi-disciplinary projects.

5 DIGGING ON THE EDGE. THE EARLY HISTORY OF THE POLISH-RUTHENIAN BORDER ZONE

Abstract author(s): Woloszyn, Marcin (Institute of Archaeology, University of Rzeszów; Leibniz Institute for the History and Culture of Eastern Europe - GWZO) - Zscheschang, Christian (Sorbisches Institut, Zweigstelle für niedersorbische Forschungen)

Abstract format: Oral

In the very east of Poland, directly at the present Ukrainian border, there are several impressive hillforts. Some of them belong to the so called Cherven' Towns which were mentioned in (Ruthenian) written sources by the description of the Polish-Rus conflicts from the 10th and 11th centuries. Over the last one hundred years, they have been investigated many times by archaeologists. But, due to the complex circumstances of the 20th century, many of the findings were stored in archives that were for decades inaccessible to the public or for scientific research.

In the last ten years, efforts have begun to re-collect and analyze this material. The area can be seen in the local (Polish-Ukrainian) but also broader perspective (contact zone between Latin Europe and the Byzantine Commonwealth). The latter is of enormous importance for European history.

The multi-disciplinary investigation of these strongholds and their surroundings, including archaeological, geographical, historical and onomastic studies, were complemented by an international team (researchers from Poland, Germany, Russia, Serbia, Switzerland and Ukraine).

The results of our investigations shows that Cherven' Towns should be seen not as a border castles with a dominant military function but rather as gateway cities (A.F. Burghardt): an area which connected East-Central and Eastern Europe.

This research included onomastic investigation as well, based on the excellent state of research in Poland. In many cases place names indicate the extent and character of early medieval settlement. According to this general statement, toponyms surrounding the hillforts were analysed to answer the question of whether the strongholds were situated - in relation to the medieval settlement landscapes of that time - in their centre, at their periphery or outside.

6 PLACE NAMES OR COMMUNITY NAMES - AN ATTEMPT TO DECODE ROCK ART SIGNS AS EMBLEM GLYPHS

Abstract author(s): Juszczak, Karolina (University of Warsaw)

Abstract format: Oral

The investigation of geographic names is an essential component of archaeological settlement studies and community migration studies. They are an essential part of archaeological interdisciplinary research because they may contain information that is elusive in other ways. However, toponyms need not always be place names encoded by language (linguistic principle). They can also be signs that encode a place name (emblem-glyph) using other principles, such as semasiography. This presentation aims to present an approach to the study of place names/signs by examining individual signs of rock art from northern Venezuela, which I analyze as potential emblems of given societies or places from pre-Columbian times. While this is a new approach to the study of rock art from that region, it has a strong basis in the fact that one of the rock art panels from the Rio Chico region of northern Venezuela was decoded as a topographic map, encoding emblems of specific places. In my presentation, I will present a holistic approach to the study of potential emblems, consisting of archaeological, ethnographical, and historical studies as well as GIS and landscape analyses. I will also present possible interpretations of individual signs as place/community names.

7 FROM BORDER FOREST TO AGRICULTURAL SETTLEMENTS. HIGH MEDIEVAL LANDSCAPE CHANGE BASED ON LINGUISTIC AND ARCHAEOLOGICAL EVIDENCE IN THE HANOVERIAN WENDLAND

Abstract author(s): Hardt, Matthias (GWZO) - Schneeweiß, Jens (Exzellenzcluster ROOTS, ZBSA, Stiftung Schleswig-Holsteinische Landesmuseen Schloß Gottorf)

Abstract format: Oral

Toponyms especially in border regions form an important source for the reconstruction of historical processes like the high medieval colonization of the 11th-13th centuries AD. Earlier, the Slavic settlement territories were protected by an elaborated system of anthropogenically modified border forests. Written sources, onomastic and archaeological evidence explain how hedges and thorny bushes should prevent unauthorized access. After the 1147 Crusade and Saxon occupation, the Slavic-speaking population between the Elbe and Oder subsequently lost their language and cultural identity. It became a genuine part of a new, German-speaking mixed population characterized by Christianity and measured villages. A planned settling of people from other cultural contexts and languages marked the colonization of the Slavic lands. This played an outstanding role in the implementation of the new lifestyle system, which meant radical change for the local population. While the Slavic material culture disappeared quickly within this process, linguistic evidence in the form of toponyms, personal names and a few enclaves has been preserved. In this context, the "Rundlinge", circular villages that have survived in large number and density in the Wendland west of the Elbe, are being intensively discussed. On the one hand, this particular village form is being associated with Slavs, which is mainly supported by linguistic evidence, on the other hand, they completely lack Slavic material culture. Due to its poor and wet soils, the Hanoverian Wendland is a hostile landscape in many respects. It was therefore a somewhat backward agricultural region for a long time. The interrelation between linguistic and archaeological remains and the surrounding landscape is of crucial interest for the assessment of the Rundling villages and their role in the high medieval colonization process in a border region. Based on this case study, the papers discuss fundamental questions relating to the connection between language and material culture.

8 THE MATERIAL AND SYMBOLIC CONSTRUCTION OF VILLAGE TERRITORIALITY IN NORTHWESTERN IBERIA

Abstract author(s): Menendez Blanco, Andres (Università di Genova) - Fernández Fernández, Jesús (University College London)

Abstract format: Oral

Present-day village territoriality in the northwest of the Iberian Peninsula results from a process that began in the Early Middle Ages and continues to the present day. Over centuries, a network of small territories was consolidated because of negotiations between the peasant communities and the elites. Within the limits of each geographical unit, all the basic resources necessary for the community were encompassed, and the village's survival depended on their effective governance and exploitation. This is why negotiating these boundaries often resulted in long-lasting disputes for years or centuries. As a result, a set of tangible and intangible elements were generated to consolidate these boundaries against neighboring communities or local powers claims, materializing these conflicts on peasant landscapes. The anthropogenic or natural landmarks of these boundaries were complemented by stories and myths attached to them that justified land ownership by the community orally transmitted over generations. On the other hand, this symbolic universe is a productive source of information complementing the archaeological survey.

In this contribution we will approach these processes considering three themes for discussion: (a) the processes of construction and fixation of boundaries through the combination of physical elements, place names and oral stories, (b) the readings of certain archaeological elements by peasant communities (past and present), and (c) the potential of this oral tradition to complement archaeological prospection.

9 ARCHAEOLOGY AND LANDSCAPE IN CENTRAL SICILY. FROM CASTLE OF TAVI TO “NEW TOWN” OF LEONFORTE

Abstract author(s): Patti, Daniela (University of Enna)

Abstract format: Oral

The research focused on the framework of feudal ownership of the land, as well as possible reconstructing it by the historical sources available, although not exhaustive and uncertain.

It's consist of the descriptions and the recensiones that, for chronological periods of just over a century, mention the succession of possessions and assets theoretically considered feudal, but really more properly defined as “land lordships” and, in some cases, as territorial lordships, starting from the settlement organization of the eleventh century, marked by numerous fortified structures.

This kind of research once again showed the importance of toponymy, needed to understand the method of organization and control of land by man who has always seen places, according to the systems with which he organized, inhabited and transformed.

The ancient place names of casalia (farmhouse), territoria (land), castra (fortress) and feuda (fief), assignable with certainty by historical and archive documentation, and in some cases (for some areas) integrated archaeological surveys.

This is the case of the castrum of Tavi, an important example in central Sicily of castle, fortress linked to the rock settlement in the late Byzantine and Islamic Age and located in the heart of large cereal estates, in depopulated areas of the Sicilian countryside, left empty by the disappearance of Norman-era farmhouses, but be revitalized by new settlements (created from the sixteenth century by Sicilian Aristocracy. The most important example in this landscape is that of Leonforte, built by the prince Nicolò Branciforti to exploit the richness of its waters, as we know also by the different place names linked to issues of the land and to work activities.

10 TWO LANGUAGES, ONE LANDSCAPE

Abstract author(s): Klir, Tomas (Charles University, Faculty of Arts, Department of Archaeology) - Jansens, Nicolas (University Heidelberg, Slavisches Institut; Charles University, Faculty of Arts, Department of Archaeology)

Abstract format: Oral

The main aim of this paper is to gain a deeper understanding of the interaction of languages during the colonisation of an unfamiliar landscape and of the dynamics of name-giving in a bilingual society. We will focus on various case studies from the Cheb region as well as neighbouring regions in the Czech Republic and Germany, where Slavic and German(ic) were used simultaneously in the naming of geographical objects in the Early and High Middle Ages. We will employ toponymic evidence of particular interest, written sources and also the archaeological record, which anchor the settlement processes chronologically. On a theoretical level, we will base our work on concepts and systemic models provided by contemporary onomastics, especially on the relational and name-formation models of Rudolf Šrámek, and on the model of toponymic integration and pairs of proper names in language contact areas. We will stress that due to the systemic differences between German(ic) and Slavic and the effects of significant linguistic interference, it is possible to gain both unique and general knowledge about the use of language and name-giving in a historical perspective.

11 HARNESSING HIGHER-ORDER EVIDENCE IN TOPONASTIC DATA AND THE CHALLENGE OF INTERDISCIPLINARITY

Abstract author(s): Jansens, Nicolas (Heidelberg University; Charles University)

Abstract format: Oral

To be discussed are new approaches to toponomastic research which seek to move beyond first-order conclusions and extract from existing data new knowledge with broader cultural-historical relevance.

Among those of particular interest is the systematic analysis of name adaptation processes and their potential for yielding insight into past sociolinguistic contexts. For example, the use of particular adaptation strategies varies over time and space and can thereby indicate degrees of bilingualism as well as changing social norms. Another promising approach – developed by Tomáš Klir – focuses on the geographical extent and social contexts within which settlement or waterbody names are historically documented. Using this data, one attempts to reconstruct the historical use of particular languages within social networks of various scopes.

A follow-up question is to what extent the findings of such approaches may be of interest for archaeological and further interdisciplinary studies. Here, a particular focus will be placed upon quantitative methods with the use of GIS software for comparative geospatial and statistical analysis of toponomastic and archaeological data. Ultimately, the methods under review here should be regarded as complementary to more traditional qualitative research, without whose data higher order (digital) analyses would not be possible.

A. THE POWER OF ROMAN PLACE NAMES IN SOUTH HISPANIA

Abstract author(s): Espana-Chamorro, Sergio (Universidad Complutense de Madrid; Institut Ausonius - UMR 5607, Bordeaux)

Abstract format: Poster

Τόπος- νόμος is literally a name of a place, a geographical point. Toponymy reveals the world view of a society with multiple cultural nuances and connotations. We can obtain huge amounts of data by examining them: perception of nature, language, ethnography... The Romans also included juridical and political information in their city names. We can advert their role in the Roman world (as a municipium, colonia, civitas libera...) and sometimes the time in which they were promoted (especially with cognomina such as

lulia, Augusta, Flavia...). In this paper, I will examine toponymy as an element of power during the Late Republic and the Early Roman Empire in South Hispania. The use of new foundations related with personal names (i.e. Brutobriga or Metellinum), the use of some specific adjectives in the coloniae (Gemina, Firma, Romula, Patricia) and the political process of land management in some specific areas can draw a map of power during this period and it reveals the different strategies of conquest used along the territory (i.e. erasing names, creating hybrid names, imposing new cities with Latin names...).

B. HINTS FOR NATURAL AND ANTHROPIC LANDSCAPES IN CORSICA ISLAND. TOPONYMIC ISSUES IN DIALOGUE WITH WRITTEN SOURCES AND ARCHAEOLOGICAL EVIDENCE

Abstract author(s): Piccardi, Eliana (Independent researcher)

Abstract format: Poster

The diachronic screening of the toponymic resources in Corsica, crossed over by written sources and archaeological evidence offers a multistratified landscape where human presence and activities appear quite significant for the island although not always chronologically easy to be detected.

Glottology may explore certain sites names recalling possible ancient Ligurian (in -sk* - : Uccinasca, Popolasca) and Etruscan roots (Rapale), while the short Ancient Greek presence, attested in ancient sources, seems not detected beyond the Phocceans' Alalia colony.

In Corsica, as well as in the ancient Liguria in the same Tyrrhenian area, the most interesting crossing over among toponyms, eventual archaeological reminds and anthropic presence in the landscape is undoubtedly linked to site-names often recalling high and sheltered dwellings, throughout the various ages: Castellare, Castellacci, I Casteddi, Castello and the several site-name of Castelli di..., A Torra; many sites have given evidence of the human presence from the Prehistoric Age to the Middle Age and onwards on (e.g. Tavera).

Corsica toponyms may carry witness of ancient heritages both about well-known archeological areas or monuments of various ages, and about remote heritage described or even culturally 'perceived' and transmitted by the inhabitants: e.g., about the prehistoric menhir-statues (Stantari, Scomunicatu) but especially about Roman Period evidence (Mariana; Taverna, Bagni, Caldonica, Musuleu, Etang de Diana, Capu a L'Altare).

Later, the Christian religion has left a wide sampling of toponymies and evidence, from Early Christian reminds and faith traditions to the Middle Age ones (e.g. Sant'Appianu, La Canonica, San Florenzu and so on).

Beyond the widespread toponyms depicting the main morphologic markers (orographic and hydrographic ones e.g. Monte Bughju; Grotta Piana; Fium'Orbu, Foce di Tanghiccina, Fangu), there is a strict connection with the exploitation of the land and aquatic resources throughout the centuries (Castagniccia, Carbonacce, Ostriconi, Saleccia, Anguillaghja), and sometimes the mining ones (Argentella).

376 EXPANDING HORIZONS: DECOLONISATION, CONTESTED OWNERSHIP OF ARCHAEOLOGICAL MATERIAL, AND THE 1970 UNESCO CONVENTION ON CULTURAL PROPERTY

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Godfrey, Evelynne (Uffington Heritage Watch) - Moedlinger, Marianne (University of Genoa) - Joosten, Ineke (Cultural Heritage Agency of The Netherlands)

Format: Round table

The collection of antiquities can be seen in the light of the decolonisation movement to represent a Western “Cultural Horizon”. This was characterised by the idolisation of Classical Greek and Roman material culture, including architectural styles, as reflected in the façades of many museums across the world. The association with ancient empires was explicit validation of British, European and American imperialist activities in the 18th to 20th centuries.

As we leave behind the ‘old normal’, what are the specific actions and policies that we as archaeologists need to be pursuing, in order to achieve an equitable settlement in terms of both the ownership of cultural heritage and the expression of the archaeological and historical narrative?

In this Roundtable session of the EAA Community on the Illicit Trade in Cultural Material, we will examine the relevance, limitations, and potential for revision of national laws based on the UNESCO 1970 “Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property”.

We invite members to share experience of how the 1970 Convention is implemented in their country, and the intersection with decolonisation.

Questions for discussants:

- How are ‘decolonisation’, ‘restitution’, ‘repatriation’ defined in practice?
- The 1970 Convention is limited to archaeology “specifically designated” by each State as important, or traded ‘illicitly’. Is the “designation” requirement too onerous?
- Regarding ‘illicit’ trade, how do we treat material acquired legally, but when the local people had no power to object?
- How can we promote local stewardship/public ownership of archaeology in countries that allow private collecting and

- exploitation of the archaeological record, e.g. through metal detecting?
- Should all trade in archaeological and ethnographic material more than one hundred years old be banned worldwide, similar to the proposed global ban on trading in wildlife and ivory?

377 A WORLD OF CLAY II: FROM FRAGMENTS TO SOCIETIES

Theme: 6. Material culture studies and societies

Organisers: Kroon, Erik (Leiden University, Faculty of Archaeology) - Delvoye, Adrien - Debels, Pauline (University of Geneva, Department of Genetics and Evolution) - Arntz, Monique (Cambridge University, Department of Archaeology) - Jean, Mathilde (Université Paris 1 Panthéon-Sorbonne)

Format: Regular session

Archaeologists have ever more tools at their disposal to study clay materials (vessels and otherwise) and past societies. For ceramics in particular, interest in chaînes opératoires has recently surged, and concepts such as use-life, craft, and entanglement provide new analytical angles onto past societies. In parallel, the third science revolution in archaeology has given new impetus to studies of mobility, kinship, social transformations, and long-term cultural dynamics.

With the wealth of new analytical tools and concepts comes the need for fundamental reflections on the methods, data, and concepts which aid us in reconstructing past societies through the lens of ceramics. Disciplines such as anthropology, history, and philosophy are key conversation partners when interpreting archaeological ceramics, and understanding the fragilities of our interpretations. Reinforcing the dialogue with these disciplines is vital, especially as the archaeological toolbox continues to expand.

In this session, we want to reflect on the methodologies, questions, and research themes in contemporary ceramic analysis. How can ceramics contribute to questions about social transformations, mobility, entanglement, cultural dynamics, and identity? We invite archaeologists, ethno-archaeologists, anthropologists, and other scholars who work with clay materials from all regions and periods to partake in a multidisciplinary dialogue on social transformations and cultural dynamics through the lens of clay materials. We wish to address such questions as:

1. How do manufacturing traditions and consumption habits reflect the sociality, mobility, and identity of human groups?
2. How can studies of crafting practices and creativity in ceramics contribute to burgeoning fields such as cognitive sciences and the history of knowledge?
3. What are future directions for the analysis of clay materials on a practical and theoretical level, especially in the age of polymers and metal?

ABSTRACTS:

1 SOCIAL CLAYS: REVEALING PAST IDENTITIES AND TRANSFORMATIONS THROUGH CERAMIC ARCHAOMETRY

Abstract author(s): Gates St-Pierre, Christian - Beaulieu, Guyane - Girard, Jean-Paul (Université de Montréal)

Abstract format: Oral

During the second half of the 20th century, the analytical focus of North American archaeologists studying Indigenous ceramic collections underwent a major, yet gradual shift from typological and stylistic to technological analyses, concurrently with the continuous development of archaeometry which is now prevalent in ceramic studies. The two approaches are not incompatible however, and can be used in conjunction to reach a more holistic perspective and to address a variety of research questions, especially those pertaining to the social dimensions of ancient populations. Among such questions are the transformation of stylistic and technological styles through time, and the social significance of these transformations in terms of knowledge transmission processes and cultural identity. After summarizing the historical and conceptual background underlying ceramic analyses in Northeastern North America, two recent case studies from that cultural area that use a computed tomography analysis of Indigenous ceramic collections will serve to illustrate our point.

2 TOWARDS MAKING SENSE OF MIGRATIONAL MOSAICS: OPERATIONALISING A NETWORK APPROACH TO TECHNOLOGY FOR THE HISTORY OF KNOWLEDGE

Abstract author(s): Kroon, Erik - Djakovic, Igor (Leiden University, Faculty of Archaeology)

Abstract format: Oral

5,000 years ago a massive migration fundamentally changed Europe as steppe groups progressively displaced indigenous populations, leaving distinct and novel material culture throughout Europe. Around 40,000 years earlier, a massive migration fundamentally changed Europe as groups of Homo sapiens progressively displaced indigenous Neanderthal populations, leaving distinct and novel material culture throughout Europe. Does history repeat so neatly?

The analogous conceptualisation of these two events, and many migration events like them, are due to the similar questions archaeologists ask about migrations. These questions focus on the 'beginnings' and 'ends' of groups (i.e. archaeological cultures) which

result from our classifications of artefacts, genomes, styles, etc. Not only is the reification of these classifications problematic, but migration events themselves also invariably turn out to be complex mosaics on closer study.

Our proposition here is to de-center classifications in studies of past migrations, and to instead take the perspective of a history of knowledge. We argue for the use of systematic, empirically-grounded analyses to reconstruct patterns in accumulation and variation of technical knowledge. These patterns are highly informative for understanding mechanisms of learning and knowledge transmission across spatio-temporal landscapes.

To achieve this, we operationalise a network approach for lithic and ceramic artefact production as a means of comparing and conceptualising technological processes. Using case studies of ceramic assemblages from the Corded Ware transition and lithic assemblages from the Middle to Upper Palaeolithic transition in western Europe, we demonstrate the broad applicability of a history of knowledge for archaeological migration events.

3 AN INFORMATION THEORETIC APPROACH TO MYCENAEAN POTTERY DATASETS

Abstract author(s): Rivers, Ray (Imperial College London) - Gheorghide, Paula (University of Toronto) - Price, Henry (Imperial College London) - Vasiliauskaite, Vaiva (ETH Zurich) - Evans, Tim (Imperial College London)

Abstract format: Oral

Understanding the relationship between artefacts and the societies that produced them is difficult. This understanding is dependent on methods of classification, curation, in addition to the usual problems of preservation, fragmentation and incomplete data. It has long been proposed that diachronic change in the nature of assemblage composition can reflect societal change. Pottery lends itself naturally to such an analysis because of the precision in which it can be quantified. This has been pursued by several authors (e.g. see [1,2]) using the diversity of the assemblages with regard to key archaeological markers to monitor societal change.

In this talk we follow this idea by exploring the changes in the diversity of a 13,700+ ceramic data set from five Cretan deposition sites over the Late Bronze Age period Late Minoan II - III B collected by one of us (PG).

Diversity is essentially a measure of how many effective categories we need to describe the different assemblages. We adopt a more general information-theoretic approach to diversity than the authors of [1,2], borrowing from ideas in ecology. Unlike for ecological data sets, archaeological assemblage size does not reflect the size of sites from which they originate. This simplifies the analysis and leads to well-defined multi-site diversities that permit diachronic site comparisons.

For all the seemingly large size of our data set, the bulk corresponds to ceramics that were produced and consumed locally, with a smaller set of ceramics produced elsewhere on Crete. An even smaller set consist of ceramics imported from outside Crete. In this paper we look at the differences reflected in these datasets insofar as the statistics are good enough to permit us to do so.

1. D Gronenborn et al. (2017), Quaternary International 446, pp54-65
2. A. Daichenko et al. (2020), Documenta Praeistorica 47, pp522-535

4 PERIOD-, SITE- OR GEOLOGY-SPECIFIC? RAW MATERIAL SELECTION IN THE 3RD-2ND MILLENNIUM BC POTTERY PRODUCTION OF THE UPPER RHÔNE VALLEY (SWITZERLAND)

Abstract author(s): Carloni, Delia (Laboratory of Prehistoric Archaeology and Anthropology, Department F.-A. Forel for Environmental and Aquatic Sciences, University of Geneva) - Šegvić, Branimir (Department of Geosciences, Texas Tech University) - Sartori, Mario (Department of Earth Sciences, University of Geneva) - Zaroni, Giovanni (Department of Geosciences, Texas Tech University) - Besse, Marie (Laboratory of Prehistoric Archaeology and Anthropology, Department F.-A. Forel for Environmental and Aquatic Sciences, University of Geneva)

Abstract format: Oral

A variety of spectroscopic and microscopic techniques have been widely established in the investigation of the raw material procurement, selection, and use in the archaeological pottery production. While acquisition of analytical data from the raw material is relatively straightforward its interpretation in the context of the local archaeology and background geology may be somewhat challenging. This paper highlights the limitations one may face while interpreting archaeometric data when relevant contextual information is scarce or non-existent.

This study reports on raw material choices and paste preparation recipes inferred for the 3rd and 2nd millennium BC pottery production in the Upper Rhône Valley. The geological setting of this Alpine valley is rather complex since the outcrops of metamorphic, (meta)sedimentary, and intrusive rocks are found throughout the region and Quaternary glaciation and semi-arid climatic conditions hampered a largescale formation of clay deposits. The Final Neolithic, Bell Beaker period, and Early Bronze Age (3300-1600 BC) settlement sites are widely distributed across the valley, which forces one to consider the distinct local geological setting while investigating the implications of compositional variations. In addition, certain sites have been widely excavated over several years while others were made known through the test trench only. This leaves us with major differences in the amount and quality of information on stratigraphy, human-related structures, and chronological attributions of the findings. Complexity caused by non-uniform geology and site documentation makes an illustrative example of the difficulties encountered by archaeologists when reconstructing the past manufacturing traditions and reflecting on the underlying long-term historical and cultural dynamics from a regional, synchronic, and diachronic perspective.

5 HIDDEN SOCIAL IDENTITY? NEOLITHIC POTTERY TRADITIONS AND RADIOCARBON CHRONOLOGY

Abstract author(s): Kvetina, Petr - Hrnčíř, Václav (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic, Praha) - Trampota, František (Department of Archaeology and Museology, Faculty of Arts, Masaryk University, Brno)

Abstract format: Oral

The aim of the paper is to interpret social identity hidden behind the stylistic variability of the Neolithic pottery in the territories of Czechia and northern Lower Austria (ca 5400–3300 BC). The changes and variability of the manufacturing pottery traditions are traditionally viewed as fundamental indicators of (i) archaeological cultures, which are then further divided into chronological (ii) stages and (iii) phases. By comparing the typo-chronological development of pottery and modelling the corresponding radiocarbon dates, we are testing these three levels in sense of relation to other cultural parameters (social identity, regional variability, distribution zones of pottery producers). Modelling of radiocarbon horizons indicates that changes in the original material culture do not necessarily occur on a time axis. While it is true that archaeological cultures have proven to be the robust materialisation of primarily chronological trends valid in larger geographic areas, at the level of more detailed pottery groups, development can be manifested in other ways (regionally, socially or in a way that is difficult to interpret).

6 OBSERVING THE RELATIONSHIP BETWEEN FUNERARY AND DOMESTIC CONTEXTS USING POTTERY TECHNOLOGY: THE UPPER RHÔNE VALLEY DURING LATE PREHISTORY

Abstract author(s): Derenne, Eve (Laboratoire d'archéologie préhistorique et anthropologie, Université de Genève) - Ard, Vincent (UMR 5608 TRACES, Université Toulouse Jean Jaurès) - Besse, Marie (Laboratoire d'archéologie préhistorique et anthropologie, Université de Genève)

Abstract format: Oral

Pottery technology analysis has proven to be an effective tool in revealing the human groups behind ceramic assemblages. It allows for the identification of communities of practices and the observation of evolution in transmission processes. The fact that this type of study is feasible on a large geographic scale constitutes another element recommending it to archaeologists.

However, ethnography has shown that such studies yield better results when focused on a smaller chronological range, as changes in transmission processes can happen fast, in a single generation or less. When working on prehistoric periods, attaining such a small time frame is almost impossible, with phases often exceeding 200 years in duration. Nonetheless, we disagree with the implication that technological analyses can therefore only be applied to sites with short occupation phases, such as pile dwellings.

In this presentation, we plan to discuss how the shortcomings inherent to non-wetland prehistoric assemblages can be mitigated in order to benefit from the important data brought by technological analyses. We wish to demonstrate that prehistorians can still approach questions of social transformations, entanglements, and mobility by (1) enlarging their chronological scale to include previous and succeeding phases and (2) considering funerary and domestic contexts in relation to each other. For example, this could mean comparing the selection of ceramics for funerary assemblages with what we find in domestic sites from the same region. One key element of this would be the identification of ceramic productions from different communities associated with the same necropolis. As a case study, we will present the results obtained by the analysis of ceramics from the Upper Rhône valley in South-western Switzerland between 3300 and 1600 cal BC. This study manages to link the pottery assemblages from small settlement sites to the megalithic necropolis of Sion 'Petit-Chasseur'.

7 DISCUSSING SOCIAL DYNAMICS OF A POTTERY WORKSHOP: EVIDENCE FROM THE MIDDLE NEOLITHIC SITE IMVROU PIGADI, GREECE

Abstract author(s): Saridakí, Niki (University of Crete) - Kyparissi, Nina (Ephorate of Paleoanthropology and Speleology) - Kalogirópoulou, Evita (University of Crete)

Abstract format: Oral

Pottery has been a powerful tool for the understanding of human past that inscribes social dynamics, community practices, habits and customs. Its manufacturing traditions reflect regional networks of social histories and reveal how a social identity group was linked with certain characteristics. In Neolithic Greece, only a small number of production centers are known leaving open questions about the social role of pottery production and distribution.

In this paper we present the case of a Middle Neolithic pottery workshop at the tell site Imvrou Pigadi, located at the south-western edge of the Thessalian plain in Greece. This exceptional find brought to light evidence of pottery production at a designated and organized pottery workshop and enriched our views on Neolithic pottery manufacturing practices in the region. The remains show how a pottery workshop was organized, following temporal social requests in producing pottery for daily and social use. The paper presents the pottery types, based on morphological, decorative and technological styles and traditions, shedding light on the operation of the pottery workshop and its production. Based on the evidence of pottery, we can approach social dynamics and community practices developed in the region during the Middle Neolithic period. How many pottery forms and decorative styles were produced in the workshop? Can we identify certain daily and social practices or traditions embedded in and reflected by the pottery production? Does the pottery workshop at Imvrou Pigadi serves for a single site or is it part of a wider community network? Does pottery production in Thessaly during the Middle Neolithic shows evidence of social transformation? This research is conducted

in the framework of BONDS - 'Beyond Oikos: Outdoor spaces, daily life and sociality in Neolithic Greece' Project (Number: 00229), funded by H.F.R.I.

8 SHAPE STANDARDIZATION, CERAMIC SPECIALIZATION AND ITS IMPLICATION TO SOCIAL COMPLEXITY: A CASE STUDY OF NEOLITHIC POTTERY FROM TAOSI SITE, CHINA

Abstract author(s): Bai, Yang (Kyushu University)

Abstract format: Oral

Ceramic specialization is often linked to implications related to social complexity. However, to simply link ceramic specialization and particular forms of social organization could be problematic due to the cultural diversity. As such, this paper aims to clarify the specific connection between ceramic specialization and social complexity in a Chinese Neolithic context. The author has chosen the cooking vessels excavated from the Taosi site (2300-1900BC), a proto-urban settlement of the Chinese Late Neolithic period, to investigate the dynamic change in ceramic specialization and its possible link to social complexity. This study has investigated pottery standardization by analyzing shape variables with geometric morphometrics analysis, one of the quantitative approaches to studying ceramic specialization. The study finds that the morphological variation of the cooking vessels, which was considerably large in the early period decreased in the middle and late periods, showing a trend toward standardization. It has also been revealed that consumption pattern also changed from the intra-community in the early period to the cross-community exchange in the middle and late periods.

The result shows that ceramic production became steadily specialized at the Taosi, but the tempo of pottery production specialization differed between the residential communities forming the proto-urban settlement. In terms of the elite's intervention in ceramic production, the middle period witnessed intensive control over specialized production units by the elite and the late period witnessed the disappearance of such control as the extant political structure appears to have collapsed. This historical process suggests that the elite controlled the specialized ceramic production for the purpose of enhancing their political authority. Interestingly, the collapse of a political authority did not affect the progression of the specialization of ceramic production.

9 POTSDERD TOOLS IN THE SOCIAL ORGANISATION OF EARLY NEOLITHIC SOCIETIES IN SOUTH-EASTERN/CENTRAL EUROPE: CONTRIBUTIONS FROM THE ANTHROPOLOGY OF TECHNIQUES

Abstract author(s): Vindrola Padros, Bruno (Institute of Archaeology, University College London) - Vieugué, Julien (Institute of Archaeology and Ethnology, Paris Nanterre University, French National Centre for Scientific Research - CNRS)

Abstract format: Oral

It is now becoming widely recognised that rather than the simple arrival of a 'technological package' the Neolithisation of Europe occurred in a variety of forms across the continent. Yet, despite this recognition, there is still very little known about the transformations of technologies undergone at a local level, as well as the bodily gestures involved in their use. This is certainly the case with the reuse of pottery, even though sherd tools and other similar objects became widespread in the Early Neolithic of south-eastern and central Europe. This paper aims to show how the reuse of broken pottery formed an important part in shaping social food (such as cooking) and craft activities (like hide processing and pottery manufacturing), and how some of the gestures involved in their use changed in these areas of the European continent. By incorporating an approach from the anthropology of techniques, we study these long-forsaken artefacts from their stages of procurement, shaping and use at various Early Neolithic Karanovo, Körös-Criş, and Linearbandkeramik sites. Use-wear analysis of potsherds combining microscopic and microphotogrammetry techniques were particularly developed to identify the gestures involved in the use of these artefacts, as well as determine the worked materials. Our study clearly shows the potsherds reused as tools were collected after the discard of broken ceramic vessels. While some of these sherds were reshaped before use, others were employed in an ad hoc way. A range of sherd objects like hide scrapers, pottery scrapers and smoothers, spindle whorls, and potentially heat-retainers were identified, showing the large range of uses given to sherds by the Earliest Neolithic societies in Europe.

10 EXPERIMENTAL MODELING OF ASBESTOS- AND ORGANIC-TEMPERED VESSELS FROM THE LATE NEOLITHIC OF EASTERN FENNOSCANDIA

Abstract author(s): Kholkina, Margarita - Muravev, Roman (Saint-Petersburg State University; Peter the Great Museum of Anthropology and Ethnography - Kunstkamera) - Zhulnikov, Aleksander (Petrozavodsk State University)

Abstract format: Oral

A tradition of making asbestos-tempered pottery first appears in Lake Saimaa region (modern Finland) in the 5th mil. BC. Since 3600 BC area of asbestos-tempered pottery distribution gradually increased and finally covered almost all of Fennoscandia from Southern Norway in the West, where it exists up to the first centuries AD, till the White Sea region in the East. Tempering clay paste with asbestos fibers became so wide-spread at the end of the Neolithic that pieces of asbestos began to be transported hundreds of kilometers away from its original deposits to the territories where no asbestos was found in natural occurrence. All these facts allow us speak of asbestos-tempered pottery as a special phenomenon. Studying this phenomenon provides us an opportunity to reconstruct a wide network of contacts between asbestos-bearing core regions and asbestos-missing periphery, as well as to discuss issues of a pottery tradition itself: how it originated, transformed and spread to such a vast territory in the Neolithic and later periods. Studying this phenomenon, we can't avoid the question: why was asbestos so popular as a temper for making pot-

tery? Could the reason lie in its technological advantages against other contemporarily used materials, or is this advantage perhaps non-functional, socio-cultural or even sacred?

To find the answer to these questions, we conducted a large-scale experiment in which we modeled over a hundred of standardized vessels with the temper of asbestos, feather and crushed granite-gneisses in various combinations and concentrations close to ones known from archeological data. In our paper we'll show the observations we've made by comparing the qualities of these tempers in modeling, firing and using experimental vessels.

The study was performed within the project "Phenomenon of Asbestos Ware in pottery traditions of Eastern Europe: making and use technology, structure of interregional contacts", Russian Science Foundation, #19-18-00375.

11 AN INKA HAUKAYPATA IN EL SHINCAL DE QUIMIVIL (ARGENTINA): CERAMIC STUDIES TO UNDERSTAND PUBLIC SOCIAL PRACTICES IN THE KOLLASUYU

Abstract author(s): Scaro, Agustina (Institute of Andean Ecorregions - CONICET-UNJu; Institute of Geology and Mining - UNJu) - Couso, María (División Arqueología, Facultad de Ciencias Naturales y Museo - UNLP) - Moralejo, Reinaldo (División Arqueología, Facultad de Ciencias Naturales y Museo - UNLP; CONICET)

Abstract format: Oral

The Inca Empire conquered a large part of South America with a central policy that sought to materially introduce conquered peoples into the Imperial Landscape through urbanisation, building administrative architectural elements throughout the Empire. Urban political-ceremonial settlements were centred around the plaza or haukaypata, where core activities for social interaction were carried out within the imperial cosmivision. El Shincal de Quimivil (Northwestern Argentina) was planned following these Inca models, becoming one of the main regional political-ceremonial centres in a landscape of intense dynamics. Among its most outstanding features are a 30,625 m² plaza and a large number of administrative and housing buildings.

To comprehend public social practices that took place in El Shincal plaza, considering social, political, and ideological aspects of Inca administration, 320 sherds were analysed, emphasising a morpho-decorative analysis within stylistic studies. The study revealed the predominance of Provincial Inca pottery (32.5%), while other local styles are very scarce. The presence of Inca Cuzqueño sherds (4.95%) is relevant as they correspond to vessels imported from Cuzco and are very rare in provincial administrative contexts. Their presence in El Shincal reinforces its importance as an imperial centre. The high incidence of aryballos (30.03%), directly associated with the consumption of a highly valued maize beer, indicates that public events were held at the plaza where it was shared alongside large amounts of food (as indicated by cooking vessels with and without soot).

The ceramic analysis provides material evidence about public events sponsored by the imperial administration in the plaza, where reciprocity and redistribution of goods between the Empire and local peoples were at stake. The high proportion of Provincial Inca vessels would indicate that large quantities of food and drink were provided by the administration. This evidence is consistent with the descriptions made by Spaniards chroniclers about haukaypata.

12 TRACING EXCHANGE PATTERNS — THE CONTRIBUTION OF TECHNOLOGICAL APPROACHES TO THE IDENTIFICATION OF POTTERY TRADITIONS

Abstract author(s): Verdelle, Cécile (Gerda Henkel Stiftung; UMR 7041 ArScAn) - Vilain, Sarah (Marie Skłodowska-Curie Fellow)

Abstract format: Oral

Since the 90's, the development of technological analyses within ceramic studies offers the opportunity to complement traditional approaches. Indeed, the manufacturing process has since become an important criterion in the identification of pottery traditions. The diffusion of cultural traits as well as the transmission of the potters' knowledge are now considered as significant signs of social contacts. Over time, the development of exchange networks favoured interactions between craftsmen, resulting in significant modifications in ceramic productions.

Through two case studies, this paper will show how the contribution of technological analyses, combined with typological studies, highlight intercultural interactions and provide new data concerning the understanding of trading connections.

During the 3rd millennium BCE, the intensification of the Mesopotamian exchange network is observable through the reduction of the variety of shapes in pottery assemblages. However, technical studies show that ceramics are still mainly produced locally. Based on a comparative study of specific pottery types from two sites of north-east Mesopotamia, this part will question the standardisation phenomenon and its meaning in the Mesopotamian social organisation.

During the 2nd millennium BCE, Levantine harbours play a crucial role in the circulation of commodities within the Eastern Mediterranean. As a result, Levantine populations are exposed to foreign containers of exogenic shapes, motifs and technics. Soon, imitations as well as new entangled ceramic productions emerge alongside local pottery shapes. Through selected examples, this part will explore the concepts of "local" and "foreign" and discuss how technological studies can be used to pinpoint features related to distinct practices and craft skills.

Ultimately, both case studies developed in this paper put forward how the combination of technological and typological approaches offer new perspectives on pottery traditions and turn out to be useful tools to trace exchange patterns and reassess their overall evolution.

13 ADAPTATION AND TRANSFORMATION OF THE CERAMIC MANUFACTURE FOR SUGAR PRODUCTION IN MEDIEVAL EUROPE

Abstract author(s): Montesana, Roberta - Buxeda i Garrigòs, Jaume (Cultura Material i Arqueometria UB - ARQUB, GRACPE, Dept. d'Història i Arqueologia, Facultat de Geografia i Història, Universitat de Barcelona) - Kilioglou, Vasillis - Hein, Anno (Institute of Nanoscience and Nanotechnology, N.C.S.R. "Demokritos") - Madrid i Fernández, Marisol (Cultura Material i Arqueometria UB - ARQUB, GRACPE, Dept. d'Història i Arqueologia, Facultat de Geografia i Història, Universitat de Barcelona)

Abstract format: Oral

Sugar production and consumption followed the Islamic expansion in the western Mediterranean and had a huge impact on European social, cultural and economic development. The introduction of sugar cultivation entailed a degree of knowledge transfer and new technological requirements, such as the manufacture of sugar pots, used for the crystallization of the sugar, which require a specific design, thermal and mechanical properties. Potters supplied the specific demands of the sugar industry and supported one of the most valuable productions of the Mediterranean in medieval times. However, little was known whether this specific ceramic production was occurring nearby sugar installations or vessels were imported from somewhere else; whether potters were applying their know-how or transformed it to produce such specialised vessels; whether common requirements, standards, for the manufacture of sugar pots were circulating alongside with sugar in the western Mediterranean.

This paper presents part of the results of the Marie Skłodowska-Curie project "SPotEU: Sugar Pot manufacture in Western Europe in the medieval and post-medieval period (11th-16th centuries AD)" which explores sugar pot production and circulation in modern Sicily and Spain. Sugar pots were assessed on morphological, technological and performance points of view aided by instrumental analysis and software modelling. For this presentation, two sugar and pottery production sites of the 15th-16th cent AD are compared, one in Sicily (Himera-Bonfornello) and one in south Spain (Motril). These two contemporary contexts were geographically distant but unified under the same political entity, the Crown of Castile and Aragon, and being part of the western Mediterranean sugar market.

The detailed reconstruction of sugar pots manufacture and circulation allows us to discuss the diverse potters' choices, the manufacture organization and the local adaptation to a common design. As well, this paper will reflect how archaeological science can offer insights on knowledge change and transformation.

14 "COOKING HISTORY": SOCIOCULTURAL, TECHNOLOGICAL AND GASTRONOMIC EXCHANGE THROUGH THE CASE STUDY OF THE PUNIC-ROMAN CITY OF CARTEIA (SAN ROQUE, SPAIN)

Abstract author(s): Sánchez Moral, Carmen María (Universidad Autónoma de Madrid)

Abstract format: Oral

Communication and trading hubs have always been optimal points to get an insight into cultural contacts and the transmission, exchange and assumption of different cultural and technological features associated with and derived from them. Thus, the main aim of this paper is to address these phenomena of cultural interaction through the analysis of the ceramics found at the Punic and Roman port town of Colonia Libertinorum Carteia (San Roque, Cádiz, Spain). The interest of the exceptional case study of Carteia lays on its geostrategic location as the keystone of the arch of the Bay of Gibraltar. That is, a place between two continents, two seas and two bays.

While this interdisciplinary study will be multifocal and holistic, special attention will be paid to technology and foodways, since gastronomy is an undeniable cross-sectional marker for both short and long-term cultural and identity dynamics. Being fundamental to human existence, food consumption implies a deeper dimension beyond mere subsistence, since it is the result of cultural interpretation and consumers choices. Hence, we will focus on their primary pottery evidence -kitchenware and tableware-, crucial yet silent witnesses of daily culinary practices, although different pottery classes will also be considered. Moreover, this contribution will be organised diachronically to analyse the evolution and variation of social and commercial trends and their impact on local technology -chaîne opératoire, incorporation of exogenous technological features, vessel shapes...- and culinary traditions, as well as the relation -the "dialogue"- between imported ceramics and local productions during the transition from Late Punic to Roman Republican periods. These aspects prove to be highly enriching in terms of tracking the eventual arrival of new people, given the integration of Carteia in the Roman Empire as a colony - one of the first colonies with Latin rights outside the Italian Peninsula.

A. A NEW DEEP LEARNING CLASSIFICATION TOOL FOR CERAMIC DECORATION: A CASE STUDY FOR THE BELL-BEAKER POTTERY

Abstract author(s): Paulos-Bravo, Rodrigo (Complutense University of Madrid) - Cifuentes-Alcobendas, Gabriel (Institute of Evolution in Africa; University of York)

Abstract format: Poster

Bell Beaker could be considered one of the first pan-European phenomena in Prehistory. However, this apparent homogeneity in ceramic shapes underlies a great heterogeneity in the styles and decoration techniques. Among these styles, one of the most common in southern Europe is the known as 'incision-style' and its regional variations. Nevertheless, in the recent years, some authors have questioned the nature of these incisions, arguing that the decoration was indeed made by impression techniques. In this way, a new term has been coined to refer to these styles that are still on discussion: 'incision-impression style'.

Recently, Artificial Intelligence methods based on Deep Learning and Computer Vision algorithms have been used to successfully differentiate and classify very distinct types of taphonomic marks. In that case, the marks being examined were almost identical to the naked eye, but the high computational power of these analyses was able to highlight features that went unnoticed by scholars until that moment. The success showed by these methods in the correct identification of structurally similar marks leads us to believe that they can also be applied to Bell Beaker decorations, probably yielding more accurate and replicable results than those that have been exposed to this moment.

The interest of knowing the techniques used for the decorations does not only relies on satisfying a research curiosity, but it can also allow us to get closer to the idiosyncrasy of the people who made them, as well as to generate new questions. Did these people use the same techniques in all the regional variants? Are certain techniques linked to any particular region? Were all the variations made with the same tool type? This work attempts to show the potential of Deep Learning for understanding the Bell Beaker phenomenon and the societies that made and used it.

B. MANUFACTURING TRADITION IN A WORLD OF IMITATION AND ACCULTURATION: A CASE OF CULTURAL TRANSFORMATION THROUGH CERAMIC ANALYSES

Abstract author(s): Moreno Megias, Violeta (Instituto del Patrimonio Cultural de España; Universidad de Sevilla)

Abstract format: Poster

In the analysis of the process of “Romanisation” of southwest Hispania, the establishment of productive initiatives has become one of the main indicators of the dynamics of social transformation. The beginning of the production of eminently Roman pottery forms is undoubtedly considered a factor of “cultural conquest” and economic domination. However, in few cases has the study of this productive renewal of the craft sector considered other internal aspects of the artefacts themselves: despite having an apparently canonical Roman morphology and undoubtedly being made with local materials, the methods of production may reveal important differences in the craft tradition of the people that modelled the objects. These are subtle differences since the potter’s wheel was well established and mastered and the technical skills of the craftsmen were undoubtedly capable of adapting to Roman standards; but archaeometric analysis can help to distinguish between those elements that remain linked to tradition despite the imposition of new formal trends and those productions that appear to be imposed from outside in the manner of a production ‘franchise’.

379 THE INTERACTION BETWEEN NOMADISM AND SEDENTISM: AN APPROACH THROUGH RELIGIOUS PRACTICES AND BELIEFS

Theme: 4. Globalisation and archaeology

Organisers: Ethier, Jonathan (Institute of Pre- and Protohistoric Archaeology, CAU Kiel) - Broglia de Moura, Samara (Centre de recherche sur les civilisations de l’Asie orientale (CRCAO, UMR 8155); Archéologies et Sciences de l’Antiquité (ArScAn, UMR 7041); École Pratique des Hautes Études - EPHE/PSL, Paris)

Format: Regular session

Throughout history, the continuum between nomadism and sedentism encapsulates humans’ relations in constant negotiation. Belief systems and religious practices played an important role at the junction of these two lifestyles, engaging shared and opposed sacred values at each interaction. Even though, the structure of belief systems and its physical translation have been central in the archaeological narrative, a thick veil still persists on its fundamental participation in the mediation between nomadic and settled lifeways.

This session seeks to explore the role of religion, its practices and institutions, in mobile contexts (nomadism, pilgrimage, etc.) and the establishment of more permanent sites. We will discuss the influence of religion on the formation of cities and urban life and its significance on the (re-)formation of encultured landscapes via pilgrimage routes, settlements, monuments, and other ritual nodes dotting the lands. Thereby, we will reflect on the religious impact on the concepts of mobility and permanency, through an archaeological, historical, and ethnographical lens.

Following a global and asynchronous perspective, the aims of the session are a) to approach this phenomenon via different angles, from material culture to sacred architecture to its inscription into the physical and cultural landscapes, and b) to explore the place of the sacred and the profane in this negotiation across different fields, such as political, economic, cultural, or religious. We invite contributions from across the disciplinary spectrum, ranging from anthropological and socio-economic approaches to historical foci, on one of the following themes: 1- religion, urbanism, and nomads; 2- sacred monumentality from pilgrimage to lieux de mémoire; and 3- encultured landscapes: a hierophanic appropriation.

ABSTRACTS:

1 WHAT IS THE IMPACT OF RELIGION ON NOMAD-SEDENTARY INTERRELATIONS IN ROMAN AND BYZANTINE NORTH AFRICA (1ST TO 6TH C. CE)?

Abstract author(s): Syrbe, Daniel (FernUniversität in Hagen)

Abstract format: Oral

The close interrelation of nomadic and sedentary populations is a characteristic feature of the cultural history of North Africa in antiquity. Urban populations and mobile pastoralists were linked in various ways, economically, socially and of course by religious ties, as for example widespread dedications for indigenous North African gods such as the dii Mauri demonstrate. In late antiquity, Christianity as a monotheist religion had the potential to unite and integrate social communities by a shared religion, but also to split local populations by claims of orthodoxy or accusations of heresy.

Tracing religious interrelations between nomadic and sedentary populations in North Africa can build on different types of sources and faces several interesting methodological problems. Literary sources speaking about the religion of nomadic societies were exclusively written by sedentary writers, which normally came from an urban environment that shaped their world view on cultural difference. Texts written by those authors tend to use religion as a tool to describe the cultural “otherness” of the nomads and, therefore, present a strongly biased picture of religious systems in the nomadic sphere. Epigraphic and archaeological materials, in contrast, indicate a much closer integration of indigenous North African cults into the sedentary urban sphere, but raise questions of how to identify nomads as bearers of a cult or how to differentiate between nomadic and non-nomadic indigenous practitioners.

Despite a long tradition of archaeological and historical research on cults and religions of the North African provinces of the Roman empire and the role of indigenous cults going back to pre-Roman traditions, the question of how nomadic populations fit into the picture still has been largely neglected. By drawing on written and material sources, the proposed paper will aim at lining out the role of religion in nomad-sedentary interrelations with a particular focus on methodological questions.

2 THE RELIGIOUS COMPLEX OF MENOUTHIS: FROM PAGAN ORACLE TO CHRISTIAN HEALING SHRINE

Abstract author(s): Fischer, Tom (Ecole Pratique des Hautes Etudes - PSL; Laboratoire d’Etudes sur les Monothéismes - CNRS, UMR 8584)

Abstract format: Oral

In the early 2000s, the underwater archaeological excavations carried out in the bay of Aboukir allowed Franck Goddio and his team to update our knowledge of the Canopic region (East of Alexandria, Egypt). The emplacement of the flooded city of Menouthis, for example, has been clarified. Nowadays forgotten, the temple of this city, dedicated to Isis « truthful » (« ἀλήθεια ») and housing an oracle as well as a place of cure by incubation, was yet known as one of the most famous pilgrimage centers in Roman times, before a competing Christian place of worship opened there in the fifth century CE.

The complex history of this place fits into the well-known practice of the reuse of pagan shrines by Christians. Indeed, despite the conversion of the local population, the temple remained a center of interest. To counter this persistent success, the Christian authorities did not content themselves with destroying idols and building a monastery and a church nearby. They ended up bringing to Menouthis Saint Cyrus and Saint John’s remains, to which were attributed medical miracles. The example of the site of Menouthis, and of its continuum of religious usage, therefore highlights the weight and the force of attraction of a place of pilgrimage in a policy of conversion and land use planning. These are the points this communication aims to clarify and discuss.

3 THE COMMON GROUND: ISLAM, NOMADS AND URBAN DWELLERS IN MEDIEVAL HORN OF AFRICA

Abstract author(s): de Torres Rodríguez, Jorge (Incipit - Institute of Heritage Sciences)

Abstract format: Oral

During the medieval and early modern ages, the Horn of Africa was one of the most active and complex regions in the world, playing a fundamental role in the trade routes that crossed the Red Sea and connected the Mediterranean with the Indian Ocean. The region, under the rule of a score of Muslim states, was home to very diverse groups, including nomadic pastoralists and sedentary villages and towns that acted as nodes in the trading routes to the interior of Africa. This paper analyses the relationships of these two communities with very different lifestyles and cultural, economic and social parameters, and how despite these differences they were able to find common grounds to collaborate and interact.

Probably, the most important of these shared interests was religion. Islam arrived to this part of the Horn of Africa relatively late, but became a strong force to promote a sense of common identity among the inhabitants of the region, even if it had different material expressions in each community. This paper will study the case of Somaliland to analyse the religious spaces of both nomads and urban dwellers (e.g. mosques, graveyards, monasteries, pilgrimage centres), the reminiscences of pre-Islamic religions in the archaeological record and the emergence of a religious landscape throughout the territory, which has survived until today.

4 RELIGION AND URBANISM AS MEANS OF COMMUNICATION BETWEEN NOMAD ELITES AND THEIR SUBJECTS - THE CASE OF MONGOL QARA QORUM

Abstract author(s): Rohland, Hendrik (Commission for the Archaeology of Non-European Cultures, DAI)

Abstract format: Oral

Between about 1220 and 1260 Qara Qorum was perceived as the capital of the vast Mongol Empire. The city is well known from contemporary written accounts to have been a melting pot. The presence of people of different religions and their places of worship attest to the importance of religious pluralism for the Mongol Empire and its pursuit of universal rule. This was not only a by-product of rapid expansion of the empire but also conscious policy of the Mongol rulers, culminating in the ostentatious staging of religious debates between Buddhist, Christian and Muslim clergymen, presided by the Khan himself. The place of such events were "cities" and residences, that resembled urban centres of sedentary people. They were the stage where the Mongol elite encountered the diverse people and religions of the empire for various transactions. The contribution hypothesizes, that exactly these encounters were an important purpose for the establishment of cities in the nomad context.

Archaeological evidence gathered by the investigations of the Mongolian-German Karakorum-Expedition allows, as a case study, some cautious insight into the development of the eastern Christian community in Qara Qorum. The interpretation suggests, that in the early phases of the empire Christians from Central Asia were directly represented in Qara Qorum. As the political framework shifted from an empire with universal ambitions towards the more China-focused Yuan dynasty, religious practice and its materialization seem to have changed to accommodate to the new conditions. Christian religious symbols were met intermixed with remains seemingly related with a sacrificial cultus. The archaeological record in Qara Qorum thereby seems to mirror the changing relations of rule, religion and urbanism in the eastern part of the Mongol Empire in the 13th and 14th centuries.

5 MONASTERIES IN THE CENTRE OF URBANISATION: PERMANENT SETTLEMENTS IN OUTER MONGOLIA DURING THE PERIOD OF THE MANCHU QING DYNASTY

Abstract author(s): Ressel, Christian (Christian-Albrechts-Universität zu Kiel)

Abstract format: Oral

Buddhism and the presence of Buddhist temples have a long history among nomadic societies of the Mongolian steppes. Initially rather related to the legitimization of political leadership, Tibetan Buddhism became widespread among the entire population of Mongolia during the second half of the 16th century. After Outer Mongolia was incorporated into the Manchurian Qing Dynasty in 1691, Buddhism was further supported by the imperial court, to reduce the power of the Mongol lay nobility and pacify the population. The number of monasteries increased rapidly, and besides military garrisons, they became focal points of the formation of permanent settlements among the largely nomadic population.

This talk intends to provide a new perspective on the mediation between nomadism and sedentism in Mongolia by approaching monastic settlements as urban nodes. Although many scholars worked on Buddhism and monasteries in Mongolia, little research has been done to analyze monastic settlements as city-like places of interaction between settled and mobile lifestyles. By applying urban anthropological theories, monasteries will not be understood as isolated sites as opposed to a nomadic hinterland, but as specialized nodes of connectivity, communication and exchange.

The presentation focuses on the monastery Baruun Khüree and its surrounding area of the Orkhon Valley. It will point to (1) how the monastery was interrelated with or distinguished from other monasteries and permanent sites within the region, particularly the famous monastery Erdene Zuu, and (2) the dynamics of urbanism that evolved in relation to a monastic node and its institutions. This requires rethinking the dichotomy between nomadic and sedentary lifestyles, usually based on concepts of land-use, with regard to religious practices, administrative duties, and economic interdependencies.

6 SARIDAG: A MONGOLIAN BUDDHIST MONASTERY COMPLEX OF THE 17TH CENTURY

Abstract author(s): Chadraabal, Enkhtuul (Ur- und Frühgeschichte, Christian-Albrechts-Universität zu Kiel)

Abstract format: Oral

The site is a 17th-century ruin called Saridag Monastery, located about 70 kilometers northeast of Mongolia's capital Ulaanbaatar in the Saridag Mountains of Khan Khentii, which includes Chinggis Khan's sacred mountain Burkhan Khaldun.

The complex was built in 1654-1686 by Zanabazar, also known as Öndör Gegeen Zanabazar (1635-1723), the first Jebtsundamba Khutuktu or spiritual head of Buddhism for the Khalkha in Mongolia. Two years after completion, in 1688, the site was destroyed by Galdanboshigt's army only during warlike clashes between Khalkha Mongols and Oirat Mongols and has not been rebuilt since.

A national research team from the Institutes of History and Ethnology at the Mongolian Academy of Sciences conducted excavations at Saridag Monastery for six years, between 2013-2018. As a result of the excavations, approximately 3,000 clay Buddhas, a Buddha statue cast in copper, ceramic cups, a silver bowl, prayer beads, two helmets, four metal swords of European type, two spearheads, two rifles, two silver coins, an ivory sundial, and as well as numerous architectural findings were found in the northern part of the main temple of Saridag Monastery. With Mongolia being in constant negotiation between a nomadic lifeway and a sedentary one, monastic communities played a central role between both instances. This paper introduces one of the major sites and its place at the negotiation table.

7 EMERGENCE OF NECROPOLISES AND CHANGE OF BURIAL RITES IN THE WESTERN ALPS: ANTHROPOLOGICAL AND CHRONOLOGICAL INVESTIGATIONS OF NEOLITHIC CIST GRAVES

Abstract author(s): Steuri, Noah (Department of Prehistory, Institute of Archaeological Sciences, University of Bern) - Milella, Marco - Lössch, Sandra (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Szidat, Sönke - Hafner, Albert (Department of Prehistory, Institute of Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research - OCCR, University of Bern)

Abstract format: Oral

Only few Mesolithic burial sites, mostly as isolated graves under rock shelters, are known in the Western alpine region of today Switzerland, France and Italy. Similar to other contexts, the transition to a sedentary lifestyle brought about a substantial change in funerary practices. With our ongoing Swiss National Science Foundation supported research project we want to understand how the burial customs of the first Neolithic populations in the western Alpine region became established and changed over time.

Here we present a synthesis of available radiocarbon dating of human remains. This allows us to test hypotheses about the chronological development of the cist graves ritual in the western alpine region. Anthropological data about sex and age-at-death of the buried individuals provide preliminary insights about the possible influence of gender and life course stages in the funerary practice.

The first necropolises date to ca. 4800 BC and include uniform cist burials made of wood- or stone slabs. In the following millennium, a wide range of funerary practices, including single inhumations, collective graves, primary- and secondary inhumations can be detected. These burial complexes were placed in distinct areas, outside of settlements and often used over centuries. This hints at the public character of the funerary rituals, and to a central social relevance of necropolises. After around 3800 BC, the cist grave burials disappear followed by gradual transformation of the funerary rituals and grave architecture. This period culminates, around 3300 BC, with the emergence of collective burials in large megalithic dolmen structures.

8 THE CHURCH AND THE TOWN - URBAN RELIGION DURING THE 10TH - 12TH CENTURIES IN ODENSE, DENMARK

Abstract author(s): Haase, Kirstine - Bjerregaard, Mikael (Odense City Museums)

Abstract format: Oral

The transition from Viking Age to the Middle Ages marks the beginning of two landmark events in Danish history, namely the introduction of Christianity and the rise of cities.

Christianity had a significant influence on cities' design, with the founding of churches, monasteries, and cemeteries. This paper will present results from a research project revolving around one of these monuments; the first church (St. Alban) in Odense, a Danish city founded in the 10th century. In 1086 AD King Cnut IV (the Holy) was killed in the church of St. Alban and subsequently canonized.

These events seem to have had a profound impact on the city's physical layout and its role in society – related to its position as a religious centre and a place of pilgrimage. However, less attention has been paid to the mutual shaping and transformation of urban space, urban life, religious practices, and ideas. Therefore it is central to the research project if there is a specific urban character to religious practices and beliefs taking place in the city.

Based on source material from large-scale archaeological excavations and written sources this paper will discuss 1) how we can trace changes in religious practices through material culture 2) how the role as a site of pilgrimage for a martyred king intersects with the negotiation between everyday urban life and religious practices and 3) how religion played a fundamental part in the early phase of the Scandinavian urbanization process.

381 CHILDREN OF THE BRONZE AGE: CONNECTING EUROPE FROM THE TIME OF BELL BEAKERS TO THE URNFIELD PERIOD

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Herrero-Corral, Ana (Universidad Complutense de Madrid) - Guba, Szilvia (Ferenc Kubinyi Museum)

Format: Regular session

During the Bronze Age important transformations of the funerary record are evident, with highly standardized rituals that spread and generalize throughout Europe. This has first been observed during the Bell Beaker period, in which despite the regional diversity, common patterns are detected, not only in the material culture but also in burial rituals. The universal character of different funerary rites endured even after the practice of cremation was introduced during the Tumulus and Urnfield periods. All these characteristics reflect intense connections between remote areas of Europe, which is proved not only by material culture but also by recent archaeogenetic data. Behind those innovations there are some crucial social, economic and ideological changes which demand an explanation.

This session explores the function that non-adult individuals would have had in these processes. The analysis of their graves permits to explore on one hand the social role of this age group in the transmission of cultural innovations and on the other hand the eventual inheritance of status during a period of incipient hierarchization. Graves are optimal contexts to analyze both aspects since the funerary behavior contributes to the creation and sustaining of social order. They also represent the perfect environment to develop political and ideological manipulations to achieve certain lineage's aspirations such as perpetuating their power. In fact,

inheritance of power is one of the features of any hierarchical society and elitist non-adult graves have frequently been mentioned as some of the clearest indications of this process.

ABSTRACTS:

1 BELL BEAKER CHILDREN: CONNECTIONS AND SOCIAL COMPLEXITY IN A TIME OF PROFOUND CHANGES ACROSS WESTERN EUROPE

Abstract author(s): Herrero-Corral, Ana (Universidad Complutense de Madrid)

Abstract format: Oral

One of the main characteristics of the Bell Beaker period is its standardized funerary pattern. This uniformity is largely reflected in the homogenous grave goods (vessels and metal objects) spread, with some regional variants, throughout Europe, but also in the particular characteristics of the tombs, which make them different from those of the rest of the population.

Through the study of Bell Beaker non-adult graves it is possible to understand the role that boys and girls played within their communities. If we accept that Beaker elements were special items of restricted use and high symbolic value and thus related to social status, the fact that young children were also buried with some of these objects would refer the eventual inheritance of the status. Furthermore, the careful analysis of non-adult Bell Beaker graves in Iberia has shown that those children not only were they buried like the adults, but also had an additional age-based identity, that of a child.

2 BORN AS PRIVILEGED? CHILDREN FROM THE EARLY BRONZE AGE CEMETERIES IN KOLÍN AND MIKULOVICE (BOHEMIA)

Abstract author(s): Langova, Michaela (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Vélková, Lucie (National museum, Prague) - Šumberová, Radka - Brzobohatá, Hana - Ernée, Michal (Institute of Archaeology of the Czech Academy of Sciences, Prague)

Abstract format: Oral

Despite of considerable attention dedicated to the research of the Early Bronze Age in Bohemia (Únětice Culture), the topic of children is still marginalized. Up to now more than 750 children remains from the Únětice Culture are known from this region. Unfortunately, large part of these data comes from old excavations with no anthropological analyses etc. This contribution focuses on the testimony of recent explored cemeteries in Kolín and Mikulovice, which brought to light an interesting amount of children remains. Together there were excavated human remains of almost 200 individuals from which one quarter belonged to children. As it is usual the category of foetuses or newborns was not detected, the youngest buried children were 2-3 years of age at death. Sufficient amount of samples enables to consider children graves among each other on the one hand and children versus adults on the other. It offers also the possibility to assess the funerary treatment under the local society as well as to compare these results between two contemporary communities and subsequently to contribute to better understanding of social role and position of children within the frame of whole Únětice Culture.

3 SOCIAL ROLE OF CHILDREN DURING THE EARLY AND MIDDLE BRONZE AGE IN WESTERN HUNGARY

Abstract author(s): Melis, Eszter (Institute of Archaeology, Research Centre for the Humanities, ELKH; Castle Headquarters Integrated Regional Development Centre Ltd.)

Abstract format: Oral

The territory of Western Hungary in the Early and Middle Bronze Age (2200-1500 cal BC) represented a border and contact zone among communities with different burial traditions: inhumation graves of Únětice related groups (Gáta-Wieselburg), biritual sites of the Kisapostag group, cemeteries with cremated burials of the Encrusted Pottery and Vátya culture. The study of burial evidence has the potential to provide important insights into the agency of children and their relationship with adults in society. The age distribution of altogether 507 individuals, out of which 185 were buried under the age of 20, from 14 sites west from the north-south flow of the Danube is being taken into consideration and analysed briefly here. I am also interested in exploring whether the ways children were buried at these sites showed any divergence from the normative mortuary treatment adults received and if so, how these divergences may be related to different age categories. My third enquiry focuses on the examination of grave goods such as dress ornaments, weapons and tools in the burials of children, which could shed further light on how gender roles and social status was conceptualized by Bronze Age communities. In addition, I attempt to discuss if the rich burial assemblages of non-adults achieve certain lineage's aspirations such as perpetuating the power or social rank was rather earned through personal achievement in their community.

4 CHILD BURIALS IN MYCENAEAN CHAMBER TOMBS FROM GLYKA NERA, ATTICA

Abstract author(s): Vrettou, Irene (Greek Ministry of Culture and Sports)

Abstract format: Oral

Among the newest discoveries of the Mycenaean cemetery of Glyka Nera are two chamber tombs which were excavated between the years 2007-2012. The first one hosted a single child. The gifts that accompanied this burial date it to the beginning of the LH

IIIB period. The second chamber tomb contained 23 burials, male, female and children. More specifically, children remains of various ages were discovered in pits inside the burial chamber and among swept away bones. The tomb was used mainly during the LH IIIA2-B1 period.

In this study we will first present the findings that are related to the child burials of both tombs and led us to identify them as such. Subsequently and more importantly, we will try to examine the similarities and contrasts between the two chamber tombs, the distinct manner in which each child was buried and the reason why their families chose that manner. The results will give us important information about the customs of child burial and the social conditions in the region of Glyka Nera during the LH IIIIB period.

5 KIDS FIRST! AGE-RELATED DIVISIONS OF CREMATIONS IN NORTHERN GERMANY DURING THE URNFIELD PERIOD

Abstract author(s): Schaefer-Di Maida, Stefanie (Institute of Pre- and Protohistoric Archaeology, CAU Kiel; CRC 1266) - Storch, Susanne (abp Anthropologie Berlin)

Abstract format: Oral

At the site of Mang de Bargen (Bornhöved, district Segeberg, federal state Schleswig-Holstein, DE) a cemetery was investigated which shows burials from the Late Neolithic to the pre-Roman Iron Age. While up to the Middle Bronze Age inhumation burials were carried out in barrows, the change from inhumation to cremation burials from 1300 BCE onwards led to cremation graves secondarily in barrows and the surrounding. In comparison to the Older Bronze Age graves, which show strong differences in burial construction and grave goods, these secondary burials of the Younger Bronze Age show a pronounced similarity in burial rites. An egalitarian society is therefore conceivable very often in such contexts in Schleswig-Holstein. However, at the site of Mang de Bargen social diversities can be seen in the grave furnishings as well as in the positioning of the graves. Anthropological analyses of these cremations show that the graves of sub-adults were treated in a special way: they were buried in groups in the immediate vicinity of the barrows and in partly special grave vessels. Differences can also be observed not only between young and old individuals but also between sub-adults at the same site in the way they were buried. Comparisons with other sites in Schleswig-Holstein, whose cremations were analysed within the scope of the same project, allow similar conclusions. The Younger Bronze Age, which often has been reported to be so egalitarian throughout Schleswig-Holstein, is thus loosened up by age-related divisions or even stratifications. This hypothesis will be presented and discussed against the background of contexts, finds, absolute datings and latest anthropological analyses.

6 THE IMPORTANCE OF NONADULTS IN LATE BRONZE AGE BELGIUM – A MULTI-PROXY APPROACH

Abstract author(s): Sabaux, Charlotte (Ghent University; Université libre de Bruxelles) - Veselka, Barbara - Snoeck, Christophe (Vrije Universiteit Brussel) - Capuzzo, Giacomo (Université libre de Bruxelles) - Sengeløv, Amanda (Université libre de Bruxelles; Ghent University) - Hlad, Marta (Vrije Universiteit Brussel; Université libre de Bruxelles) - Warmenbol, Eugène (Université libre de Bruxelles) - Stamataki, Elisavet (Vrije Universiteit Brussel; Université libre de Bruxelles) - Vercauteren, Martine (Université libre de Bruxelles) - De Mulder, Guy (Ghent University)

Abstract format: Oral

A deficit of nonadult graves has been observed in a wide range of archaeological excavations. Several factors could be at play, such as a difference in funerary practices between adults and nonadults, partial excavation of the sites or possibly the small size of nonadult remains, especially when cremated. The site of Herstal, and its 21 Late Bronze Age cremation graves, offers a unique opportunity in the Belgian Meuse valley to improve our understanding of nonadult funerary rites and their potential social status using typology, grave goods, osteology, and strontium isotope analyses. Among the deceased, a relatively large number of nonadults (44%; 11/23) was discovered. Based on multi-proxy analyses, funerary rituals are determined to have been similar for adults and nonadults, as it was also observed in other cemeteries from the same period (e.g., Ireland, Scotland, Scandinavia, and in the southern Carpathian Basin). However, one grave reveals the somewhat unique presence of multiple nonadults buried together in an urn as opposed to other cemeteries where commonly nonadults are buried together with at least one adult. One of these nonadults was aged between 7 and 12 years and based on the age and the grave goods, this individual could already have been considered as an adult within this community. This research shows that multi-proxy analyses improve our understanding of changing social roles and significantly contributes to our understanding of the funerary practices in the Middle Meuse Valley and more broadly for the Late Bronze Age.

7 CHILDHOOD IN PROTOHISTORY IN THE SOUTHERN CARPATHIAN BASIN: EXAMPLES FROM THE URNFIELD PERIOD

Abstract author(s): Ložnjak Dizdar, Daria (Institute of Archaeology, Zagreb) - Rajić Šikanjić, Petra (Institute for Anthropological Research, Zagreb)

Abstract format: Oral

Childhood in protohistory in the southern Carpathian Basin is a research project funded by the Croatian Science Foundation. The research objectives of the project are: to determine the biological age and gender of the children; to research the social age of children in protohistoric communities and to recognise life phases in young populations of protohistoric communities. Project team try to reconstruct the everyday life of children by analysing different material traces, especially through the data on health, diet, costume,

and personal items. Multidisciplinary interpretation of the collected data give us insight into play, work, the children's relationship to their environment, and child-related rituals. The goals of the project is researched on three levels: each community separately; within a time period and diachronically through protohistory from the 14th century BC to the 2nd century BC within the chronological framework.

The envisaged multidisciplinary research (archaeology, anthropology, residue analyses, stable isotope analyses) use the archaeological context of the found material traces of children and their activities as the basic criterion for researching childhood in the past. Planned and controlled analyses within natural sciences will provide more knowledge on the diet and ritual of protohistoric communities. A joint interpretation will provide a more comprehensive view of the past through current methodologies of research applied to the archaeology of childhood.

Some examples from the Late Bronze Age communities in the southern Carpathian Basin will be presented in this paper. The biological and social age as well as the funerary context will be used in the reconstruction of their role in the hierarchy of a particular community and the change of perception through the period of the Urnfield culture.

8 BABIES IN FLAMES – CREMATION AS A SOCIAL ACT?

Abstract author(s): Guba, Szilvia (Ferenc Kubinyi Museum) - Köhler, Kitty (HAS)

Abstract format: Oral

The funerary landscape in Late Bronze Age Carpathian Basin shows great variation with spectacular burial mounds on one hand and almost unrecognisable cemeteries on the other. Although funerary practises are in general very strict, the burial rites (disposal of the body, arrangement and structure of the graves) show great diversity within regions or even in different cemeteries. In NE-Hungary and in the southern areas of Central Slovakia, the Late Bronze Age is marked by the cultural phenomenon of the Pilyiny and the subsequent Kyjatice cultures. Until today, there are about 160 cemeteries and 5300 individual burials known, which are – with just a few exceptions – all incinerations. Although a great deal of grave types and attributes are recognised and funerary acts might have changed during centuries, one basic act, the manipulation of the body with fire remained constant. This fact applies even for children, regardless of age or sex.

In our presentation we would like to highlight some aspects of non-adult LBA burials based on recent investigations. One important aspect is, when non-adults become part of the society. The idea of rites the passage manifests a specific age when children become fully accepted within the community. Archaeological record show that already by birth (and/or followed by rituals) they are recognised as full members: they are buried within the cemetery by getting the same treatment as adults. The anthropological data also suggest, that cremation itself was conducted in the same manner for children or even prenatates, e.g. burning the bodies on separate pyres, collecting the cremains in vessels. This paper discusses some of the archaeological evidence, when special attention was given to children in Late Bronze Age funerary practices.

A. FORGOTTEN BABIES? THE YOUNGEST CHILDREN IN THE EARLY BRONZE AGE IN CENTRAL EUROPE

Abstract author(s): Hladikova, Katarina (Comenius University, Faculty of Arts, Bratislava) - Vélková, Lucie (National museum in Prague) - Daňová, Klaudia (Institute of Archaeology SAS Nitra)

Abstract format: Poster

In recent years the subdiscipline archaeology of children and childhood has generated increasing scientific interest. Our project takes a closer look at children remains in archaeological records from Central European Early Bronze Age, especially in the area of Middle Danube. The collection of analysed children remains comes from different culture contexts and offers insight into construction of children personhood, their social identity and roles in the prehistoric communities.

This poster opens a discussion concernig (in)visibility of the youngest children (up one year including foetuses) in the archaeological record based on the contextual analysis of their remains and material evidence. The results of the analysis indicate high variability of the infant remains treatment (single graves, double and multiple graves and depositions, pithoi burials) and regional differences. The revealed differences among treatment of foetuses, newborns and infants could reflect slightly changing social position of children during childhood in relation to the age, gender, kinship and related social status.

B. AN INFANT BRONZE AGE FUNERARY CONTEXT FROM EL PENDO CAVE (CANTABRIAN SPAIN): THE ROLE OF CHILDREN IN RITUAL SPACES

Abstract author(s): Camarós, Edgard (McDonald Institute for Archaeological Research - University of Cambridge) - Cueto, Marián - Higuero-Pliego, Antonio (Instituto Internacional de Investigaciones Prehistóricas de Cantabria - IIIPC. Universidad de Cantabria) - Martín-Seijo, María (Departamento de Ciencias Históricas. Universidad de Cantabria) - Cubas, Miriam (Departamento de Historia y Filosofía. Universidad de Alcalá; Sociedad de Ciencias Aranzadi) - Teira, Luis (Instituto Internacional de Investigaciones Prehistóricas de Cantabria - IIIPC. Universidad de Cantabria) - Ruiz-Cabanzón, Alba (Universidad de Cantabria) - Arias, Pablo (Instituto Internacional de Investigaciones Prehistóricas de Cantabria - IIIPC. Universidad de Cantabria)

Abstract format: Poster

El Pendo Cave (Cantabrian Spain) is a well-known Palaeolithic archaeological site listed in the World Heritage by UNESCO. Nevertheless, the site preserves outstanding evidence of a Bronze Age context defined by the presence of non-sedimented circular

structures, organic material (i.e., cordage, crafted wood and bark elements), metal objects and abundant pottery. Decontextualized human remains were also present at the site and collected during previous excavations. The Bronze Age context has been described as a ritual votive area, similar to others identified in Cantabrian Spain. Among other evidence of a non-domestic use of a specific area of the El Pendo Cave, an infant funerary assemblage has been located. A 1.5-2 years old individual was placed between two rocks within the ritual votive context. What role did this child play among ritual activities at El Pendo Cave? How does this funerary context link with sacred spaces during Bronze Age in Northern Iberia? Is there evidence of differential treatment when comparing with funerary contexts associated to adults? Was El Pendo Cave used as a collective funerary context?

In the present contribution, we face all those questions with the aim of defining and contextualizing the infant funerary unit at El Pendo in the context of significant social change observable through funerary and ritual variability and changes.

382

FROM THE FIELD TO THE COMPUTER. THE VALIDITY OF QUANTITATIVE METHODS REGARDING THE QUALITY OF ARCHAEOLOGICAL DATA

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Cortell-Nicolau, Alfredo - Pardo-Gordó, Salvador (Departament de Prehistòria, Arqueologia i Història Antiga. Universitat de València) - Perrin, Thomas (Université Toulouse. CNRS)

Format: Regular session

Measuring archaeological diversity has known a great theoretical and methodological development in the past decades. The inclusion of ever more sophisticated techniques, as well as thorough consideration of archaeological theory have provided current archaeologists with a useful toolset able to tackle different kinds of problematics and research questions. The analysis of radiocarbon datasets, the study of archaeological networks or the adaptation of different ecological techniques are just some of the methodological solutions that try to understand archaeology and bring solid explanations for past dynamics.

However, the archaeology's Achilles' heel has always been the quality of its data. How can we measure diversity without a clear understanding of archaeological units? How do we move on to synthetic research without a full reliance on our primary sources? What is the responsibility of field archaeologists producing information, and of theoretical archaeologists tailoring useful generalised methodologies?

In this session, we mean to build bridges between field archaeology and theoretical archaeology, from the acquaintance that one is useless without the other. We welcome all proposals trying to improve the recollection and understanding of primary data and how that can be translated into useful primary information. Also, we welcome any insight assessing the validity of the application of quantifying techniques (from ecological general solutions, to ad hoc developed methods) regarding the quality of the archaeological record.

ABSTRACTS:

1 WHO CARVED? RUNIC INSCRIPTIONS FROM BERGEN, NORWAY

Abstract author(s): Magin, Elisabeth (University of Nottingham)

Abstract format: Oral

Between 1955 and 1979, almost 700 runic inscriptions on small wooden sticks, ceramics and other objects were found on the Bryggen site in Bergen, Norway, dating to the 10th to the 15th century AD. Many of the objects carry little more but a name – but these names are significant. Traditional interpretations of runic inscriptions have often viewed runic script as an elite medium of communication, similar to the Latin alphabet. However, medieval Scandinavian names not only function as tools to properly identify and address individuals, but also as a way to express status and family affiliation. The names in the runic inscriptions therefore provide valuable clues regarding the potential social status of the rune-carvers; by extent, they therefore also provide clues to which parts of the population made use of runes for communication purposes.

This paper will discuss how comparisons between archaeological and manuscript sources can aid our understanding of medieval runic literacy within the context of a medieval trading town, by combining archaeological and onomastic data. It will further discuss how the data aspect of either side of the study has to be modelled to be able to employ a relational database and statistical methods like the Chi-Square-test for analysis.

2 OBJECT TO SCREEN: RUNIC INSCRIPTIONS, LEGACY DATA AND A RELATIONAL DATABASE

Abstract author(s): Magin, Elisabeth (University of Nottingham)

Abstract format: Oral

The Bryggen excavations (1955-1979, Bergen, Norway), represent one of the largest medieval archaeological excavations in Northern Europe, and a breakthrough in excavation methodology – from the very start, mechanical methods of data processing were used to store information about the roughly 100,000 finds.

As of 2021, the excavation has still not been fully published despite what, at first, appears to be fortunate circumstances. The data from the IBM cards has been transferred into a relational database, but that does not necessarily make it easier. The legacy data

is of varied quality, and later evaluation of the materials raised doubts about, for example, the dating of artefacts. Either presents additional obstacles, for example when working with the roughly 700 runic inscriptions found during the excavations. These constitute a unique corpus of great importance for archaeologists, linguists, philologists and cultural historians alike, offering genuine impressions of daily life in a medieval town from the perspective of the inhabitants.

Analysing them as a corpus, however, requires first dealing with several obstacles: the legacy data of the excavations combined with the problems of adequately representing runological research in a database model allowing large-scale analysis of the material. This paper focusses on how the legacy data was carefully transferred into a data structure better suited to analysis by computer, and how the combination of proper data structure, legacy excavation data and runological data permits fascinating additional insights into the rune-carving population in Bergen.

3 A GLITCH IN THE MATRIX? HOW RE-USEABLE IS THE STRATIGRAPHIC DATA WE RECORD, ANALYSE, SYNTHESIZE OR PUBLISH?

Abstract author(s): May, Keith (HE - Historic England; University of South Wales) - Taylor, James (University of York) - Binding, Ceri (University of South Wales)

Abstract format: Oral

Stratigraphic laws and principles underpin the archaeological records from excavated sites and are essential for integrated analysis, wider synthesis and accessible digital archiving of the growing body of archaeological data and reports generated through the commercial archaeological sector in the UK and internationally. On most excavated sites, the stratigraphic record, most often visualized, and to a degree quantifiable, in the form of a stratigraphic matrix, acts as a primary, if not the primary piece of evidence for how, and in what order, the site was excavated. As such the stratigraphic record is the key mechanism that enables anyone less familiar with the site, to re-visit the excavation records, understand what data is most relevant for any research questions, or problems encountered, and piece together the underlying details of how the interpretations by the excavator(s) were arrived at.

However, such primary records are often only held on paper or scanned copies of matrix diagrams that cannot easily be re-used with associated data. Often the key phasing data needed for re-use in synthesis work and interpretive understanding, let alone Bayesian Chronological modelling, is not consistently documented, if at all, in written reports. This results in key records being unsearchable or remaining unconnected and lacking interoperability with other data (unFAIR).

The focus of digital archives and museums is now switching from simply providing better access to digital archives, to questions of how users in commercial units, curatorial organizations and academia, along with the general public, are going to make best use of this growing body of digital information and data.

This paper will present work undertaken by The Matrix project [AH/T002093/1] which is addressing some of the current problems caused by the lack of standardized approaches to analysis and digital archives of archaeological stratigraphic and phasing data.

4 TRUST IN NUMBERS OR TRUST IN DIGGERS? QUANTITATIVE AND SIMULATION-BASED METHODS TO ASSESS FIELD DATA QUALITY: STRATIGRAPHY AND REFITTING ANALYSIS

Abstract author(s): Plutniak, Sébastien (TRACES laboratory, Toulouse; Centre Émile Durkheim, Bordeaux)

Abstract format: Oral

Theoretical issues raised by the dialectical relationship between the quality of archaeological data and the quality of their modelling will be addressed from a methodological standpoint. I argue that 1) archaeological science needs to ensure the highest standards regarding each of these two aspects, and 2) that the theoretical problems must be addressed with regards to their consequences for operational methods. I will demonstrate this approach from the case of a new method to study the relationships between stratigraphic units and refitting, and related problems regarding the ontology of archaeological facts.

Refitting pieces have been long-used in archaeology to assess the consistency of discrete spatial units (e.g. layers) and to evaluate disturbances and post-depositional processes. Previous methods, despite their differences, relied on the count and proportion of refits within and between spatial units. Little attention was paid to the distribution and topology of the relations between fragments, although this can have significant effects on archaeological interpretation. The TSAR method (Topological Study of Archaeological Refitting), presented here, draws on concepts and methods from graph theory to model the network of connections observed between refitting fragments. Measures for the cohesion and admixture of spatial units are defined based on the topological properties of these connections.

In this approach, confidence in field data is evaluated and consolidated through modelling and quantitative methods, which are used in three related ways: 1) descriptive statistics, 2) ad hoc measurements (based on specific assumptions) of cohesion and admixture, and 3) testing of site formation hypotheses comparing the observed data against simulated data generated using the properties of the observed data.

Finally, the methodological need to model refitting relationships between objects and their relations with spatial archaeological units raises theoretical issues related to the elementary archaeological concepts, such as the very concepts of object, fragment, site, layer, etc.

5 NEW UNCERTAIN PREHISTORIC SITES: CONFRONTING ARCHAEOLOGICAL PALIMPSESTS USING BAYESIAN PROBABILISTIC METHODS APPLIED TO LITHIC ARTIFACTS

Abstract author(s): Gironès Rofes, Ivan (Departament de Prehistòria. Universitat Autònoma de Barcelona) - Pardo Gordó, Salvador (Departamento de Geografía e Historia. Universidad de La Laguna) - Molist Montaña, Miquel (Departament de Prehistòria. Universitat Autònoma de Barcelona)

Abstract format: Oral

The study of archaeological palimpsests tends to a common problem for the treatment of data, mainly characterized by the performance of analyzes with a lack of scientific and interpretative bases which are limited to the chronological and technological representativeness of the artifacts with the shortage of flexibility. The contrast of these data with the reference data currently available, therefore, they are associated according to qualitative criteria that are outside the total representativeness of the archaeological assemblages and without fixed bases that support them.

In this communication, it is intended to expose the construction of Bayesian models applied to lithic artifacts to confront these archaeological situations. Following its application to Valencian contexts, our objective is to approach a certain contextualization of the decontextualized with more solid bases identifying Prehistoric occupations (c. 13.400-4.200 cal BP) in the lower Ebro valley (Catalonia, Spain). Under this line, we will expose from the construction and criteria of the referential base (sampling, reliability of the absolute dating contexts used, etc.) to its application in case of studies with lithic assemblages without time and space associations, recovered in the fluvial terraces of the lower Ebro. Finally, we will emphasize the exposition of not solved problems to take stock of the effectiveness of the model.

6 INTEGRATING DATA FROM OTHER SOURCES AND EXPANDING THE ARCHAEOLOGICAL PERSPECTIVE: A CASE FROM ANATOLIA

Abstract author(s): Arikan, Bulent (Istanbul Technical University)

Abstract format: Oral

The connection between field archaeology and theory is a sensitive one. There is a two-way relationship; however, it is also fraught with problems concerning data quality. More often than not, hypotheses we build in archaeology require integrating data sets from various fields, and these datasets come with their own issues. This paper will focus on how to integrate ecological data into archaeology in north-central Anatolia. North-central Anatolia witnessed the social evolution from chiefdom to statehood, but archaeological research has been intermittent. There has been limited paleoecological research in this part of the Anatolian steppe. Due to the nature of the archaeological record and paleoenvironmental data, combining these groups for synthesis was never achieved. Adopting a holistic approach and re-assessing both archaeological and paleoecological datasets allowed us to build testable hypotheses. Consequently, the relationship between social evolution and past environmental conditions may be assessed through data sets that are better suited for synthetic research.

7 MANUAL AND AUTOMATED REDISCOVERY OF SMALL VILLAGE PONDS IN NORTHWEST INDIA, AND POTENTIAL CONTRIBUTIONS TO RESILIENT AND SUSTAINABLE WATER MANAGEMENT

Abstract author(s): Green, Adam (University of Cambridge) - Garcia-Molsosa, Arnau (Catalan Institute of Classical Archaeology) - Alam, Aftab (Banaras Hindu University) - Orengo, Hector (Catalan Institute of Classical Archaeology) - Petrie, Cameron (University of Cambridge)

Abstract format: Oral

Archaeological data can contribute substantially to interdisciplinary debates about sustainability and resilience, and can help guide policymakers to improve resource management in the present. Agricultural water management in South Asia is particularly critical in this regard. In northwest India certain kinds of anthropogenic surface water features, such as village ponds, appear to have played an important role in the region's deep history and can play a role in contemporary water management. These surface water features are critical in the region's distinctive environment, which receives significant rainfall from the Indian Summer Monsoon and additional input from the winter rains. However, before these features can be integrated into policy debates, it is necessary to identify them in the landscape, as well as their associations with settlements and other landscape features. After all, to understand the potential of these and similar features to mitigate the worst effects of climate crisis, data about them must be translated into units that are pertinent to interdisciplinary research; archaeological and historical data must be assembled into comparable units to contemporary data, and at scale. In this paper, we discuss the potential of historical maps and archaeological data to identify the extent of surface water in both the near and distant past. Using a combination of GIS, remote sensing, and historical analysis, we outline a new big data approach to the assembly of surface water data in northwest India. We focus in particular on the analysis of historical Survey of India maps that were prepared by British Colonial authorities nearly a century ago. We compare manual and automated methods of extraction, present a new machine-learning workflow, and explore the potential of these results to contribute to debates about resilience and sustainability in the face of a growing climate crisis.

Theme: 6. Material culture studies and societies

Organisers: Zeman-Wisniewska, Katarzyna (Uniwersytet Kardynała Stefana Wyszyńskiego w Warszawie) - Recht, Laerke (University of Graz) - Georgiou, Artemis (Cyprus American Archaeological Research Institute)

Format: Regular session

This session will explore social transformations in ancient Cyprus. Islands can be seen as laboratories of cultures and societies, and Cyprus is particularly fascinating in this regard, due to its rich material culture, with both internally and externally caused processes of social transformations, stemming from the island's geographical position within key Mediterranean maritime routes. The focus is on transitional periods, for example the so-called Philia phase between the Late Chalcolithic and the Early Bronze Age, the little understood Early Cypriot to Middle Cypriot and Middle Cypriot to Late Cypriot, the end of the Bronze Age and the beginning of the Early Iron Age and the transition from the Cypro-Classical to the Hellenistic period. Papers on any aspect of material culture and archaeological contexts that analyse transformations in social structures, economy or ideology are welcome. These can include, but are not restricted to, changes in settlement patterns, architecture, practices of production and consumption (e.g. ceramics, figurines, metalwork), human-environment interaction, intra- and extra-insular exchange networks and burial practices. We also encourage papers that question the conventional chronological standards and divisions themselves as they have been established and are used in scholarship today, closely examining their validity and usefulness. Such papers may in fact challenge the previously assumed transformations or our current chronological framework and terminology.

ABSTRACTS:

1 INTER-PERIOD TRANSITIONS: EXPLORING THE LONG-TERM HISTORY OF THE ACERAMIC NEOLITHIC THROUGH THE NEW CASE STUDY OF PYRGOS AYIA MARINA

Abstract author(s): Chelazzi, Francesca (University of Glasgow) - Menozzi, Oliva (Università 'G. D'Annunzio' di Chieti e Pescara) - Agostini, Silvano (Centro di Ateneo di Archeometria e Microanalisi - Università 'G. D'Annunzio' di Chieti e Pescara) - Ciarico, Alessandra - Di Valerio, Eugenio (Università 'G. D'Annunzio' di Chieti e Pescara)

Abstract format: Oral

The long-term history of human societies is characterised by major transformations, which usually coincides with macroscopic changes in settlement, material culture, technology, architecture, and socio-economic organisation. Especially where no sizable change is self-evident, there is usually a tendency to acknowledge ancient communities as 'monolithic' social bodies, with no distinction in space and time.

The Cypriot Aceramic Neolithic consisted of an extensive period (almost three millennia) when the island's earliest communities commenced manipulating their territories, through an increasing intensification of farming and grazing, and the development of symbolic and ideological thinking. The Aceramic Neolithic legacy of Cyprus includes old and newly excavated sites revealing regional sequences of 'inter-period' transformations in terms of chipped stone technology, architecture, and subsistence economy.

Pyrgos Ayia Marina is an excellent case study for exploring the evolution of the Aceramic Neolithic in Southern Cyprus, given its long-term occupation which preliminary radiocarbon dates place from the half of the 10th millennium to the 7th millennium BC at least. Whilst new radiocarbon analyses are in progress to date the entire sequence of occupation, the available chronology indicates the potential of Ayia Marina to yield new data about the so-called PPNA hiatus and – possibly – the 8.2 ka BP climatic event. The extended stratigraphy includes at least six distinct phases of occupation, alternated with episodes of abandonment, flooding, and accumulation of deposits.

The remarkable set of threats affecting the site provides an opportunity not to be missed to collect new data about the socio-economic transformation of Neolithic Cyprus, addressing a broad range of topics through a multi-disciplinary approach. New data in human-environment interaction, technology, production and consumption aims at filling some critical gaps in the archaeological knowledge, revealing that Aceramic Neolithic communities were not a changeless and 'monolithic' society.

2 VARIATIONS ON A THEME: REASSESSING THE PHILIA CONUNDRUM

Abstract author(s): Paraskeva, Charalampos (Archaeological Research Unit, University of Cyprus)

Abstract format: Oral

The transition from the Chalcolithic to the Bronze Age in Cyprus has been a topic of often heated debate amongst archaeologists working on the island since the discovery of a series of tombs at Philia-Vasiliko, which provided the earliest traces of Bronze Age cultural material in the 1940s and led to the establishment of the term Philia culture/facies to identify the transitional period prior to and leading into the Early Bronze Age. However, the paucity and poor publication of evidence regarding the material culture associated with this period, the absence of an island-wide typology for the Late Chalcolithic pottery; and the lack of temporal data for most sites dating to and around either side of the transition, have led to the adoption of interpretive perspectives that are more reliant on abstract archaeological theory than concrete material evidence. This tendency to emphasize theory over data tends to disregard data that cannot be explained by the former, promotes unilinear, often monocausal narratives regarding the transition, masks cul-

tural variations in the archaeological record, reduces the plurality of responses by agents of change to collective action, and ignores spatiotemporal differences in the rate and mode of managing technological, social, material, and cultural novelty. The present study proposes a radical realignment of the timeline and narrative for this transition based on re-examined and new data (bibliographic, chronometric, spatial, artefactual) spanning from the Late Chalcolithic to the Early Bronze Age and spatially covering nearly the entire island. In this regard, a multilineal explanatory model will be outlined, which allows for a longer overlap between the Chalcolithic and Bronze Age, accepts that change occurs at varying speeds; regions and perhaps sites emerge as primary actors of change, and the external versus internal agents of change debate is replaced by a complex web of dynamically interacting population groups.

3 BREAKING BOUNDARIES: EXAMINING TRANSITIONAL PERIODS AND TECHNOLOGICAL CHOICES IN PREHISTORIC SOUTH-WEST CYPRUS THROUGH POTTERY ANALYSIS

Abstract author(s): Menelaou, Sergios (University of Cyprus, Archaeological Research Unit) - Bolger, Diane (University of Edinburgh School of History, Classics and Archaeology) - Bombardieri, Luca (University of Turin) - Crewe, Lindy (Cyprus American Archaeological Research Institute)

Abstract format: Oral

Pottery, and ceramic artefacts in general, are sensitive markers of technological and socio-economic transformations and their detailed analysis holds a key position in investigating in a more tangible manner developments in social structures, craft practices, past interaction and external influence, connectivity and mobility, and human-environment interactions. In fact, recent years in Cypriot studies have witnessed an increasing concern towards pottery's technological significance from a rather scientific perspective, moving beyond morpho-stylistic and typological approaches. These have so far made clear that the ceramic regionalism evident across the island shows distinct differences between the north/centre and south/west of the island from at least the Philia phase onwards. Until recently, stylistic and typological sequences were constructed almost entirely on the basis of tomb finds from cemeteries excavated in northern Cyprus. This fragmented picture has, however, started to change through the investigation of settlement sites in south-west Cyprus with the examples of Kissonerga-Mosphilia, Kissonerga-Skalia, and Erimi-Laonin tou Porakou. This paper will discuss the preliminary results of a targeted combined macroscopic and petrographic analysis of ceramic samples from the three aforementioned sites, which will enable important insights into synchronic and diachronic developments in Chalcolithic through Middle Bronze Age Cyprus, with a special concern with how these developments are imprinted in the transitional phases. Through these case studies, aspects of ceramic manufacture and technology at the micro-scale level will be illuminated, alongside the examination of continuity and/or change in local technological traditions, breaking away from monolithic chronological boundaries and transitional periods. Beyond the establishment of the local ceramic profiles, the examination of technological influences at an intra-island and inter-regional level will be attempted.

4 ABANDONMENT PRACTICES IN THE TRANSFORMATIVE MIDDLE BRONZE AGE CYPRUS

Abstract author(s): Amadio, Marialucia (Dipartimento di Civiltà e Forme del Sapere, Università di Pisa) - Bombardieri, Luca (DF-CLAM, Università di Siena)

Abstract format: Oral

The characterization of abandonment practices is a key topic in archaeological discussion as it provides an excellent arena to analyse social and historical processes in ancient communities (e.g. Cameron 1991; Cameron and Tomka 1993; Stevanovic 1997, 2002; Verhoeven 2000; Twiss et al. 2008; Driessen 2013). If the construction of a building may offer evidence of the formation of social identities, roles and statuses, the analysis of abandonment dynamics may provide significant data to examine the way these identities are reinforced, maintained or -alternatively- negotiated through social practices for individual households and across generation in the longer term.

In this view, the proposed paper aims at presenting a fresh perspective on socio-cultural practices and dynamics during the Middle Bronze Age in Cyprus. In this period, new social identities, roles and relationships emerged, transforming a household-based society into a more complex social system, which would ultimately develop into the urban centres of the Late Bronze Age (Webb and Knapp 2021). While the evident outcome of this process, the ex-novo foundation of cities in the Late Cypriot (LC) II period, has received ample attention, complex abandonment phenomena and destruction practices of Middle Bronze Age centres deserve further investigation as part of the same overarching process of social transformation.

New evidence resulting from integrated analyses conducted on abandonment sequences at Middle Bronze Age Erimi will be presented along with a reassessment of data from abandonment contexts of coeval settlements in Cyprus in order to attempt a reconstruction of the causes that triggered the abandonment of these centres. The final purpose is to stimulate a discussion about possible social, cultural, political and ideological circumstances behind the identified abandonment practices of Middle Bronze Age contexts in Cyprus.

5 TRADITION AND INNOVATION DURING THE 12TH-TO-11TH CENTURY BC TRANSITION IN CYPRUS: NEW DATA FROM THE KITION-BAMBOULA SETTLEMENT

Abstract author(s): Georgiou, Artemis - Georgiadou, Anna (University of Cyprus) - Fourier, Sabine (Laboratoire HiSoMA, Maison de l'Orient et de la Méditerranée)

Abstract format: Oral

The transition from the 12th to the 11th century BC in Cyprus constitutes a critical junction that marks the close of the Late Bronze Age and the inception of the Early Iron Age. This transformative phase remains poorly known and ill defined, not least because of the remarkable dearth of stratified settlement strata exposed to this day on the island.

Recent investigations by the French Archaeological Mission at Kition, within the locality of Bamboula, situated on the northern part of the modern-day town of Larnaca, have brought to light a continuous stratigraphic succession of floor layers spanning from the 13th to the 11th centuries BC, thus marking an exceptional instance on an island-wide basis.

The aim of this contribution is to provide a comprehensive presentation of the stratigraphic, architectural and artefactual remains exposed at Kition-Bamboula that provide crucial new data for the transitional 12th-to-11th century BC horizon. In particular, through the contextual analysis of well-stratified pottery remains, the study aims to discuss the transformations observed on the island's ceramic repertoire and especially as regards the impact of the endorsement of wheel-made technology for the production of ceramic finewares. The study will also elucidate the extra-insular connections maintained by the cosmopolitan harbour town at Kition, based on the analysis of the plethora of Levantine maritime transport amphorae contained within the settlement's pertinent levels. Finally, this presentation will discuss a series of idiosyncratic phenomena, such as infant jar-burials and purple-dye production, dating to the settlement's transitional phases of the 12th and 11th centuries BC. Ultimately, our contribution aspires to shed light on the continuities and innovations characterising the Cypriot material culture and the transformative capacities of the island's communities at the dawn of the Early Iron Age.

6 TRANSFORMATION & DEEP TIME: ANIMALS IN PREHISTORIC CYPRUS

Abstract author(s): Recht, Laerke (University of Graz)

Abstract format: Oral

Animals have always had a central role in human lives, as a resource, as companions and as determining lifestyles, among many other things. This paper will examine the transformative powers of animals in Prehistoric Cyprus. Cyprus is particularly suited for this kind of study as an island where we can trace which animals travelled with humans. From the first human visitors through increased settlement to the end of the Bronze Age, human-animal relations were incredibly varied and catalysts for changing lifestyles. Marine animals, mammals and birds were not only the basis for fishing, hunting, pastoralism and agriculture, but also represent ways in which humans interact with other animals and their environment more broadly. The earliest humans on the island appear to have primarily interacted with indigenous species, to the extent that it may even have caused extinctions of some species. The next visitors settled more long-term and brought with them species such as deer that could be hunted, while pigs, sheep and goats involved more intimate relations and new technologies. The Prehistoric Bronze Age introduced larger mammal species such as cattle and donkeys that aided in agriculture and overland transport; later in the Protohistoric Bronze Age, horses became an integral part of international trade and relations. Each animal species imply a range of relations between human and nonhuman animal and some were indeed transformative for both humans and nonhumans.

7 DOVES AND PIGEONS IN THE BRONZE AGE CYPRUS – TRACING CHANGING HUMAN-BIRD RELATIONS

Abstract author(s): Zeman-Wisniewska, Katarzyna (Uniwersytet Kardynała Stefana Wyszyńskiego w Warszawie)

Abstract format: Oral

Columbidae are birds common in Cyprus, both nowadays and in the past, as local, migratory and domesticated animals. Doves and pigeons also hold a special, symbolic place in the human culture of ancient Cyprus, as sacred birds of the most Cypriot deity – Aphrodite. However, their presence in iconography, cult... and cuisine can be traced much further back, then the oldest remnants of the goddess' sanctuary in Paphos. Their bones were identified within Epipaleolithic bone assemblages, which makes them one of the first hunted animals in the island, thus one of the reasons for the early human presence here. During the Bronze Age doves and/or pigeons became visible in the Cypriot iconography. In the Early Bronze Age dove-shaped figurines were often attached to vases associated mostly with graves, which points not only to their symbolic role in cult, but probably also in changing agricultural practice and human-animal relations. In the Late Bronze Age presence of those birds in iconography (i.e. vessels, glyptic) connected with cult activities depicts doves (and/or pigeons) probably as sacrificial animals. This paper discusses changing human-bird relations within changing social and environmental context of the Bronze Age Cyprus.

8 FARMING THE BIG ISLANDS OF THE MEDITERRANEAN: CRETE AND CYPRUS IN THE BRONZE AGE

Abstract author(s): Margaritis, Evi - Henkel, Carly (The Cyprus Institute)

Abstract format: Oral

The exploitation and exchange of natural resources has been a key parameter in the survival and evolution of past and modern societies. Subsequently, specialisation and control of these resources constitutes a major indicator of increasing social complexity.

In the Mediterranean, aspects of social change such as urbanisation, technological sophistication and agricultural diversification, intensification and extensification are evidenced from the later fourth into the second millennia BC but also during the late Iron Age and the Archaic period. Although these developments have been extensively studied in the past, archaeobotanical approaches – and so a whole swathe of crucial evidence – have not been brought to bear on these questions, with notable exceptions. This paper will explore these aspects of research in two similar islands of the Mediterranean, Crete and Cyprus. The focus of the paper will be the 2nd millennium, a period of major transformations, which will be approached through the lens of the archaeobotanical remains.

9 CYPRUS™: LOOKING FOR BRANDING PRACTICES IN LATE BRONZE AGE CYPRUS

Abstract author(s): Meneghetti, Francesca (Independent researcher)

Abstract format: Oral

During the Late Bronze Age, Cyprus plays a pivotal role in Eastern Mediterranean trade networks. Even though the island lacks deciphered written evidence on its political organization, the archaeological record shows Cypriot elites who gained political and economic power thanks to overseas trade, thus having a political and entrepreneurial role in local society (Sherratt 2016).

After the collapse of the palatial system and related commercial networks (end of 13th cent. – beginning of 12th cent. BC), Cyprus and its elites survive the crisis and thrive. These elites are mostly recognizable from the rich mortuary data, which gives only a partial overview of these people. In this paper, I argue that it would be possible to spot entrepreneurial elites from other markers, such as branded commodities and branding practices (e.g., marks, potmarks, iconography, writing). I will address the topic using available sociological works on brands (Arvidsson 2005; De Waal Malefyt 2018; Holt 2006; 2003), to set out a theoretical approach applicable to goods and trades in the Late Bronze Age Eastern Mediterranean. Thus, the paper aims to shed further light on the Cypriot society in a transitional period, as the end of the Late Bronze Age.

10 FROM ISOLATED DATA SILOS TO AN INTEGRATED AND MULTI-PROXY REGIONAL SYNTHESIS. INSIGHTS IN A PAN-MEDITERRANEAN APPROACH TO HUMAN-ENVIRONMENT-CLIMATE INTERACTION

Abstract author(s): Chelazzi, Francesca (University of Glasgow)

Abstract format: Oral

Data integration in Mediterranean and Near Eastern archaeology has become a very fertile area of research in the last decade, exploring how to aggregate and compare the many legacies that archaeology has produced over time. An increasing body of intersectoral research projects has developed and tested new methodologies to explore the varying nature of human responses to environmental, climatic and societal transformations. These projects that have opened up the potential of using Big Data in archaeological research including radiocarbon, landcover, satellite, botanical, zoological and genetic datasets and general (climate) circulation models (GCMs) that can be mapped onto each other in order to examine long-term, large-scale trends in different datasets calibrated against each other.

Is Cyprus ready for the challenge? This paper explores some methodological problems that might emerge when applying these multi-proxy techniques to the Cypriot datasets. Preliminary problems include the many sources of bias related to temporal uncertainty and the reliance on traditional typo-chronological schemes for historical periods. While radiocarbon dates from Cyprus suggest that new techniques such as the Summed Probability Distribution (SPD) might be coupled with probabilistic modelling techniques inferred from archaeological data (e.g. raw site counts, summed settlement area, aoristic sum), major problems arise when dealing with pollen cores, pollen-inferred land cover models and locally acquired climate proxies.

The purpose of this paper is to highlight the potential of this new 'season' of multi-proxy techniques, to prepare Cypriot archaeology for this exciting challenge where the island can successfully become a solid bridge within the reconstruction of the Holocene history of the Mediterranean region.

11 POLYGONAL COLUMNS IN ARCHAIC CYPRUS

Abstract author(s): Emanuelsson-Paulson, Therese (Classical Archaeology and Ancient History, Department of Archaeology and Ancient History, Stockholm University)

Abstract format: Oral

Archaic polygonal columns are found in Amanthus, Idalion, Kition, Marion and Palaepaphos, where the latter is the only site with numerous examples and the polygonal shape might even be more common than other column shapes. The inspiration for polygonal columns has been sought in Egyptian or Mycenaean architecture, but probably the Assyrian and Hittite use of polygonal columns down to the 7th century BC is a more likely source of inspiration. These columns mainly carry Leaf or Helmet capitals, where the former is inspired by Assyrian or Phoenician capitals, while the latter might be a local invention. In the same period similarly shaped polygonal columns with Doric capitals appears in Greece, likely originating from the same inspiration or possibly secondary inspired from Cyprus. Simultaneously in both regions, the polygonal columns vanish around 500 BC, when the war with the Persians escalates.

A decorated column is not a necessary; a wooden pier would often suffice. Columns and decorated architecture in general, were most often used to express once wealth, status or identity, either within the own group or collectively towards other groups of people. The use of polygonal votive columns dedicated in the open air sanctuary in Palaepaphos seems therefore to be a local religious tradition similar to the Phoenician or Canaanite sanctuaries. The column from Kition also originates in a sanctuary, next to a Phoe-

nician temple. It is therefore possible that the few polygonal columns found in other sites, mainly sanctuaries are also dedicated by either people for Palaepaphos or of a similar tradition, possibly Phoenicians. When polygonal columns disappear around 500 BC likely either the people left or the polygonal columns were for some reason too closely connected to the invading occupying power.

12 BETWEEN THE KINYRAD TRADITION AND THE COSMOPOLITAN NEA PAPHOS

Abstract author(s): Mlynarczyk, Jolanta (University of Warsaw)

Abstract format: Oral

Dramatic shifts in the political power that took place within the Eastern Mediterranean after the conquest by Alexander the Great were inevitably connected to many social changes including the foundation of new towns, the rise of civic institutions and new facets of the religious life. With the abolition of Cypriote kingdoms and establishing a new centre of power in Alexandria, the island became a place of residence for many foreigners, including representatives of the Ptolemaic administration and mercenary soldiers from all parts of the Greek world whose presence on the island must have been felt in the life of the local communities.

All these changes influenced also one of the most conservative regions of Cyprus, the former kingdom of Paphos. Its culture, firmly rooted in the indigenous tradition of the LBA, at the same time featured Greek cultural ties as well as some links to Phoenicia religion. A special impetus to the changes in the life of the Paphians was given by the foundation of Nea Paphos between 321 and 310 BC.

Essential evidence for the transition from the Cypro-Classical to the Hellenistic period in the Paphos region are, in addition to scanty written and epigraphic sources, archaeological records of material culture, among which the ceramic finds are perhaps the most relevant. They may reflect the patterns of external contacts, the material/social status of inhabitants, sometimes also specifics of the local economy. The examination of all available sources demonstrates that the transitional period in question lasted well into the 3rd century BC. It is only in the 2nd century BC that Cyprus became fully absorbed into the Hellenistic koine in all aspects of her culture, as evidenced by e.g. the iconography of divine representations, or disappearance of inscriptions both in the Cypriot syllabary and the Phoenician alphabet.

13 CULTURAL SHIFT OR SHORT FASHION? HELLENISTIC BRAZIER FROM THE AGORA OF NEA PAPHOS, CYPRUS IN A GEO-POLITICAL AND SOCIO-ECONOMIC CONTEXT

Abstract author(s): Nocon, Kamila (The Polish Centre of Mediterranean Archaeology, University of Warsaw)

Abstract format: Oral

One of the benchmarks of the Hellenistic material culture were portable braziers, available to probably most areas and regions of the Hellenistic Eastern Mediterranean. One of the major theoretical issues that have dominated the field for many years concerns the social and symbolic function of braziers which were traditionally connected with the preparation and processing of food or interpreted as a type of altars associated with rituals of a religious nature, often combined with commensality of meat, also interpreted as incense for domestic cults. Studies over the past two decades have provided important information concerning braziers as a tool to create images of certain aspects of daily life and to come to the social and cultural principles of the communities they examine, but they are also bound into a description of local coarse ware ceramic production, by investigating how their fabrics were related to other contemporary pottery reveals the context of their production. The present study aims to offer a preliminary overview of braziers from the excavations at the Agora in Nea Paphos excavated during several research seasons. The main intention is to indicate presumably local production as well as examples manufactured outside Cyprus in the Hellenistic period. To date, there have been no reliable studies combing the presence of the braziers in Nea Paphos with socio-economic interpretation supported by archaeological and historical data. This study seeks to obtain data that will help to address research gaps in the material culture of the Hellenistic Nea Paphos and deepen understanding of the broader process of Hellenization.

14 MOVING WITH THE TIMES: SOCIAL CHANGE AND RITUAL MOVEMENT IN CYPRUS

Abstract author(s): Wink, Sarah (University of Glasgow)

Abstract format: Oral

This paper analyses social change from the Hellenistic to Early Byzantine periods of Cyprus through the analysis of changing ritual movement patterns and use of space. This period covers Cyprus' transition from Pagan to Christian, several changes in ruling authority and dramatic events that include earthquakes and Arab raids. These changes have important consequences on the use of city-space, sacred space and the associated movement between them. Analysis of ritual movement throughout this period will address how changing movement patterns are affected by both the sacred and the secular. This will provide insight into how people respond to social change through their devotional movement patterns within a complex web of interacting influences working for or against the change. Kourion, Paphos, Salamis and Amathus are employed as case studies in this paper as they demonstrate significant change and continuity throughout this period associated with changing secular and sacred circumstances. Movement patterns considered here include movement to and within the place of worship as how religious space is organised provides important insights into social and cultural norms.

388 PREHISTORIC INTER-SOCIETAL DYNAMICS ALONG THE ATLANTIC FAÇADE FROM THE NEOLITHIC TO THE IRON AGE

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Higginbottom, Gail (Incipit, Spanish National Research Council) - Carrero-Pazos, Miguel (Institute of Archaeology, UCL)

Format: Session with keynote presentation and discussion

In addition to sharing a common environmental background, the communities that were linked by the sea along the Atlantic Façade have repeatedly shared cultural phenomena for more than several millennia. The location of the Atlantic regions as a limit towards the vast Ocean was a vector for developing a strong social identity(ies), an anchor for long-distance connections and the circulation of ideas, innovations and people that started in prehistory. Throughout our focal period, communities became sedentary. Tied to new and old ancestral landscapes, people established local and regional traditions in monument architecture, with certain groups using idiosyncratic changes through a variety of material culture and behavioural forms to express social and political identity.

This session aims to focus on researches and projects along the Atlantic Façade that help uncover possible inter-societal relationships along this expanse. Papers can be regional or local case-studies related to maritime and terrestrial movement, social networks, environmental connections (place, landscape, territory), ritual experiences, cultural practices, material creations and so forth. In this way, papers maybe comparative themselves or they may contain results that can be used for future comparative analyses. Specifically, we would like to see papers coming from a variety of backgrounds and methodological approaches in order that this session can unite studies that contribute towards a greater understanding of this region of western Europe. These include: excavation results to computer modelling and archaeogenetic approaches to landscape archaeology, especially interdisciplinary.

We invite presenters with future projects or ideas as well as those already begun or completed. Together these studies will enable this session to foster future investigations and relationships with emerging research synergies between contributors and participants. With such things in mind, we will look to publishing this session and co-ordinating a yearly session connected within this dynamic geographical region.

ABSTRACTS:

1 BOYNE TO BRODGAR, AND BEYOND: THE COMPLEX CONNECTIONS OF THE NEOLITHIC MONUMENT BUILDERS IN BRITAIN AND IRELAND

Abstract author(s): Sheridan, Alison (Dept. Scottish History & Archaeology, National Museums Scotland)

Abstract format: Oral

Similarities between the Neolithic monuments found in different parts of Britain and Ireland, and with some Continental monuments - especially along the Atlantic facade - have long been recognised, and advances in dating, DNA, isotope analysis etc are enabling us to create a rich and nuanced narrative of the connections between the builders. This presentation summarises the main aspects of this changing pattern of connectedness over the period c 4100-2800 BC, and discusses the different social dynamics that are responsible for these connections. The earliest connection arises from the initial process of colonisation by farmers from Brittany, Normandy and Nord-Pas de Calais-Picardie to different parts of Britain and Ireland, which brought both megalithic and non-megalithic traditions. Connections between the subsequent regional trajectories of monument 'evolution', and the reasons for these connections, are then presented, with the role of what Mary Helms has termed 'cosmological acquisition' being a major factor behind the sharing of aspects of monument design between c. 3200 BC and c. 2800 BC. The presentation will end with a critique of other models that have been proposed, in recent years, to account for apparent similarities in monument forms between Britain and Ireland and the Continent, and it will highlight outstanding questions which the Boyne to Brodgar research initiative seeks to address.

2 INVESTIGATING A PORTAL DOLMAN: TRETHEVY QUOIT A CORNISH MEGALITHIC TOMB IN A SHARED SEA

Abstract author(s): Jones, Andy (Cornwall Archaeological Unit)

Abstract format: Oral

Early Neolithic portal dolmens are located around the Irish Sea towards the northern end of the Atlantic façade, with notable concentrations in Ireland, west Wales and Cornwall. Their distinct form comprising jamb stones, a doorstone and a spectacular capstone set at a 'jaunty' angle make them one of the most distinctive megalithic monument type in the repertoire of chambered tombs and stone settings erected in the period between circa 3800-3500 cal BC.

Trethevy Quoit is one of the best preserved Early Neolithic portal dolmens both in Cornwall and in the British Isles as a whole. Its erection reveals a knowledge of widely held traditions, as indeed do the building techniques which had no parallel in the local Mesolithic. Its construction, given the range of other megalithic structures, also represents a deliberate choice of architecture and a desire to materialize a particular monument form.

Trethevy Quoit does not, however, just represent the process of replication of the portal dolman form, but rather embodies choices made by community who built it. These decisions include the place that it was erected, and the materials which comprise it. Inves-

tigations at Trethevy Quoit in 2019 revealed a low cairn or platform comprised of deliberately fragmented pieces of green stones, brought to the site in large quantities from a local source. By contrast, the granite slabs forming the chamber of the quoit, suggests that they were from the same rocky outcrop and had been transported from the Bodmin Moor 1.5 kilometres to the north.

This contribution will consider Trethevy Quoit as a designed monument which expresses both local choices and long distance connections of the community who built it.

3 REGIONAL IDENTITIES AND CULTURAL VARIATION IN THE SOUTH NORWEGIAN NEOLITHIC (CA. 4000–1700 BC)

Abstract author(s): Olsen, Dag Erik (Museum of Cultural History, University of Oslo)

Abstract format: Oral

At the onset of the Neolithic, the people in South Norway were well-adapted hunter-gatherer-fishers with distinct differences in settlement patterns and material culture between western and southeastern groups. This is due to adaptations to unique natural and climatic regional variations and to participation in different cultural networks. The regional variation became even more pronounced after 4000 BC with the spread of the Funnel Beaker Culture (TRB) into South Norway. The southeastern coastal groups became integrated in this network reflected by the presence of imported pottery and polished flint axes. In contrast, this new cultural network did not have any major impact on the western Norwegian societies, where novel local technologies became important instead. This is interpreted as a choice in order to preserve the existing social traditions and also reflects the degree of contact with groups from eastern Norway. One area of possible direct contact between people from the two regions is the high mountains of Hardangervidda and Nordfjella where seasonal hunting for reindeer has a long tradition. Here, distinct regional technological traits indicate a low presence of western groups while the majority of activity can be related to eastern Norwegian coastal and inland groups. This changed after ca. 2800 BC with a more prominent western Norwegian presence and led to more contact and interaction between different cultural groups. This coincides with a marked cultural change in western Norway integrating the region to southern Scandinavian networks via eastern Norway. This paper aims to discuss how various groups developed distinctive social traditions that changed to various degree partly related to fluctuating participation in networks where cultural knowledge was transferred. This also opens for discussing how new ideas was implemented or integrated into existing social structures as reflected by the material culture found at the settlement sites.

4 THE TRANSMISSION OF CERTAIN ARCHITECTURAL ELEMENTS DURING THE EARLY NEOLITHIC (LBK)

Abstract author(s): Minnich, Alexander (Universität Wien)

Abstract format: Oral

The transfer on of a certain architectural knowledge can be understood as one of the cornerstones of civilizations or cultures and contributes just as much to the self-image of these, such as a common belief, value concept or material culture. Much is already known about the tradition of building knowledge in the Middle Ages, but not much about the transfer of knowledge in the Neolithic, in particular for the Linear Pottery Culture (LBK). The relatively rapid expansion of this culture would not have been possible if there had not been a common basic idea of what a building should look like and how certain interior spaces should be designed. The areas between two adjacent transverse rows play an important role here. The distance between two transverse rows determines the size of the respective interior. The combination of certain rooms of the same size, which can rightly be called modules due to their architectural design, creates interior surfaces that can be combined with one another as required. By omitting a transverse row, a larger interior can be created, for example, which can be referred to as the central room of a long house. When comparing these modules across regions, it was noticeable that similar or equally large interior surfaces or rooms were found in houses throughout the entire distribution area. The study presented here is intended to provide an insight into the architectural ideas and solutions in the Early Neolithic on the basis of selected case studies.

5 INTER-SOCIETAL DYNAMICS ALONG THE ATLANTIC FAÇADE - DOLMENS OF GALICIA AND WESTERN BRITAIN

Abstract author(s): Higginbottom, Gail - Gonzalez-Garcia, César - Vilas-Estévez, Benito (El Instituto de Ciencias del Patrimonio - Incipit, CSIC) - Carrero-Pazos, Miguel (University College London)

Abstract format: Oral

'Analysis of Neolithic spatiality at the scale of the European Atlantic Façade remains a difficult task ... the different research traditions in different parts of western Europe have resulted in disparate approaches to material culture, landscape, space and their interpretation' (Gianotti et al. 2011: 392). By incorporating the uniquely combined cultural indicators of landscapes, megaliths, skylines, skyscapes and astronomy, and the use of bespoke-software as well as more standard forms of statistical analyses, this novel project introduces a globally applicable method to unite research areas across the Façade, thereby resolving such disparate methodological applications. Whilst last year's presentation concentrated on the early results of our work on Iberian landscapes, in particular Costa de Morte, we now broaden our focus to south-west Britain. This paper, then, will briefly explain the methods applied to dolmen landscapes and sky-scapes in Iberia and Britain, and reveal whether or not Neolithic ideologies, not just architectural rituals, made it to the west coast of Britain from the 'other side'.

6 COMPARATIVE MODELS OF MEGALITHIC LANDSCAPES IN NEOLITHIC ATLANTIC EUROPE. AN OUTLINE OF THE "MEGASCAPES" PROJECT

Abstract author(s): Carrero-Pazos, Miguel (UCL Institute of Archaeology)

Abstract format: Oral

The idea that Europe's Atlantic façade shares elements of a common culture rooted deep in prehistory has long fascinated geographers and archaeologists, and finds expression in modern political organisations such as the Atlantic Arc Commission. The MegaScapes project will use the latest statistical and quantitative methods to examine whether the explosion of megalithic construction across Europe's Atlantic façade between 5000-2500 BC (and especially 4500-3500 BC) provides evidence of a shared understanding across distant regions of the Atlantic European seaboard as long ago as the Neolithic. It will undertake a comparative study of four important micro-regions of megalithic construction spanning the United Kingdom, Ireland, France and Spain, which will use advances in computational and spatial statistical modelling to analyse spatio-temporal patterns in the arrangement of megalithic monuments, and their possible meaning in a wider landscape context. The latter will be inferred by rigorously investigating regularities in the geographical placement of megaliths, trends in their visibility, their association with pathways and their relation with the lived environment such as settlement and land use. Ultimately the core aim of MegaScapes is to investigate whether the spatial meaning of Neolithic megalithic architecture was regionally variable, or whether it was indeed shared along the Atlantic European seaboard.

7 HEATHLANDS AS INTERSPECIES, INTER-SOCIETAL LANDSCAPES OF THE ATLANTIC FAÇADE

Abstract author(s): Løvschal, Mette (Aarhus University; Moesgaard Museum)

Abstract format: Oral

Atlantic heathlands were once one of the most extensive open landscapes existing across Northern Europe. They are most frequently defined in biological terms as open, treeless landscapes, dominated by evergreen sclerophyllous plants, and thriving on sandy, nutrient-poor soils. Heather connects large stretches of landscapes above ground (Calluna canopy) and below ground (rhizomes and ericoid mycorrhiza); as well as connecting its accompanying (non)human others who, in turn, ensure its rejuvenation by e.g. systematic burning, turf cutting and grazing. However, although they are frequently portrayed as disowned, disposed and degraded landscapes, the deep-time history of heathlands is one of incredible interspecies complexity, leading to exceptional economic infrastructures, funerary complexes and heath-bound traditions. These deeply integrated ecocultural Atlantic heathlands once formed a connected but somewhat patchy belt along the European west coast spanning from Portugal to the Netherlands, Britain and Ireland, Scandinavia and the steppes of Ukraine in the east and up to Lofoten in northern Norway. At their greatest extent, in the early 19th century AD, they covered millions of hectares, whereas today only a small percentage remains. This poses an intriguing question of what drove and linked the earliest human-driven expansions of heathland-associated grazing regimes and their sometimes incredibly deep-time existence. This paper presents a series of interim results from the newly commenced ERC project: 'Anthropogenic heathlands: The Social Organization of Super-Resilient Past Human Ecosystems [ANTHEA]', including new paleoecological and palynological evidence and landscape organisation modelling. These analyses shed new light on how particular landscape-bound practices of resurgence and extraction-oriented disturbances emerge, entangle and institutionalise. Practices that bind people to landscapes and landscapes to people, connecting humans, plants and animals across incredible distances and timespans. As a consequence, I will propose that both the extensive geographical range and deep-time success of the Atlantic heathlands were an interspecies, inter-societal achievement.

389 FROM COAST TO COAST - CURRENT ARCHAEOLOGICAL RESEARCH ON CULTURAL EXCHANGE ALONG AND ACROSS THE BALTIC SEA

Theme: 6. Material culture studies and societies

Organisers: Jahn, Christoph (Center for Baltic and Scandinavian Archaeology Schleswig) - Cieśliński, Adam - Wadył, Sławomir (University of Warsaw) - Shiroukhov, Roman - Sirkin, Annika (Center for Baltic and Scandinavian Archaeology Schleswig)

Format: Regular session

The Baltic Sea is a connecting environment for trade, migration and cultural exchange in prehistoric and historic times and enables long distance trade from modern Scandinavia at the northern coast of the Baltic Sea to the southern coast: the Baltic States, the Kaliningrad area, Poland and Germany. The reception of archaeological research in this area is still very much influenced by the political events of the 20th century, when the Baltic Sea was rather an insurmountable border than a connection between the neighboring states along the northern and southern shores of the Baltic Sea.

This session intends to be a kind of overview on the recent and current research, studies and research projects related to the cultural interaction between different areas along and across the Baltic Sea during the Bronze Age, Iron Age, Roman and Migration Period, Viking Age and the Middle Ages. We are looking for examples of archaeological data that illustrate social and economic processes, cultural exchange, intercultural and cross-cultural relations of different societies around the Baltic Sea. How much Scandinavian influence can be found at the other Baltic societies? What kind of Baltic, Slavic, Finno-Ugric, etc. material came to Scandinavia? What are the connections amongst the cultures at the southern or eastern coast of the Baltic Sea? Can we identify migration, demographic changes or group identity by international and interdisciplinary exchange of data? We are interested in new research projects

and results of studies on the widely understood topic of cultural exchange as well as presentations on methodology, chronology and typology of archaeological sites and artefacts of the Baltic Sea region.

ABSTRACTS:

- 1 PRUSSIA MUSEUM DIGITAL. A NEW RESOURCE FOR RESEARCH ON ARCHAEOLOGY IN FORMER EAST PRUSSIA**
Abstract author(s): Eilbracht, Heidemarie (Museum für Vor- und Frühgeschichte Berlin)
Abstract format: Oral
Since 2012, the project "Continuity of Research and Research of Continuity. Basic Research on Iron Age Settlement Archaeology in the Baltic Region" has been working on the scientific processing of archaeological sources from the former Prussia Museum in Königsberg/Ostpreußen. Until the Second World War, the Prussia Museum owned one of the most important and largest collections of prehistory in the southern part of the Baltic region. In the post-war period, these important holdings fell into oblivion. They were considered lost or destroyed until big parts were rediscovered decades later through fortunate circumstances, among others in Berlin and Kaliningrad. Since then, they have been scientifically treated in several projects with the aim of making these documents and finds of about 150 years of archaeological activities in the region usable for modern research again.
Within the context of "Continuity of Research and Research of Continuity", the database "prussia museum digital" was developed as an important digital tool for the presentation as well as for the scientific interpretation and the long-term preservation of archaeological sources from former East Prussia. It currently offers information on more than 2,700 archaeological sites. It presents about 2,200 volumes of so-called site files with excavation reports, find notes, drawings and photos and, last but not least, more than 18,000 archaeological finds. Step by step, the richness of the archaeological remains is coming to light again, highlighting the role that the region has played in exchanges and contacts with its neighbours throughout the ages. The database has been made available to the specialist community since 2021. The lecture will give an insight into the concept and further perspectives and present selected archaeological results within the database.
- 2 BORNHOLM - THE ISLAND IN THE MIDDLE. SOCIETIES, CONTACTS AND ALLIANCE SYSTEMS ON THE THRESHOLD OF HISTORY**
Abstract author(s): Trolle, Tine (National Museum of Denmark)
Abstract format: Oral
Based on the archaeological material from Bornholm's largest cemetery of cremation graves, Store Frigård, the purpose of the project is to shed light on societies, contacts and alliance systems in the Baltic Sea region in the Early Iron Age (500 BC - 400 AD).
With its central geographical location in the middle of the Baltic Sea, Bornholm has always been an obvious link between the Continent and Scandinavia. This is especially true in the Early Iron Age, where the island's communities were in close contact with the northern German and Polish as well as the southern Scandinavian areas, especially Öland and Gotland. The cemetery of Store Frigård contains 1250 graves and has been used for a continuous period of almost 900 years.
The project, which is planned in the time frame 2021-2024, is anchored in a Danish-Norwegian-Swedish collaboration supplemented by the participation of a large number of researchers from Denmark and Poland.
The project and its perspectives are presented at the session.
- 3 TRACES OF A MIGRATION FROM SCANDINAVIA? THE ROMAN PERIOD CEMETERIES WITH STONE CIRCLES ON THE SOUTHERN BALTIC COASTLAND**
Abstract author(s): Cieslinski, Adam (University of Warsaw / Faculty of Archaeology)
Abstract format: Oral
One of the most interesting features of the Wielbark culture, the most important archaeological unit in northern Poland in the early Roman Period, is a relatively small group of cemeteries with stone circles. In historical times, these sites were being destroyed on a large scale to obtain stone for construction purposes. Until today, only a few surely confirmed sites of this type have survived in Pomerania, of which only a few have been excavated.
The tradition of building stone circles was unfamiliar to the communities living in the areas between the Oder and the Vistula before the Roman Period. Moreover, all cemeteries with stone circles seem to have been established in previously unsettled territories, unlike most of the Wielbark culture cemeteries from the early phase, which had apparently been used without interruption from the Pre-Roman Period. For this reason, it is believed that stone circles were built by the communities that had come from Scandinavia, where structures of this type date back to the Bronze Age. Stone circles are quite commonly associated with the migration of the Germanic tribe of Goths, described in written sources. According to an account by Jordanes from the first half of the 6th century, which he based on Cassiodorus (Getica IV, 25, 26), the Goths came from the island of Scandza, i.e., from Scandinavia. In the specialist literature, the thesis of the Scandinavian origin of the Goths was either accepted, very often without critical analysis, or completely rejected - in this second case Jordanes's tradition was regarded as a topos.

The paper will present the state of research and discussion on the genesis and interpretation of stone circles in Poland, with particular emphasis on the possibility of linking this phenomenon with the information about the migrating Goths found in written sources.

- 4 "STONES AND CIRCLES": TO THE STUDY OF THE BURIAL RITE OF THE SOUTHEASTERN BALTIC IN THE 1ST CENTURY AD**
Abstract author(s): Khomiakova, Olga (Institute of Archaeology of RAS, Moscow) - Skhodnov, Ivan (NIC Pribaltijskaja Archaeologia, Kaliningrad) - Kleshchenko, Ekaterina (Institute of Archaeology of RAS, Moscow)
Abstract format: Oral
At the beginning of Common Era, the cultures of the coastal zone of the Southeastern Baltic, associated with the Aestians of Tacitus, underwent changes in the funeral rite. Collective burials are being replaced by individual ones, characterized of corpses and cremations, accompanied with personal ornaments in Provincial-Roman style and covered with concentric stone structures. Despite an extensive database of burials of the most representative Aestian culture - Sambian-Natangian (SNC) of Kaliningrad region, the origin of their main characters is still not clear. A relatively small number of complexes of this period are known mainly from archival data. The presentation shows new data on the burial rite of the SNC, obtained as a result of recent work on its sites in the Pregolya Valley, from where the earliest finds of ornaments in Celtic-Roman style originate, indicating the beginning of the formation of the Roman period culture. Using modern research methods, data have been obtained on individual burials (cremations in urns and without) dated to the Central European phases B1/B2 (middle - third quarter of the 1st century AD) with stone circles and causeways. The bioarchaeological aspect of such burials is considered for the first time. Analogies in the funeral rite of the south of the Scandinavian Peninsula, the islands of Gotland, Öland and Bornholm, as well as in the burial grounds of the lower reaches of the Vistula, again raise the question - who were the ancient Aestians?
- 5 AMBER FINDS FROM 1ST-7TH CENT. AD IN NORTHERN EUROPE - NEW STUDIES ON DISTRIBUTION AND USE OF A SPECIAL MATERIAL**
Abstract author(s): Offermann, Karl Johann (Center for Baltic and Scandinavian Archaeology Schleswig)
Abstract format: Oral
Amber from different periods of human history has always been in the interest of archaeological research. However, for Scandinavia and Northern Germany no comprehensive studies on amber in the period from 1st to 7th century AD have been carried out so far.
Apart from few regional studies and investigations on specific amber bead types, there is a lack of analyses that takes the overall perspective in the area. Therefore, an overall survey of amber finds from various contexts is now presented for the first time. Besides the large number of grave finds, there are also amber finds from settlements, sacrificial bogs or hoards, which have to be evaluated differently. Thus, on the basis of amber different value concepts and exchange mechanisms at that time can be deduced and investigated.
Especially with regard to the origin of the raw material only theories are available so far. Besides the coasts of Southern Scandinavia, such as the North Sea coast of Jutland, the south/southeast coast of the Baltic Sea is in focus as well, like the territory of the former East Prussia. This area was known for its amber wealth already in the 1st mill. AD - the largest deposit in Europe. So, it is quite possible that amber was not only traded/exchanged from here to Central and Southern Europe, but also found its way to Northern Europe, which would provide further evidence of the relationship between these regions.
This offers the opportunity to trace the development of amber use and distribution in the first half of the 1st mill. AD in Northern Europe and beyond - away from the well-known "Amber Roads".
- 6 GLASS BEADS OF LATE ROMAN PERIOD FROM WEST LITHUANIA AS INDICATORS OF COMMUNICATION ACROSS THE BALTIC SEA**
Abstract author(s): Banytė Rovell, Rasa (Lithuanian Institute of History, Vilnius)
Abstract format: Oral
At first sight glass beads represent a database of finds which was formed by the process of chaotic inflow and by the luck of archaeological investigations. M. Mączyńska remarked that it is difficult to find necklaces of identical composition. Nevertheless some compositions of beads are typical for particular cultural areas. This tendency testifies that at the same time different collections of beads were brought from Roman provinces to particular regions (M. Mączyńska 1997, 103). Analysis of West Lithuanian material proved that the first considerable distribution of imported glass beads is noticeable in burials from mature phase B2. The same horizon of rich glass necklaces is recorded also in other areas of West Balts dwelling in South-Eastern - Eastern Baltic. The diversity and number of glass beads became very modest during phase B2/C1-C1a in West Lithuanian areas. The new inflow of glass beads is remarkable in the material of burials which belong to the second half of phase C1b - phase C2. Many types of beads from this time also were typical for Southern Scandinavia. It seems that similar collections of glass beads circulated in various Baltic Sea regions. Glass beads of the Late Roman Period should be brought to West Lithuania via sea routes. They are another confirmation that various Baltic coastlands shared the same goods especially such as glass beads. The distribution of similar sets of beads support the thesis that such luxurious finds typical of Southern-South-western regions of the Baltic Sea as a bronze-silver gilded omega

buckle from Jogučiai Cemetery or the silver-gilt detail of a rosette brooch from Baitai cemetery did not find their way to Lithuanian Coastland by accident.

7 “GOTLANDIC” IMITATIONS OF LATE ROMAN SOLIDI – LOCAL CUSTOM OR BROADER PHENOMENON?

Abstract author(s): Zapolska, Anna (Faculty of Archaeology, University of Warsaw)

Abstract format: Oral

Within the finds of hoards of late Roman and early Byzantine solidi, there is a small group of barbaric coins which are impossible to link to any known existing mint in the Roman Empire or to any of the barbarian kingdoms established on its ruins. These coins have some common elements (e.g. degenerated legends, obverses and reverses taken from different coins), and a few of them share common dies which can be identified on Gotland and Bornholm, and in Pomerania. All of them can be overall dated to late 5th and 6th. In this paper, these imitations will be briefly presented and as well as a typological and chronological arrangement.

Their interregional connections around the Baltic mirrored by the circulation of the gold objects will also be considered. In the end the differences in perceiving and treating the gold objects (coins, one-sided bracteates, and jewellery) by societies living in the Baltic region.

8 GOLD LADY AND TROLLS. THE ARCHAEOLOGICAL SITE AT SMØRENGE ON BORNHOLM AS INSIGHT INTO INTERREGIONAL CONTACTS IN THE BALTIC REGION

Abstract author(s): Czonstke, Karolina (University of Gdańsk; Archaeological Museum in Gdańsk) - Świątkowski, Bartosz (University of Gdańsk)

Abstract format: Oral

The heritage of the Baltic Sea region is unique and has many different faces. The flow of people and ideas here throughout the past were complex and multifaceted. Not least, various Baltic societies were linked through rituals, rites, and religious beliefs. These elements were also diverse and changed across time and space. Additionally, ceremonies contained significant meanings and played important roles in explaining the world, the annual cycles, and everyday life. They also had a binding effect on life after death. The ways in which rituals and rites were conducted and performed as well as the time and spaces in which they occurred also contain essential meanings.

These phenomena are a reflection of social life and the scale and form of contacts that a given community maintained in the past. In the case of the Baltic Sea region, the interregional character of these contacts is especially visible.

However, capturing these subtle nuances in archaeological material is extremely difficult but, at the same time, a fascinating avenue for archaeological research.

Research on the Danish island of Bornholm will serve as an important case study for examining the rituals' forms and meanings and their reflection in social life. They also contribute to discussions about contacts in the Baltic Sea region. For instance, the archaeological site in Smørenge revealed remains connected to belief-structures from the Vendel period. At this unusual place, archaeologists also found the remains of a spring with a rich collection of unique artefacts like gold votive foils, weapons, and glass beads, among other materials.

The form and meanings of the rituals behind these materials are still ambiguous, but they can help shed a little light on the ethereal world of beliefs and rituals of past inhabitants of the Baltic Sea region.

9 LANDSCAPE OF THE GODS – A PROJECT ABOUT SACRAL TOPOGRAPHY AND RELIGIOUS NETWORKS OF IRON AGE BORNHOLM

Abstract author(s): Albris, Sofie Laurine (National Museum of Denmark)

Abstract format: Oral

This paper presents a new research project about the sacral landscapes and religious networks of Iron Age Bornholm. This island in the Baltic Sea has an exceptional density of well-documented archaeological locations, offering a unique possibility to investigate pre-Christian sacral topography in detail. Several sites on Bornholm have evidence of pre-Christian cultic activity and a large amount of gold foil figurines reveal elite networks throughout Scandinavia. In the Iron Age, the island was a hub of trade and contacts in the Baltic Sea area.

The project runs from August 2021 and is a cooperation between the National Museum in Denmark and Bornholms Museum, funded by the Carlsberg Foundation. It consists of a detailed interdisciplinary analysis of place names, archaeology and landscape related to pre-Christian religion on Bornholm. These materials are brought together to form a comprehensive study of religious activities and places on the island. Based on these investigations, the project uncovers interplays between social organisation and sacral topography and explores the role of these interplays in developments at local and supra-regional levels as well as relations between levels of the cult in the topographical and social landscape. The project will thus seek to identify dynamics behind religious change and the position of Bornholm in pan-Scandinavian religious networks.

10 THE ANTHROPOMORPHIC FIGURINE ´S HEAD FROM HAITHABU - A VIKING AGE GAMING PIECE?

Abstract author(s): Andersen, Anna-Theres (Institute for Prehistoric and Historic Archaeology, Kiel University)

Abstract format: Oral

In 2018 an anthropomorphic amber-figurine ´s head from a private archaeological collection was shown to the Schleswig-Holstein State Museums Foundation Schloss Gottorf in Schleswig (Germany). Both the first impression of the figurine and the statement of the collector declaring the object was originally found close to the UNESCO world heritage Haithabu led to the assumption of a Viking Age artefact. Due to new evidence the presented object originally has been found at an excavation in Haithabu which took place in 1936 but never reached the museum.

This paper compares the head of the figurine with other archaeological finds from this old trading place – especially the amber gaming pieces are considered. In this context different interpretations will be presented and discussed.

However, amber seems to be a valued material for gaming pieces due to Scandinavian comparative finds. Not only the size but also the design of gaming pieces suggests a significant resemblance in the understanding of board games in Viking Age Scandinavia.

11 FROM SCANDINAVIA THROUGH THE PIAST ROYAL COURT TO POMERANIA. AN AMAZING STORY OF MEN BURIED IN CHAMBER GRAVES IN CIEPŁE

Abstract author(s): Wadył, Sławomir (Faculty of Archaeology, University of Warsaw)

Abstract format: Oral

The story of Ciepłe begun in 1900. Chance discovery of an outstanding grave that was thought to be a Viking burial excited a great deal of interest. The 21st century has added some new chapters to the history of Ciepłe. Rediscovery of burial ground and further excavations revealed very richly furnished chamber graves.

The Ciepłe cemetery is part of an extensive settlement complex comprising three strongholds, three settlements and two burial grounds. Previous research results indicate that it was founded on the initiative of the first Polish rulers, Mieszko I (c. 960-992) or Bolesław I the Brave (992-1025). Seven chamber graves were unearthed in Ciepłe. These graves were distinctive because they bore witness to an unusual burial rite and because they were remarkably richly furnished, both in comparison with other burials at this cemetery and with other graves of this period on a nationwide scale. Four of them – the ‘founder graves’ in the cemetery’s central, demarcated section – are exceptional. Graves 35, 42, 43 and V are without doubt the most richly furnished burials of the early medieval period ever found in Poland. Similar sets of goods were deposited in each of these graves, consisting of swords, spears, and horse equipment in the form of spurs, stirrups and bits.

The individuals buried in graves 35, 42, 43 and V were probably particularly prestigious. The weapons and horse equipment deposited with them attest to their rank, and possibly their profession. They were probably members of a mounted elite. The origin of those buried at the Ciepłe cemetery is a key question. Genetic studies and strontium isotope analysis have shown that the men buried in these graves were most likely born (or spent their childhoods) in western Scandinavia, probably Denmark. There are some evidences of Polish-Scandinavian political and military alliances.

12 CROSSING WATERS – THE SCANDINAVIAN INFLUENCE ON THE VIKING AGE CEMETERIES OF WISKIAUTEN AND LINKUHNEN AT THE CURONIAN LAGOON

Abstract author(s): Jahn, Christoph (Center for Baltic and Scandinavian Archaeology Schleswig)

Abstract format: Oral

The cemeteries of Wiskiauten (Mokhovoye) and Linkuhnen (Rzhevskoye) were excavated from the 1870s to the 1930s by archaeologists in the former German province of East Prussia. Both archaeological sites sparked an intense discussion about the Scandinavian presence, and cultural influences on the southern coast of the Baltic Sea in the Viking Age. High quality Scandinavian jewelry in the grave mounds of Wiskiauten and the large number of ULFBERHT-swords from Linkuhnen were extraordinary finds among the Baltic tribes on the Sambia peninsular and the Curonian Lagoon and indicated different kinds of cultural contacts across the Baltic Sea. Due to the Second World War, the excavation results were never properly published, and during the Cold War the archaeological objects and excavation diaries from Wiskiauten and Linkuhnen were considered lost, so that the archaeology of East Prussia was more or less forgotten. However, it turned out in the 1990s, that finds and archives from Prussia-collection in Königsberg (Kaliningrad) have partly survived in Berlin (Germany), Olsztyn (Poland) and Kaliningrad (Russia), and therefore the reconstruction of former excavation results was possible.

The revaluation of the cemetery of Linkuhnen was finished and published in 2019, the reconstruction of pre-war research in Wiskiauten is an ongoing publication project at the ZBSA in Schleswig. The comprehensive analysis of the available archival information sheds a new light on the wide range of grave goods and funeral rites in Linkuhnen and Wiskiauten. This presentation discusses finds and grave features from both sites, which indicate different ways of cultural interactions between Scandinavians and Balts across the Baltic Sea in the Viking Age. The reconstruction of pre-war research is essential for the understanding of modern excavation in the Wiskiauten area (see abstract of Annika Sirkin).

THE MISSING TRADING PORT OF WISKIAUTEN/MOKHOVOYE ON THE SAMBIA PENINSULA – A FINAL ASSESSMENT ON THE ARCHAEOLOGICAL INVESTIGATIONS 2005–2011

Abstract author(s): Sirkin, Annika (Centre for Baltic and Scandinavian Archaeology, Schleswig)

Abstract format: Oral

The interpretation of the rich Early Medieval burials in the burial ground of Wiskiauten/Mokhovoye (Kaliningrad region, Russia) as of Scandinavian and Prussian origin (see abstract of C. Jahn) raised the question of a nearby Baltic trading port at the Curonian Lagoon of the scale of Truso, Hedeby or Birka. In the 20th century, the search for this marketplace was not successful. Only a German-Russian field study carried out from 2005 to 2011 under the direction of Dr Timo Ibsen was able to document numerous settlement traces. The study comprised an extensive geophysical survey, excavations and a preliminary geological survey within a radius of around 1 km from the burial ground of Wiskiauten. In addition, 14C-dating, archaeozoological, and archaeobotanical analyses were carried out.

In the author's dissertation, completed in 2020, a final assessment of the enormous data from this interdisciplinary study was made. Four settlement areas could be identified that acted as satellites for the sought-after trading port. For the first time, Prussian house structures could be reconstructed. A large number of small finds suggest influence and trade with Scandinavians, Slaves, Rus', other Balts and perhaps even Finno-Ugrians. Traces of amber bead production and metalwork were found. Intensive 14C-dating revealed an astonishingly broad chronology of the settlements, which gives insight in the development of local settlement activities, with a special focus on the time of the arrival of the Scandinavian settlers. Furthermore, a new interpretation of geological data of the variable coastal landscape could provide an explanation as to why the trading port has not yet been found, but where it might be.

FROM THE BALTIC TO THE BLACK SEA. IN SEARCH OF THE ORIGIN OF OSTRIV CEMETERY MIGRANTS (UKRAINE)

Abstract author(s): Shiroukhov, Roman (Centre for Baltic and Scandinavian Archaeology - ZBSA) - Baranov, Vyacheslav - Ivakin, Vsevolod - Kozak, Oleksandra (Institute of Archaeology National academy of science of Ukraine)

Abstract format: Oral

The Late Viking Age cemetery Ostriv was discovered by an Institute of Archaeology of the National Academy of Science of Ukraine (IA NASU) team in 2017, approximately 100 km from Kyiv in the Porossya region. To date, 82 inhumation graves have been excavated in an area of 1500 m². Most of the artefacts from Ostriv are uncommon in Ukraine, but are frequently found in the East Baltic region.

The pilot project "Baltic migrants in Kievan Rus'" is implemented by IA NASU and ZBSA together with CAU laboratories and anthropologists from Latvia and Lithuania in 2019-2020. The work started at the point of analysis of morphological features of Ostriv and East Baltic archaeological artefacts and burial rite. Complex AMS 14C-dating, stable isotopes, aDNA and non-destructive metal analysis was provided in frames of the pilot-study.

Ostriv cemetery combines the local Kievan Rus' and East Baltic region funerary and typo-chronological features. According to the AMS 14C dating two phases can be distinguished: phase 1 (980-1020 AD) correspond to the first wave of migrants and associated with time of reign of Vladimir; phase 2 of (1010-1040 AD) correspond to the short time of Svyatopolk and Yaroslav the Wise rivalry and the long reign of Yaroslav.

Skeletal remains anthropological research demonstrate the Ostriv population as rather young with a low adaptation level. The similarity of the AMS 14C dating results together with $\delta^{15}N$ and $\delta^{13}C$ isotopes ratios and the typo-chronological background of Ostriv and East Baltic individuals may indicate the synchronous origin of both two populations sites and their similar diets. The first results of the genetic analysis show the external origin of the Ostriv individuals, placing them closer to the Baltics and Scandinavia. At the preliminary level of research, the people of Ostriv are considered as East Baltic region incomers.

YATVINGIAN 'VALLEY OF THE KINGS' AT THE SZCZEBERKA RIVER

Abstract author(s): Nowakiewicz, Tomasz - Rembecki, Dawid - Lewoc, Iwona (University of Warsaw) - Miłek, Sławomir (Ab Terra Foundation)

Abstract format: Oral

The year 2020 brought not only pandemic restrictions to most of the aspects of life activity but also - in contrast - a series of discoveries changing the image of Balt archeology, at least in its regional frames, limited to the southern part of the territories of the Balts (within Polish borders).

In a hard-to-reach area inside the former tribal land Yatvingia/Sudovia (in the neighborhood of so-called 'Sacred Place' at the Rospuda River), a group of closely located early medieval cremation cemeteries with above-standard rich equipment was registered. They form a distinct burial zone that functioned there in the last phase of tribal Yatvingia (12-13th century). Its recognition is a huge challenge in a few various research areas: methodological (a stratified cemetery with features similar to Aschenplätze but far from typical examples of that kind of necropolis), material (the largest collection of the Balt artifacts so far in the history of Polish archaeology!) and interpretative (related to the settlement topography, forms of the burial rite, Yatvingian-Prussian and Yatvingian-Lithuanian relations, etc.).

The paper presents the characteristics of this phenomenon, the current state of research, the first conclusions, and a list of the questions and research postulates.

SOMETHING OLD AND SOMETHING BORROWED: DRESS IN NORTH-ESTONIA IN THE TURN OF THE 12TH-13TH CENTURIES

Abstract author(s): Rammo, Riina (Department of Archaeology, University of Tartu)

Abstract format: Oral

Clothing research in the eastern Baltic region often seems to follow the modern state borders. This state-of-the-art is understandable because many special features exist, for example, in the ornaments and other clothing-related finds in different areas around the Baltic Sea. The paper's starting point is the clothing habits in present-day North-Estonia in the turn of the 12th and 13th centuries. The grave finds of the period give an idea of proper appearance and clothing habits adopted by a group of people in a particular area and period. The words 'traditional' and 'local' describe the outfit based on this source material in many aspects, and finding regionality has also been the focus of previous studies. The presentation aims to look at these clothing habits in the context of fashions in the wider Baltic region, as the sea provided opportunities for communication and interaction with different people and places. Did these contacts somehow affect the choices made by dressing? If the focus will be on finding similarities in clothing-related finds instead of emphasizing differences, can they be discovered? How influences from across the sea manifest themselves, for example, for men and women? The presentation will follow certain clothing aspects, such as textiles, special garments, that reveal the communication across the northern Baltic Sea.

CROSS-DISCIPLINARY APPROACHES TO ARCHAEOETHANATOLOGICAL AND TAPHONOMIC ANALYSES OF HUMAN REMAINS

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Camarós, Edgard (IIIPC - Universidad de Cantabria) - Knüsel, Christopher (PACEA - Université de Bordeaux) - Schotsmans, Eline (Centre for Archaeological Science - University of Wollongong)

Format: Regular session

Both archaeoethanatomical and taphonomic analyses of human remains are emerging fields. Since the 1980s taphonomic analysis of human remains has evolved from an adjunct and secondary interest within archaeology and palaeoanthropology to become a core interest on both archaeological and geological time scales. This change came about through realisation that the context in which remains were found had a profound influence on not only the preservation of them but also permitted researchers to better interpret the processes that contributed to the patterns found in the archaeological and palaeontological record. In essence, this shifted interests from being solely concerned with the biological analysis of remains to a more holistic and systematic approach to consider the contexts in which remains are found to address both biological and social evolutionary questions - from the origin of hominins to the present day. This opened a new scientific agenda in which taphonomic research informs research objectives in bioarchaeology, osteoarchaeology, palaeoanthropology, and palaeontology, and it is the central focus for research interests variously identified as funerary taphonomy, funerary or mortuary archaeology, archaeoethanatology and the archaeology of death, and has also become increasingly important in forensic anthropology and archaeology and medico-legal science, which share an interest in understanding how past physical processes influence the preservation and patterning of human remains. Although there may not be an agreed single definition of taphonomy, there is homogeneity in taphonomic analysis, which shares the idea that modifications of human remains have enormous potential for answering behavioural and environmental research questions about the past. This session welcomes contributions from those with shared interests in fostering cross-disciplinary perspectives. The goal of the session is to develop a collaborative network that will assess the state of these studies, aid the development of new techniques, and identify and disseminate experimental approaches to better address research questions.

ABSTRACTS:

WHAT IS ARCHAEOETHANATOLOGY, AND HOW DOES IT RELATE TO TAPHONOMY?

Abstract author(s): Knusel, Christopher (UMR 5199 PACEA, Université de Bordeaux)

Abstract format: Oral

Archaeoethanatology is defined as the scientific study of death in all its dimensions, biological, cultural and social (Duday 2012: 62). It focuses on reconstructing the original disposition of the cadaver based on the distribution and state of articulation of the skeletal remains, whether in an archaeological or medico-legal context. It is a method that offers a way to develop greater insight into funerary ritual; it encompasses funerary archaeology, with its emphasis on the grave and its constituents, and the study of human remains. Having developed as part of biological anthropology, at its heart is the active participation of biological anthropologists trained in archaeological methods in the excavation of human remains, with additional detailed recording of the grave and its contents, often involving multiple, incremental plans and observations.

The original terminology and applications of archaeoethanatology were solely published in French and in Francophone publication venues. As a consequence, they developed in parallel but in isolation from other approaches to human remains, their archaeological

context, and analysis. This means that archaeothanatology principles and terminology require synthesis with a variety of other existing practices, terms and uses to aid dissemination. Moreover, the relationships between archaeothanatology and bioarchaeology, as well as with archaeological excavation and analysis, in general, and taphonomic studies, in particular, are at the present time unclear. This presentation reviews the basic principles of archaeothanatology, considers its disciplinary place, and broaches some questions surrounding its use in the context of taphonomic studies.

Reference:

- Duday, H. 2012. L'Archéothanologie: une manière nouvelle de penser l'archéologie de la mort (Archaeothanatology: a new way to think about the archaeology of death), in Sophie A. de Beaune and Henri-Paul Francfort (eds.) L'Archéologie à Découvert: Hommes, objets, espaces et temporalité. Paris: Centre National de la Recherche Scientifique (CNRS), pp. 62-71.

2 FROM FLESH TO BONE: BUILDING BRIDGES BETWEEN TAPHONOMY, ARCHAEOETHANATOLOGY AND FORENSIC SCIENCE FOR A BETTER UNDERSTANDING OF MORTUARY PRACTICES

Abstract author(s): Schotsmans, Eline (University of Wollongong; University of Bordeaux) - Georges-Zimmerman, Patrice (Institut National de Recherches Archéologiques Préventives - Inrap; Université Toulouse Jean Jaurès) - Ueland, Maiken (University of Technology Sydney) - Dent, Boyd (Red Earth Geosciences Sydney)

Abstract format: Oral

Archaeothanatology goes beyond taphonomy and bones. It touches on cultural aspects, funerary practices and their socio-cultural interpretation. However, in order to come to an interpretation, careful observations should first be made in the field. A thorough archaeothanatomical analysis cannot be conducted without studying the depositional environment and human decomposition. Therefore, it is important to gather data from burials of known form and context to support these interpretations. Based on experiments at the Australian Facility for Taphonomic Experimental Research (AFTER) and modern cemetery research, this presentation will show that archaeo-anthropologists require understanding of human decomposition, material degradation and factors that influence decay and bone movement. The examples will highlight that human remains should be analysed in their broader depositional context; that experimental research is highly valuable; and that hypotheses and interpretations should be treated with caution. The aim is to emphasise a critical use of terms and methods, and the integration of interdisciplinary approaches such as forensic experiments and modern cemetery studies.

3 RESULTS AND METHODS OF AN ONGOING EXPERIMENTAL TAPHONOMIC RESEARCH PROGRAM TO IMPROVE THE INTERPRETATION OF HUMAN REMAINS IN (FORENSIC) ARCHAEOLOGY

Abstract author(s): Mickleburgh, Hayley (Linnaeus University; Forensic Anthropology Center Texas State University)

Abstract format: Oral

Understanding the formation processes of human burials and distinguishing the effects of human modification of the remains and their surroundings from taphonomic processes is key to reconstructing the sequence of events leading to death and burial. This paper discusses the methods and findings of an ongoing experimental forensic taphonomic research program developed to improve the interpretation of human remains in both traditional and forensic archaeological contexts. This inter-disciplinary program aims to advance and develop archaeothanatomical methods and models, as well as study the effects of decomposition and diagenesis on the isotopic composition of different body tissues over time, assess the potential of using biomarkers for post-mortem interval and age at death estimation (proteomics), and research changes in the human microbiome throughout decomposition. The program focuses on replication of two distinct medicolegal/archaeological burial contexts - individual depositions and mass graves - in a series of actualistic experiments at the outdoor human decomposition facility associated with the Forensic Anthropology Center at Texas State University (FACTS).

The actualistic experiments have been designed to collect a body of data suitable for both qualitative and quantitative analysis, distinguishing the effects of specific variables, and replication studies in other environments. An important objective of the experiments is to examine two important taphonomic models used in archaeothanatology 1) the sequence of joint disarticulation, and 2) the relation between spatial displacement of bones and primary and secondary open space (voids) in the burial environment. A pipeline of 3D documentation and analysis was developed specifically to study the spatial relation and movement of human remains throughout soft tissue decomposition and skeletal disarticulation, based on photogrammetry, 3D GIS and animation. This presentation describes the results of the research as well as the 3D documentation pipeline, and outlines important avenues for future development and collaboration in this area of research.

4 AN EXPERIMENTAL TAPHONOMIC STUDY OF HUMAN DECOMPOSITION AND DISARTICULATION IN COFFINS

Abstract author(s): Alfsdotter, Clara (Linnaeus University; Bohusläns museum)

Abstract format: Oral

Archaeothanatology offers valuable insights into past corpse treatment. The method heavily relies on the relative timing of joint breakdown. Through in situ observations, interpretations of the space and nature of the deposit can be interpreted from skeletal positions.

Experimental (actualistic) studies of human decomposition can inform archaeological knowledge in regard to human taphonomy. This paper discusses results from a human decomposition study conducted at the Forensic Anthropology Center, Texas State University (FACTS). Two willied donated deceased humans were reserved for the study. They were placed in wooden coffins, one below ground, and one with the lid in ground level. The study addresses the general taphonomy of coffin decomposition, as well as the sequence of joint disarticulation and associated factors.

The disarticulation sequence in the continuously monitored coffin diverges from the sequence proposed in previous archaeothanatomical research. Quantitative actualistic studies are needed in order to deduce if a common disarticulation sequence exists. While interpretations relying on a disarticulation sequence based on archaeological findings are discouraged by the current results, they do not conflict with the more general archaeothanatomical principles that movement of bones out of anatomical position in general can be a useful indicator for postmortem manipulation or taphonomic processes, and that archaeothanatology is useful in terms of identifying movement out of the original space of the corpse to deduce if the corpse was placed in an open (such as coffin) or closed (directly in sediment) space. However, the process of decomposition and disarticulation is more complex than can be deduced from skeletal remains, and therefore inferences about decomposition from skeletal remains can be misleading.

The results confirm the importance of a holistic understanding of how dead bodies interact with the surroundings, which is paramount for complex reconstructions of archaeological mortuary treatment.

5 THE USE OF PHYSICOCHEMICAL CHANGES TO ADDRESS THE LATE POSTMORTEM INTERVAL AND UNBURNT AND BURNT BONES

Abstract author(s): Vegh, Emese (University of Oxford) - Marquez-Grant, Nicholas (Cranfield University, Defence Academy of the United Kingdom) - Schulting, Rick (University of Oxford)

Abstract format: Oral

Chemical profiles of bones undergoing diagenesis can provide information on the early post-depositional changes to the skeleton. The post-depositional environment and treatment of human remains, such as burial, exposure, or burning, can alter bone chemistry. The trace element content of the mineral phase of bone - bioapatite - is susceptible to changes as soon as it is exposed to the depositional environment. This paper aims to utilise alterations in elemental and structural changes in bioapatite to help determine the post-mortem interval (PMI) prior to burning through an experimental taphonomic approach.

Fleshed pig (*Sus scrofa*, N=25) tibiae were left exposed in a field in Oxfordshire, UK, and collected at 14, 34, 91, 180, 365 day intervals before being burnt in an outdoor fire (≤ 750 °C bone temperatures). Fresh tibiae (N=10) acted as unburnt and burnt controls. Samples were spatially analysed for major and trace elements by energy wavelength-dispersive spectroscopy (WDS-EMPA) and Fourier Transform Infrared Spectroscopy (FTIR).

Results show a significant linear decrease in K in both unburnt and burnt bones, while Al and Mg increase in unburnt bones through time. Mn shows a non-linear increase at all PMIs upon exposure in the cortical walls of unburnt bones. Na, K, and Ca could potentially assist in estimating the PMI prior to burning. Lowest variations of concentrations were found further from the outer cortical surface. Elements associated with bioapatite (Ca, P) and the extracellular fluids (Na, K) covaried the least. Carbonates (A and B) decreased while crystallinity index increased in unburnt bones during the first 1 year of PMI.

6 LET'S MAKE A MESS, MAYBE NO ONE WILL NOTICE. IMPACT OF BIOTURBATION ACTIVITY ON THE URN FILL STRATIGRAPHY

Abstract author(s): Haluszko, Agata (Archeodzy.org Foundation; Institute of Archaeology, University of Wrocław) - Kadej, Marcin (Department of Forensic Biology and Entomology, Institute of Environmental Biology, Faculty of Biological Science, University of Wrocław) - Gmyrek, Grzegorz (Usługi Archeologiczne Grzegorz Gmyrek, Kalisz)

Abstract format: Oral

The study of prehistoric cremation burials is an interesting subject of research of taphonomic processes occurring directly in the urn fill. Often these processes have a significant impact on the subsequent interpretation of the data, and to a broader extent, on the reconstruction of the funeral rite of the studied society.

Bioturbation activities are particularly difficult to observe in sandy soil on which urnfields were most often established. This type of soil characterized by macroscopic color uniformity, and therefore it is difficult to catch certain taphonomic processes occurring in the fill of the urn. During standard exploration of mechanical layers, it is complicate to observe layers disturbed by rodents, insects, earthworms or plant roots. Computed tomography (CT), which is a non-invasive imaging method, can solve these problems.

The bioarchaeological examination was carried out at the Wtórek cemetery, Greater Poland, Poland. This cemetery is connected with the Lusatian culture's society which forms as a part of the Urnfield tradition. It is dated from the Late Bronze Age to the Early Iron Age. Of over 200 graves, 20 urns were CT-scanned and postprocessing analyses were conducted. In this way, 3D reconstructions of archaeological artefacts were obtained, but also information on elusive taphonomic processes. Among the various types of bioturbation, some of them have a significant impact on the interpretation of the anatomical order system in the urn, or the degree of bone fragmentation. Others, may be misleading in the context of the interpretation of plant debris. Another group of identified bioturbators may contribute to the reconstruction of land-use and changes in the landscape.

The research was conducted within the National Science Centre, Poland, project no. UMO-2018/29/N/HS3/00887 entitled: Influence of (non)local population on forming crematory burial practices in the Late Bronze Age and Early Iron Age in South-Western Poland.

7 THOSE BONES ARE MINE: AN ARCHAEOETHANATOLOGICAL APPROACH TO POSSIBLE DISMANTLED BURIALS FROM COLOMBA AND LES PEDROSES CAVES (ASTURIAS, SPAIN)

Abstract author(s): Drak, Labib (Dpto. Biodiversidad, Ecología y Evolución, Universidad Complutense de Madrid) - Martínez-Villa, Alberto (Centro Ecomuseo de la Fauna Glacial de Onís. Asturias) - Garralda, María Dolores (Dpto. Biodiversidad, Ecología y Evolución, Universidad Complutense de Madrid) - Fano, Miguel Ángel (Dpto. de Ciencias Humanas. Universidad de La Rioja) - Arias, Pablo (IIIPC - Instituto Internacional de Investigaciones Prehistóricas de Cantabria. Universidad de Cantabria-Gobierno de Cantabria-Grupo Santander)

Abstract format: Oral

Archaeoethanatomical approach is currently used to obtain information about funerary treatment of individuals at a given time in Prehistory or History, and also about processes by which corpses decay (Duday, 2009). The human bones recovered from the caves of Colomba and Les Pedroses (Asturias, Northern Spain) have been studied from both Anthropological and Archaeoethanatomical perspectives.

A tibia and a fibula have been found in each cave, as well of some other human bones (a talus in Colomba, and a rib in Les Pedroses). In both cases they have been recovered from Mesolithic shell middens. The tibia from Colomba cave has been directly dated by ¹⁴C AMS (TO-10223: 7090 ± 60 BP; 5711-5469 cal BC; Arias et al., 2009). Les Pedroses tibia has been sampled in order to obtain a Radiocarbon date, which is currently in process.

The scarcity of human remains hinders the reconstruction of the possible funerary practices related to those sites. Yet the position of the remained bones supports the hypothesis that both finds might correspond to dismantled late Mesolithic burials. Other examples of burials in a shell midden are known in Cantabrian Spain, such as Molino de Gasparín in Asturias, El Truchiro in Cantabria and J3 in the Basque country.

8 ARCHAEOETHANATOLOGY AND GIS: A POSSIBLE CONTRIBUTION TO A BETTER UNDERSTANDING OF THE SYNCHRONIC AND DIACHRONIC USE OF COLLECTIVE BURIALS

Abstract author(s): Neves, Maria João (Universidade de Coimbra; CIAS - Research Centre of Anthropology and Health; III - Institute of Interdisciplinary Research) - Silva, Ana (University of Coimbra; CIAS - Research Centre of Anthropology and Health)

Abstract format: Oral

Although the development of Archaeoethanatomical approaches in Portugal began in the mid-1990, its application to collective funerary graves remained largely to be achieved. The large amounts of bones, the lack of field anthropologists before 1999, and the perception by archaeologists that bones weren't particularly informative led to a vast accumulation of poorly contextualized and truncated osteological series.

In 1990 a prospective excavation altered this situation. Excavated by a team composed by archaeologists and anthropologists (before its legal enforcement), the hypogeum of Monte Canelas I (Portimão, Portugal) allowed a retrospective Archaeoethanatomical and GIS analysis of the processes that led to a vast accumulation of skeletal and archaeological materials. Later the possibility of excavating two other hypogea located in inner Alentejo region, Monte do Carrascal 2 (Ferreira do Alentejo, Portugal), turned possible the development and testing of a field protocol for the recovery of osteological remains, being all data compiled in a GIS project. The results show that these hypogea were used successively, being the corpses of non-adults and adults of both sexes laid directly on top of one another in crouched position, oriented to different cardinal directions. The radiocarbon dates, the complex stratifications, the architectural reformulations, and the amount of individuals evoke long chronologies with persistent memory of burial places for several generations from the 4th millennium until almost the beginning of the 2nd-millennium cal. B.C. Despite the good results obtained, a significant number of collective necropolis are still excavated without this kind of approach, being the financial and time consuming operations the most common criticisms for its application.

In this communication, we intend to discuss our results as well those critics, aiming to develop better ways to disseminate archaeoethanatomical and GIS approaches, indispensable to achieve an accurate interpretation of past mortuary practices.

9 FORENSIC TAPHONOMY APPLIED TO COMMINGLED COLLECTIVE BURIALS FROM THE NEOLITHIC - CHALCOLITHIC: DIFFERENTIATING MOMENTS OF USE

Abstract author(s): Moreno-Ibáñez, Miguel (Institut Català de Paleoeologia Humana i Evolució Social - IPHES-CERCA; Universitat Rovira i Virgili, Departament d'Història i Història de l'Art) - Saladié, Palmira (Institut Català de Paleoeologia Humana i Evolució Social - IPHES-CERCA; Universitat Rovira i Virgili, Departament d'Història i Història de l'Art; Unit associated to CSIC. Departament de Paleobiologia, Museo Nacional de Ciencias Naturales) - Morales, Juan - Cebrià, Artur - Fullola, Josep (SERP, Departament d'Història i Arqueologia, Universitat de Barcelona)

Abstract format: Oral

The study of human remains from a taphonomic perspective allows us to approach a holistic understanding of funerary behavior and the individuals present in the sites, especially in the case of the commingled collective burials of recent Prehistory. Through Forensic Taphonomy, we can reconstruct the taphonomic history of burial, from the last moments of the life of the individuals until our days. Consequently, it is possible to carry out a more complete study on the funerary treatment applied to the bodies in a given period, as well as to identify different moments of use of the same sepulchral space. At the Cova Foradada site (Calafell, Tarragona, Spain) we differentiated two accumulations of human remains depending on whether or not they were thermally altered. Our initial objective was to determine whether this was a single accumulation in which some of the material was burned, or whether there were two different assemblages. We studied the surface modifications of a total of 1360 unburned bone remains and 1430 burned remains using a stereomicroscope. In this way, the taphonomic modifications and the characteristics of the cremation allowed us to identify these two accumulations as the result of two different funerary practices separated in time. Firstly, the collective burial of a minimum of 18 individuals was carried out during the Late Neolithic - Chalcolithic period and subsequently, the cremation of a minimum of five individuals was carried out inside the cavity, probably towards the beginning of the Late Bronze Age. There was, therefore, a repeated use of this cavity with the same sepulchral conception for different funerary practices, inhumation and cremation, which has been possible to observe through Forensic Taphonomy.

10 EXAMINING MORTUARY TREATMENT IN NEOLITHIC CAVES OF SOUTHWEST BRITAIN: A TAPHONOMIC APPROACH

Abstract author(s): Konstantinidi, Eirini - Madgwick, Richard - Mulville, Jacqui (Cardiff University)

Abstract format: Oral

Current research has progressed our understanding of burial practices in caves, however, a substantial corpus of funerary remains of prehistoric date, with many dating to the Neolithic, have not been subject to holistic study. Previous research on Neolithic burials has tended to focus on biographic themes such as diet, basic information in catalogues and regional syntheses. Focus on taphonomy and mortuary practice has been very limited. These aspects represent clear gaps in Neolithic cave studies that desperately call for more research, the potential of which can only be realised with a multi-level approach.

This research employs a multi-scalar taphonomic approach to Neolithic human remains from fifteen caves in Wales and one comparative site in North Somerset. By combining macroscopic analysis of bone surface preservation and microscopic analysis of bone microstructure (histology) this research examines pre- and post-depositional treatment of the deceased and the means by which bones became disarticulated. The provision of new dating evidence from ten sites examined in Wales will also maximise the interpretative resolution of the project. Macroscopic taphonomic analysis provides information on the degree and duration of exposure of the remains, the nature of manipulation and/or disturbance and modifying agents that impact the bone. Microscopic analysis (thin section transmitted light microscopy) provides insight into early post-mortem processes and reveals the rate and nature of soft tissue decay by assessing the degree and nature of microstructural bioerosion. This presentation outlines findings from the taphonomic analysis on sites across Wales. Burial patterns and practices revealed from analysis of disarticulated remains will be presented, including some unusual case studies, and future plans for analysis described.

11 THE CROSS-DISCIPLINARY PARADIGM LAG: ARCHAEOETHANATOLOGICAL ANALYSES AND SOCIOCULTURAL ANTHROPOLOGICAL MODELS IN THE ARCHAEOLOGY OF BRONZE AGE CRETE

Abstract author(s): Finn, Ellen (British School at Athens)

Abstract format: Oral

Archaeoethanatomical and taphonomic analyses are asking new questions of prominent interpretative frameworks. However, although these approaches are now critical to the archaeology of death, their findings must often contend with entrenched frameworks of interpretation born from sociocultural anthropology. One area in which this is most apparent is in interpretations of engagement with bodily decomposition, a process framed by the conflated models of Robert Hertz (1906), Arnold Van Gennep (1906) and Victor Turner (1967, 1995) as a source of fear, revulsion and pollution.

This paper will discuss the consequences of cross-disciplinarity in the interpretation of the human remains of Prepalatial Crete (c. 3200-1900 B.C.), namely the paradigm lag between recent archaeoethanatomical evidence and the extensive application of the anthropological models of Van Gennep, Hertz and Turner. With reference to the recent evidence from the east Cretan sites of Petras and Sissi, it is argued that while these anthropological models have acted as the basis for many influential case studies of funerary practices, conflicting archaeoethanatomical data illustrates the urgent need for their clear definition and critical reconsideration.

This paper thus highlights that while archaeothanatology and taphonomic approaches have much to contribute to our understanding of the past, any attempt at fostering cross-disciplinary approaches must begin with the acknowledgement of such an endeavour's reliance on clear definition, terminology and theoretical consistency.

12 ONE IS NOT ENOUGH, IT'S TOMB 21: TAPHONOMY AND CHANGE IN THE EARLY MYCENAEAN AYIOS VASILEIOS NORTH CEMETERY, GREECE

Abstract author(s): Moutafi, Ioanna (The Malcolm H. Wiener Laboratory for Archaeological Science, American School of Classical Studies at Athens; Center for Hellenic Studies, Harvard University) - Voutsaki, Sofia (University of Groningen)

Abstract format: Oral

Social Bioarchaeology and mortuary studies in general have received a new impetus through the emerging fields of funerary taphonomy and archaeothanatology. Multi-dimensional taphonomic analyses enable the reconstruction of funerary acts with unprecedented accuracy, and add depth and nuance to our interpretations. Taphonomic approaches are especially useful for the study of multi-staged burial rites that result in "difficult" funerary assemblages, characterised by multiple interments and commingled remains.

Burial customs in the southern Greek mainland in the Late Bronze Age (or Mycenaean period, ca. 1700-1100 BC) are a characteristic example of this category, showing increased complexity and new funerary practices (new and larger grave types, multiple burials, 'secondary treatment', etc). The recent excavation at Ayios Vasileios in Laconia brought to light an Early Mycenaean cemetery (North Cemetery, ca. 1700-1500 BC), in use exactly during the period when these new practices are being introduced. This cemetery therefore offers a unique opportunity to explore changes of mortuary practices by means of an integrated bioarchaeological approach which pays equal attention to biological and cultural evidence (taphonomy, architecture, human remains, artefacts). Our paper focusses on the long history of an exceptionally large tomb (Built Tomb 21) with an unusually large number of burials (MNI:>30) in variable internal contexts (primary and secondary assemblages placed in different levels, pits and bone piles). Using a multi-disciplinary set of taphonomic methods, our main aim is to reconstruct the details of funerary actions and establish the sequence of use. Our ultimate aim, however, is to go deeper: we would like to study the process of change itself, i.e. understand the process of innovation and experimentation which led to the crystallisation of new mortuary practices in the North Cemetery and the southern mainland in general.

13 IRON AGE MORTUARY PRACTICE IN SOUTHWEST BRITAIN

Abstract author(s): Bricking, Adelle - Madgwick, Richard - Sharples, Niall (Cardiff University)

Abstract format: Oral

This research aims to shed light on the enigmatic Iron Age (800 BC-AD 43) mortuary practices in southwest Britain using a multi-scalar suite of secondary data collection and primary macroscopic and microscopic analyses. The first part of the research explores the various means of corpse disposal by compiling all available human remains data into a coherent database allowing statistical comparison of burial characteristics (site, feature, context, deposit, and associations). However, the dead were subject to various treatments prior to disposal, as indicated by different states of skeletal completion and fracturing in Iron Age sites. Data from secondary analysis alone limits insight into aspects of a complex funerary rite, thus the need for a holistic study incorporating examination of surface taphonomy and microscopic analysis is evident.

Thin section light microscopy of bone diagenesis can be used to identify processes that a body went through prior to disposal (such as burning and rates of exposure to the elements) and, in some cases, what environment decomposition occurred. This PhD research compares diagenetic change from c.200 human bone samples from 17 sites across the region ranging in articulation (from whole inhumations to scattered limbs and fragments) recovered from a variety of environments and features (e.g. ditches, middens, pits, postholes, graves, caves, and cists). This paper presents the results of the analyses and attempts to reconstruct patterns of deposition and early post-mortem treatment in Iron Age Britain.

14 HALTING DEATH IN ITS TRACKS: HISTO-TAPHONOMIC METHODS FOR INVESTIGATING CURATION AND ACTIVE MANIPULATION OF CORPSES IN IRON AGE BRITAIN

Abstract author(s): Tollefsen, Emma (University of Manchester)

Abstract format: Oral

Recent advances in histo-taphonomic studies have dramatically changed our understanding of the complexities of mortuary treatments during both the Neolithic and Bronze Age periods in Britain. But what about the Iron Age: An era renowned for its naturally curated 'bog bodies' and 'kept' human remains, sometimes modified into objects?

This paper presents the results of the first cross-regional study of this phenomenon, probing the famously diverse burial practices of Wessex and the inhumation tradition of East Yorkshire. It reveals diverse and intriguing burial assemblages from iconic sites such as Danebury Hillfort and its Environs, reflecting on what this might tell us about mortuary ideology. The 'Arras Culture' rites of East Yorkshire is re-evaluated, showing equally complex trajectories of the dead towards final interment. This study demonstrates the merits of using diagenetic data alongside archaeothanatology frameworks to piece together post-mortem treatments of the dead.

This research introduces two new conceptual terms: 'delayed decomposition' – indicative of partial cessation of decay – and 'deferred decomposition' – reflecting more active anthropogenic intervention to curate a corpse. This paper suggests that these strategies were actively employed to facilitate more complex temporalities of burial and deposition, not just to create ancestral bodies which might linger longer amongst the living or curate enemy relics, but as a response to particular kinds of death and perceived agencies of the deceased. These findings build on new and fascinating research into elusive burial rites in Iron Age Britain (e.g. Booth and Madgwick 2016; Tollefsen 2016).

This paper proposes a contrastive range of practices through which differential curation might be achieved and will resituate them within the wider context of communities actively experimenting with long-term storage in many other ways: bringing both a practical and ideological notion of intervention in time and decay, to transform mortuary practices in this millennium.

15 SAME SAME BUT DIFFERENT – DISARTICULATED IRON AGE HUMAN REMAINS FROM BASEL-GASFABRIK (SWITZERLAND)

Abstract author(s): Pichler, Sandra L. - Stopp, Barbara - Brönnimann, David (IPAS University of Basel) - Spichtig, Norbert (Archäologische Bodenforschung Basel-Stadt)

Abstract format: Oral

Disarticulated human remains are a regular occurrence in Iron Age sites, especially during the La Tène period. They are usually recovered from inside settlements, both in apparent ritual installations and common features like settlement pits or layers in residential areas or craft zones. These disarticulated bones are interpreted as relics of multi-stage funerary practices including exposure and excarnation and often display traces of perimortem and post-mortem modifications. At the La Tène period Basel-Gasfabrik site, all human skeletal remains were systematically extracted from the hand-collected animal bones in a screening process. The complete sample was then analyzed using largely the same parameters employed in animal bone studies, albeit with special regard to forensic and post-mortem taphonomic indicators. The study found that, even though all skeletal elements are represented among the human remains, bone frequencies do not correspond to their anatomical proportions. While all age groups and both sexes are present, the proportion of young male individuals stands out the sample's demographic profile. There are also conspicuous differences regarding the frequency and type of intra-vitam and perimortem trauma as well as animal gnawing. A comparative evaluation of post-mortem taphonomic indicators on human and animal bones from the same archaeological features revealed both similarities and discrepancies, yielding insights into the differential treatment of dead bodies. Such differences also emerged in a histotaphonomic analysis of a sub-sample of long bones.

16 BONE FIRE SIGNATURES ON CREMATION BURIALS FROM ROMAN LUSITANIA PROVINCE

Abstract author(s): Silva, Filipa (Research Centre for Anthropology and Health - CIAS, University of Coimbra)

Abstract format: Oral

The understanding of the cremation practice on past populations, particularly the burning process, is based on bone fire signatures such as color change, deformation and distinct thermal fractures. Through the macroscopic study of cremated human bone from 117 burials (1st-2nd centuries AD) associated to two Roman cities in Lusitania province, namely Augusta Emerita (Mérida, Spain) and Salacia (Alcácer do Sal, Portugal) this work aims to analyze the bone fire signatures observed on these sites according to the biologic profile of individuals and the burials' characteristics.

The main color per burial indicates the burning process was more efficient among individuals from Salacia, especially adults. Furthermore, no significant differences were noted between males and females from both sites. Regarding the percentages of bone deformation and thermal fractures they are also higher on the Salacia sample, and more common among female individuals. The high values of curved transverse fractures and deformation found on both samples point out to a potential scenario of individuals' cremation shortly after their death (cadaver phase). Nonetheless, the interpretation of burning signatures on cremated bone from archaeological contexts is quite challenging because their manifestation is multifactorial. It depends on extrinsic and intrinsic variables, whose influence could not be fully acknowledged.

17 MICROTAPHONOMIC APPROACH TO ARCHAEO THANATOLOGY: A CROSS-DISCIPLINARY PERSPECTIVE FROM A VISIGOTHIC FUNERARY CAVE CONTEXT (LA GARMA, CANTABRIAN SPAIN)

Abstract author(s): Camarós, Edgard (McDonald Institute for Archaeological Research, University of Cambridge) - López-Gijón, Ramon (Universidad de Granada) - Zurro, Débora (Institució Milà i Fontanals - IMF-CSIC) - Gutiérrez-Zugasti, Igor (Instituto Internacional de Investigaciones Prehistóricas de Cantabria - IIIPC, Universidad de Cantabria) - Sánchez-Moral, Sergio - Martín-Pozas, Tamara (Museo Nacional de Ciencias Naturales - MNCN-CSIC) - Sánchez Carro, Miguel Ángel (Instituto Internacional de Investigaciones Prehistóricas de Cantabria - IIIPC, Universidad de Cantabria) - Gleba, Margarita (Ludwig-Maximilians-University of Munich) - Ontañón, Roberto (Instituto Internacional de Investigaciones Prehistóricas de Cantabria - IIIPC, Universidad de Cantabria; Museo de Prehistoria y Arqueología de Cantabria - MUPAC) - Arias, Pablo (Instituto Internacional de Investigaciones Prehistóricas de Cantabria - IIIPC, Universidad de Cantabria)

Abstract format: Oral

The present contribution seeks to untangle the funerary practices developed in the Lower Gallery of La Garma (Cantabrian Spain) during the early medieval period. At different zones of the Lower Gallery (i.e., Zones IV and V), an intact Visigothic deposit including

five skeletons dating to the seventh-eighth centuries AD were discovered. An archaeothanatology approach to two of the five Funerary locus has been combined with the analysis of microsamples from these contexts. We define microsamples as the minimum amount of necessary sample in terms of conservation strategies of this site declared World Heritage by UNESCO. A cross-disciplinary microtaphonomic perspective (e.g., paleobotany: fibers, phytoliths and microorganisms: parasites) has been implemented to analyze the archaeological funerary context, in addition to the use of non-destructive techniques (i.e., photogrammetry and bone surface casting) and integrated in a general taphonomic study.

The results of our research are presented in order to a better understanding of early medieval beliefs and attitudes towards death through an extraordinary snapshot of the Visigothic period, but also with the aim of advancing in the methodological analysis of funerary contexts and human remains from a taphonomic perspective.

18 TAPHONOMY AND 'ANCIENT' HUMAN REMAINS IN THE MEDIEVAL MIND

Abstract author(s): Nugent, Ruth (University of Liverpool)

Abstract format: Oral

While modern archaeothanatology has been advanced by archaeologists in increasingly refined ways in the 21st century, there is perhaps a need to also reflect on the potential long history of taphonomic and pseudo-taphonomic methods which pre-date the (post-)modern period.

The exhumation of the 'ancient' dead in medieval Britain (England, Scotland, Wales) and the methods, meanings, and perceptions inherent in this activity, has never before received dedicated study. However, a new UKRI Future Leader's Fellowship launched in November 2019 is addressing this issue using textual and archaeological evidence from across the period, and analysing this large dataset using complex interrogative tools and methods from Digital Humanities (Corpus Linguistics, Natural Language Processing, Machine Learning).

Using detailed, explicit accounts of investigations into 'ancient' burials, written during the medieval period (5th-15th century) in Britain, this paper will explore how the aims and principles of archaeothanatology might be identified in a pre-forensic, 'pre-archaeology' society and explores what role taphonomy played in early 'scientific' and proto-archaeological interpretations of 'ancient' human remains. This is not to argue for direct continuity of approaches and ideas, but to investigate how the remains of archaeological bodies were understood taphonomically, and how taphonomy contributed to their interpretations of the long-dead in medieval Britain, taking our understanding of burial disturbances beyond merely 'veneration or violation' of the dead and instead trace how the knowledge, experiences, methods, beliefs and ethics of the medieval period influenced and shaped people's desire to 'read' and 'reverse engineer' archaeological human remains, how effective this was in a pre-forensic society, and to what purpose. This in turn may help us as modern archaeologists reflect on the aims, caveats, and influences surrounding our own use and discussion of archaeothanatology in both quantitative and qualitative research today.

A. MAXIMISING SKELETAL DATA COLLECTION IN COMMERCIAL ARCHAEOLOGY

Abstract author(s): Chroustovsky, Lubos (Faculty of Arts, University of West Bohemia in Pilsen) - Pruchova, Erika (Faculty of Arts, University of South Bohemia in Ceske Budejovice) - Kacil, Pavel (Archeo Pro o.p.s. Prague)

Abstract format: Poster

This paper explores the application of quick, simple and low-cost procedures for data collection in commercial-driven salvage or rescue archaeology and evaluates methodologies to manage complex cemetery excavations from a bio-anthropological perspective. Commercial archaeological excavations operate under numerous constraints, such as limited funding, tight deadlines, demanding developers, and varying degrees of public engagement. In order to be successful, they require unique approaches to data collection that differ significantly from more stable long-term academic projects. This requires the application of tailored field techniques and interdisciplinary collaboration between archaeologists, anthropologists and developers in order to maximise results. The authors examine procedures recently utilised to document and preserve skeletal data in three post-mediaeval cemeteries in Prague, and evaluate their efficacy. The basic methodical steps presented can be easily modified for specific site requirements and combined with more complex (or costly) methods when these are available. Therefore, the findings from this study are applicable to numerous archaeological contexts beyond commercial salvage archaeology.

B. PRELIMINARY TAPHONOMIC EVALUATION OF A BRONZE AGE HUMAN SKELETON DISCOVERED AT RUGINOASA (IASI COUNTY, ROMANIA)

Abstract author(s): Petraru, Ozana-Maria - Bejenaru, Luminița ("Alexandru Ioan Cuza" University of Iași, Faculty of Biology; Romanian Academy – Iași Branch, "Olga Necrasov" Center of Anthropological Research) - Simalcsik, Angela (Romanian Academy – Iași Branch, "Olga Necrasov" Center of Anthropological Research) - Tencariu, Felix-Adrian ("Alexandru Ioan Cuza" University of Iași, Interdisciplinary Research Institute, Science Department, Arheoinvest Centre)

Abstract format: Poster

Archaeological excavations carried out in 2020, at Ruginoasa (Iași County, Romania), revealed a Bronze Age human skeleton in a burial context. The skeleton was oriented West-East, in a crouched position on the right side, facing South. The tomb was discovered in an alveolar pit, which penetrate in the level of a Chalcolithic Cucuteni settlement. Although the taphonomic process has been

intensely studied on the human bones, the teeth have not been studied with the same intensity. Furthermore, the morphological differences between trauma and taphonomic changes represents occasionally a challenge due to the limits of interpretation. The aim of this study is to assess the taphonomic changes of the human skeletal remains (i.e., bones and teeth) discovered in the above-mentioned archaeological site. The estimations of age at death and sex, along with macroscopic and microscopic analysis were applied. The skeleton belonged to a male with an age at death of 45-50 years. A fracture was identified in the left clavicle, antemortem produced and healed, resulting a deviation from normal bone axis. Several postmortem fractures were identified in ribs, vertebrae, and in the bones of the feet and hands. Subaerial weathering exfoliation was identified on the diaphysis of humeri and tibiae, along with traces left postmortem by rodent teeth on the crests of tibiae. On the teeth, white sinuous lines of opacity were observed in enamel and dentine, probably produced by hypomineralization. Also "tunnel" like external alterations were observed on the enamel and dental root surfaces. We presume that the lines of hypomineralization existed antemortem, but ones of them were altered postmortem by environmental factors. Considering the limitations of the light microscopy in distinguishing taphonomic and enamel hypomineralization features on archaeological teeth, further research is necessary regarding the alterations of the dental tissues.

C. THANADOS - THE ANTHROPOLOGICAL AND ARCHAEOLOGICAL DATABASE OF SEPULTURES

Abstract author(s): Brundke, Nina (Austrian Archaeological Institute) - Eichert, Stefan (Natural History Museum Vienna)

Abstract format: Poster

For the area of present day Austria burials are the main archaeological source for the Early Middle Ages (~ 600 - 1100 CE) as in comparison there are hardly any settlements excavated. While only a handful of early medieval settlements are known there are several hundred cemeteries with thousands of graves that are published mostly in a very traditional way in form of printed books with catalogs, maps, figures and plates. Regarding thanatoarchaeological questions they serve as the main source. Although nowadays many publications are open access, the underlying data (i.e. catalogs etc.) are not available as structured digital data that can be used further for digital analyses. Neither is it possible to get a glance at the big picture as mostly only single sites are processed. Cross site publications or homogenous data ranging over more than one site are hardly available.

Within the THANADOS Project (<https://thanados.net>) we developed open source web applications to collect data on burials and their context and to disseminate, query, analyse and visualise the data respecting the FAIR principles based on the CIDOC CRM standard of the International Council of Museums. The area of present day Austria served as a case study and the data pool consists of appr. 500 burial sites with altogether roughly 5000 graves and several thousand finds that are provided as open data under open licences.

The proposed poster wants to present this project and show how it can serve as a hub for cross disciplinary thanatoarchaeological data.

392 IDENTITY POLITICS AND CULTURE(S) IN NEOLITHIC AND BRONZE AGE ARCHAEOLOGY

Theme: 6. Material culture studies and societies

Organisers: Arponen, VPJ (Kiel University) - Brinkmann, Johanna (Kiel University) - Johannsen, Niels (Aarhus University)

Format: Regular session

Identity politics has taken a central place in contemporary political and cultural discourse. On the one hand, the concept can denote a political strategy that uses identity, increasingly weaponising it politically to suggest societal polarisation and social divides. On the other hand, some argue identity politics is a symptom of real socio-economic transformations taking place in modern society.

In Neolithic and Bronze Age archaeology we witness a wide range of material phenomena which frequently have been associated with identities on smaller and larger scales, such as the occurrence of megaliths and the emergence and spread of copper and bronze artefacts as well as phenomena like corded ware or bell beakers, just to name a few.

This session invites contributions to discuss identity politics from an archaeological perspective by means of specific case studies as well as theoretical contributions. Do we have examples of politicised identity in Neolithic and Bronze Age Europe? What kind of social and cultural transformation trajectories do we witness in these cases? Which are the essential triggers and causes of transformation that can be identified in these case studies? What can we learn from prehistory with regard to modern day identity politics, and vice versa?

We also wish to see reflective, theoretical contributions looking at, for example, the relation and/or discrepancy between archaeological concepts of culture and identity. To what extent do these concepts in archaeology reflect the complexity of factors shaping contemporary identity politics? Conversely, do modern (Western) constellations provide a suitable frame of reference for studying these phenomena in prehistory? Can archaeological concepts of identity and culture be weaponised politically today?

ABSTRACTS:

1 IDENTITY POLITICS IN AN INTERDISCIPLINARY CONTEXT: A CONCEPTUAL ANALYSIS

Abstract author(s): Arponen, VRJ (Institut fuer Ur- und Fruehgeschichte Kiel)

Abstract format: Oral

In this talk, the concept of identity politics is approached from an interdisciplinary philosophical and reflective perspective as a theoretical construct calling for an analysis of the concept's ontological commitments. Intuitively, identity might be thought of as essentially a cognitive process of categorisation, acknowledgment, and belonging. Archaeological work on material culture, architecture, and social memory implies a cognitive concept of identity (even while, per Hawke's ladder, strictly beyond the reach of archaeological data). From the cognitive concept of identity follows a concept of identity politics as manipulation of those cognitive processes for political ends.

However, the cognitive concept of identity displays certain romantic and conservative aspects. It is romantic, for it casts an emotional "sense of belonging" as central to identity, especially to cultural or social identity —which in archaeological contexts might even be seen as harking back to colonialist concepts of the "primitives" as uncritically cognitively attuned to their prevailing "symbolic orders". It is conservative, because it implies that a sustainable cultural and social identity can only be a "herd mentality" of a homogeneous, alike thinking and feeling, cognitive community.

Here, the concepts of emergence and capability might offer a plausible extension of the cognitive concept. An emergent identity is a dynamic, "issue specific" identity that is generated and emerges at moments of "reading" or "encoding" of particular socio-cultural, political, economic, and environmental contexts and that may recede and be reshaped again in other contexts. Capabilities denote potential opportunities and perspectives available to members of socio-cultural, political, economic and environmental communities in those contexts. Following David Graeber's action-based theory of value, identity can be conceived as orientated towards capability-enhancing community building in which, not the emotional and static belonging to the community as such, but the leading of active lives as a recognised member of the community is central.

2 CAUSEWAYED ENCLOSURES AND LONG BARROWS AS LANDMARKS OF THE NEOLITHIC RITUAL LANDSCAPE IN BOHEMIA

Abstract author(s): Turek, Jan (Center for Theoretical Study, Charles University, Prague) - Kristuf, Petr (Department of Archaeology, University of West Bohemia in Pilsen)

Abstract format: Oral

Main focus of our project is reconstruction concept of ritual landscapes and representation of personal and communal identity during the Neolithic Period and Copper Age in Bohemia. Specifically we focus on the possibilities of reconstruction of the ritual landscape and settlement areas in relation to funerary monuments and ancestral monuments, such as causewayed enclosures. The death as a social event was never isolated from social, economic and symbolic life of farming communities. The ceremonial level of funerary events connected to ancestral worship is reflected in the landscape with variety of monuments and their intra and extra territorial relations. The ritual landscape was constructed in long tradition symbolic system. The cultural landscape of prehistoric farmers was divided and structured in a continuous diachronic development and the archetypes of landscape divisions and monuments (enclosures; hill-top sites; long barrows) as landmarks was part of the cosmological legacy for generations.

We attempt to explore the palimpsest of funerary and ceremonial land use in order to reconstruct the long term perception of the farmer's world and its structure. In this approach some monuments, seemingly isolated, fit into much wider spatiotemporal structure of prehistoric community areas. Spatial studies of 5th - 3rd Millennium BC will be presented from the territory around the Vltava and Elbe confluence and the mythical mount of Říp.

3 FRAMING PAST IDENTITIES

Abstract author(s): Mlekuž Vrhovnik, Dimitrij (University of Ljubljana; Institute for the protection of the cultural heritage of Slovenia)

Abstract format: Oral

Contemporary identity politics refers to political stances rooted in experiences of injustice shared by excluded social groups. It is marked by multiplication of overlapping identities and their use in fighting various forms of oppression. This seems to be a relatively novel phenomenon. How to frame past identities?

I will approach past identities using the Lacanian psychoanalysis.

Identities can be framed within two registers. The first is the "imaginary axis"; this is the domain of inter-subjectivity that functions to support and consolidate the images subjects use to substantiate themselves. This is the register of identity politics and it is usually invoked when we approach past identities (individual identity, visible through personal adornment and ornaments). This kind of identity is most fluid and prone to change.

The second register of identity occurs along the "symbolic axis". This axis provides the subject with a symbolic framework, and it ties them into a variety of roles and social contracts. Importantly, it entails the radical alterity of what Lacan refers to as 'the big Other',

as an amassed collection of social conventions and laws, an embodiment of authority and truth. It has a kind of supra-agency, of language, of the norms and rules – which speak through subjects and determine their position. This is what we usually refer to as a "culture" and appears to be static and rigid, yet, as Žižek insists, it exists only insofar as we act as if it exists.

What was the relationship between both registers in the past, especially as critics of identity politics insist that particular struggles effectively cover up the universal oppression embodied in the big Other? What is the role of material culture in negotiating to mean, both in intersubjective and trans-subjective (big Other) exchanges?

4 A WARRIOR IDEOLOGY IN LATE NEOLITHIC CENTRAL EUROPE?

Abstract author(s): Schultrich, Sebastian (Institut fuer Ur- und Fruehgeschichte Kiel)

Abstract format: Oral

In northern Central Europe, a male warrior ideology often is associated with the Final Neolithic concepts of Corded Ware and Bell Beakers. This ideology is particularly reflected in burials, where individuals were buried according to specific and gender related rules and males exclusively were accompanied by artefacts with warlike connotations. This burial custom and the ideological, binary social roles associated with it are seen as an opposition to the egalitarian burials of the Late Neolithic (3300–28/2700 BC) societies.

In Southern and Eastern Europe, however, corresponding burials can be traced back to the fourth millennium. On closer examination, many of the attributes that contribute to the assumption of warrior ideology there can also be observed in Central Europe at the same time. In particular, shaft-hole battle axes are to be understood as an outstanding symbol. They represent a symbol that became a common burial gift at the end of the fourth millennium. Before that, they were mainly isolated finds. Moreover, battle axes were articulated in copper, stone as well as in pictorial art and thus they were associated with ideology in a particular way. They reflect the symbolic value that daggers and halberds had in southern Europe.

Although it will never be possible to reconstruct to the actual ideology, it is clear that Central Europe was an active participant in these novel ideas already in the fourth millennium BC. Thus, the assumed distinction between Late and Final Neolithic societies must be abolished. The historical significance of the Beaker cultures must be put into perspective.

However, it should be noted that the general concept of a warrior ideology must be viewed critically, and the implicit assumption of a gender distinction is to be doubted. Supposedly warlike attributes cannot be clearly equated with a masculine symbolic world.

5 POTS AND PEOPLE? THE IMPLICATIONS OF THE CONCEPTS OF ARCHAEOLOGICAL CULTURE AND POLITICISED IDENTITY IN THE NORTHERN EUROPEAN NEOLITHIC

Abstract author(s): Brinkmann, Johanna (Institut fuer Ur- und Fruehgeschichte Kiel)

Abstract format: Oral

At least since Childe (1925, 1929) classic definition of archaeological culture as a complex of recurring types of remains (pots, implements, burial sites, houses) that form the material expression of a (homogenous) group of people, the concept of culture has been used in archaeology to divide material culture into entities which are fixed in time and space. Alternatively single artefact types or features such as particular forms of megalith tombs are used as "type fossils" which in many cases are also viewed as social entities („passage tomb people"). Several scholars have remarked that such uniformity is hardly ever questioned, because the idea of a corresponding social group, has already been imposed itself on the classification process (see e.g. Furholt 2014). Arguably, this form of implicitly imposed circular reasoning, where the result is taken as a premise, causes an emphasis on division of material culture rather than on continuity and fusion. The uncritical use of the concept of archaeological culture therefore cements the division of the past into homogeneous social groups. In a similar way the concept of identity has been used to describe fixed social entities, sometimes implying a "clash" of identities i.e. of different groups of people. In this way both concepts often neglect the variability in the archaeological material. Despite of the increasing use of absolute dating methods, a detachment of the chronology from the archaeologically defined cultures/entities does often not take place. It is shown, that such a detachment is very beneficial and allows for the structured comparison of the material culture in a particular area, in this case the British Isles, Scandinavia and Northern Germany, without an overemphasis on cultural division.

394 WHO WERE THE FIRST POTTERS? CURRENT RESEARCH IN EARLY POTTERY PRODUCTION IN WESTERN EURASIA. PART 1

Theme: 6. Material culture studies and societies

Organisers: Spataro, Michela (The British Museum) - Dolbunova, Ekaterina (The State Hermitage Museum) - Mylnikova, Liudmila (Siberian Branch Institute of Archaeology and Ethnography of the Russian Academy of Sciences)

Format: Regular session

Pottery appeared throughout this huge territory, between Western Siberia, the Mediterranean and the Atlantic Ocean, between c. 8000 and 4000 cal BC, following different trajectories, cultural choices and needs.

We are interested in how the first pottery was made throughout western Eurasia, and particularly in links between technological, morphological and decorative traditions in different regions. We welcome contributions based on interdisciplinary research, using archaeological evidence, ethnoarchaeology and archaeological science, and addressing questions including:

- Was the first pottery always technologically unelaborated?
- Was the chaîne opératoire of the first pottery determined by environmental constraints, economic and demographic factors, or the historical trajectory of the spread of pottery?
- Were early pottery forms based on existing container shapes or new functional requirements?
- How significant is decoration in explaining the spread of the earliest pottery in Eurasia?
- How were different aspects of ceramic production (technology, morphology and decoration) changed or maintained while pottery was dispersed?

ABSTRACTS:

1 EMERGENCE OF POTTERY IN THE NENJIANG RIVER BASIN (NORTHEAST CHINA) DURING THE EARLY NEOLITHIC: UNDERSTANDING TECHNIQUE THROUGH THIN-SECTION ANALYSIS

Abstract author(s): Duval, Pauline (Ecole Pratique des Hautes Etudes - EPHE; Jilin University, School of Archaeology) - Keute, Jennifer (Oxford University, School of Archaeology) - Sebillaud, Pauline (CNRS-CRCAO UMR8155; Heilongjiang University) - Wang, Lixin (Jilin University, School of Archaeology)

Abstract format: Oral

Since the early 2000's archaeological excavations in the Nenjiang river basin have led to the discovery of some of the oldest pottery assemblages in Northeast China, notably at the sites of Houtaomuga and Shuangta (13.000 – 7.500 cal BP). These ceramics are important as they present the emergence of ceramic technology in the region. It has been hypothesized that this is the result of a dietary shift which relies more on fishing.

This research provides a comparative analysis of pottery from the two sites in question using thin-section petrography. The aim of this work is to characterize practices of pottery production for each phase by considering technological and morpho-stylistic evidence in order to highlight cultural transmission. Preliminary results show Houtaomuga phase I (13.000 – 11.000 cal BP) pottery is plant-fiber tempered, while Shuangta phase I (11.000 – 7.500 cal BP) and Houtaomuga phase II (8.000-7.500 cal BP) sherds are shell tempered. The selection and the processing of raw materials seem to significantly vary with the form and decoration of ceramics. The long-term cultural sequence of these sites offer insight into transmission of ceramic technology during the early Neolithic in a hunter-gathering society.

2 EMERGENCE OF POTTERY IN THE NENJIANG RIVER BASIN (NORTHEAST CHINA) DURING THE EARLY NEOLITHIC: UNDERSTANDING THEIR USE THROUGH RESIDUES

Abstract author(s): Keute, Jennifer (School of Archaeology, University of Oxford; Research Laboratory for Archaeology and the History of Art) - Duval, Pauline (Ecole Pratique des Hautes Etudes - EPHE; Jilin University, School of Archaeology) - Sebillaud, Pauline (CNRS-CRCAO UMR8155; Heilongjiang University) - Wang, Lixin (Jilin University, School of Archaeology) - Deviése, Thibaut (School of Archaeology, University of Oxford; Research Laboratory for Archaeology and the History of Art) - Hein, Anke (School of Archaeology, University of Oxford)

Abstract format: Oral

Since the early 2000's, archaeological excavations in the Nenjiang river basin have led to the discovery of some of the oldest pottery assemblages in Northeast China, notably at the sites of Houtaomuga and Shuangta (13.000 – 7.500 cal BP). These ceramics are important as they present the emergence of ceramic technology in the region. It has been hypothesized that this is the result of a dietary shift which relies more on fishing.

One way to approach this hypothesis and the issue of the relationship between pottery use and changes in subsistence and food preparation methods is through the analysis of organic residues trapped in these sherds. The research presented here examines absorbed lipid residues from 200 total pottery sherds from the Houtaomuga and Shuangta sites to shed light on pottery use among hunter-gatherers in this region. These samples come from Houtaomuga phase 1 through 4 and Shuangta Phase 1 and 2, in an attempt to understand pottery use over an extended period of site occupation. Residues have been extracted from the sherds using a method that does not require the sherds to be damaged and allows for more organics to be recovered. Extracts obtained have been subsequently characterized and quantified using gas chromatography-mass spectrometry (GC-MS). This paper will discuss the results of these analyses, focusing in particular on what they can tell us about changes in subsistence and food preparation practices over time.

3 EARLIEST POTS: SHAPES VARIABILITY (EAST ASIA AS A CASE STUDY)

Abstract author(s): Zhushchikhovskaya, Irina (Institute of History, Archaeology & Ethnography of Peoples of Far East FEBRAS)

Abstract format: Oral

The research area discussed in this paper includes the Japanese archipelago, southern and northeast China, southern Russian Far East. The first pottery appeared in these regions between 20,000/18,000 and 10,000 BP. Ceramics assemblages are not numerous containing mainly small-sized fragments. The database for pottery shapes examined is very restricted allowing preliminary estimated observations.

Earliest ceramic containers of all regions are characterized by basic morphological complexity. There is no structural distinction between main pot's functional parts – body and orifice. Morphological diversity is caused mostly by the modeling of pot's bottom part. Three kinds of bottom part contour can be distinguished – conical-shaped, roundish-shaped and flat line-shaped. Flat bottoms are characteristic for the earliest pots of Russian Far East and areas of northeast China. Conical-shaped and roundish-shaped bottoms occur in southern China area and partially in northern China. Among the earliest pottery of the Japanese islands all kinds of shapes bottoms are presented. So, the oldest ceramics assemblages of East Asia show almost synchronic appearance of different bottom models – conical/roundish one and flat horizontal one.

The earliest shapes of ceramic containers are quite similar to the shapes of traditional containers made of various organic materials (plants, fibers, leather). Many kinds of these containers having very old technological routes are survived in East Asia until present. Hypothetically, the process of imitation of shapes of organic containers by the shapes of the earliest clay containers might have various social and technological patterns.

4 EARLY POTTERY IN WESTERN SIBERIA: CHRONOLOGICAL AND TYPOLOGICAL ASPECTS

Abstract author(s): Dubovtseva, Ekaterina (Institute of History and Archeology of the Ural Branch of the Russian Academy of Sciences - IIAA UB RAS) - Piezonka, Henny (Institute of Pre- and Protohistorical Archaeology, Christian Albrecht University Kiel) - Klementieva, Tatyana (Institute of History and Archeology of the Ural Branch of the Russian Academy of Sciences - IIAA UB RAS)

Abstract format: Oral

Western Siberia is a key region for understanding early hunter-gatherer pottery dispersals in North Eurasia. Located halfway between the earliest Late Glacial cores of pottery production in East Asia, and Eastern Europe, Western Siberia plays a prominent role in various dispersal scenarios currently under discussion. In the study region, the early pottery horizon coincides with a unique set of innovations and intensification in the socio-economic sphere. Recently published results of a thorough AMS dating programme show that the earliest reliable evidence for pottery stems from the south and west of the area, dating to the second half of the 7th millennium cal BC. Over the following centuries, the innovation spread rapidly north into the taiga.

The talk will present new typological, contextual and chronological data from across the region. At least two major styles dominate the earliest ceramics in the taiga zone in the 7th millennium cal BC: flat-based vessels with incised ornamentation, and pointed-based vessels with comb stamp decoration. The first type is dominating on sites in the middle and southern taiga and in the forest steppe to the south, whereas the second type is concentrated in the northern taiga north of the West Siberian land ridge and in the Lower Ob' region. However, at some sites both styles are present in the same contexts, as is the case e.g. at the fortified settlement of Amnya I. In the first half of the 6th millennium cal BC, the stylistic diversity, especially concerning decoration, is further increasing.

In our talk, we will compare selected early pottery complexes, including new materials from the Middle and Lower Ob' regions, and from the Konda area. We will also provide insights on dispersal trajectories, roles and functions of these early wares within the dynamic socio-economic system of the hunter-gatherer-fisher communities.

5 TECHNOLOGICAL CHARACTERISTICS OF THE EARLY NEOLITHIC CERAMICS IN VOLGA-KAMA

Abstract author(s): Vybornov, Alexander - Vasilieva, Irina (Samara State University of Social Sciences and Education)

Abstract format: Oral

One of the most relevant issues in studying the Neolithic in Volga-Kama is to determine the particular qualities of emergence and spread of the ceramics traditions at this territory. This is due to the very early age of the Neolithic complexes: 6500 BC. This presupposes the existence of centres where the ancient crockery emerged. Our study of the pottery technology attaches particular importance to the ideas about the initial plastic raw material and the traditions of composing molding materials. They remain unchanged for a long time even when different population groups intermingling. The difference in the types of plastic raw materials of the earliest ceramics points to belonging of the ancient pottery to different areas of ceramics origin. The technical and technological analysis of the pottery revealed three areas of the emergence and development of ceramic traditions in the Volga-Kama: the north of the Caspian Sea, the Middle Volga and the Kama. The main mechanism of spread of the early Neolithic ceramic traditions was direct contacts and intermingling processes of culturally different groups of the ancient population. As a result of intermingling of early Neolithic traditions from the north of the Caspian Sea and the Middle Volga (Elshanskaya culture), a syncretic Middle Volga culture formed with a specific technology of making pottery. In conditions of intercultural intermingling outwardly similar vessels could be made by different technological methods. Thus, the ceramics with comb stamp decoration and made of natural clay, that was dry crushed and chamotte admixed, was predominant at the early stage of the development of the Kama area with Neolithic pottery. At the late stage (as a result of interaction with the societies of the Middle Volga area), the ornament remained the same, and the technology for production of vessels changed and became mixed with the Middle Volga traditions.

6 THE FIRST POTTERS OF EASTERN EUROPE: TECHNOLOGICAL TRADITIONS AND CULTURAL CHOICES

Abstract author(s): Dolbunova, Ekaterina (The State Hermitage museum) - Kulkova, Marianna (Herzen State Pedagogical University of Russia) - Mazurkevich, Andrey (The State Hermitage museum)

Abstract format: Oral

One of the oldest groups of pottery in Eastern Europe date back to the 6th millennium BC. Early ceramics appeared in different regions in the steppe, forest-steppe and forest zones, mainly around tributaries of major water basins - the Volga, Don and Dnieper River. They belong to different local archaeological cultures. The striking similarity of certain features, and the proximity of the chronology, may point to some networks that existed at that time. However, the peculiarity of the 'chaînes opératoires' preserved in these different complexes may point to local technological traditions that might have been shaped by certain cultural choices. It becomes particularly clear when comparing it with complexes from other regions. This paper will present reconstructed 'chaînes opératoires' for some of the earliest ceramic assemblages of the steppe zone - Lower Don basin and forest zone - Dniepr-Dvina basin. The results of petrographic analysis of ca. 300 vessels will also be presented. The study of the raw material used for the production of vessels allows us to suggest cultural choices and certain adaptation to local raw material sources, which manifested in a change of raw material sources selection or in the search of paste recipes closest to customary recipes.

7 THE EARLIEST POTTERY ON THE TERRITORY OF SOUTH-EAST BELARUS: MAIN FEATURES AND WAYS OF PENETRATION

Abstract author(s): Tkachova, Maryia (Institute of History NAS of Belarus)

Abstract format: Oral

The beginning of the Neolithic period in Eastern Europe is associated, mainly, with the advent of ceramic production. For this reason, the earliest pottery, which carries information about the ways of penetrating new ideas, and, sometimes, the population in the region, has a particular importance for research. A comprehensive multistage analysis of the ceramic allowed distinguishing the most ancient vessels in South-East Belarus.

Technological features, morphology and ornamentation made it possible to classify this pottery as the pottery of the Strumel-Gastiatin type. Such ceramic was found on the settlements in the interfluvium of the Dnieper and Desna.

Among researchers there is no consensus about the origin of the Strumel-Gastiatin type. However, it is still possible to talk about the origin of ancient pottery in the territory of South-East Belarus from the "south pottery centre" that has developed in the south-western region of Eastern Europe - in the area of the Bug-Dniester culture.

The data may indicate the penetration of the bearers of the early pottery making traditions on the territory of South-East Belarus by the "southern" way (by the Dnieper River from the south to north). The "eastern" way (by the Desna River from the east to west) seems less possible.

8 FROM THE MOMENT OF CREATION TO THE FUNERAL RITE - CERAMICS FROM NEOLITHIC CEMETERIES ON THE MIDDLE AND LOW DNEIPER

Abstract author(s): Andriiovych, Marta (Institut für Archäologische Wissenschaften)

Abstract format: Oral

Neolithic ceramic is one of the areas of big research interest. First pottery production caused a big influence on everyday humans' lives... Including the last funeral ritual.

The Neolithic ceramic from Azov-Dnieper, Dnipro-Donetsk, Surska styles impresses with rich ornamentation made on full vessels body including the inner part of the rim and bottom. The variability of the ornamentation shows the interaction between social groups in the region. The same pottery was following the human throughout his life and probably was a valuable and respectful thing. The comparison of the pottery from settlements and cemeteries would give us a more complete understanding of the place of Neolithic vessels in the society, as well as how pottery was developed and change. The analyses of the main vessels' types, styles, and correlation with different ornamentation techniques and ornamentation plots present us a full picture of the pottery development and human interaction in the region.

9 POTTERY IN THE ERTEBOELLE CULTURE – ORIGINS, PRODUCTION AND IMPACT ON MESOLITHIC DAILY AND SOCIAL LIFE

Abstract author(s): Meyer, Ann-Katrin (University of Hamburg)

Abstract format: Oral

The earliest pottery in Northern Germany and Denmark appeared between 4700 and 4500 BC within the late Mesolithic Erteboelle Culture.

Until today it has been subject to many typological analyses and to extensive studies of food crusts. However, a detailed analysis of the role of pottery within the development of Mesolithic society and economy or its influence on the Neolithisation process has been lacking.

This contribution, based on a recent PhD completed at Hamburg University, aims to shed light on the reasons behind the initial adoption of pottery technology as well as on use and function of the first pots and the ways the new technology spread. Using entanglement and agency theory, the paper addresses how form and function of the containers are connected to each other, if the function of pottery changed over time and if the technology arrived fully developed or underwent some "re-invention". Another focus lies on the impact pottery had on Mesolithic daily life as well as on a development towards a complex society and on the Neolithisation process.

The results show that Erteboelle pots are characterized by a distinct shape, decorations and manufacturing techniques showing close proximity to (Eastern) Baltic hunter-gatherer groups in Poland. The pots are mainly connected to domestic activities with a strong emphasis on cooking aquatic resources whereas there are very few indications for functions related to prestige and status.

However, the newly created dependences and dependencies between people, pots and aquatic (marine) resources shaped Erteboelle life at various (social, cultural, economic etc.) levels and influenced patterns of mobility as well as formerly established structures of social complexity which paved a way to a Neolithic mode of subsistence.

10 KNOWLEDGE TRANSFER IN NEOLITHIC CERAMICS OF THE BALKANS AND EUROPEAN RUSSIA – A PATTERN

Abstract author(s): Spataro, Michela (British Museum) - Vybornov, Alexander (Samara State University of Social Sciences and Education) - Bacvarov, Krum (National Institute of Archaeology & Museum of the Bulgarian Academy of Sciences, Sofia)

Abstract format: Oral

Systematic archaeometric analyses have shown a variety of ceramic chaîne opératoire systems present in European Neolithic societies, but it is not always easy to detect craft transmission between neighbouring areas. Some natural barriers, such as mountains and

rivers, seem to act as boundaries for different cultural groups, e.g. the early Neolithic Impressed Ware communities of the Adriatic and the Starčevo-Criş-Körös and Karanovo groups in the Balkan peninsula. However, in the middle/late Neolithic, the pottery produced throughout this region was superficially similar, although the technological choices were different. In some cases, previous traditions were maintained, and in others, most of the steps of the chaîne opératoire were replaced.

In this paper, a variety of ceramic chaînes opératoires will be discussed, emphasising the correlation between places, social structures and craft knowledge transfer. By the 6th

millennium BC, pottery production in the Middle East was standardised, and had nothing in common with contemporaneous ceramic production in south-eastern Europe. By contrast, 6th millennium BC hunter-gatherer communities in European Russia made ceramics using multiple techniques, which varied geographically, and appear unrelated to those of the first farmers in the Middle East and south-eastern Europe. Is technological

exchange possible only when similar social systems are in place? Do different social/economic structures prevent the exchange of knowledge?

11 EARLY NEOLITHIC POTTERY AND POTTERS IN THE EASTERN BALKANS: EXPLORING THE BEGINNINGS

Abstract author(s): Dzhafzova, Tanya (University of Oxford)

Abstract format: Oral

The precise starting point of incipient technologies is not necessarily always clear in many regions, including the Eastern Balkans. This territory provides an excellent opportunity to examine pottery beginnings and dispersal, the conformity to traditional approaches and the introduction of innovative pathways while spreading the new ceramic technology.

However, complexity arises from: missing links to known pre-ceramic predecessors; scanty data about the earliest sites; disparate perceptions regarding the reasons, the trajectories and the dynamics of Neolithisation, and so forth. Understanding Early Neolithic pottery production is thus inextricably intertwined with the analytical approaches towards the accessible 'earliest' materials and, essentially, the interpretations of results.

In this paper, the questions how the first pottery was made in the Eastern Balkan region and who the first potters were, are tackled by the application of thin section analysis and scanning electron microscopy. The clay fabrics and inclusions, surface treatment and especially the decoration are considered within cultural, social and environmental context, thus widening the research horizons.

12 EARLY POTTERS IN GREECE: THE CASE OF MAVROPIGI-FILLOTSAIRI

Abstract author(s): Bonga, Lily (unaffiliated)

Abstract format: Oral

The Early Neolithic site of Mavropigi-Fillotsairi in Western Macedonia, Greece is one of the earliest ceramic sites in Southeastern Europe, and its location at a natural geographic crossroads makes understanding how and why ceramic choices were made all the more important as they relate to surrounding areas (local and extralocal). Both the technological details of vessel construction (e.g., tempering choices) and decoration (e.g., plastic, painted) demonstrate extensive and sustained interaction with surrounding communities. These choices demonstrate both external influences as well as independent innovation. Like most sites, the first ceramic forms

are technological simple and unelaborated, but unlike some early pottery in Western Eurasia, Early Neolithic pottery in Greece is not considered to be used for cooking or even food processing.

The ceramics from Mavropigi-Fillotsairi demonstrate that the choices in the production and uses of ceramic vessels were primarily driven by social and cultural needs. These choices, however, were also a result of historical trajectory of the spread of pottery, particularly the environmental constraints encountered by people moving further into the continent. Mavropigi-Fillotsairi provides an excellent opportunity to investigate how different aspects of ceramic production (including technology, morphology, and decoration) were changed or maintained as pottery was dispersed both in Northern Greece.

395 WHO WERE THE FIRST POTTERS? CURRENT RESEARCH IN EARLY POTTERY PRODUCTION IN WESTERN EURASIA. PART 2

Theme: 6. Material culture studies and societies

Organisers: Spataro, Michela (The British Museum) - Dolbunova, Ekaterina (The State Hermitage Museum) - Mylnikova, Liudmila (Siberian Branch Institute of Archaeology and Ethnography of the Russian Academy of Sciences)

Format: Regular session

Pottery appeared throughout this huge territory, between Western Siberia, the Mediterranean and the Atlantic Ocean, between c. 8000 and 4000 cal BC, following different trajectories, cultural choices and needs.

We are interested in how the first pottery was made throughout western Eurasia, and particularly in links between technological, morphological and decorative traditions in different regions. We welcome contributions based on interdisciplinary research, using archaeological evidence, ethnoarchaeology and archaeological science, and addressing questions including:

- Was the first pottery always technologically unelaborated?
- Was the chaîne opératoire of the first pottery determined by environmental constraints, economic and demographic factors, or the historical trajectory of the spread of pottery?
- Were early pottery forms based on existing container shapes or new functional requirements?
- How significant is decoration in explaining the spread of the earliest pottery in Eurasia?
- How were different aspects of ceramic production (technology, morphology and decoration) changed or maintained while pottery was dispersed?

ABSTRACTS:

1 EARLY NEOLITHIC POTTERY AT SCHELA CLADOVEI. A COMPARATIVE STUDY OF ARCHAEOLOGICAL AND EXPERIMENTAL VESSELS FROM THE PERSPECTIVE OF COMPUTED TOMOGRAPHY

Abstract author(s): Opris, Vasile (Bucharest Municipality Museum) - Boroneant, Adina ('Vasile Pârvan' Institute of Archaeology) - Petroneac, Marta - Focsaneanu, Marin - Sirbu, Robert - Constantin, Florin ('Horia Hulubei' National Institute of Physics and Nuclear Engineering) - Bonsall, Clive (University of Edinburgh) - Golea, Mihaela ('Vasile Pârvan' Institute of Archaeology)

Abstract format: Oral

Traditionally, studies of Early Neolithic pottery in the Iron Gates region have focused on relative chronology based on shape and decoration characteristics. In recent years, technological approaches have become more common, reflecting the growing interest among archaeologists in the processes underlying the transition from hunting and gathering to farming.

However, many technological questions remain unanswered. Our paper offers a fresh insight into the Starčevo-Criș pottery from Schela Cladovei based on the application of computed tomography (CT) to obtain cross-sectional images of both archaeological and experimental vessels. The pottery experiments were conducted in the summer of 2019 at Schela Cladovei, while the CT scans were performed at the Horia Hulubei National Institute of Physics and Nuclear Engineering in Bucharest. The key feature of this study is a comparison between the characteristics of the archaeological and experimental pottery as observed in the CT images. The study takes into account the quantity and quality of technological variables such as voids, natural inclusions, vegetal tempers, forming techniques and surface finishing.

2 DIVERSIFICATION OF POTTERY STYLES AS A RESULT OF MULTICULTURAL CHANGE DURING THE MID-6TH MILLENNIUM BC IN THE SOUTHERN CARPATHIAN BASIN

Abstract author(s): Botic, Katarina (Institute of Archaeology, Zagreb)

Abstract format: Oral

Relative uniformity of the early Neolithic pottery styles in the southern Carpathian Basin by the mid- 6th millennium BC saw a swift change. This change occurred in all the aspects of pottery production, from vessel shaping and decoration to the techniques of firing, recognized as various pottery styles in the archaeological records. Change in pottery styles accompanied diversification of other aspects of archaeological cultures such as house construction, husbandry, agricultural practices, flint production, etc. On some sites degree of hybridity in pottery styles is noticed.

This paper presents new evidence of the multicultural change in the specific micro region at a specific time in Prehistory based on the macroscopic and petrographic analysis of new pottery thin section samples and new analyses of space organization and the structure of settlements of several Neolithic sites situated in the Sava-Drava-Danube interfluvium. New results are compared with already published results for a wider region, both on pottery and settlement organization.

3 TECHNOLOGICAL CHARACTERIZATION OF NEOLITHIC POTTERY FROM THE SITE OF LUGO DI GREZZANA (VERONA – ITALY)

Abstract author(s): Ciela, Marika - Tavella, Andrea - Pedrotti, Annaluisa (LaBAAF - University of Trento)

Abstract format: Oral

This summary reports the results of the ceramic paste and manufacturing analysis related to the Neolithic site of Lugo di Grezzana (Verona, Italy). The site is located in the Lessini Mountain and dated between 5400 and 4900 – 4800/4700 BC cal, which material culture is principally attributed to Fiorano culture and Vhò group. The aim of the study is to reconstruct part of the chaîne opératoire of XIII area of the site.

The ceramic paste analysis was initially carried out through the macroscopic observation of the inclusions with the aid of a stereomicroscope. Subsequently, 27 potsherds were selected, which thin-sections were observed under petrographic microscope. The evaluation of the nature and higher frequencies of the inclusions allowed to classify the fabrics into four groups. About manufacturing analysis, fashioning and finishing techniques were observed by low-angled light in order to detect diagnostic traces on surfaces, sections and in the fracture networks. The interpretation of the ceramic record was obtained by comparing with experimental and ethnographic data.

The results were compared to typological classification and stratigraphic evolution of the site. The ceramic paste and manufacturing analysis highlighted, in the last phases of frequentation, some technological changes such as bone tempered fabric and handle with tenon. Both confirm what has already been observed in the typological classification, with a partial contemporaneity between the Fiorano and early phase of Square Mounted Pottery culture (5000 – 4800/4700 BC cal). The results of the technological analysis provide new research data, not only for the site of Lugo di Grezzana, but in general for Early Neolithic ceramic production in northern Italy.

4 YOU WILL KNOW THEM BY THEIR POTTERY... THE POTTERY OF THE EARLY NEOLITHIC (5700- 4700 BCE) IN THE WESTERN MEDITERRANEAN

Abstract author(s): García-Martínez De Lagrán, Íñigo (UNED) - Molina, Lluís - Bernabeu, Joan (Universitat de Valencia) - Manen, Claire (CNRS - Université de Toulouse-Jean Jaurès) - Rojo, Manuel A. (Universidad de Valladolid) - Arcusa, Héctor - Laborda, Rafael (Professional Archaeologist)

Abstract format: Oral

This paper presents the first data on the ceramic style of the main sites located in the south of France, and in Spain in the Ebro Valley, Catalonia, the Northern Plateau and the Valencian Country. This research is part of an R+D+i project (PGC2018-100007-A-I00) of the Spanish government and aims to give a new vision of the Neolithisation and early Neolithic process of this wide area through the ceramic style as the main interpretative tool. This paper will present an overview and preliminary data from a study that is still in progress. For this reason, we will focus on certain global aspects such as techniques and the zonation of the decoration on the vessels, without analysing the specific cases of each site. We will also provide a general chronological framework of the main styles defined at this time and in this geographical framework. These styles will also be analysed from the perspective of the different types of archaeological sites and contexts.

5 ORIGIN AND SPREAD OF ANTHROPOMORPHIC-POT FROM THE NEAR EAST TO EUROPE BETWEEN THE 7TH-6TH MILLENNIUM BC

Abstract author(s): Bersani-Pancheri, Monica - Pedrotti, Annaluisa (University of Trento)

Abstract format: Oral

Through the analysis of anthropomorphic-pot (face-vessels and vessels with anthropomorphic depiction) our aim is to contribute to the understanding of the spread of this phenomenon from the Near East to Europe, with a particular focus on the Italian Peninsula, between 7th-6th millennium BC. Most of the data presented in this paper arise from a PhD project, completed in 2019. The research has taken advantage of important summary works that have studied human representation, both on vase and in the round, over vast areas, among which the works of Svend Hansen (2007), Valeska Becker (2011) and Heiner Schwarzberg (2011) stand out for their systematicity and breadth. The survey has concerned the examination of 927 specimens from 229 sites, belonging to the cultures attested between Mesopotamia, the Rhine river and Italian Peninsula. Starting from Anatolia, the obtained results allowed us to establish two distinct 'routes' of dissemination, reconstructed by the absence or presence of certain iconographic patterns, according to a hypothesis that would be confirmed by the chronological sequencing of the 14C dates of the finds:

- a 'continental route' to the north which, through waterways flowing into the Aegean, reaches first western Bulgaria, between 6000 and 5900 BC (Karanovo I), and then the heart of Europe, arriving in Serbia (Starčevo) and central Hungary (Körös) around 5800-5500 BC;
- a westward 'sea route' involving first Thessaly, between 6200 and 6000 BC (Protosesklo), and then Apulia (Guadone),

around 5800-5650 BC.

In the Italian Peninsula anthropomorphic-pots are not evenly spread, they do not cross the boundary defined by the Apennine Range, and their diffusion from south to north occurs only in the eastern part of the peninsula, arriving in northern Italy around 5300 BC. Face-vessels are mainly concentrated in south-eastern Italy, while anthropomorphic depiction on vase characterize the early Neolithic in the Po Valley.

6 ADDED TEMPERS AND WAYS OF DOING IN THE FIRST POTTERY PRODUCTIONS

Abstract author(s): Clop García, Xavier (ARCAEOM, Department of Prehistory, Autònoma de Barcelona University)

Abstract format: Oral

The treatment of clays is one of the first work processes carried out in the pottery production process. Once the clays have been transported to the place where the ceramics are made, they are treated by developing various operations (fragmentation or crushing of the clay; granulometric selection to homogenize, to a certain extent, the size of the minerals components; elimination of large mineral elements or visible plant elements; etc.) in order to obtain an optimal raw material for carrying out the rest of the work processes necessary to produce pottery.

In the treatment of the raw material there is also an optional operation: the possible addition of some type of added temper. In many cases in different parts of the world and in different periods, characterisation studies show the deliberate addition of temper to pottery in the form of minerals/crushed rocks (e.g. talc, calcite, chert), organics (e.g. vegetable matter, bone fragments, shells) or anthropogenic materials (e.g. grog).

This communication presents a systematized view of the added tempers documented in the framework of the first pottery productions in the Near East and the Mediterranean basin. Carrying out a large number of archaeological characterization studies allows us to start proposing global visions that allow us to know the specific characteristics of the use of added temper in the first productions of this entire area and to raise and discuss issues such as specific chronological frames the use of the different types of added temper, their role in the context of the ways of doing and their transmission, the relationship between their use and the functionality of the pots, etc.

7 TECHNOLOGICAL TRANSFER IN PRODUCTION OF MAJIAYAO-STYLE POTTERY BETWEEN NEOLITHIC COMMUNITIES IN NORTHWEST CHINA

Abstract author(s): Dammer, Evgenia (University of Oxford; The British Museum, Department of Scientific Research)

Abstract format: Oral

The present paper discusses the transfer of technological knowledge for making the Majiayao-style pottery in Neolithic China (5300-4000 BP). The Majiayao-style is known for its elaborate painted designs in monochrome black or in black and red on large globular vessels made of fine clay, and for the coarse pottery decorated with cord impression and appliqué. The Majiayao-style pottery was widely distributed in prehistory across different river valleys located hundreds of kilometres away from each other. This study investigates whether there are similarities in making technology of the Majiayao-style beyond the shape and decoration and addresses communication and connectivity of prehistoric people living in different river valleys.

The methods of macroscopic examination, ceramic petrography and experimental firing of raw materials were used to reconstruct the chaîne opératoire of the Majiayao pottery from four sites. The results of this study revealed parallels in materials and techniques for making this pottery in different locations indicating common technological knowledge that could have been disseminated among potters. Furthermore, the combination of macroscopic and microscopic analysis has shown that there are patterns in connection between the coarse and fine clay fabrics with specific decoration and firing atmospheres. The observations suggest that beside the technological knowledge, the making of Majiayao-style pottery also required specific social knowledge to connect outer appearance of the Majiayao-style with the production materials and techniques. This paper concludes that the two contrasting fabrics - coarse and fine, and surface textures - rough and smooth - need to be considered together in order to address issues of prehistoric technology and shared social knowledge in Neolithic northwest China.

8 COMPARATIVE ANALYSIS OF CERAMICS THE VOLOSOV CULTURE OF THE UPPER AND MIDDLE VOLGA REGIONS (BASED ON TECHNICAL AND TECHNOLOGICAL ANALYSIS)

Abstract author(s): Andreeva, Olga (Samara State University of Social Sciences and Education)

Abstract format: Oral

The Volosov Eneolithic culture was identified in the Middle and Upper Volga regions at the beginning of the 20th century. Its chronological framework falls within the interval from 4100 to 2800 BC. Vessels with a rounded and flat bottom are ornamented over the entire surface, less often along the outer and inner sides of the rim with large non-ornamented zones. The ornamental elements presented are toothed and comb impressions, frame stamp; rope and pits. The study of the ceramics manufacturing technology was carried out according to the method developed by A.A. Bobrinsky, based on the study of skills (stable methods of performing work) with the help of which the dishes were made.

The ceramics of the Volosovo culture of the Middle Volga region (121 vessels) and the Upper Volga region (28 vessels) were analyzed. For the manufacture of dishes, silty clay was used as the initial plastic raw material: Middle Volga region 98%, Upper Volga region

100%. The following artificial additives were used: chamotte (CH), organic solution (OS), crushed shell (CS), and down-feather of a bird(F). The potters of the Upper Volga region made up the molding mass according to two recipes: OS+F 29%; OS + CS + F 71%. The population of the Middle Volga region applied six ones: OS+F 55%; OS+CH+F 20%; OS 11%; OS+CS+F 10%; OS+CH 3%; OS+CH+CS 1%.

For the Volosov population, the admixture of organic solution is persistent while the introduction of chamotte and crushed shell into the molding mass is the most archaic tradition associated with the early stage of culture. The admixture of down-feathers of birds might be due to the mixing of the population at the later stages of the development of the Volosov culture.

The research has been carried out with the grant from the Russian Science Foundation (project 19-78-10001).

9 TECHNOLOGICAL VARIABILITY IN THE EARLY CHALCOLITHIC POTTERY PRODUCTION FROM EASTERN ROMANIA

Abstract author(s): Matau, Florica (ARHEOINVEST Center - Science Department, Interdisciplinary Research Institute, Alexandru Ioan Cuza University of Iasi)

Abstract format: Oral

The aim of this study is to identify how the Precucuteni ceramic artefacts (5050-4600 cal BC) were produced in order to diagnose the imposed constraints caused by the selected raw materials. Further, we will explore the solutions advanced by the potters both at the level of raw material selection and at the paste preparation and vessel firing.

The morphological analysis based solely on visual inspection and complemented only with typological and stylistic analysis is not sufficient to determine the variation present in the paste recipes and in the raw materials. In order to address the above-mentioned issues a combination of archaeometric techniques is necessary.

Until now, only two studies were dedicated to the investigation of technological features of a small number of Precucuteni pottery identified at Târgu Frumos (Ellis, 2005) and Târpești (Mățău et al., 2019). Both studies mention the existence of at least two recipes for pottery making and the constant experimentation with reducing conditions combined with a tendency to experiment firing in oxidizing atmosphere.

This study aids five more sites located in the eastern part of Romania aiming to evaluate the pottery chaîne opératoire and examine the correlation between pottery production, chronological and regional variability. We undertook visual examinations of the manufacturing techniques combined with thin-section petrography and X-ray powder diffraction (XRPD) for a more accurate estimation of the firing variability.

References

- Ellis, L. (2005) Analysis of Precucuteni Ceramics from Târgu Frumos, România, In: Scripta Paehistorica. Miscellanea in honorem nonagenarii magistri Mircea Petrescu-Dîmbovița oblata, V. Spinei, C. M. Lazarovici, D. Monah (eds.), Iași, pp. 261-270.
- Mățău, F., Chișcan, O., Pintilei, M., Garvăn, D., Stancu, A. (2019) Technological features of the Chalcolithic pottery from Târpești (Neamț County, Eastern Romania), Mediterranean Archaeology and Archaeometry 19 (3), 93-104.

A. EARLY NEOLITHIC CERAMICS OF THE BARABA FOREST-STEPPE: INSTRUMENTAL ANALYSIS

Abstract author(s): Mynikova, Liudmila - Molodin, Vyacheslav (Siberian Branch Institute of Archaeology and Ethnography of the RAS)

Abstract format: Poster

At the multilayer sites Tartas-1, Ust-Tartas-1, Vengerovo-2, Avtodrom-2/2, a new complex of the Early Neolithic era (late VIII-early VI millennium BC) was identified, which was named the Barabinskaya culture. These are the earliest objects in Western Siberia containing pottery. The ceramic collection has undergone binocular, petrographic and thermal analyzes. Low-sand ferruginous loams of montmorillonite-hydromica composition were used as a raw material. Revealed the use of two sources of raw materials, which, in addition to the above, included chlorite-hydromica medium sandy loam. One recipe for molding materials is fixed: loam + sand + chamotte + organic solution. The vessels were molded on a base mold using a capacitive filling. An ordered two-three-layer flap acts as a building element. The upper part of the vessel was molded separately with two strips composed of a two-layer flap. A thin twisted cord was superimposed on the upper edge, which was then covered with a ribbon of patches bent inside the vessel. Channels from the burnt-out strapping cord are fixed on the fracture of all the rim fragments. The bottom - the cake was also made using patchwork technique, inserted into the finished form and attached to the body with small patches, as a result of which a roller was formed around the perimeter. The ornament is represented by a complex subject composition covering the entire surface of the vessel including the bottom. The assignment to this culture of similar in appearance sites of modern Kazakhstan and the Ishim region requires additional research, since in these territories there could also be local cultural groups that had their own specifics, but made flat-bottomed dishes.

With a high degree of probability it can be assumed that the origins of this culture can go back to the culture of the local Pleistocene.

402 CLIMATE AND ENVIRONMENTAL CHANGE IN THE NILE VALLEY

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Panagiotakopulu, Eva (School of GeoSciences, University of Edinburgh) - Sigl, Johanna (Kommission für Archäologie Außereuropäischer Kulturen - KAAK)

Format: Discussion session

Environmental change either as a result of human impact or climate change has a long history in the Nile valley. From the much discussed Old Kingdom collapse to a variety of apparently catastrophic events and more nuanced incremental change, the archaeological record, with unique information from organic remains, resulting from optimal preservation, provides a detailed body of data. These allow refined interpretations for past events, including societal change. The session aims to present case studies from archaeological and palaeoenvironmental research, combining novel techniques and established approaches, theories and data in an attempt to engender a holistic approach to change in the Nile Valley during the Holocene, in particular during the last 10.000 years. We shall look into results on environmental change from different research methods in order to obtain a multidisciplinary perspective. The session will range from detailed site interpretations to key events and moments in time, from droughts, extinctions and changes in agriculture, famine, disease, trade networks and biogeographic change. We shall approach the problems and datasets with a view to using knowledge of the past to understand also present change.

ABSTRACTS:

1 NILE FLOODS DURING THE LAST AFRICAN HUMID PERIOD: A SEASONAL RECORD FROM THE DEEP-SEA FAN

Abstract author(s): Blanchet, Cecile - Arne, Ramisch - Rik, Tjallingii - Achim, Brauer (GFZ Potsdam)

Abstract format: Oral

Seasonal floods are life-supporting events in the Nile Valley and have been crucial to the development of complex societies. Present populations depend on their occurrence but the alteration of fluvial dynamics under climate change remains elusive. In order to better understand how fluvial dynamics respond to climatic changes, we explore past flood dynamics of the Nile River using a unique finely laminated sequence from the Nile deep-sea fan.

Today, floods occur during the summer, when monsoonal rainfall hits the Ethiopian highlands and feeds the Blue Nile. Core P362/2-33 covers the past 9.5 ka BP and is ideally located to record changes in fluvial dynamics during periods of stronger monsoon activity such as the Saharan Humid Periods. The absence of oxygen in the Mediterranean bottom waters during the last Saharan Humid Period (during sapropel S1 deposition) allowed to preserve the laminated structure between 9.5 and 7.5 ka BP.

We focus here on examining the nature of the laminations in order to 1) understand the deposition mechanism and 2) obtain a reconstruction of past fluvial dynamics at seasonal resolution.

Microfacies analysis and elemental micro-XRF scanning indicate that couplets of alternating dark- and light-coloured layers represent seasonal deposits of Nile discharge and marine hemipelagic sedimentation, respectively. Preliminary lamination counts suggest that couplets were deposited at an annual rate for most of the record. Increases in layer thickness is observed around 9.5 and 9.1 ka BP, followed by a gradual decrease until 8 ka. Careful examination of lamination structure and time-series analysis of layer counts will permit to further explore sub-annual changes in flood dynamics during the Saharan Humid Period. Finally, due to its high temporal resolution, our record has the potential to link reconstructions of Nile discharge to other regional archives of hydrological changes (e.g., speleothems, lakes) and thereby identify overarching forcing mechanisms.

2 CHANGING DESERT LANDSCAPES: PAST AND PRESENT LAND USE IN THE NORTHERN DONGOLA REACH, SUDAN

Abstract author(s): Sevara, Christopher (Newcastle University) - Minor, Elizabeth (Wellesley College) - Fera, Martin (University of Vienna) - Oliver, Kalei (Wellesley College) - Schellinger, Sarah (Ohio State University) - El-Hassan (Sokhari), Ahmed (National Corporation for Antiquities and Museums, Sudan)

Abstract format: Oral

Social and environmental changes had significant impacts on lifeways of Nilotic communities as the African Humid Period came to an end. Since that time, people have employed various strategies to cope with climate change, population increase, and shifting socio-political influence. Adaptations in Human Landscapes Along the Nile (AHLAN) is a new multidisciplinary landscape research project focused on understanding how people developed such strategies through a study examining the development of rural agricultural and transport infrastructures in the region near modern-day Dongola, Sudan. Prior research indicates infrastructure development occurred around former river channels as climate and social change necessitated innovative strategies for sustainability. AHLAN is investigating these traces using data from new remote sensing technologies, geospatial analysis, and community engagement to better understand how these developments contributed to the growth and decline of local and regional settlement networks over time. In this paper, we present our initial work with AHLAN, discussing the new contributions analysis of remote sens-

ing data can make to our current understanding of the regional archaeological and paleoenvironmental record, including the impacts from recent rapid modern agricultural development on archaeological resources.

3 CLIMATE CHANGE, HUMAN IMPACT AND INSECT FAUNAS FROM THE NILE VALLEY

Abstract author(s): Panagiotakopulu, Eva (School of GeoSciences, University of Edinburgh)

Abstract format: Oral

The scale of human impact in the Nile Valley has accelerated with intensification of settlement and increasing population from the pharaonic period onwards and at least since the Roman period human impact significantly altered natural environments. Such impacts, from grazing pressure to storage loss and disease can be traced in changes in the insect fauna, and the frequent survival of fossil assemblages in archaeological contexts as a result of desiccation provides one source of this information.

Based on ongoing insect research from sites in the Nile Valley this paper will discuss changes in the insect fauna during the pharaonic and the Roman period and how these may relate to climate change and human impact. Results so far indicate environments different to the contemporary desert one further away from the Nile, with presence of dung beetles associated with large herbivores and perhaps large herds, including scarabaeids, even from urban contexts. Taxa representative of pests of stored products increase during the New Kingdom. Their diversity further increases during the Roman period, when new species are introduced in the Nile Valley, a direct result of movement of armies and long distance trade networks. Although insect results are context and site specific, current data indicate that there is a change in diversity of the assemblages over time and past environments differ significantly from modern ones.

404 NEW TECHNOLOGIES, NEW THEORIES? REFLECTIONS ON THE PERCEPTION AND SIMULATION OF BUILDING ENVIRONMENTS AND ARCHITECTURE

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Kreiser, Jane - Lang, Franziska (TU Darmstadt) - Grobe, Lars (Lucerne University of Applied Sciences and Arts) - Brünenberg, Clemens - Noback, Andreas (TU Darmstadt)

Format: Regular session

Digital methods and tools in analyzing archeological data, complemented by computational simulation, offer new opportunities in the research of the interdependence of humans and buildings. We will focus on the intangible building environment and its effects on human practices, namely in the domains of

- building physics, e.g. heat transfer, lighting and daylighting, and acoustics,
- perception, e.g. visual, tactile, and spatial perception,
- changes in building practices, e.g. the advent of new technologies.

The question arises whether and how e.g. simulation, mixed realities, algorithms, and artificial intelligence change scientific processes and impact the archaeological epistemology. For example, complex human-thing relationships, which are theoretically anchored in concepts such as agency (affordance, entanglement etc.) are suitable for testing the effects of extensive data and computational simulations of building environments on the knowledge process.

We invite researchers working with a genuinely digital approach in the field of architecture and/or building environment to discuss and to critically evaluate how the use of digital methods reflects, extends or changes the objectives, practice, and theory formation in archaeological research.

The aim of this session is to achieve a deeper understanding of the new opportunities – and challenges – in digital research and to sharpen up the interdisciplinary archaeological objectives in theory, terminology, methodology and technology.

ABSTRACTS:

1 AFFORDANCE-BASED ANALYSIS OF DAYLIGHT IN ANCIENT HOUSES BY MEANS OF SIMULATION

Abstract author(s): Lang, Franziska - Kreiser, Jane - Hollaender, Julian (Department of Classical Archaeology, TU Darmstadt)

Abstract format: Oral

Previous scholarship on ancient housing addresses furnishing, function, and activities within houses. Widening the primary focus on architecture and finds from individual rooms leads to questions regarding the social structuring of houses. Light, sound, smell & other aspects of the sensory perceptions of space are considered only recently. Due to their immateriality, these cognitive phenomena can be analysed through new technologies. Computational simulation techniques and methods lend from computer graphics in particular now enable researchers to approach the immaterial phenomena of the past.

Our project complements such investigations by taking account of daylight and its role in ancient houses. Daylight is a variable phenomenon affecting visual perception; it is therefore a particularly potent parameter of interaction enabling, causing or limiting social, technical and cultural activities. The availability of daylight structures and determines multimodal options of usage (affordance) of the built environment in the course of a day or a year. Daylight thus takes on an object-like character. To reconstruct daylight as an agent connected with possible uses and social interactions in houses and make it measurable in the architecture context, we use

digital reconstruction methods and computer simulation in an interdisciplinary project approach. In this multidisciplinary project, the significance of daylight for the ancient inhabitants is also recorded by evaluating ancient written sources and compared and validated with archaeological-architectural results and computer simulation. Analytical-empirical and experimental methods are networked in a complementary way.

2 MODELLING KNOWLEDGE. ON INTRODUCING DYNAMIC RECONSTRUCTION AS A TOOL TO INVESTIGATE THE USE AND PERCEPTION OF BUILT ENVIRONMENT

Abstract author(s): Brünenberg, Clemens - Mächler, Claudia (TU Darmstadt, Faculty of Architecture, Institute of Classical Archaeology)

Abstract format: Oral

The determination of the scientific value of 3D reconstructed architecture is a controversial and widely discussed topic. In most cases, however, this discussion is based on individual, fixed reconstructions or at most a small number of variations. At the same time, extensive 3D models are usually only created at a very late stage of the project or even after the end of a research project, which suggests that their scientific value is still primarily within their visual effect. Therefore, in most cases the reconstruction does not directly influence the scientific objectives itself.

This paper discusses a novel practice to linking the process of modelling directly to the knowledge process with a parametric approach. Thereby, our starting point is neither the visualisation of an ideal reconstruction nor a final research result, but rather examine how built environment could be used and perceived depending on a large range of reconstructed situations. Within the reconstruction process and therefore the knowledge process we seek to generate dynamic variations of the reconstruction (e.g. room height, number of windows, etc.) by defining parameters of which this dynamic reconstruction is based on. We will discuss the general approach of finding, defining, and describing these parameters for this novel method of reconstruction and present a case study in which it is examined how daylight influences the dynamic reconstruction of built spaces and vice versa.

3 A MODEL CHAIN TO SIMULATE DAYLIGHT IN HISTORIC BUILT ENVIRONMENTS

Abstract author(s): Noback, Andreas (Technical University of Darmstadt) - Grobe, Lars - Schuetz, Philipp (Lucerne University of Applied Sciences and Arts)

Abstract format: Oral

The simulation of daylight in buildings of the past, based on archaeological record, and its interpretation in the context of human history is a field of interdisciplinary research. It relies on a consecutive combination of models, that emerge from different disciplines and are possibly based on diverging assumptions. Each of these models comes with its particular capabilities, limitations and uncertainties. This contribution distinguishes four major model domains: 1. Architectural reconstruction reflects historic practice and provides a geometric representation of the evaluated building in the past. 2. Models of building materials describe their interaction with light, e. g. scattering and absorption. They cannot just mimic the characteristics of an archaeological find but must deduce its state in the past, taking into account physical material properties and historic production methods. 3. Environmental conditions are defined by sky models. They must reflect the luminance distribution of the sky hemisphere and can integrate effects of external occlusion and reflection. 4. Perception models bridge the gap between the results of light simulation, e. g. in terms of radiometric or photometric quantities, and the subjective response of a human observer for the interpretation in the context of historic research. For each of these four model domains, an example is introduced and critically discussed. Structuring the interdisciplinary research along a chain of distinct models is proposed to foster the discourse between the disciplines. This shall provide a better understanding of the potential and uncertainties of daylight simulation in the research of production and perception of historic built environments.

4 LIGHT OF REASON: USING LIGHT SIMULATION TO INVESTIGATE A POMPEIAN HOUSE

Abstract author(s): Campanaro, Danilo (University of Lund)

Abstract format: Oral

Light played a key role in the Roman house, where daylight and flames were the only sources of illumination and warmth. Importantly, light (and darkness as its counterpart) deeply influenced other aspects of Roman society, effectively acting as a social agent. In this regard, the “social atmosphere” of domestic space was certainly affected by the lighting conditions. The owner might have intentionally leveraged on these aspects to bolster messages of wealth and power delivered to the guest. By means of historically based and physically accurate lighting simulations and analyses, this study investigates the intertwining of spatial and social patterns, in order to get new insights into social and spatial behavior in the Roman house under the influence of light. Notably, the adoption of such digital methods calls for new epistemological duties to ensure transparency of the processes. In this light, a point is also made that a pattern of reasoning, known as inference to the best explanation (IBE), can proficiently be used to build unitary hypotheses from complex and multifarious sets of data in a transparent way. Specifically, the proposed inquiry focuses on the case study of the House of the Greek Epigrams (V 1,18.11-12), located in the northern part of Insula V 1 in Pompeii.

5 ACOUSTICS AND PROXEMICS OF ROMAN ‘CONTIONES’

Abstract author(s): Kopij, Kamil (Institute of Archaeology, Jagiellonian University) - Pilch, Adam (AGH – University of Science and Technology in Krakow) - Drab, Monika - Popławski, Szymon (Wrocław University of Science and Technology) - Głomb, Kaja (Institute of Applied Psychology, Jagiellonian University)

Abstract format: Oral

In our paper, we present the results of an acoustic and proxemic analysis of selected speaking platforms from which Romans have spoken publicly at Forum Romanum. Our main goal was to determine the maximum number of recipients that were able to hear speeches intelligibly as well as see the gestures of an orator. Given that at the turn of the Republican and Imperial periods significant changes in the rhetorical landscape of the Forum took place, our goal was to study and compare speaking platforms in two periods: Late Republic (ca. 55 BCE) and Early Imperial (Augustan).

The analyses were conducted based on 3D virtual reconstructions of the structures taking into account the acoustic properties of the materials from which they were built. Using Catt-acoustic software we run simulations in order to establish Speech Transmission Indexes (STIs) for different background noise levels (between 36dBA and 55dBA). At the same time, we established maximal visibility of three different classes of rhetoric gestures based on the results of experiments we conducted.

Based on the results of acoustic and proxemic simulations (the areas of audibility and visibility) we estimated the crowd sizes using two different methods based on modern observations of the behaviour of crowds. As a result we:

1. estimated the number of people that could intelligibly hear a speaker and see his gestures for all case studies,
2. established what percentage of attendees (taking into account the maximum capacity of the available spaces) could hear the speaker intelligibly and see his gestures.
3. by comparing results for different rostra we showed that they had different acoustic properties depending on the level of background noise, which affects the maximum number of recipients. This in turn leads us to consider the awareness of speakers’ choice of rostra depending on the circumstances.

6 AURAL EXPERIENCES IN THE ARCHAEOLOGICAL SPACES: APPROACHES, METHODS, AND PERSPECTIVES

Abstract author(s): Bellia, Angela (Institute of Heritage Science - National Research Council of Italy)

Abstract format: Oral

The aural experience is a fundamental process in the development of human beings, which is shaped by architecture and the environment. Sensory experience has rarely been considered in the study of public spaces in antiquity. As Barry Blesser and Linda-Ruth Salter (2007) pointed out, aural architecture is that aspect of real and virtual spaces that produces a sensorial and behavioural response in inhabitants. For example, a performative space in antiquity related to a sanctuary can produce feelings of connectedness and a sense of numinous.

This paper aims to investigate new insights and a radical reappraisal of antiquity’s sounds and sights in a performative space. Furthermore, this paper will explore the visual and acoustic experiences in the performative spaces “as sensory artefacts” (Eleonor Betts, 2017), developing a new theoretical basis and linking digital heritage and acoustical techniques.

Through the acoustic analysis of particular case study in Italy, this paper will intend to explore a new approach to the development of the relationship between space, sound, and environment and a novel method to decipher geophony, biophony, and anthropophony, as a sort of “sonic fabric” (Steve Mills, 2015) of the performative spaces and their immediate surroundings, taking into account the relationships between the different and interactive sonic components of a landscape, thanks to digital technology.

7 SPACE SYNTAX AS A PRIMARY TOOL IN (RE)SHAPING OUR PERCEPTION OF THEIR PERCEPTION, AND INTENTION: THE CASE OF TURÉGANO CASTLE

Abstract author(s): López Lillo, Jordi A. (Institute of Heritage Sciences, National Research Council - Incipit-CSIC) - Yuste Burgos, L. Miguel (Caminos del Románico)

Abstract format: Oral

Despite its main theoretical body was developed several decades ago, the use of Space Syntax techniques and software in archaeological research on built environments only started to gain strength lately. In short, this approach poses that, if inhabiting a space is a way of segmenting it in culturally meaningful terms, then systemic analyses could be practiced in order to reveal the underlying non-discursive, mathematical structures of such “semantics”. Node analysis in particular constitutes a readily applicable tool for understanding circulation flows within buildings, while providing robust means to compare different layouts and distinguish genotypes. In the case of Turégano castle, originally a Romanesque church in Segovia Province (Spain) that underwent various fortification processes ranging from the 13th to 16th centuries, node analysis was implemented together with visibility graphs and agent-based movement simulations. The primary goal of this study was to experimentally test the feedback between stratigraphic reading of preserved wall faces and Space Syntax, as a way to approach the shape of the building following the last massive remodeling works. However, in doing so, not only specific functional areas and subsystems were detected –guest chamber vis-à-vis the main one, possible garrison location, visitor paths framed by multidimensional expressions of power, etc.–, but an extremely consistent defensive plan arose. The latter is particularly significant since the military intention of such remodeling has been discussed to a certain

extent, given its conspicuous representative function, and, foremost, its apparent obsolescence in a context of growing use of firearms. These results evidence therefore that simple computational tools placed in hands of Archaeology, and interpreted through its lens, can make a big difference in comprehending spatial perception from the point of view of historical agents. Sometimes even against our current experimentation of the very –only apparently– same spaces.

8 DIGITAL APPROACHES IN EXPERIMENTAL LEARNING. MARBLE AS A CASE STUDY

Abstract author(s): Miznazi, Diana - Stroth, Fabian (University of Freiburg)

Abstract format: Oral

The project MARBLE has been conceived to develop and test three-dimensional visualisation methods in archaeology higher-education teaching over the next three years. Using the smart augmented-reality glasses, students are able to virtually walk around and examine monuments, architectural elements and archaeological sites in the classroom and virtually visit sites that are normally not accessible e.g. due to their fragile state of conservation. New technologies used in the smart glasses offer the chance to perceive the model in an interactive, mixed-reality scenario. Thus, creating new conditions for teaching and research.

Although space has been tightly linked to human existence, digital representations of space are, in contrast, a fairly new medium, which is still developing its qualities of perception. This new medium has been adapted for the communication of historical architecture and archaeology. Current archaeological research has been intensively devoted to the development of digital tools and the produced large 3D data sets for the documentation heritage sites. However, archaeological university teaching is still characterized by a reduction of the investigated 3d objects to 2d images. In MARBLE, we focus on the potentials offered by technologies such as VR and AR in regard to a didactic integration into the object-related university teaching.

The latest AR technology offers to view objects in their spatial complexity, hence enhancing the learner's perception and understating of archaeological and cultural heritage assets. The project MARBLE also aims at assessing the efficiency of using 3d models of cultural heritage sites, in the perception of archaeology and aspires to suggest best practice examples for future research. Moreover, MARBLE has the potential to make significant contributions to the current phenomenological aspects of architectural/archaeological research such as spatial perception.

During the course of this project, we aim to assess our innovative digital approach and identify its advantages and challenges.

409 ARCHAEOLOGISTS, SITES AND METHODOLOGIES: PROFESSIONAL AND PERSONAL NETWORKS IN MID-20TH-CENTURY EUROPE (PART 2)

Theme: 6. Material culture studies and societies

Organisers: Gramsch, Alexander (Römisch-Germanische Kommission - RGK) - Mytum, Harold (University of Liverpool) - Babić, Staša (Faculty of Philosophy, University of Belgrade)

Format: Regular session

At the EAA Virtual Annual Meeting in 2020 part 1 of our session addressed the professional and academic exchange in the decades before and after World War 2. In the follow-up session we want to – in accordance with the EAA 2021 conference motto – widen the horizon and to include further aspects and expand the time period under investigation. The post-war generations were indeed widening horizons and increasingly put the socio-political implications of archaeological interpretations on the agenda and discussed how archaeological results became used for political ends. This awareness culminated in archaeology losing its innocence. This conforms to Theme 6, seeing the changes in understanding of material culture and how it could be interpreted to reveal insights about past societies. Part 2 of our session on the 20th century history of archaeology thus addresses the rise and challenge to culture history in the mid-century and the attempts to develop New Archaeologies. We suggest considering on the one hand whether these developments lead to a split of research traditions across Europe into Western, Northern, Central, and Eastern European schools of thought or whether diverse traditions already existed before, and on the other hand whether or to what extent personal connections and institutional international links circumvented a split. Communication and exchange surely existed – but what was communicated: methods, theories, or results? And how far were these taken up? Did the 1960s and 1970s experience a loss of the previous European perspective, regained only in the 1990s? We encourage addressing individual biographies, institutional level networks, and trans-national to trans-continental research agendas.

ABSTRACTS:

1 AN INTRODUCTION TO PROFESSIONAL AND PERSONAL NETWORKS IN MID-20TH-CENTURY EUROPE

Abstract author(s): Gramsch, Alexander (RGK - Romano-Germanic Commission DAI)

Abstract format: Oral

With the political changes of the 1990s the interest in the history of archaeology increased, leading to a number of conference presentations and collected volumes. Two of the main issues debated were the impact of nationalism on the establishment of archaeology as a discipline in Europe in the late 19th century and the impact of the post-war political tensions in Europe on its development in the mid-20th century. Contemporary witnesses reported that personal networks were kept alive across the Iron Curtain,

while at the same time academic exchange was impeded by reduced travel opportunities and reduced exchange of publications on an institutional level. Introducing our session on the professional and personal networks in mid-20th-century Europe we want to take a fresh look on the development of new ideas and approaches in Western, Central and Eastern Europe, and on how post-war generations were increasingly putting the socio-political implications of archaeological interpretations on the agenda and discussed how archaeological results became used for political ends. We want to address the challenges to “culture-historical archaeology” in the mid-century and the attempts to develop New Archaeologies within various schools of thought. Opening the session we want to take a look at the schools of thought that existed before and after World War II, and on whether or to what extent personal connections and institutional international links circumvented a split along the Iron Curtain.

2 REVOLUTION OR MYSTIFICATION? REFLECTIONS ON ATTEMPTS AT SPREADING NEW ARCHAEOLOGY IN 1970S ENGLAND

Abstract author(s): Mytum, Harold (University of Liverpool)

Abstract format: Oral

The appearance of new archaeological theories can be stimulating or threatening. The conflicts in North America between culture historians and New Archaeologists were played out partly in print, and some of the venom is clear to read in journals and edited collections. In contrast, the British and European interactions largely remain undocumented in the public sphere. This paper takes an autobiographical approach to examine the New Archaeology challenge to culture history in Britain through the viewpoint of a young observer, not at that time strongly attached to a particular mode. Active in field archaeology and attending a variety of evening classes by University of Birmingham extra-mural staff whilst at school, the author experienced diverse views about what culture historical archaeology was about, and how it should be carried out. Attempts to spread David Clarke's ideas regarding New Archaeology from Cambridge to the Midlands of England in the early 1970s exposed a young mind to an alternative paradigm. This presentation recalls and analyses this dissemination through the reading of Analytical Archaeology (1968) and a seminar at the University of Birmingham. The reactions of Birmingham University staff to the seminar, and the impact of the book and event on the presenter's intellectual development and career path, are considered in the light of conservatism and innovation within UK academic and 'Rescue' archaeology through the 1970s. Archaeological fieldwork in the UK was not immediately transformed by New Archaeology, but a historical perspective now allows shifts in policy and practice to be seen in an evolving intellectual landscape. This established a fusion of processualism and culture history that became the dominant mode of discourse that is still reflected in many aspects of Historic England's regional and national research frameworks.

3 INTERNATIONAL NETWORKS AND GEOGRAPHIES OF KNOWLEDGE IN EUROPE BEFORE AND AFTER WORLD WAR II

Abstract author(s): Díaz-Andreu, Margarita (ICREA; Universitat de Barcelona)

Abstract format: Oral

Since the late 1980s, sociologists and historians of science have drawn attention to the key role played by contingent historical factors in the creation of scientific knowledge. Science is seen not only as a cultural formation inserted into wider networks of social relations and political power, but, significantly, as also being shaped by the local environments or geographical locations in which it is produced. In this light this paper will analyze how scholars may be affected not only by ideas in their learned environment, but also by the social networks of their academic milieu in their close geographical area and beyond. To date, most of the studies that have investigated this issue have focused on the academic and personal links formed by colleagues who are frequently in contact. In contrast, this paper will critically explore the impact on science of the exchanges between scholars living in distant geographies, i.e., the impact of wider, international networks in the discipline.

The international scholarly networks established before and after World War II will be explored on the basis of the information gathered from several archives containing correspondence by three university professors, Luis Pericot (University of Barcelona), Gordon Childe (UCL) and Christopher Hawkes (University of Oxford). The information contained in letters exchanged between some of the main prehistorians after World War II up to the 1970s will be analyzed in order to reconstruct networks. Ultimately, the aim is to assess how these networks affected the development of archaeology from the 1940s to the 1970s.

4 THE 'SWINGING SIXTIES': NETWORKING ARCHAEOLOGY IN PORTUGAL

Abstract author(s): Martins, Ana Cristina (IHC - Polo da Universidade de Évora; UNIARQ - Universidade de Lisboa)

Abstract format: Oral

The 1960s and 1970s were of particular importance for the history of Portugal. It was then that the transition took place between the totalitarian regime of the 'Estado Novo' and the process of democratisation of the country brought about by the 'Carnation Revolution'.

But despite such a complex political context, scientific production in the territory is deepened and expanded through state and private support, as well as following the implementation of international projects.

Archaeology was no exception. In fact, although in a reduced number, when compared to other areas of knowledge, we verify the public and private financing of research centres and projects, scholarships in the country and abroad, exhibitions, congresses, and publications.

More than that, there is a growing tendency of presence of foreign archaeologists in Portugal, under protocols established between different entities and respecting the necessary legal procedures. But we are also witnessing the inverse process, that is, the presence, even if limited in time, of young Portuguese in foreign archaeological institutions and excavations.

It is in this sense that we propose to identify, to know and to understand the influence exerted by this new generation that, returning from their short-term internships abroad where they establish new networks of personal and institutional contacts, influences, directly and indirectly, the course of archaeology in Portugal in the period under analysis.

5 PRE- AND PROTOHISTORIC STUDIES IN THE DAWN OF NEW WAVES IN ARCHAEOLOGY – THE GERMAN ARCHAEOLOGICAL INSTITUTE IN MADRID 1954-1994

Abstract author(s): Sasse-Kunst, Barbara (Albert-Ludwig-Universität Freiburg, Institut für Archäologische Wissenschaften)

Abstract format: Oral

The first part of this study about methodology and concepts of investigations of the German Archaeological Institute's department in Madrid dealt with the conceptions for this new institution in the time of its first foundation during the World War II under fascistic governments in Germany and Spain. It showed the intend to avoid investigations with political explosiveness in favour of mean explosive themes and methods, and a preference of humanism and art history in spite of empirical excavation archaeology. The second part of this study, concerning the period after the reopening of the institute in 1954 until the end of the "era Hermanfrid Schubart" in 1994, should widen the horizon in four directions: 1. to the new pre- and protohistoric section of the institute, beginning to work 1955 with empiric positivistic excavation methods, interdisciplinarity and historic-archaeological interpretation method and diffusionism; 2. to the involved German schools of Marburg and East Berlin; 3. to the interaction between Iberian and German investigators and if conceptions and methods were accepted, and 4. to the question of methodological change within this period, its nature and its periodization. To find answers I shall examine selected theoretical and practical works of the main investigators.

6 'SLAVIC ARCHAEOLOGY' AND ITS IDEOLOGICAL AND POLITICAL INTERPENETRATIONS IN POLAND AND EAST GERMANY AFTER 1945. A COMPARATIVE-BIOGRAPHICAL CASE STUDY

Abstract author(s): Kluger, Anne (Leibniz-Institute for the History and Culture of Eastern Europe - GWZO; University of Münster)

Abstract format: Oral

After 1945, the term 'Slavic archaeology' was used in the Eastern Bloc to describe the archaeological and historiographical research on the early 'Slavs' from prehistorical and early medieval times. Examining 'Slavic' roots, migrations, and material culture(s) as well as the origins of 'Slavic' statehood, which were traced back to the ancient past, represented one of the main branches of archaeology and prehistory within the Soviet sphere of influence.

This research focus, which at times received particular support by the communist rulers, was all the more remarkable in light of the fact that the underlying idea of 'Slavic archaeology', that a 'Slavic entity' had existed throughout history, technically contradicted the Marxist-Leninist world view (focusing on 'classes' as the relevant historical categories). Based on this observation, which seems contradictory only at first sight, I aim to discuss the role of 'Slavic archaeology' under these circumstances and its political and ideological interpenetrations. I therefore focus on communist Poland and East Germany, as I take two leading figures of Polish and East German 'Slavic archaeology' as case studies: Witold Hensel (PPR) and Joachim Herrmann (GDR), who headed the prehistorical institutes at the Academies of Sciences in their countries and were considered experts on the early 'Slavs' within the respective national and international scientific community. By analysing the archaeological interpretations and narratives, which Hensel and Herrmann presented in their scientific publications, I aim to draw conclusions about the archaeological and historical discourses of their time concerning the early 'Slavs' and their relation with the political and ideological environment. Furthermore, the comparative-biographical approach enables to identify transnational developments, networks, and interactions between communist Poland, East Germany, and other members of the Eastern Bloc as well as Polish and East German specifics.

7 TRENDS IN THE DEVELOPMENT OF SOVIET RUSSIAN PROVINCIAL ARCHEOLOGY

Abstract author(s): Shcherbakov, Nikolai - Shuteleva, lia - Leonova, Tatiana (Laboratory of Methodology and Methods of Humanitarian Research M.Akmullah Bashkir State Pedagogical University)

Abstract format: Oral

In 1960–1980 Soviet archaeology began its transformation from Marxism to Neo-Marxism. Archaeology in the USSR had a special aspect: development of theory, methodology and methods of research was determined by peculiarities of publication and keeping of manuscripts. The first direction is an official historical doctrine based on the formation approach to history. The development of archaeology in the USSR was similar to that of archaeology in Czechoslovakia as described by Eduard Krekovic and Martin Baca in 2013. Theoretical constructions of Soviet archaeologists of 1960–1980 were dedicated to the matter of archaeology and the nature of archaeological sources, structure of archaeological knowledge, the basic category of "archaeological culture", etc., but could not bring to life issues such as formation scheme and discussion on pre-capitalist modes of production and on "Non-Historic

Nations". Second, alternative direction of archaeologic theory in the Soviet Union was represented by doctrines of "samizdat". In 1980's quite often such works were created under the influence of "bourgeois" archaeologic theory. In 1980's "samizdat", a form of dissident activity, was represented by deposited manuscripts containing discussions of different approaches to the theory of archaeology. At the end of 1980's – beginning 1990's theoretical archaeology in the USSR experienced significant impact of western theoretical constructions. This impact manifested in correlations of ethnographic and archaeological sources. Weakening of Soviet ideology resulted in Russian scientists' moving off the principles of Marxism in archaeologic theory and in attempts to lean on Neo-Marxism. In the provincial archaeology of the USSR in the 1960's – 1980's national archaeology began to develop. The role of women archaeologists in the provinces has grown. M. Sadykova became the first Bashkir woman archaeologist. In difficult conditions, she investigated the sites of the early Iron Age and the Middle Ages.

8 BETWEEN AMBITION AND REALITY – THE FEDERALIZATION PROCESS OF THE ARCHAEOLOGICAL SOCIETY OF YUGOSLAVIA (1959–1972)

Abstract author(s): Lorber, Crtomir (University of Ljubljana)

Abstract format: Oral

European archaeological communities were forced to contend with the aftermath of WW2. An interesting example can be seen in Yugoslavia, where the war's aftermath led to the reorganization of the archaeological discipline, beginning with the 1st Consultation of the Yugoslav archaeologists in Niška Banja (1950) and followed by the formation of the Archaeological Society of Yugoslavia (ASY) (1953–1972). Its purpose was to lead a unified development of Yugoslav archaeology. A problematic concept since there never was a Yugoslav archaeology, rather there was a mix of national archaeologies that differed in organisation and development levels. This idea of a unified development of archaeology in Yugoslavia was soon replaced by an idea of federalization, embodied in a process of the transformation of the ASY, from a unified society towards an Association of Archaeological Societies of Yugoslavia (AASY) (1972–1991).

We will show the goals of the Archaeological Society of Yugoslavia, focusing on its' unifying ambition. We shall discuss why did ASY relatively quickly accept the concept of federalization – the formation of the ASY's Slovene section (1959) represents the beginning of this process – focusing on the 1963–1972 period, during which ASY was transformed into an association of equal national archaeological societies. We formulate a thesis society's reorganization was a consequence of self-critical realization by different Yugoslav archaeologists, who realized that their ambition of integrating different national archaeological traditions into a coherent whole was an unworkable project. Although this project was unrealistic, we can say it widened the horizons of national archaeologies in Yugoslavia and integrated them into the wider European environment. We conclude with an overview of the consequences of said federalization, as shown by the coexistence of the AASY with Slovene and Croat archaeological societies (1972–1991), emphasizing similarities, trends of continuity from the ASY and differences in their outlook.

9 HURRYING UP SLAVS: INTRODUCTION OF SLAVIC ARCHAEOLOGY IN YUGOSLAVIA (1945 – 1960)

Abstract author(s): Novakovic, Predrag (University of Ljubljana)

Abstract format: Oral

Except in Croatia, Slavic archaeology did not exist in other Yugoslav national/regional archaeologies before the WW II. This may be surprising since the development of 'national' archaeologies was already long ago closely connected with national movements and politics. While this was the case in Croatia where archaeology of Early Croats was institutionalized at the end of the 19th century, the archaeology in Slovenia, Serbia and Bosnia and Herzegovina did not follow the same steps. Besides other things, there were simply not enough local Slavic finds and sites in these lands to create more robust 'national' archaeological corpora. The situation radically and rapidly changed after 1945 when in the new, Communist-ruled Yugoslavia, Slavic archaeology became the top priority but had to be established literally from scratch, also to refute the 'imperialist and racist' interpretations of the German, Italian and Bulgarian archaeologies which were deeply engaged in changing the past of the Yugoslav nations.

The initial phase took some fifteen years in which the elementary conceptual apparatus, databases and major interpretative models were designed and canonized. All this was done by a handful of archaeologists of the new post-war generation manoeuvring between the then-dominant historical interpretations, Yugoslav Socialist-Marxist concept of brotherhood-and-unity, requirements for national emancipation of the Yugoslav nations, and archaeological standards of the time. By the early 1960s, the Yugoslav archaeologists started to participate at the Slavic archaeology international conferences in Europe gradually building up a respectable reputation. This process could not go without international cooperation in very challenging political circumstances in the early Cold War years. At first sight, the task was accomplished. Still, a deeper analysis reveals a series of shortcomings, 'shortcuts' and simplifications in this process, which started to be corrected only later, from the 1970s onwards; this process is still underway, but now, in new political circumstances.

411 A COMMUNITY OF ANCESTORS: THE URNFIELD PHENOMENON IN NORTHERN EUROPE

Theme: 4. Globalisation and archaeology

Organisers: Rose, Helene (Centre for Baltic and Scandinavian Archaeology) - Christensen, Lisbeth (Department of Archaeology, Museum of Southern Jutland) - Møller, Niels (Museum Thy) - De Mulder, Guy (Department of Archaeology, Ghent University) - Louwen, Arjan (Faculty of Archaeology, Leiden University)

Format: Regular session

This session explores the current state of research into the North and West European urnfield phenomenon in the last millennium BC. The urnfields occur slightly later in the northern and western European coastal plains than in the central European core areas of the Urnfield Culture. The introduction of urnfields as large collective burial monuments was a very distinct cultural development, though across much of North and West Europe the urnfields were incorporated into the various local burial traditions.

The urnfields have traditionally played a major role in constructing the typo-chronological frameworks of the Late Bronze Age and Early Iron Age. In later years, the reinvestigation of urnfield materials shows the potential for in further in-depth studies of burial rites, artefacts and osteological material in the study of e.g. absolute chronology, cultural identity, networks of exchange, demography and cosmology. We invite papers that present the urnfield phenomenon in different regions, reviews of existing typo-chronological systems using relative or scientific dating methods and applications of scientific methods on urnfield material (e.g. strontium isotopes and radiocarbon dating). We especially welcome papers that ask new questions of existing urnfield collections or explore interconnectivity in Northern Europe in the last millennium BC as expressed through the urnfield burial practices.

This session is part of the network project 'URNFIELD - The urnfield phenomenon in Denmark and Northern Germany', funded by Interreg Deutschland-Danmark.

ABSTRACTS:

1 LATE BRONZE AGE URNFIELDS IN BELGIUM : A CROSSROADS OF FUNERARY TRADITIONS

Abstract author(s): De Mulder, Guy (Ghent University)

Abstract format: Oral

During the Bronze Age, present-day Belgium was oriented to two cultural areas: the Scheldt basin to the Atlantic complex and the Meuse basin towards Central-Europe. The funerary ritual of cremation, which is associated with the spread of the urnfields, was already present during the Early and Middle Bronze Age. From 1500 BC onwards, the first indications of isolated flatgraves and small urnfields appears already in the archaeological record, but they become only dominant from 1200 BC on. Diversity in these urnfields can vary from small cemeteries with a few cremation deposits to large urnfields with 100's of graves. Also the way in which the cremation remains are deposited can be very different. During the Late Bronze Age central-European influence becomes more pronounced during the phase Ha A2-Ha B1 (1100-900 BC) with the spread of the group Rhin-Suisse-France orientale (RSFO). The group RSFO is prominent visible in the southern part of Belgium, especially in the material culture. However, the dominant funerary practice in this region seems to be inhumation in caves. Group RSFO influence is also visible in the Scheldt basin but on a limited scale. One of these elements is the adaption of its ceramic repertory in the funeral practices. Next to the Atlantic and Continental cultural aspects, contact with northwestern Europe is visible in the funerary ceramics at certain urnfields which forms are related to the Westphalian region in Germany.

2 THE CEREMONIAL WAGON AND URNFIELD IDEOLOGY – AN EXPORT HIT?

Abstract author(s): Pankau, Claudia (Goethe-Universität Frankfurt, Abt. III Vor- und Frühgeschichte)

Abstract format: Oral

A rare but central element of the Urnfield Culture, closely linked to cremation and waterbird-sun iconography, is the horse-drawn ceremonial wagon. The oldest evidence of these complex "high-tech products" of their time, which can be dated in BzD, originates from the Carpathian Basin and southern Central Europe, while in the late Urnfield period the focus is clearly in the west of Europe. On the one hand, this phenomenon is due to the fact that most of the wagon fittings were found in hoards - and the rise of the hoarding practice in Late Bronze Age Europe can also be described as a time-shifted spread from southeast to northwest. On the other hand, it is probable that these wagons conveyed a central religious message, which had to do closely with the Urnfield Culture's new concept of the afterlife. Can the spread of ceremonial wagons to the north and west of Europe thus also be seen as a side effect of the obvious attractiveness of the "Urnfield ideology"? Did this ideology have a collective core, and was the ceremonial wagon used as ritual vehicle of an entire group, while its successor in the Hallstatt period can primarily be interpreted as status symbol of elitist individuals?

The aim of this contribution is to analyze the spread of the ceremonial wagon to the north and west of Europe in the course of the Late Bronze Age, either as real imported goods or as an idea, and to discuss the possible ideological reasons for this. Basis of the study are the bronze fittings that can be addressed more or less safely as parts of wagon and horse harness. The meaning of ceremonial wagons in the social and religious systems of their vast distribution area is considered in a differentiated way according to time and space.

3 BREAKING AND MAKING THE ANCESTORS

Abstract author(s): Louwen, Arjan (Leiden University, Faculty of Archaeology)

Abstract format: Oral

The Lower-Rhine-Basin is literally dotted with Late Bronze Age and Early Iron Age cremation grave cemeteries. In the Netherlands alone, more than 700 sites have been documented that produced cremation graves dating to these successive periods. Traditionally, these cemeteries are seen as the product of local adaptations of burial customs famous for the Central European 'Urnfield Phenomenon.' However, a recent study of the Dutch dataset suggests that funerary traditions in the Lower-Rhine-Basin developed much more autonomously over the course of the second millennium BC than was until recently thought. Not only do the funerary practices observed seem to tie into much older notions about ancestry and senses of belonging the land but the destructive and transformative qualities of the cremation process also provided the perfect means for emphasising these notions. Based on an extensive dataset of more than 3,000 cremation graves dating to the second and last millennium BC this paper will showcase how in the Lower-Rhine-Basin the dead were believed to relate to each other, how plain and simple objects could be used as metaphors in the creation of relational and ancestral identities and how the dead were inextricably linked to the land.

4 THE OCCURENCE OF THE URNFIELD-PHENOMENON AT THE CEMETERY OF MANG DE BARGEN, SCHLESWIG-HOLSTEIN (NORTHERN GERMANY)

Abstract author(s): Schaefer-Di Maida, Stefanie (Institute of Pre- and Protohistoric Archaeology, CAU Kiel; CRC 1266) - Kneisel, Jutta (Johanna Mestorf Academy Kiel)

Abstract format: Oral

At the Mang de Bargaen site (Bornhöved, district Segeberg, federal state Schleswig-Holstein) we were able to find a burial ground with barrows, which were used in the Late Neolithic and the Older Bronze Age. Since the transition from Older to Younger Bronze Age (around 1300 BCE) the barrow areas were used for urn burials, which were interred in the immediate vicinity of the grave mounds. In the Iron Age, an extensive urn cemetery was built in the close proximity of the burial ground. With the help of extensive radiocarbon dating, which is available in this amount for the first time for a site in Schleswig-Holstein, it is possible to determine not only the enduring use beyond the various time periods, but also the different sequences of burial types (inhumation, cremation) and grave furnishings (grave goods, grave vessels, grave construction), which also seem to show a connection to the age of the occupants, as anthropological investigations made clear.

Furthermore, the dating was extended to other sites in Schleswig-Holstein. The data so obtained allowed us to come up with new explanations for the distribution of the cremation burial customs: for example, their distribution patterns appears to be independent from those of the urnfield phenomenon, at least in Schleswig-Holstein. This and other considerations regarding the distribution and influence of the urnfield phenomenon will be further discussed for the North of Germany.

5 DANISH IRON AGE URNFIELDS - A COMMUNITY OF ANCESTORS

Abstract author(s): Møller, Niels (Museum Thy)

Abstract format: Oral

This paper will present the results of an in-depth study of two Pre-Roman Iron Age Urnfields in South-Western Jutland, Denmark as a starting point for a wider discussion of the late urnfield phenomenon in Western Denmark. The project applied the first major study of osteological materials from Danish urnfields revealing a large proportion of interred children and post-internment curation of bones from some graves, suggesting a prolonged interaction with the deceased. Urns show signs of ritual dismantling during burial. All burials adhere to strict regulatory principles of burial rites. Cremations are all done at approximately the same temperature, burial goods are kept at a minimum and all individual expression minimized. Size of urns and burial monuments on the other hand vary with the age of the individual suggesting that both urn and burial monument is an embodiment of the individual buried. The Danish urnfields, their monuments and the treatment of the deceased show similarities with urnfields from Northern Poland, Northern Germany and the Netherlands.

6 INVESTIGATING URNFIELD ARTEFACT ASSEMBLAGES WITHIN A BAYESIAN CHRONOLOGICAL FRAMEWORK

Abstract author(s): Rose, Helene (ZBSA - Centre for Baltic and Scandinavian Archaeology; CRC 1266 Scales of Transformation)

Abstract format: Oral

The chronological frameworks of the Pre-Roman Iron Age in Southern Scandinavia (c.500-200 BC) have traditionally been based on typo-chronological analysis of artefact assemblages from the large urnfield cemeteries located in Southern Jutland in Denmark. Carl Johan Becker's influential chronology from 1961 was primarily based on his excavations of Aarre urnfield, and more recently, both Aarre and Aarupgaard urnfields contributed significantly to Claus Kjeld Jensen's chronology from 2005. This paper presents a continuation of this urnfield research tradition with a re-investigation into the chronology of the urnfield tradition based on artefact assemblages from three urnfield cemeteries, Aarupgaard, Aarre and Søhale. The project presents the first large-scale 14C dataset in support of the chronological framework of the Pre-Roman Iron Age, in contrast to earlier work that has been largely unconstrained by scientific dating because the period coincides with a major plateau in the radiocarbon calibration curve (c.750-400 cal BC). Re-

cent methodological advancements now allow the cremated bone to be radiocarbon dated, thus offering an indirect date of the associated burial and artefacts. Having multiple dates on the same type of artefacts enables their currencies, i.e. the period a type was in production, to be modelled dynamically within a Bayesian chronological framework. There are demonstrated difficulties in correlating metalwork and pottery, which can be a challenge when comparing funerary and settlement evidence, but the artefact currency models provide an absolute correlation of metalwork and pottery as a mean to overcome this challenge. The currency models also provide new insight into the temporal processes of change in material culture by demonstrating periods of both rapid and slower change in the material culture. The chronological frameworks of the Pre-Roman Iron Age are evaluated based on the independent radiocarbon evidence and absolute estimations of key transformation points will be offered.

7 LATE BRONZE AGE MOBILITY AND INTERACTION AT SIMRIS II (SCANIA, SOUTHERN SWEDEN)

Abstract author(s): Sabatini, Serena (University of Gothenburg) - Ladegaard-Pedersen, Pernille (National Museum of Denmark) - Kristiansen, Kristian (University of Gothenburg; Globe Institute, GeoGenetics Centre, Denmark) - Frei, Karin (National Museum of Denmark)

Abstract format: Oral

The Late Bronze Age urnfield phenomenon in southern Scandinavia, when seen as an attempt to create large collective burial monuments may play a significant role to widen our understanding of the social and cultural dynamics within local communities. An in-depth analysis of given contexts may unveil significant information not only about the single individuals buried in them, but about the whole community using the site. Northern European Late Bronze Age communities adopted different types of burial monuments that at times show strong similarities with practices common in other European regions. Each burial is likely to have been an event that groups of various sizes attended, following norms, rituals, and customs, or eventually also transforming them and/or introducing new ones.

In order to unveil possible patterns of mobility and interaction with the outside world in the community burying its dead at the Simris cemetery we have carried out strontium isotopes analyses on the six individuals whose bone remains were preserved well enough to allow such investigation. The number of samples is too limited to make statistics reliable. However, the results suggest that the complexity 'at display' in Late Bronze Age urn burials from Southern Scandinavia is far from being fully understood and invite to reassess the methodological approach when investigating mobility in communities practicing cremation.

412 PEOPLE ON THE MOVE: CHANGING GENES, CULTURES AND LANGUAGES

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Torv, Mari (Department of Archaeology, Institute of History and Archaeology, Faculty of Arts and Humanities, University of Tartu) - Tambets, Kristiina (Institute of Genomics, Institute of Genomics, University of Tartu) - Vesakoski, Outi (Department of Finno-Ugric Languages, University of Turku) - Moilanen, Ulla (Department of Archaeology, University of Turku) - Kask, Silvia-Kristiina (Department of Archaeology, Institute of History and Archaeology, Faculty of Arts and Humanities, University of Tartu)

Format: Regular session

Population encounters - migrations, dispersal and admixtures - have brought about changes in cultures, languages, genes, and landscape through history. Recently, ancient DNA studies pointing to considerable temporal changes in the European gene pool have resurged migration as an explanatory model for cultural change in prehistoric societies. These scientific findings, however, have rarely been discussed in a more theoretical framework to demonstrate the complex relation between material and immaterial cultures, and genes. Instead, the biochemical and -molecular data produced under the umbrella of the 3rd Scientific Revolution in archaeology have been suited to old models in explaining cultural changes in the past. We have far less acknowledged the conceptual discussions from the beginning of the 21st on the matter of social identities (see Furholt 2019).

In this session we discuss the theoretical challenges in bringing together humanities and natural sciences. We invite case studies and wider theoretical contributions to discuss the interplay between archaeological/anthropological theories and archaeological sciences in the context of piles of data obtained with a variety of laboratory methods during the last decade. We welcome researchers combining archaeology, and linguistics with genetics and other biomolecular analysis, and archaeological/anthropological theories to study changes caused by (pre)historic population contacts. The presentations could focus either on i) the state-of-the-art methodologies in any of these fields or in interdisciplinary studies of human past, ii) challenges of bringing together archaeology, genetics, linguistics and other disciplines in the study of cultural change in (pre)historic societies and/or iii) to the challenges and threats in communicating the novel results to the wider non-academic audiences.

Furholt, M. 2019. Re-integrating Archaeology: A Contribution to aDNA Studies and the Migration Discourse on the 3rd Millennium BC in Europe. *Proceedings of the Prehistoric Society* 85, 2019, pp. 115-129.

ABSTRACTS:

1 GENETIC ANCESTRY CHANGES IN STONE TO BRONZE AGE TRANSITION IN THE EAST EUROPEAN PLAIN

Abstract author(s): Saag, Lehti (University of Tartu) - Vasilyev, Sergey (Russian Academy of Sciences) - D'Atanasio, Eugenia (Italian National Research Council) - Kivisild, Toomas (University of Tartu; KU Leuven) - Scheib, Christiana Lyn (University of Tartu; University of Cambridge) - Tambets, Kristiina - Kriiska, Aivar - Metspalu, Mait (University of Tartu)

Abstract format: Oral

The transition from the Stone to the Bronze Age in Central and Western Europe was a period of major population movements originating from the Ponto-Caspian Steppe. Here, we report new genome-wide sequence data from 30 individuals from the territory north of this area – from the under-studied Western part of present-day Russia.

We present genetic data from three Stone Age hunter-gatherers (10,800–4,250 cal BCE), including an on average 5x covered shotgun sequenced genome. Furthermore, we have sequenced the genomes of 26 Bronze Age farmers associated with the Fatyanovo Culture (2,900–2,050 cal BCE). Fatyanovo Culture is the easternmost extension of the Corded Ware cultural complex that was spread over a large area in Western Russia and introduced animal husbandry and probably crop cultivation into the forest belt.

We show that Eastern hunter-gatherer ancestry was present in Northwestern Russia already from around 10,000 BCE. Hence, we present the highest coverage whole genome and oldest individual with this ancestry published so far. Furthermore, we see a change in ancestry with the arrival of farming – Fatyanovo Culture individuals were genetically similar to other Corded Ware cultures, carrying a mixture of Steppe and European early farmer ancestry. We propose that the possible origin of the migration leading to the formation of the Fatyanovo Culture and of the Corded Ware cultures in general could be modern-day Ukraine, which is the closest area where these ancestries coexisted from around 3,000 BCE.

2 THE ORIGIN AND GENOMIC LEGACY OF THE ETRUSCANS

Abstract author(s): Posth, Cosimo (Archaeo- and Palaeogenetics group, Institute for Archaeological Sciences, University of Tübingen; Achaeogenetics Department, Max Planck Institute for the Science of Human History, Jena) - Zaro, Valentina (Department of Biology, University of Florence) - Spyrou, Maria (Archaeo- and Palaeogenetics group, Institute for Archaeological Sciences, University of Tübingen; Achaeogenetics Department, Max Planck Institute for the Science of Human History, Jena) - Vai, Stefania (Department of Biology, University of Florence) - Gneccchi-Ruscone, Guido (Achaeogenetics Department, Max Planck Institute for the Science of Human History, Jena) - McCormick, Michael (Initiative for the Science of the Human Past, Department of History, Harvard University) - Bondioli, Luca (Bioarchaeology Service, Museum of Civilizations, Rome) - Bos, Kirsten (Achaeogenetics Department, Max Planck Institute for the Science of Human History, Jena) - Caramelli, David (Department of Biology, University of Florence, Italy) - Krause, Johannes (Achaeogenetics Department, Max Planck Institute for the Science of Human History, Jena)

Abstract format: Oral

The Etruscan civilization occupied a large area of central Italy known as Etruria during the Iron Age. The history and legacy of this population remain enigmatic as well as its extinct language, a non-Indo-European language not fully interpreted until today. Two main competing hypotheses have been proposed for the origins of the population associated with the Etruscan civilization: an autochthonous development or an Anatolian birthplace. Here we report an ancient genomic time transect across Etruria alongside a historical and linguistic synthesis of our findings through time. During the Iron Age, we identify a mismatch between ancestry composition and the non-Indo-European Etruscan language challenging previous hypotheses on the recent Anatolian origin. The documented genetic make-up is stably maintained in Etruria across the first millennium BCE, despite the arrival of migrants as shown by the presence of several genetic outliers. However, this broad genetic continuity is overturned during the Roman Imperial period due to a large-scale spread in the region of eastern Mediterranean ancestries. This suggests that the Roman Empire might have left a long-lasting demographic contribution to the genetic profile of central Italian populations resulting in a vast displacement of the Etruscan-related gene pool.

3 CONNECTIONS IN LATE IRON AGE BALEARIC COMMUNITIES: THE CASE STUDY OF THE STAGGERED TURRIFORM OF SON FERRER

Abstract author(s): Salvador, Paloma - Calvo, Manuel (University of the Balearic Islands) - Santos, Cristina (Autonomous University of Barcelona) - García, Jaume (University of the Balearic Islands)

Abstract format: Oral

In the last decades, ancient DNA studies have proven to be a very powerful tool for studying mobility and kinship in prehistoric communities. Thus, we aim to present a case study of a Balearic archaeological site that uses Palaeogenetics to better understand Late Iron Age Balearic communities.

The Staggered Turriform of Son Ferrer is a Postalaitic (Late Iron Age) archaeological site (650/550-123 BC) located in the Calvià peninsula in southwestern Majorca (Balearic Islands). During the Postalaitic period, this site worked as a necropolis. As a result of the study of the ceramic materials recovered there, we hypothesized that the individuals buried there came from different archaeological sites in this area.

This necropolis remained as a closed context until the time of its excavation. Hence, it is an ideal place to carry out an anthropological study at both osteological and molecular levels. This study is also allowing us to delve into the study of communities from Postalaitic period, a time of great social, economic, and ideological changes. Furthermore, it is a moment in which the presence of the Punic (settled in Ibiza since the 6th century BC) in the Mediterranean Sea becomes stronger.

Through this project we aim to: i) examine the patterns of mobility and isolation, ii) analyse what insularity implies at a genetic level, iii) explore the regional connectivity of the prehistoric communities of this moment, iv) assess the intensity of the contact between the indigenous people and the Punic communities and v) contrast the hypothesis that the Staggered Turriform of Son Ferrer worked as a meeting place.

We intend to present the first results of the osteological analysis of this archaeological site and how we will address future aDNA analysis. We will also approach the state of the art of Palaeogenetic studies in the context of Balearic prehistory.

4 MIGRATION PERIOD ELITES FROM LITHUANIA – LOCALS OR MIGRANTS? NEW INSIGHTS BASED ON ARCHAEOLOGICAL AND NATURAL SCIENCES DATA

Abstract author(s): Kurila, Laurynas - Simčėnka, Edvardas (Lithuanian Institute of History; Vilnius University) - Piličiauskienė, Giedrė - Miliauskienė, Žydrūnė (Vilnius University) - Lidén, Kerstin (Stockholm University)

Abstract format: Oral

In the Migration period, Europe saw a turbulent era of movement of nomads and Germanic peoples, rise and collapse of the Hunnic Empire and fall of the West Rome, and complete reshape of the social landscape. Hypotheses are suggested that these events also touched the then remote periphery of the Barbaricum in the present-day Lithuania, i.e. that warrior or marauder bands from the Carpathian basin, Central Europe, or Black sea coasts reached the region, or that Balt warriors returned home after distant military campaigns. These people are related to new elites: males buried with prestigious non-local ornaments, weapons, and horses of exceptional body size, and females buried with rich non-local adornments. Hypotheses of savage invasions and immigration of elite dominate Lithuanian archaeological narratives, which, however, lack solid empirical background.

The results of $^{87}\text{Sr}/^{86}\text{Sr}$ and $^{180}\text{Tl}/^{160}\text{Tl}$ stable isotopes analysis and AMS dating of Migration Period humans (both the elites and commoners) and horses from Lithuania will be presented, as well as isotopic measurements of faunal remains serving as local baselines. The results demonstrate that most of the individuals are of local origin, except of only several humans and horses with a higher degree of mobility. New insights will be proposed: first, individuals of possible non-local origin are those from the elite group, second, this applies to both males and females, and third, different regions of provenance can be hypothesized for individuals from different parts of Lithuania.

However, interpretation of the isotopic results and combining these results with archaeological data appeared more complicated than expected. Several “migrants” were not representatives of local communities, but their place of origin may be either a nearby settlement or the provinces of the Roman Empire. In our presentation, we will discuss the challenges we met bringing together archaeology and natural sciences, and perspectives in this field.

5 MIGRATION AND ADMIXTURE EVENTS ON THE EURASIAN STEPPE AND THEIR IMPACT ON THE EARLY MEDIEVAL POPULATIONS OF THE VOLGA-URAL REGIONS

Abstract author(s): Gyuris, Balázs - Szeifert, Bea (Institute of Archaeogenomics, Research Centre for the Humanities, Eötvös Loránd Research Network; Department of Genetics, ELTE-Eötvös Loránd University, Budapest) - Ringbauer, Harald (Department of Archeogenetics, MPI for Evolutionary Anthropology, Leipzig) - Türk, Attila (Faculty of Humanities and Social Sciences, Institute of Archeology, Pázmány Péter Catholic University) - Mende, Balázs (Institute of Archaeogenomics, Research Centre for the Humanities, Eötvös Loránd Research Network) - Reich, David (Department of Genetics, Harvard Medical School; Department of Human Evolutionary Biology, Harvard University) - Szécsényi-Nagy, Anna (Institute of Archaeogenomics, Research Centre for the Humanities, Eötvös Loránd Research Network)

Abstract format: Oral

Ancient Hungarians are considered to originate from the Ural region of Russia. During their westward spread they reached the Middle-Volga and Kama regions, and later the Dnieper and Dniester regions from where in the late 9th century AD, they settled in the Carpathian basin. The location of the ancient homeland of the Hungarians is debated, although archaeological and fresh genetic evidence show parallelism between Hungarian conquerors in the Carpathian basin and the population of the southern Trans-Ural region, associated with the Kushnarenkovo and Karayakupovo cultures (6-10th century AD). These uniparental results suggest that people of the Kushnarenkovo culture may have taken part of the formation of the later Hungarian conquerors or have a common genetic source. Here we focus on the main migration events that shaped the Western Siberian-Ural region in the Late-Iron Age and the Western-Eurasian steppe from the Migration Period to the early Medieval Era. In our whole genome analysis we use enrichment for 1.24 million single nucleotide polymorphisms (SNPs). Understanding the distribution of the ancestry proportions in this wide area should help us to detect possible source populations of the Kushnarenkovo and subsequent cultures of the Volga-Ural region and the later Hungarian conquerors in the Carpathian Basin. Moreover, modeling population transformations in the Ural region has the potential to answer fundamental but highly debated questions about the origins not only of proto-Hungarians and later conqueror Hungarians but also closely related populations. In this talk, we will discuss admixture events leading to the formation of these populations, discuss the extent of genetic continuity, and provide insight into the dynamics of complex migration patterns. We will also

discuss the challenges of joining and presenting scientific evidence from archaeological, historic and genetic results on a politically charged topic.

A. ANCIENT DNA ANALYSIS OF EARLY MEDIEVAL ALAN POPULATIONS OF THE NORTH CAUCASUS

Abstract author(s): Dzhaubermezov, Murat (Institute of Biochemistry and Genetics - Subdivision of the Ufa Federal Research Centre of the Russian Academy of Sciences, Ufa; Department of Genetics and Fundamental Medicine, Bashkir State University, Ufa) - Gabidullina, Liliia (Department of Genetics and Fundamental Medicine, Bashkir State University, Ufa) - Ekomasova, Natalia - Khusnutdinova, Elza (Institute of Biochemistry and Genetics - Subdivision of the Ufa Federal Research Centre of the Russian Academy of Sciences, Ufa; Department of Genetics and Fundamental Medicine, Bashkir State University, Ufa) - Atabiev, Biyaslan (Ltd. Institute for Caucasus Archaeology) - Chagarov, Ongar (Laboratory of Contextual Anthropology at the Institute of Archaeology of the Russian Academy of Sciences) - Aybazon, Akhmat (Director of the Archaeological Museum of the Umar Aliev Karachay-Cherkess State University) - Metspalu, Mait - Villems, Richard - Tambets, Kristiina (Estonian Biocentre, Institute of Genomics, University of Tartu)

Abstract format: Poster

The earliest existing written evidence about Alans – people of Ponto-Caspian steppes and Caucasus region of I-XIII century AD – is found in the works of Chinese authors who mention the politonym “Yancai” in the “Records of the Grand Historian” and in the “History of the Former Han”, and of European antique authors in the middle of the 1st century AD.

Genetic data of the early Middle Ages Alans and their affinities to the Scythian-Sarmatian tribes, traditionally considered as their ancestors, as well as to the modern population of Europe and the Caucasus have not yet studied thoroughly, the whole genome data exists for only 6 individuals [1].

In this study we have analyzed ancient DNA of 70 individuals from 12 burial complexes belonging to the Alan culture from the III-XIII century AD, from the territory of the North Caucasus (Russian Federation). DNA was extracted from the archaeological material (teeth, temporal bone) of 70 individuals. We produced low-coverage Illumina whole-genome shotgun sequencing data for 63 individuals and will analyze these in a context of ancient and modern genetic variation of the region. The coverage of the genomes was 0.0004-0.3X (median coverage 0.045X and content of endogenous DNA 21,45%). The preliminary analysis allows us to assume close contacts of the Alans with the populations of the North Caucasus. The Y-chromosomal palette of Alans consisting of 5 different haplogroups (R, Q, J, G, I) started to be similar to that of present day autochthonous North Caucasus populations only in the later phase of Alan culture.

This study is supported by the Ministry of Science and Higher Education of the Russian Federation (grant № FZU-2020-0027), the Russian Foundation of Basic Researches (№ 19-04-01195 and №20-29-01018) and by the EU through the European Regional Development Fund (№ 2014-2020.4.01.16-0125).

415 NORTHERN EURASIA IN THE LATE PLEISTOCENE-HOLOCENE: PERIPHERY OR TRANSIT ZONE? (PAMI)

Theme: 6. Material culture studies and societies

Organisers: Ponkratova, Irina (North-Eastern state University, Magadan) - Lbova, Liudmila (St. Petersburg Polytechnic University) - Davis, Loren G. (Oregon State University)

Format: Session with precirculated papers

Modern research in the field of stone age archaeology shows that the Northern territories of Eurasia began to be actively developed by humans during the upper Paleolithic (MIS3-MIS2). For a long time, there was little interest in the development of the peoples of the North, their ethnogenesis and cultural, low visibility of archaeological materials, and the limited set of research topics compared to tropical or Mediterranean territories. Material practice of northern populations, the agency of things and the social interpretation of the impact of material culture are increasingly defining the contours of social archaeology.

Paleogenetic studies confirm the distribution of populations from Scandinavia to Alaska as wave-like process in Northern latitudes. Numerous archaeological and ethnographic collections obtained in recent years, have presented the cultural mosaic of the North. These have become available due to the unique special taphonomic conditions of burials of ancient hunters and fishermen. The stable preservation of this autochthonous population and traditional way of life allows us to employ ethnographic materials as correct analogies.

The section will consider the following issues:

- features of geological processes and taphonomy of cultural remains.
- variability of late Pleistocene and Holocene archaeological cultures.
- cultural traditions and innovations of societies of hunters, fishermen, and gatherers of the North.
- specifics and forms of adaptation strategies to low-temperature conditions.
- methods and means of transportation in the conditions of northern latitudes in the Prehistory.

ABSTRACTS:

1 DISPERSAL OF THE LAMINAR INITIAL - EARLY UPPER PALEOLITHIC TECHNOLOGY: DEFINING OF NORTHERN BOUNDARY

Abstract author(s): Rybin, Evgeny - Khatsenovich, Arina (Institute of Archaeology and Ethnography SB RAS)

Abstract format: Oral

The territory of the mountain belt in the Southern Siberia and Central Asia, ranging from 53 to 40 degrees north latitude, is the main region where distinctive MIS-3 laminar industries of early stages of Upper Paleolithic have been spread.

In the high latitudes of northern Eurasia, there are of several blade assemblages - Kolpakov Ruchey on the Northern Angara river, Makarovo-4 in the upper reaches of Lena river, Ust'-Chirkuo in Viliuy valley in Yakutia and Ust'-Maltat-2 and Derbina-4 sites on the Middle Yenisei. All these sites, located within 55 - 63 degrees of north latitude in the valleys of giant Siberian rivers still insufficiently studied, and situated in disturbed stratigraphic conditions. The technological and typological features of these assemblages indicate that they belong to the Initial Upper Paleolithic laminar industries entity. The distribution of these industries in high latitudes demonstrates the adaptation plasticity and marks the northern limits to the dispersal of Initial Upper Paleolithic populations.

This study was supported by the Russian Science Foundation grant No. 19-18-00198.

2 WITH NO ANALOGUES: IUP ENGRAVED BEADS OF BELEMNITE ROSTRA

Abstract author(s): Stepanova, Ksenia (Institute for the History of Material Culture, Russian Academy of Sciences; Saint-Petersburg State University, Institute of History, Archaeological Department) - Girya, Evgeny - Bessudnov, Alexander (Institute for the History of Material Culture, Russian Academy of Sciences)

Abstract format: Oral

Assemblage of Kostenki 17, layer II (41 ka cal BP) is an eponymous and seems to be a single site for the "Spitsynian" – an Initial Upper Palaeolithic local taxon in the Middle Don basin which is characterized by the predominance of different types of burins, including special "Spitsynian" one. Kostenki 17, layer II is an important point to trace the paths of the initial settlement of Eastern Europe by anatomically modern humans. Assemblage includes quite unique personal ornaments made from perforated fossils, small pebbles and polar fox canines, among which 4 pendants from belemnite rostra have gained special attention in publications since the 1950s, but some questions of processing techniques remain unresolved. And the most controversial - how was the ribbed translucent surface obtained? For the IUP and EUP it is common to use personal ornamentation in the form of natural materials (tooth, shells etc.) with rare additional treatment as simple linear ornaments. In the case of Kostenki 17, layer II rostra were not only perforated by double-sided drilling, but also symmetrically engraved with a very sharp edge and specially mechanically and chemically treated, as we suppose according to micro traces on the rostra surfaces. Also, pendants were worn for quite a long time, and they were not broken before deposition in the cultural layer. As can be concluded, in this case we see a unique example of the prehistoric jewelry art, which does not yet have an analogue of comparable age, not only in the shape of pendants, but also in a wider range of technical methods of shaping and decorating the surface.

This work was funded by RSF grant №20-78-10151.

3 TECHNOLOGICAL CHARACTERIZATION OF LATE PLEISTOCENE-AGED STEMMED PROJECTILE POINTS FROM THE USHKI LAKE SITE, LAYER VII, KAMCHATKA, RUSSIA

Abstract author(s): Ponkratova, Irina (North Eastern State University) - Devis, Loren (Oregon State University, Department of Anthropology)

Abstract format: Oral

We provide the first 2D and 3D digital characterizations of stemmed projectile point technologies from the late Pleistocene-aged Layer VII at the Ushki Lake Site, located in Kamchatka, Russia. Our focus on the site's earliest cultural component is intended to more fully explore cultural elements of technological design, manufacture, and use reflected in the morphometric form of projectile weaponry. These characterizations are derived from photographs and photogrammetric models that are processed through the Geographic Information Systems Lithic Morphometric Research (GLiMR) approach to geometric morphometric measurement. This approach harnesses the analytical abilities of geographic information systems (GIS) software in order to render quantitative measurements of stone tools in ways that far exceed traditional manual techniques. Moreover, since these measures are derived from digital 3D models of artifacts, the results are highly detailed and replicable by other researchers who are provided virtual access to the Ushki collection items. This approach not only leverages the empirical power of GIS but represents a new approach to sharing archaeological information. Based on the results of the GLiMR measures, we seek to establish patterns of traditional technological practice shared among the late Pleistocene peoples who lived at the Ushki Lake site. We consider how these cultural patterns relate to other early projectile point technologies discovered in North America and what they may tell us about the initial lithic technological patterns employed by the First Americans. We hope that this study demonstrates an approach to the study of artifact collections that promotes an increase in international collaboration and fosters greater insight into the Pleistocene record of the northern Pacific Rim.

4 SURVIVING TURBULENT TIMES: CLIMATE CHANGE, CULTURAL CONNECTIONS AND SHIFTING ADAPTATIONS IN HOKKAIDO-SAKHALIN DURING THE PLEISTOCENE-HOLOCENE TRANSITION

Abstract author(s): Jordan, Peter (Department of Archaeology and Ancient History, Lund University; GSI, Hokkaido University) - Vasilevski, Alexander (World and Russian History, Sakhalin State University) - Kato, Hirofumi (GSI, Hokkaido University) - Grishchenko, Vyacheslav (Archaeological Museum, Sakhalin State University)

Abstract format: Oral

The Pleistocene-Holocene transition brought turbulent times to human societies confronted by rapid climatic fluctuations, shifts in biogeographic zones and the flooding of continental shelves. While the disappearance of Doggerland's inhabited landscapes under the grey waters of the North Sea marks the culmination of these changes for European Archaeologists, our aim in this paper is to draw parallels with Northeast Asia, where the islands of Hokkaido and Sakhalin once formed a major terrestrial extension of the vast Eurasian landmass. During the LGM, this terrestrial corridor offered an "escape route" from the harsh glacial conditions of Siberia, but as temperatures gradually warmed, prehistoric societies faced a growing subsistence crisis as landscapes flooded and faunal resources declined. Our goal is to understand how these societies responded to a warming – yet frequently unstable – climate in an ever-shrinking terrestrial world. Late Glacial warming witnessed to a brief expansion of Incipient Jōmon traditions into Hokkaido, cut short by the Younger Dryas. As Holocene warming accelerated, a broader suite of innovations including house pits, plant use and pottery expanded across Sakhalin and Hokkaido. The onset of the 8.2 cal. BP cold event partly reversed this trend, and brought Siberian lithic traditions (Blade Arrow Culture) back down through Sakhalin and into Hokkaido, signalling the temporary return to more mobile sub-arctic lifeways and a growing reliance on coastal resources. Understanding human- and community-scale responses to these major shifts is challenging because the region's acidic soils mean that bone material is not preserved, other than at a few shell-midden sites in Hokkaido. At the same time, the region's extended hunter-gatherer pottery traditions offer rich scope for undertaking biomolecular reconstruction of changing cooking practices across major cultural and environmental transitions. We report recent results, examine remaining gaps in knowledge, and present ideas for future research.

5 FROM CONTINENT TO CONTINENT: PROPOSED PATHWAYS OF HUMAN TRAVEL FROM KAMCHATKA TO AMERICA IN ANCIENT TIMES

Abstract author(s): Ponkratova, Irina (North Eastern State University)

Abstract format: Oral

The processes of both internal and external human migrations took place on the Kamchatka Peninsula during the Pleistocene – Holocene transition. This appears to have resulted in the replacement of existing populations during this time. The causes of human population displacement during this time period appear to be linked to general processes of environmental instability associated with catastrophic volcanic eruptions resulting in linked alterations of landscape, hydro-networks, floods, fires, earthquakes, tsunamis. These catastrophic volcanic eruptions may have resulted in the displacement of existing populations and migrations to safer regions. This may have resulted in the abandonment of interior regions and the occupation of coastal areas. This would have resulted in the passage of people along the northern coast of the Asian continent, along the coast of Beringia and ultimately to the west coast of America. Under these conditions the technological means of individual mobility would have played an important role to permit expeditious movement along rivers, across coastal waters and circumvent sea ice played an important role for the migration of human populations. Included among such technological innovations may have been the construction of seaworthy boats and dog sledges. It is critical that we develop testable hypotheses that permit the reconstruction of possible means of transportation to convey people across Asian to the American continent. An examination of existing archaeological collections and ethnographic descriptions of the peoples of Kamchatka and America can serve to inform the development of testable hypotheses.

6 FINAL PALAEO-LITHIC OSSEOUS TECHNOLOGIES IN THE EASTERN BALTIC: OVERVIEW OF DATA AND TAXONOMY ISSUES

Abstract author(s): Rimkus, Tomas (Centre for Baltic and Scandinavian Archaeology - ZBSA)

Abstract format: Oral

The chronology and cultural periodization of the Final Palaeolithic in the Eastern Baltic was entirely formed on the basis of traditional typological-technological methods, studying lithic tools, tanged points in particular. In this way, by comparing the archaeological material with the analogous data of the adjacent regions, a chronological and cultural periodization of this period was formed, covering the period between the end of Bølling and early Preboreal. The vast majority of the studied sandy type settlements do not contain AMS dates, nor any dated organics and prehistoric tools made from them. Recent research intensification on stray prehistoric bone and antler artefacts in the Eastern Baltic has revealed the Final Palaeolithic working and hunting implements here, as well as early mobile art scenes on their surface. Current data show that the Final Palaeolithic communities in this region produced and used bone and antler products within a chronology of ca. 11 500 – 9 200 cal BC. On the basis of these researches, it became possible to a more precise chronology of the Final Palaeolithic, to typologize specific technologies and to observe technological development and transformations of such artefacts. Unfortunately, data on the cultural attribution of these tools are still lacking. However, by examining their chronology and linking them to the typological-technological aspects of the available lithic material, it became possible to link some groups of these implements to separate taxonomic units.

7 PALEOART OF NORTHERN EURASIA IN EARLY UPPER PALEOLITHIC: MATERIALS, TECHNIQUE, IMAGES, SEMANTICS

Abstract author(s): Lbova, Liudmila (Peter the Great St. Petersburg Polytechnic University; Novosibirsk State University)

Abstract format: Oral

The Initial and Early Upper Paleolithic in Siberia is represented by a mosaic combination of stone reduction technologies, bone and antler processing, as well as an amazing variety of anthropological fossil finds representing various species within of the Homo. Forms of symbolic behavior appear to be rather stable in the archaeological context of the Early Upper Paleolithic of northern Eurasia between 40,000-50,000 years ago. In the Middle to Upper Paleolithic transition in southern Siberia, surviving Middle Paleolithic technology forms converge with the appearance and evolution of Aurignacian elements. Here we use microscopic, technological, use-wear, and spectral analyzes to explore the manufacture and meaning of personal ornaments during these periods.

Based on studies of various Early Upper Paleolithic objects, a preliminary classification is proposed, presented in the form of a typological scheme of features incorporating forms and techniques for manufacturing items of personal adornment. In addition, to standard archaic forms (pebbles, bones, teeth, and drilled shells) we push new types such as "C-image" or "horned pendant", figurative (geometric) forms and figurines with decoration and painting.

The system of joint meanings ensures the effectiveness and success of communication in human culture. Items of personal ornamentation can be defined as the material form of symbolic communication, endowed with qualitative characteristics of personal and cultural identity and expressed through a system of signs. It is possible that such items could play the role of exchange equivalents or prestige items. Based on the presence of exotic raw materials, teeth of unusual animals, or ostrich eggshell and seashell in the collections some items may be imported.

This work is supported by the Russian Science Foundation (project 18-78-10079).

416 VISIBLE TO THE EYE? TRANSMISSION OF IDEAS THROUGH EVERYDAY VISUAL CULTURE

Theme: 6. Material culture studies and societies

Organisers: Kurisoo, Tuuli (Tallinn University) - Sirkin, Annika (Centre for Baltic and Scandinavian Archaeology - ZBSA)

Format: Regular session

The material and the visual are combined in the archaeological record. Design and style of artefacts, but also different technological choices (e.g. materials, tools, and methods) participate actively in the production, reproduction and transformation of sociocultural meanings and values. These aspects become more pronounced when we consider long-term trends and developments.

The study of visual culture is closely related to the study of art objects and images, but we seek to expand the discussion on portable material culture that is not necessarily perceived as 'art'. Decorated everyday items, dress accessories, and weapons can be named as examples of such objects. These items were often locally produced and can be seen as indicators of everyday visual culture. We would like to discuss the changes in the social, cultural and religious environments that affect design, style and iconography of portable material culture. We are interested in the dynamics of transformation, whether the changes took place gradually or rather abruptly and what was the scale of the changes in the visual culture (e.g. restricted to certain artefact types or used as a cross-reference between different artefact categories).

We welcome contributions that examine these topics and we would be particularly interested in papers that focus on a long-term perspective. This view helps to see a bigger picture, which is necessary for more balanced narratives about specific ideas (e.g. the spread of Christianity). The aim of this session is to bring together a wide range of case studies across all periods and places in Europe that enables insights into how the concept of visual culture can be expanded and explored in archaeology.

ABSTRACTS:

1 INTRODUCTION: EVERYDAY VISUAL CULTURE

Abstract author(s): Kurisoo, Tuuli (Tallinn University)

Abstract format: Oral

This paper introduces the general topic of visual culture with the focus on everyday material culture from Estonia. The movement of ideas, styles and designs are examined in a long-term perspective with the aim to understand the change in the visual culture that was stimulated by the spread of Christianity. The latter is still one of the most debated topic in Estonian prehistory, but visual culture has received only a little attention in the archaeological context. Moreover, most of the studies tend to focus on a single theme (mainly cross symbolism) or a specific time period around the Baltic Crusades in the beginning of the 13th century. It will be demonstrated that widening not only the temporal scale but also material base by including everyday items then new insights can be obtained how we tackle this problem. Therefore, visual culture is seen as a useful tool for revisiting old debates and introducing new lines of inquiries.

2 TIMELESS DESIGN - BIRD SHAPE LADLES FROM THE STONE AGE TO SOUVENIR SHOPS

Abstract author(s): Iršenas, Marius (Vilnius Academy of Arts)

Abstract format: Oral

The bird motif is one of the most important in the Stone Age in the Baltic region. A wooden ladle with a bird-shaped handle is reminiscent of a stylized water bird sculpture. Perhaps because of the suitability of this function and shape for depicting a bird, the tradition of such ladles does not end with the Stone Age. They are found in the archeological layers of medieval cities in the Baltic Sea region, in the jewellery collections of rulers, in the collections of 19th-20th centuries ethnography in museums, and in the souvenir shops of today.

What supports the longevity of such a design solution? The simplicity of the form and its constant rediscovery? The importance of the image of the bird in the worldview or other reasons that are difficult to see?

We will try to answer these questions in a presentation dedicated to the ever-young design of bird-shaped ladles.

3 MIGRATION PERIOD PICTURE STONES FROM GOTLAND - COMPARISONS TO OTHER STONE MONUMENTS AND METALWORK

Abstract author(s): Strehlau, Hannah (Centre for Baltic and Scandinavian Archaeology - ZBSA)

Abstract format: Oral

The Gotlandic picture stones are a unique find group that is limited to the Swedish island of Gotland. The carved stone slabs occur in various sizes and forms between 400 and 1000 CE. The Swedish researcher Sune Lindqvist divided the monuments in five different groups, A to E. The oldest group is, thus, group A (400-600 CE) and is central to this PhD project.

The so-called A-stones appear in trapezoidal or axe-shaped form and show a rather abstract ornamentation of geometric motifs, in combination with anthropomorphic and zoomorphic figures and border decorations. The sudden appearance in perfectly elaborated form and without previous development phase gives reason to explore their parallels and possible predecessors in Scandinavia and the Roman provinces. A possible connection exists to Roman Imperial tombstones from remote Spain and Portugal where both the choice of motifs and their arrangement on the stone resemble the Gotlandic monuments. Likewise, parallels exist to portable objects, such as Late Roman chip-carved metalwork, and artefacts decorated in the Nydam- and the Sösdala style. The task of this PhD project is, therefore, to collect material that is similar to the Gotlandic A-stones regarding style and motif. It aims to understand processes of idea transfers and to shed light on the long unanswered research question of the origins of these monumental stones.

4 TO SEE AND BE SEEN: ADOPTION OF ROMAN VISUAL CULTURE INTO FEMALE RELIGIOSITY OF DALMATIA

Abstract author(s): Mech, Anna (University of Warsaw)

Abstract format: Oral

Female religiosity in Roman Dalmatia represents a most interesting case study, as it is the province with the highest proportion of finds related to public cult activity of women among all the provinces of the Empire. This may be related to pre-Roman local customs and peculiarities of social organisation (Liburnia, the northern part of the province, was even described as "ruled by women" – which is a classic literary topos, but may be in some part based on reality) which gave women more religious agency than in other provinces. It is however precisely the adoption of Roman ways of visual and material expression of piety which allowed those women to produce the most permanent and visible manifestations of their religious activities. Votive monuments set up by women in this province follow mostly foreign, Roman patterns in their form and iconography, in their cultic purpose, in the customs associated with their erection, and in their public, social importance; as well as in the use of Latin as the language of religious communication. This is true even when the dedicants bear Illyrian, Celtic or other local names and use those objects to address local gods, pointing to an emergence of hybrid provincial religion. The paper will discuss not only the ways in which the inclusion of elements of Roman visual culture allowed the expression of female religiosity within the context of a provincial religion, but also the strategies used by Dalmatian women to visually mark their agency and complex cultural identities.

5 VISUALISING IDEOLOGIES: MANIFESTATIONS OF MODERNITY AND CONSERVATISM IN BRITISH PERIOD CYPRIOT DRESS

Abstract author(s): Hadjittofi, Petroula (University of Cyprus)

Abstract format: Oral

The post-Medieval history of Cyprus is defined by its successive subjugation to the Ottomans (1571-1878) and the British (1878-1960). The island's integration in two expansive and diverse empires of the Early Modern and Modern world influenced in a decisive manner the quotidian life of its people. In the last decades of the Ottoman period (ca. 1830 onwards), and especially during the British period, Cyprus underwent a series of complex political, economic, social and cultural transformations, which led to modernisation and laid the foundations for the development of the contemporary Cypriot society and identity. Yet, despite their significance, these processes are not yet adequately studied, nor cohesively explored. Given the potential of a material culture approach to the analysis of social phenomena, this study wishes to focus on dress in order to explore issues of sociocultural change and negotiation

of modernity in Cyprus during the British Period. Dress, which has been aptly characterised as a form of “social skin” and as part of the “technologies of the self”, comprises one of the strongest visual, self-communicative mechanisms, and as such it is considered especially suitable for studying and understanding sociocultural processes and the construction of identity through material culture. Drawing on evidence from an array of primary sources (extant dress items, archival and press material, photographs, and oral testimonies), the analysis focuses on matters of dress typology and use in order to study the material culture mechanisms through which social agents, from the level of the individual to the level of regional and/or island-wide social groups, choose to negotiate their identity in a transitional period.

6 EVERYDAY AESTHETICS: SENSORY EXPERIENCE AND MEDIEVAL MATERIAL CULTURE

Abstract author(s): Friedrich, Matthias (University of Vienna, Department of Prehistoric and Historical Archaeology)

Abstract format: Oral

Aesthetics, broadly defined as the evaluation of sensory experience and perception, is often limited to the study of art appreciation. In this line of thought, ordinary and ‘everyday’ objects—which constitute most of the archaeological record, such as pottery—are excluded from aesthetic consideration. Recent debates in contemporary aesthetics, however, also emphasized ‘everyday’ aesthetics as part of human responses to sensory experience. This paper tries to blur such boundaries through a comparative approach, exploring the concept of everyday aesthetic experience for the archaeological study of material culture.

This includes an assessment of relevant theoretical approaches within and outside of archaeology. The focus lies, however, on exemplifying aesthetics of the ‘everyday’ through a range of brief case studies, ranging mostly from late Antiquity to early modern Europe: this includes, for example, the shininess and visual reflection of early medieval dress accessories, the texture of medieval pottery, the warmth of late medieval stove tiles, and the smell of clay tobacco pipes.

417 CONNECTIVITY IN LATER PREHISTORIC EUROPE: MOBILITY, TRADE AND INTERACTION FROM THE 2ND MILLENNIUM BCE TO THE 1ST MILLENNIUM AD

Theme: 4. Globalisation and archaeology

Organisers: Gorgues, Alexis (University Bordeaux Montaigne) - Büster, Lindsey (Department of Archaeology) - Črešnar, Matija (University of Ljubljana) - Melheim, Lene (University of Oslo; Museum of Cultural History) - Poigt, Thibaud (UMR 5607 Ausonius - Bordeaux; UMR 5608 Traces - Toulouse)

Format: Regular session

Recent scientific and methodological advances have reshaped our understanding of ancient mobility. Although patterns of far-reaching contact have long been hypothesised, DNA and isotope analyses have demonstrated that mobility was much more widespread than has traditionally been supposed, and that these networks were complex and diverse. Furthermore, artefact studies (including the more routine implementation of materials science and provenance studies) are demonstrating the ubiquity of long-distance trade networks, and the different ways trade (here defined as any peaceful way of exchanging materials, commodities or services) was made.

Such strong and sustained levels of connectivity between different regions for varying durations could only have been achieved with a certain degree of agreement over common social and economic rules, which must have been achieved on the basis of an enduring shared practice, particularly in pre-literate societies where written laws did not exist. As such, informal institutions – i.e. those not enforced by law but based on a common sense of honour and trust – must have been sufficiently strong to allow for swift travel and convenient interaction, within or outwith a formal economic framework.

This session invites contributions examining the materiality of long-distance networks across Continental, Atlantic, Northern and pre-classical Mediterranean Europe, from the beginning of the Bronze Age until the appearance of written law. Papers examining patterns of trade, exchange and mobility through systems of material exchange or distribution, the transmission of ideas (related to, for example, technological or symbolic activities) and bioarchaeological methods are welcome, as are those which consider these processes from a range of perspectives: theoretical models, case studies, regional synthesis, etc.

ABSTRACTS:

1 THE “MOVING LANDSCAPE” OF THE AEGEAN LATE BRONZE AGE IN THE ARGOLID, GREECE

Abstract author(s): Brysbaert, Ann (Leiden University, Faculty of Archaeology)

Abstract format: Oral

In past pre-industrial societies featuring large-scale building projects, extensive manual labour was invested during the entire chaîne opératoire of construction. This synthesis focuses on the cost of a range of labour activities during the 13th century BCE in the Aegean Late Bronze Age. Following Janet DeLaine’s (1997) example, this paper aims to move “beyond the calculation of average and peak overall man-power requirements to consider the workforce as individuals, thereby allowing a closer estimation of the size and nature of the man-power”. Prehistoric people in the Argolid were interconnected through their multiple daily tasks while remaining resilient before the accumulation of adverse events around 1200-1190 BCE. In doing so, I investigate labour costs required for mon-

umental and domestic house building, infrastructure provision, tomb digging, pottery production, and several agricultural activities. Next, their joint implications to society are compared and discussed in light of the entire taskscape which mobilised large groups of people on a daily basis, and far beyond the regional scale, if both elites and commoners are taken into the equation.

This research highlights that rural landscapes and their populace formed the backbone connector of these Late Mycenaean pre-industrial Argolid-based societies. Understanding energy expenditure from a bottom-up perspective suggests large levels of responsibility in the hands of farmers and workers rather than allowing elites to rule the scene continuously. Since most ancient societies were based on subsistence economies, important decision-making was a daily balancing act between building work, agriculture and many craft activities, thus invoking multiple scales of connection. The enduring long-term labour practices in which human and other energy was expended as sustained levels of interconnected work tasks, there is no doubt that the completed structures, but also the process of making them, exuded power that would have rippled throughout the entire society and through the individual people.

2 THE HOARD FINDS OF THE LATE BRONZE AGE OF CYPRUS IN THEIR EASTERN MEDITERRANEAN CONTEXT

Abstract author(s): Bartelheim, Martin (Universität Tübingen) - Kızılduman, Bülent (Eastern Mediterranean University) - Müller, Uwe (Universität Tübingen)

Abstract format: Oral

From the Late Bronze Age in Cyprus we know an unusually large number of hoards compared to other Eastern Mediterranean regions. They were mostly found in settlement areas and often contain high-quality bronzes. In the past decades, there has been an intensive discussion about how these deposits should be interpreted. In addition to being understood as hiding places for precious possessions in times of crisis, they have above all been regarded as deliberate deposits in the sense of sacrifices. On the basis of a new comprehensive treatment of the Cypriot hoard finds of the Late Bronze Age and against the background of the current discussion on the characterisation of the phenomenon of Bronze Age hoards, their interpretation will be debated in this lecture. The characteristics of the Cypriot hoards and their cultural embedding in Cyprus will be compared with the situation in other regions of the Eastern Mediterranean. This forms the basis for addressing the question whether they are visual manifestations of trans-regional cultural connectivity in the East Mediterranean and markers for the existence of networks with similar rules and ideas, or are rather expressions of similar and possibly also simultaneous behaviour in times of crisis.

3 THE ORIGINS OF METAL: STRATEGIES FOR SOURCING SUPPLIES AND CONNECTIVITY IN THE BALEARIC ISLANDS DURING THE BRONZE AGE

Abstract author(s): Perelló Mateo, Laura - Lluï Estarellas, Bartomeu - Calvo Trias, Manuel (University of Balearic Islands)

Abstract format: Oral

The Balearic archipelago is the westernmost group of islands in the Mediterranean. Archaeological data shows that the communities that inhabited the islands were well connected during the Bronze Age. One of the clearest indications of this is the existence of local bronze metallurgy, even though there was no tin in the Balearics. At the same time, based on the available lead isotope data for minerals and bronze metals, this paper explores the different links that the islands may have had with other geographical regions during this period.

Hence, three levels of connectivity can be established: 1) among the communities of the different islands that make up the archipelago; 2) between the islands and the nearest Mediterranean regions, such as the south, east and north-east of the Iberian Peninsula and the south of France; 3) long distance links, with the existence of objects whose metal is possibly of Sardinian, Alpine and Central European origin.

4 METAL EXCHANGE AND CONNECTIVITY: EVIDENCE FROM NEW MULTIDISCIPLINARY RESEARCH

Abstract author(s): Melheim, Lene (Museum of Cultural History University of Oslo) - Ling, Johan (University of Gothenburg) - Grandin, Lena (Arkeologerna, Statens Historiska Museum) - Hjärthner-Holdar, Eva (Independent researcher)

Abstract format: Oral

Few areas in temperate Europe exhibit such accumulated densities of bronze as southern Scandinavia, with an estimated yearly consumption of c. 1 ton, and yet, recent lead isotope and chemical analyses have established that metals were imported in large amounts from distant regions in Europe despite local availability of copper. Thus, a key issue in current research is how the peripheral polities in northern Europe were able to attract so much metal from distant regions. Recent research has argued that southern Scandinavia became integrated into European long-distance trading networks during the 2nd millennium BCE, and that this development had a profound impact on the evolution and complexity of local societies in Scandinavia.

This paper will present and sum up the results of a research programme using lead isotope and chemical analysis to establish the provenance of c. 250 Scandinavian bronzes. The interpretation of the dataset suggests a complex picture of possible connections between Scandinavia and Europe 1700-1000 BCE. Overall, the varied compositions and origins of copper identified in artefacts dated to the earliest phases indicate a dynamic diffusion of metals across Europe with a variety of sources. It is indicated, however, that trade networks became more stable around 1500 BC, when the sea-based supply of copper from Great Orme in Wales into Scandinavia declined, and suppliers in the southeastern Alps gained in importance. This paper addresses questions related to the

social mechanisms behind the trading networks. It is argued that the participation of Nordic groups in the metal trade was a result of their ability to organise and capitalise on a maritime mode of production reliant on trading and raiding. In this system, surplus production from agriculture enabled chiefs to invest in boats and crew for long-distance exchange.

5 ISOTOPIC AND GENETIC EXPLORATIONS OF CROSS-CHANNEL CONNECTIVITY IN BRONZE AGE AND IRON AGE KENT

Abstract author(s): Bleasdale, Madeleine - Fischer, Claire-Elise - Büster, Lindsey (University of York) - Evans, Jane (National Environmental Isotope Facility, British Geological Survey) - McKinley, Jacqueline (Wessex Archaeology) - Reich, David (Department of Genetics, Harvard Medical School) - Armit, Ian (University of York)

Abstract format: Oral

Persistent long-distance networks of connectivity between Britain and the Continent have been evidenced archaeologically through shared aspects of material culture. During the Middle and Late Bronze Ages, cross-channel exchanges resulted in the formation of a broad, common cultural entity on both sides of the Channel: the “Manche—Mer du Nord (MMN) complex”. Such interactions persisted during the Iron Age, becoming more visible in the Late Iron Age, when new continental imports (e.g. Mediterranean pottery) reached southern Britain. Lastly, as the Roman provinces expanded, textual sources frequently evoke resources originating from northwestern France and southern Britain.

Existing sources demonstrate that, rather than being a barrier, the channel was a dynamic maritime axis during the Bronze and Iron Age. Nevertheless, reconstructing the nature of cross-channel interactions remains challenging. In recent years, aDNA has confirmed movements between the Continent and Britain (Fischer et al., 2018), and strontium ($87\text{Sr}/86\text{Sr}$) and oxygen ($\delta 18\text{O}$) isotope measurements of tooth enamel have identified potential migrants in southern Britain (McKinley et al., 2014).

This paper synthesizes existing and new multiproxy data at a regional-scale, focusing on sites from Kent, including Margetts Pit and Cliffs End Farm. Given its proximity to the Channel, Kent is an important locale for exploring cross-channel connections. Indeed, several individuals from Cliffs End Farm have already yielded isotope measurements demonstrating they spent their childhood outside of Britain. New aDNA analysis targeting individuals from Cliffs End Farm and elsewhere has now identified the continent, and perhaps France as a potential point of origin for incoming individuals.

The revaluation of pre-existing data, combined with new analysis demonstrate that Kent was an important crossroads between continental Europe and Britain throughout the Bronze and the Iron Ages. Our study also highlights the strength of multi-proxy approaches for reconstructing the timing and tempo of mobility, and individual life histories.

6 PERFORMING ENCOUNTER: THE INSTITUTIONS OF CONNECTIVITY IN BRONZE AND IRON AGE EUROPE

Abstract author(s): Gorgues, Alexis (University of Bordeaux Montaigne)

Abstract format: Oral

Data on human mobility and commodity exchange have clearly demonstrated that Bronze and Iron Age European societies experienced high levels of connectivity, and that long-distance interactions were frequent. Patterns of interaction were shared across large geographical areas, with supra-local institutions providing later prehistoric societies with a framework of mutual trust. Using a series of case studies, this paper will discuss the nature of these institutions. It will first distinguish between different spheres of interaction (trade, diplomacy, education, craftworkers mobility, etc.), before demonstrating that most of them were embedded in a institutional frameworks that regulated interpersonal relationships. It will then propose that rejection or denial of these interactions was also governed by institutionalized processes responsible for regulating mobility.

Such institutional frameworks allowed for the creation and maintenance of multi-directional networks of interaction, in which people rather than places were the nodes. The paper will conclude by highlighting the importance of long-range connectivity in late prehistoric societies as a competitive process which was central to identity building at a number of scales.

7 WIDESPREAD ELEMENTS OF SOLAR SYMBOLISM FROM THE LATE BRONZE AND EARLY IRON AGE. TRACING CONNECTIONS BETWEEN SOUTHERNSCANDINAVIA AND THE CIRCUM-ALPINE AREA

Abstract author(s): Wirth, Stefan (Université de Bourgogne)

Abstract format: Oral

Over a long period, distant regions of prehistoric Europe have shared specific elements of an iconography centering on solar symbolism. In the search for a cosmological narrative underlying this material evidence, we aim to bring together fragments reflecting what seems to have been a widespread and long lasting oral tradition. In order to do so, we will consider selected objects and assemblages potentially embodying mythologems, dating to the late Bronze and early Iron Age.

The well-known Bronze Age burials at Skallerup (Sjælland) and Peckatel (Mecklenburg) will serve as the starting point of our survey. These famous discoveries show early evidence of a distinctive arrangement combining a large movable metal vessel with bird imagery. At Skallerup, the wheeled cauldron was destined to accommodate the ashes of the deceased. We will follow this phenomenon of extraordinary burials, additionally qualified by the presence of rare gold ornament, until the transition from the late Bronze to the early Iron Age. Examining in a complementary way other characteristic assemblages, including metal hoards, we will focus on the ritual use, which was at that time made of decorated metal vessels.

Finally, we will also point out a fundamental change perceivable in the shape and decoration of a number of types of bronzes occurring north of the Alps around 900 BC and entailing a new fashion of expressing the same eternal subject matter while certain features of traditional form persist. By analyzing the success of the basic structure of the two- and three-dimensional images in question, we hope to get closer to understanding the pertinent point that is the wide acceptance and longevity of what we intent to define as a unique configuration related to cognitive representation.

8 PEOPLE ON THE MOVE: EARLY IRON AGE ENCOUNTERS ACROSS THE ALPS

Abstract author(s): Moetsch, Angela (Max Planck Institute for the Science of Human History; Max Planck Institute for Evolutionary Anthropology)

Abstract format: Oral

Evidence for contact and exchange between the Westhallstattkreis and Northern Italy has been documented for a long time. Traditionally, it is described by either the import of southern artefacts or by locally made artefacts or features that show Mediterranean influence in shape, design, and/or technique found in archaeological contexts north of the Alps. The view from the south, implicating the more active role of the agents of Mediterranean cultures, often still prevails. Scenarios describing the nature of such exchange include institutionalized long distance trade via commercial settlements and/or middlemen, but also the travel of individuals, e.g. craftspersons, who left their home and came in direct contact with a foreign cultural environment. However, reliable evidence for direct encounter is only rarely attested and the nature of interactions often has to remain a theoretical consideration. In my presentation I will highlight the presence of people who actually crossed the Alps in a southward direction to live within Northern Italian communities.

9 ANATOMY OF AN EARLY IRON AGE GRYPHON

Abstract author(s): Czifra, Szabolcs - Kreiter, Attila - Viktorik, Orsolya (Hungarian National Museum - Magyar Nemzeti Múzeum)

Abstract format: Oral

More than a decade ago fragments of a decorated large clay object were unearthed in a settlement feature of the Early Iron Age Hallstatt culture during a preventive excavation at Báticasék (W Hungary). After restoration, the artefact reborn as a large clay seal, characteristic of the Scythian influenced Vekerzug culture. In addition to the fact, that the artefact's size is much larger than similar clay seals, it has a unique decoration in the form of two mythical animals. Based on the form of diagnostic parts of the animals, e.g. the head, body, legs and tail the large winged animals can be determined as gryphons. This paper aims to explore the origin and meaning of the unique artefact by traditional formal and stylistic investigations, which is supplemented by thin-section petrographic analysis. As the origin and meaning of the gryphon image lead us far beyond the Carpathian Basin, the orientalisising motif is studied within broader time and geographical frames. Nevertheless, the formal overview of the object will largely focus on the Carpathian Basin, as similar clay seals are primarily associated with Vekerzug women. Concerning the fact that these items had a characteristic role in constructing female identity, special attention will be dedicated to the communication networks in the Carpathian Basin in the 7th-5th centuries BC. Thin section petrography is used to analyse the fabric of the seal and compare it with local sediments, collected at the site, to reveal valuable information on its provenance.

10 MEETING AROUND THE CAULDRON: CONNECTIONS BETWEEN SCANDINAVIA AND CONTINENTAL EUROPE DURING MID-FIRST MILLENNIUM BC EXPLORED THROUGH THE HASSLE HOARD, SWEDEN

Abstract author(s): Sörman, Anna (Stockholm University) - Ojala, Karin (Stockholm University; Uppsala University)

Abstract format: Oral

In 1936 an intriguing deposition dating to the Bronze Age-Iron Age transition (c. 500 BC) was found in a river bed in Hassle in south-eastern Sweden. It contains a rare combination of foreign metalwork: two bent Hallstatt swords of Mindelheim type, two rippenzisten/ciste a cordoni buckets, two small hooks and twelve ornamental bronze discs, along with some unidentifiable fragments - all found inside a reworked and heavily repaired cauldron, possibly originating from Italy or Greece.

While the discs could be of either local Nordic or Central European production, the other items clearly belong to a high-status sphere of exotic goods, linking Scandinavia to the Continent. The origin and trajectory of these objects are now being examined by means of chemical composition and lead isotope signatures as well as renewed comparative studies.

This paper presents the working hypotheses and preliminary results concerning these objects' possible areas of production and history of use. A special focus is placed on the buckets and cauldron as equipment for communal meals or drinking ceremonies. Sacrifices of metal bowls and cauldrons appeared in Scandinavia from the mid Bronze Age and up into the Iron Age. The wide-spread distribution and geographical displacement of hammered metal vessels testify to far-reaching exchange.

This paper highlights feasting as an arena where travelers were exposed to foreign objects. Conspicuous metal containers upheld a meeting culture in which they were highly visible and easily recognizable elements. The serving vessels can be understood as 'encounter material', brought to Scandinavia due to its familiar form and role in shared socio-political practices rather than as a foreign exotica.

11 RITUAL MOBILITY, NETWORKS AND INTERACTION IN IBERIAN IRON AGE SANCTUARIES (3RD-1ST CENTS. BC)

Abstract author(s): Grau, Ignacio (Institute of Archaeology and Historical Heritage. University of Alicante)

Abstract format: Oral

This paper present recent archaeological, typological and archaeometrical studies on the votives offered in sanctuaries of the Eastern Iberia Iron Age, in modern Valencia Region, Spain. The analysis had proved the existence of clearly established groups of local and non-local offerings. According to these results we can trace the influence of the sanctuaries in their local landscape but also to expand the scale of interaction to some larger regional areas. This opens up opportunities for analysing ritual mobility, networks and interactions at different scales. The data show that there is a clear evidence of ritual practices shared within the communities of different territories in the region. The offering of identical objects that circulated and were deposited in diverse sanctuaries opens new prospective for the interpretation of the cult places sites and their role in building local and regional identities. At the same time, the data is employed to trace social interactions between specific places and regions according to this ritual mobility and encounters at the cult places.

12 MAPPING MIDGARD. RECONSTRUCTING MENTAL GEOGRAPHIES OF VIKING AGE SEAFARERS

Abstract author(s): Jarrett, Greer (Lund University)

Abstract format: Oral

Conventional representation techniques in archaeology have proven to be less than ideal for exploring the experiences and world-views of cultures distinct from our own. Over the last few decades a range of alternative methods have received scholarly attention, originating both in the rise of digital technologies and in the efforts of subaltern communities to illustrate their beliefs, histories and land claims. Drawing on this creative diversity, this project explores the mental geographies of Viking Age seafarers, proposing a series of alternative approaches for representing these using experimental archaeology, critical cartography, and digital mapping techniques. It is hoped that alternative representations will give rise to new interpretations and new possibilities for Viking Age archaeology, contributing to debates about sailing routes, geopolitical relationships, settlement and migration patterns and the relationships between seascapes and cosmologies.

The project draws on the wealth of experimental scholarship conducted aboard reconstructed Viking Age ships as a source of experiential and technical data. Phenomenological and ethnographic fieldwork shall be performed aboard similar reconstructed vessels to select and quantify the most fundamental experiential variables related to Viking Age seafaring. These data shall be used to build models in the form of maps. Factors that are rarely included in conventional cartography such as movement, time and sensory experience shall be the focus of these maps. They shall then be evaluated based on their potential for contributing to wider research questions in Viking archaeology such as those mentioned above. This project is still in a very early stage, but exciting inroads have been made into experiential mapping using isochronal cartography, and fieldwork in Norway is due to begin in August. It is hoped that the project will illustrate the potential of digital technologies for promoting intercultural dialogue and research, and offer an alternative window into the Norse world.

418 SHOULD I STAY OR SHOULD I GO? PATTERNS OF MOBILITY IN PREHISTORIC SEDENTARY AND PASTORALIST SOCIETIES

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Scharl, Silvine (Institute of Prehistoric Archaeology, University of Cologne) - Hofmann, Daniela (Department of Archaeology, History, Cultural Studies and Religion, University of Bergen) - Gerling, Claudia (Integrative Prehistory and Archaeological Science - IPAS, University of Basel)

Format: Regular session

Not so long ago, one might have been forgiven for thinking that people in prehistoric sedentary societies did not move around so much. Yet we now command an overwhelming amount of data which seem to show the exact opposite and have blurred the distinction between sedentary and more mobile ways of life. Ancient DNA, isotopes and new insights from human/animal osteology have come to supplement traditional artefact studies to create a picture of people – be it individuals, groups of people or larger social units –, animals and things constantly on the move – for shorter or longer distances, over varying amounts of time, and for widely different reasons. Our main challenge now is how to make sense of this diversity.

Mobility occurs at different spatial scales, from short distances travelled for obtaining resources to long travels, perhaps among complete strangers. It can happen at very different rhythms, from daily or seasonal rounds, to settlement relocation at yearly or decadal frequencies, to once-in-a-lifetime journeys. Tracing and identifying these scales, let alone agents and their reasons, makes huge demands on our data, both scientific (dating methods, isotopes, artefact sourcing studies, DNA etc.) and more traditionally archaeological (stylistic comparisons, data concerning settlement/economy etc.). However, this necessary attention to detail can make it hard to compare results and patterns across case studies, in order to identify recurrent trends.

In this session, we aim to bring together scholars who are working in particular prehistoric contexts in which different forms of mobility co-exist. We would like to focus on how these different mobilities come together to form a particular way of life or dynamic

system, and what variables are responsible for creating/changing these patterns. We hope that a broad comparison of synthetic case studies across prehistory can help us grasp the bigger picture.

ABSTRACTS:

1 INTRODUCTION: SHOULD I STAY OR SHOULD I GO? PATTERNS OF MOBILITY IN SEDENTARY AND PASTORALIST SOCIETIES

Abstract author(s): Scharl, Silvine (Institute of Prehistoric Archaeology, Cologne University) - Gerling, Claudia (Integrative Prehistory and Archaeological Science - IPAS, University of Basel) - Hofmann, Daniela (Department of Archaeology, History, Cultural Studies and Religion, University of Bergen)

Abstract format: Oral

There is now a wealth of case studies showing that mobility in sedentary societies was far from unusual, while it can also take a wide variety of forms in pastoralist groups. These patterns of mobility operate at various temporal, spatial and social scales. There are long-term strategies which become embedded in a society's way of life, as well as short-term reactions to changing circumstances and one-off exploratory voyages. There are journeys which cover many hundreds of kilometres and those which may just involve a day's walk. And finally, large groups of people can sometimes move together, while at other times it is small collectives or even just single individuals which are on the move.

All this is now amply documented, both through traditional archaeological case studies (imported goods, diffusion of styles etc.) and through newer bioarchaeological models. Yet most of the time, we look at just one component of this complex system. Using selected case studies mainly from Neolithic Europe, we set the scene for the remainder of the session by asking how these different axes intersect and what sorts of questions remain to be tackled before we can draw a more comprehensive picture of past mobility as a durable component (rather than an exceptional behaviour) of prehistoric life.

2 RETHINKING THE SUB-NEOLITHIC IN NORWAY: SUBMISSIVE AND VULGAR OR CREATIVE AND AFFLUENT?

Abstract author(s): Mansrud, Anja (Museum of Archaeology, University of Stavanger) - Nielsen, Svein (Museum of Cultural History, University of Oslo) - Præsch-Danielsen, Lisbeth (Museum of Archaeology, University of Stavanger) - Berg-Hansen, Inger Marie (Museum of Cultural History, University of Oslo) - Austvoll, Knut Ivar (IAKH, University of Oslo)

Abstract format: Oral

For many years the Middle Neolithic (3300-2350 cal BCE) forager settlements on the central Skagerrak coast was the epitome of the sub-Neolithic phenomenon in Norway. The sub-Neolithic is traditionally defined as societies existing in Neolithic times that rejected a Neolithic ideology. They appear in many forms in Northern Europe during the fourth millennium BCE; from Horgen in the south to Pitted Ware in the north; from Wartberg in the west to Zedmar in the east. New analyses of zooarchaeological, palynological, geological and archaeological evidences from the central Skagerrak coast in Norway strongly encourages a rethinking of the sub-Neolithic in this region. Rather than a submissive and vulgar remnant from Mesolithic times, as was previously thought of these settlements, we discover a resilient, creative and affluent society, well adapted to its local environment. We reconstruct a model of seasonal mobility and flexible utilisation of resources, ranging between e.g. pottery production and exploitation of Atlantic Bluefin Tuna on the coast, and small-scale crop growing in the hinterlands. There is also evidence of long-distance trade and coastal travelling around the Skagerrak and Kattegat Sea. The diverse mobility made these societies robust despite environmental variation and changes in living conditions over time. Finally, we suggest a redefinition of the sub-Neolithic in this region from a 'Neolithic culture' to an eohistorical regime, presupposing that complex ecodynamic relations in the past resulted in non-linear and contingent historical trajectories.

3 SULPHUR ISOTOPES, ENVIRONMENT, LOCAL MOBILITY, AND THE STONE AGE MARIAGER FJORD, EASTERN JUTLAND, DENMARK

Abstract author(s): Gron, Kurt - Gröcke, Darren - Winton, Anna (Durham University) - Robson, Harry (University of York)

Abstract format: Oral

Until recently, sulphur ($\delta^{34}\text{S}$) isotope analysis of bone collagen was not routinely undertaken in the archaeological sciences; however, its application is becoming increasingly widespread. Sulphur isotope values potentially reflect a number of factors, including diet, geology, ingested water, and coastal proximity. Such analyses are therefore of relevance to many questions regarding Stone Age coastal environmental reconstruction, including human and animal mobility, ecosystem characterisation, salinity gradients, and in understanding prehistoric local animal behavioural ecology. Here, we present a series of sulphur isotope analyses, together with more routine carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) isotope analyses, to a number of archaeological taxa from the Mariager Fjord in Eastern Denmark, in order to understand the Late Mesolithic and Early Neolithic environmental conditions in the area. The fjord system is characterised by the presence of a substantial number of Late Mesolithic and Early Neolithic shell middens along its length, indicating a long-term human presence. Results indicate that sulphur isotope analyses reveal variation that may permit a better

understanding of how different microhabitats were exploited, and the local character of the movement of both human groups and resources.

4 STRONTIUM ISOTOPE ($87\text{Sr}/86\text{Sr}$) ANALYSIS REVEALS MOBILITY PATTERNS AMONG STONE AND BRONZE AGE POPULATIONS IN THE SOUTHEASTERN BALTIC

Abstract author(s): Piliciauskas, Gytis - Simčėnka, Edvardas (Archaeology Department, Lithuanian Institute of History) - Kozakaitė, Justina (Faculty of Medicine, Vilnius University) - Piličiauskienė, Giedrė (Faculty of History, Vilnius University) - Robson, Harry (Department of Archaeology, the University of York)

Abstract format: Oral

Strontium isotope ($87\text{Sr}/86\text{Sr}$) analysis has been successfully applied to archaeological materials for more than 30 years to understand prehistoric mobility. Despite this, prehistoric skeletal remains from Eastern Europe have not received the same attention as other regions of Europe meaning that the majority of interpretations concerning prehistoric human mobility are largely based on material culture, physical anthropology and very seldom aDNA data. In this presentation we present the first $87\text{Sr}/86\text{Sr}$ measurements obtained from 40 Stone Age human individuals from the present-day territory of Lithuania as well as measurements obtained from faunal remains serving as local baselines. The preliminary results demonstrate a higher degree of mobility among inland hunter-gatherers compared with those residing on the coast as well as subsequent farmers dating to the Iron Age. In addition, we have identified several 'migrants' among the Mesolithic and Neolithic individuals, which, it would appear, are derived from region(s) outside of the present-day territory of Lithuania. Lastly, we compared these data with other strontium isotopic studies undertaken on Stone and Bronze Age human remains throughout Europe to place the results into a wider context.

5 MOBILITY AND SEDENTARY IN THE STEPPE BRONZE AGE (ON THE EXAMPLE OF ONE ARCHAEOLOGICAL MICRODISTRICT IN THE SOUTHERN TRANS-URALS, RUSSIA)

Abstract author(s): Epimakhov, Andrey (South Ural State University; Institute of History and Archaeology UB RAS) - Kupriyanova, Elena (Chelyabinsk State University)

Abstract format: Oral

Local Bronze Age is represented by numerous archaeological cultures (Sintashta, Abashevo, Petrovka, Srubnaya, Andronovo, etc.). All of them are characterized by a similar life support system based on complex animal husbandry. There are also traces of local ore mining and metal smelting. Traces of fortified and unfortified settlements were studied well for all cultures. The nature of economic activity inevitably implies the mobility of people and animals. Testing the scale and form of mobility requires a variety of archaeological and scientific methods. This work has begun for the microdistrict near the village of Stepnoye (Chelyabinsk Region). The first step was to create a basemap of strontium isotopes to determine the extent of local mobility and the presence of exchange operations. Archaeological data illustrate the mosaic nature of material culture (first of all, ceramics), to some extent, burial rituals. Some of the finds have non-local features (Seima-Turbino complex), the closest analogies of which are located several hundred kilometers away. The widespread use of radiocarbon dating made it possible to establish that a significant part of cultural traditions existed simultaneously, which is well traced back to the beginning of the 2nd millennium calBC. An analysis of the inventory typology, stratigraphy, and planigraphy of burial sites also confirms the continuity of some cultures. The first results of DNA-studies confirmed the heterogeneity of the population. This heterogeneity could have been partially formed during the migration of different groups at the end of the 3rd millennium calBC. Thus, the archaeological data for the microdistrict illustrate traces of mobility of different scales, caused by different factors - migrations, trade relations, economic activity (animal husbandry and mining of copper ore). The heterogeneity of the collectives was supposed to facilitate their inclusion in the systems of movement and exchange of various scales, from global to local.

6 A TALE OF EARLY NOMADISM? SUBSISTENCE MOBILITY WITHIN THE YAMNAYA CULTURE IN THE NORTHERN BLACK SEA STEPPE

Abstract author(s): Riesenberger, Martin - Kaiser, Elke (Institut für Prähistorische Archäologie, Freie Universität Berlin)

Abstract format: Oral

Recently an increasing number of ancient DNA-studies highlighted the key role that the Yamnaya culture of the Eastern European steppe played in the last major genetic turnover in Europe. In light of these apparently large-scale population dynamics that took place during the transition from the Eneolithic to the Bronze Age the academic research often focused on migration as a major factor in terms of mobility.

Although these steppe communities were also repeatedly described as early pastoral nomads the character of the mobility in the sphere of Yamnaya subsistence economy remains still widely understudied. As an attempt to reduce this research gap we focus in our study on the examination of the level of this subsistence mobility.

In our paper we will present the case study of Generalka-2 – a Yamnaya settlement in the lower Dnieper area. Its faunal record is predominated by domestic cattle. Livestock enamel was sampled sequentially for carbon and oxygen isotopes ratios. These function as proxies for the proportions of C3- versus C4-plants within the diet as well as an approximation to the seasonal temperature. Furthermore strontium isotope ratios were measured to detect seasonal changes of locality.

The results revealed a notable seasonal variability in the birth timing of the animals implying a non-uniform herd management strategy. The strontium isotope ratios show seasonal differences as well. Additional reference data might enable us to clarify the spatial meaning of these results. This is – to our knowledge – the first study that addresses the question of seasonal mobility of domestic animals with the help of sequential isotope data within the Eastern European Steppe Belt. It outlines considerable potential in the research aiming to characterize the pastoral subsistence strategies, modes of 'domestic' mobility and the manner of landscape use of communities attributed to the Yamnaya complex.

7 ISOTOPIC INVESTIGATIONS OF HUNTING ACTIVITIES IN NEOLITHIC SWITZERLAND

Abstract author(s): Gerling, Claudia (Integrative Prehistory and Archaeological Science, Department of Environmental Sciences, University of Basel) - Doppler, Thomas (Kantonsarchäologie Aargau, Brugg) - Knipper, Corina (Curt-Engelhorn-Zentrum Archäometrie - CEZA, Mannheim) - Pike, Alistair (Department of Archaeology, University of Southampton) - Lehmann, Moritz (Biogeochemistry, Department of Environmental Sciences, University of Basel) - Schibler, Jörg (Integrative Prehistory and Archaeological Science, Department of Environmental Sciences, University of Basel)

Abstract format: Oral

Hunting was a key economic strategy in the Pre-Neolithic periods and remained – aside the herding of domestic animals – important during the Neolithic. Given that hunting required a certain degree of mobility of at least some part of the communities, constraints on hunting activities also yield indirect information on the "everyday" mobility in sedentary Neolithic societies.

In NE-Switzerland, archaeozoological evidence further suggests that the economic strategy to hunt has been of particular importance during times of climatic aggravations, when crops failed and domestic animal foddering resources became limited, e.g. during the food crisis of the 37th century BCE attested for the pre-alpine lakeshore settlements. In a case study, we explored the role of hunting in communities living at the Lakes Constance and Zurich during the 4th and 3rd millennia BCE. By analysing red-deer tooth enamel for strontium and oxygen and human bone for carbon and nitrogen stable isotope ratios, we gained insights into the Neolithic hunting ranges and mobility, as well as the role wild animal products played in the human diet at the time.

In this contribution, we present and discuss the results of the case study, putting them into the wider context of the diversity of mobility patterns related to the economy of the pre-alpine Neolithic wetland sites.

8 NOT JUST A LOCAL SITE FOR LOCAL PEOPLE. PATTERNS OF MOBILITY IN LATER NEOLITHIC BAVARIA

Abstract author(s): Hofmann, Daniela (University of Bergen) - Szilágyi, Marton (Eötvös Loránd University Budapest) - Grupe, Gisela - Perutka, Anna - Schreil, Franziska (LMU Muenchen) - Kęgler-Graiewski, Nicole (Independent Researcher) - Helfert, Markus (University of Frankfurt) - Ramminger, Britta (University of Hamburg)

Abstract format: Oral

The enclosure at Riedling (c. 4300-4000 cal BC) in Bavaria stands out due to many human remains and several striking examples of depositional practices involving large amounts of complete vessels and animal bone. In the course of analysis, these activities and people reinforced the striking range of contacts and connections previously suggested for the local Münchshöfen culture, as well as revealing some new ones. The pottery shows striking links to cultural phenomena further east, in modern-day Hungary or the Czech Republic amongst others. In contrast, some of the human individuals appear to have been regionally mobile, utilising upland resources in a more concerted fashion than previously. There is no apparent distinction in treatment or dietary intake between isotopic locals and outsiders, suggesting that this was not an important defining criterion for inclusion in the community of users at Riedling. Rather, the Riedling enclosure and the activities that took place there could have functioned as a mechanism for integrating and people and things of diverse origins, mostly mediated through the consumption of food and drink.

9 A CROSS-DISCIPLINARY VIEW ON RESIDENTIAL MOBILITY DURING THE 5TH MIL. BC IN CENTRAL EUROPE

Abstract author(s): Scharl, Silvine - Krewer, Elisabeth (Institute of Prehistoric Archaeology, Cologne University)

Abstract format: Oral

The beginning of agriculture in Central Europe marks the beginning of a sedentary way of life in terms of living in one place year-round. For the early farming societies the archaeological record reflects rather long-lasting settlement structures. We find numerous settlements that have been occupied for several generations sometimes even hundreds of years. During the second half of the 5th mil BC, however, this sedentary way of life is transformed. Traces of settlements let alone houses almost disappear and it is mostly through ditched enclosures that the Neolithic population is still visible for us. This is interpreted as a reflection of increased residential mobility. So far, however, we have almost no isotopic studies on this period that allow for an evaluation of this idea on the level of individual actors. Therefore, six burials from the site of Altdorf (Landshut) in Southern Bavaria were sampled to get an insight into diet habits and mobility patterns during the 5th mil B.C. The results of the strontium isotope analysis show significant differences between the individuals from the so-called Oberlauterbach group (c. 4750-4500 BC) and the Muenchshoefen Culture (c. 4500-4000 BC). Whereas the male individuals from the Oberlauterbach group show local isotopic signatures, all individuals from the Muenchshoefen-Culture seem to exhibit higher mobility, i.e. they had changed residence in the course of their lifetime before they moved to Altdorf (Landshut).

These results will be set into a wider context by looking at further traces for residential mobility in the archaeological record in order to get a bigger picture for Central Europe at that time.

10

USTICA (SICILY), THE NEOLITHIC JOURNEY: FAR-AWAY ISLAND OR NETWORK NODE?

Abstract author(s): Speciale, Claudia (Istituto Nazionale di Geofisica e Vulcanologia; University of Las Palmas) - Battaglia, Giuseppina (Soprintendenza per i BB.CC. di Palermo, Sicily) - Larosa, Nunzia (School of Humanities, Arts, and Social Sciences, University of New England) - de Vita, Sandro - Di Vito, Mauro - Arienzo, Ilenia (Istituto Nazionale di Geofisica e Vulcanologia) - Veltre, Virginia - Battistini, Andrea - De Angelis, Flavio (Centre of Molecular Anthropology for Ancient DNA Studies University of Rome Tor Vergata)

Abstract format: Oral

The main aim of this paper is to cross the data obtained with the geological investigation, the archaeological and geochemical analyses on human bones and material found in the Neolithic site of Piano dei Cardoni, to deepen the knowledge about the origin and entity of the first human population of Ustica and define its connectivity with the close and far regions of Central Mediterranean.

Ustica is a small volcanic island (9 sq. km) around 70 km away from the northern Sicilian shores. The low altitude (and hence low visibility), the almost total lack of freshwater springs, the absence of valuable geological resources, and the remarkable distance from the north-western coast of Sicily made Ustica relatively marginal in the trade dynamics of the southern Tyrrhenian area during prehistory. Nevertheless, human occupation started at the end of the Middle Neolithic period (around 4700 BC), as attested by the recent archaeological survey of Piano dei Cardoni. These findings witness the spread of Neolithic communities in some areas of the island, that probably represented a stepping stone in the obsidian trade route and exchanges between Aeolian islands and western Sicily. Recent investigations brought to light a Neolithic site with a hypogeum stone megalithic sepulchral area. The analyses on the origin of raw materials and artifacts (obsidian, volcanic stones, pottery) and the cultural comparisons show a multiple sources reliance, based both on local and imported materials (from Aeolian islands and Sicily but also Southern Italy).

11

ROUTES ACROSS THE BASALT: ANALYSING PATHWAYS IN THE JORDANIAN DESERT TO DETERMINE PREHISTORIC MOBILITY PATTERNS

Abstract author(s): Smith, Stefan (Universiteit Gent)

Abstract format: Oral

The Harra desert of northeastern Jordan is part of a basaltic plateau that stretches from southern Syria into the northwestern corner of Saudi Arabia. While archaeological projects over the last few decades, and in particular the last few years, have identified a dense prehistoric site distribution, the important question of human movement across this region is less well investigated. This is a crucial issue in this landscape in particular due to the extreme access difficulties of traversing the dense scatter of basalt rocks that cover almost its entire surface.

The "Western Harra Survey", co-directed by the author and M.-L. Chambrade, Archéorient, Lyon, is a project conceived to study the interior of the Harra. A comprehensive remote sensing survey and four seasons of fieldwork have, among other results, identified a complex network of paths cleared through the basalt, some extending long distances, linking sites along roughly linear trajectories over many kilometres. Others appear to emanate from individual sites towards resources, such as valleys for seasonal water. A preliminary analysis first presented at the Landscape Archaeology Conference (LAC) in 2018 showed that a majority of paths connect sites to natural access features or resources, while a minority connect sites with each other. Building upon this research, this paper will analyse various properties (e.g. width, depth, uniformity of trajectory) of a variety of paths using a combination of ground observations and remote sensing data (e.g. vectorised satellite imagery, drone-derived digital elevation models). Together, this will show which paths were in most frequent use, or re-use, and which were used less often or fell out of use relatively quickly. This can shed light on the main reasons for human mobility in the Harra desert, which regions were strongly connected with each other, and potentially identify sociocultural links across this vast landscape.

12

ANDEAN MOBILITIES IN TRANSITION: A DEEP-TIME HISTORY OF INTERACTION AND DEPENDENCY IN SOUTHERN PERU

Abstract author(s): Mader, Christian (University of Bonn) - Beresford-Jones, David (University of Bonn; University of Cambridge) - Lane, Kevin (University of Buenos Aires) - Cadwallader, Lauren (PLOS Cambridge) - Chauca, George (National University of San Marcos) - Isla, Johny (Peruvian Ministry of Culture) - Reindel, Markus (German Archaeological Institute)

Abstract format: Oral

Mobility defines human behaviour and is implicated in socioeconomic dependency and change through the movement of ideas, technologies, material culture, people and animals, entailing diverse activities such as transhumance, migration, labour, trade, pilgrimage and colonialism. In this paper we study mobility as a decisive factor in pre-Columbian social development in the Andean region by bringing together data from two large-scale archaeological studies of entire Andean watersheds, from their highland headwaters to the Pacific littoral: the German Archaeological Institute's (DAI) Nasca-Palpa Archaeological Project and Cambridge University's One River Project. The Andean region is the perfect theatre for an archaeology of mobility because its extreme topography compresses enormous vertical diversity across short horizontal distances, propagating a concomitant diversity of transhumant and agro-pastoralist human trajectories. By uniting archaeological findings of these two projects from the Río Grande de Nasca and Río

Ica drainages we create a credible regional perspective rare in Andean archaeology, and, moreover, essential for interpretations of mobility. We use new data from geochemical analyses of obsidian lithics, stable isotope analyses of human and camelid remains and radiocarbon dating to offer insights into the origins of mobility here through the transition from hunting and gathering to pastoralism and agriculture, and the subsequent transformations in patterns of mobility and dependency that, we argue, call new attention to the definitions of the so-called 'horizons' and 'intermediate' periods of the pre-Columbian past.

13

INTERDISCIPLINARY EVIDENCE FOR MIGRATION, MOBILITY, AND COMMUNITY FORMATIONS AFTER THE DECLINE OF THE ROMAN EMPIRE IN THE CARPATHIAN BASIN

Abstract author(s): Knipper, Corina (Curt Engelhorn Center Archaeometry - CEZA, Mannheim) - Koncz, István - Rácz, Zsófia (Eötvös Loránd University, Institute of Archaeological Sciences, Budapest) - Hajdu, Tamás - Szeniczey, Tamás (Eötvös Loránd University, Faculty of Science, Institute of Biology, Department of Biological Anthropology, Budapest; Hungarian Natural History Museum, Department of Anthropology, Budapest) - Ódor, János (Wosinsky Mór Museum, Szekszárd) - Mende, Balázs (Research Centre for the Humanities, Hungarian Academy of Sciences, Budapest) - Vida, Tivadar (Eötvös Loránd University, Institute of Archaeological Sciences, Budapest)

Abstract format: Oral

The decline of the Roman rule caused significant political instability and led to the emergence of various 'Barbarian' powers. Scholars proposed that this situation caused a remarkable number of people to re-settle so that the time between the end of the 4th and the 6th century AD is generally considered the "Migration Period". Using archaeological, anthropological, and multi-isotope data from the cemeteries of Mőzs in Pannonia (5th century) and Hajdúnánás in the Transtisza region (5th-6th century), we compare direct evidence for individual residential changes inside and outside of the former Roman Empire. Despite geological and climatic homogeneity of the study area in general, we find indication for a remarkable number of non-local individuals at both sites. Some of this evidence goes along with similarity in dietary habits or artificial modifications of human skulls. At both sites, non-local individuals are not restricted to the first generation of inhumations, but also include later arrivals. Moreover, they exhibit differentiation regarding age and sex as well as placement of the burials within the sites, pointing towards complex patterns of individual and group mobility in a generally unsettled time.

421

DEMOGRAPHY IN ARCHAEOLOGY BEYOND BOOM AND BUST? CRITICAL EXAMINATIONS OF PHASES OF UNDER- AND OVERPOPULATION

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Hinz, Martin (Institute for Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research, University of Bern) - Kolář, Jan (Department of Vegetation Ecology, Institute of Botany of the Czech Academy of Sciences, Brno; Institute of Archaeology and Museology, Masaryk University, Brno) - Heitz, Caroline (Institute for Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research, University of Bern) - Laabs, Julian (Institute of Pre- and Protohistoric Archaeology, Christian-Albrechts-Universität zu Kiel; Department of Geography, Physical Geography, Christian-Albrechts-Universität zu Kiel)

Format: Regular session

The study of prehistoric population dynamics has experienced a significant upswing in recent years, not only due to new methodologies but also growing significance of the human-environment relationship. However, current approaches are comparatively simple: we observe an increase or decrease in the number of archaeological finds or sites at certain times, and conclude from this population increase or decrease. Special attention is paid to so-called boom-and-bust phases, often explained by environmental disasters; above all effects of abrupt climatic deterioration. Many approaches are frequently based on a rather simple Malthusian worldview: the population grows until it reaches the limit of its environment's carrying capacity, and then has to move into a dynamic equilibrium, determined by technological innovation as well as by birth control and/or emigration. The other extreme is a simple Boserupian perspective of ever-increasing innovation through population pressure, raising the environment's carrying capacity by technological advancements. In this scenario, mainly external triggers (warfare, climate events, or else) would be the cause of bust phases in human demographic history. How can data-driven archaeology help to assess the most plausible scenario? Over the long course of human history, the above-mentioned model's expectations of exponential population growth cannot be observed. To explain the prehistoric population dynamic we might search for more mundane factors keeping population sizes 'in check'. What role do diseases and violence play? How can social norms and inter-group relations influence demographic dynamics?

For this session, we invite contributions addressing the question of how to achieve a meaningful and historically significant investigation of past demographic dynamics beyond the mere descriptive representation of increased or decreased amounts of archaeological remains. We would be happy to receive contributions with integrative and alternative models, multi-proxy evidence or simulation studies showing in which direction demographically oriented archaeology might develop in the 2020s.

1 DEMOGRAPHY IN ARCHAEOLOGY AS THE STUDY OF BOOM AND BUST PHASES? AN ASSESSMENT OF THE CURRENT STATE OF RESEARCH

Abstract author(s): Laabs, Julian (Institute of Pre- and Protohistoric Archaeology, Christian-Albrechts-Universität zu Kiel; Department of Geography, Physical Geography, Christian-Albrechts-Universität zu Kiel) - Hinz, Martin - Heitz, Caroline (Institute for Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research, University of Bern) - Kolář, Jan (Department of Vegetation Ecology, Institute of Botany of the Czech Academy of Sciences, Brno; Institute of Archaeology and Museology, Masaryk University, Brno)

Abstract format: Oral

The question of the size, density and demographic structure of human populations has a very profound impact on how we imagine communities in prehistory and their relations within the social and natural environment. Therefore, the study of such relations has preoccupied researchers since the early years of the discipline. Particular attention has always been paid to the extreme: signs of severe population decline in particular have always called for explanation and its embedding into an overall historical narrative. Often, proposed interpretations of extreme changes in past population sizes are based on single proxies and are explained by correlated contemporaneous or preceding events in other - mostly palaeoenvironmental - proxies. Rarely, but increasingly, investigations into past demographic developments have been systematically supported by a general consideration of various indicators on different spatio-temporal scales. Therefore, it is not surprising that the popular notion of collapse was quickly voiced where societies' doom was sealed by single events or developments.

In this introduction to the session, we briefly reflect the historical background of archaeological demography and the theoretical considerations in the study of boom and bust phases to critically examine the methodological challenges on how they could be reconstructed from archaeological contexts. We also like to discuss different possible reasons (e.g. wars, invasions, diseases, climate, technological and social change, ...), their mutual influences and interrelations, as well as consequences for such potentially dramatic demographic developments labelled as boom or bust. Above all, we will present our view on how data-driven archaeology can contribute to a better understanding of such particularly prominent phases in the demographic dynamics of prehistory and make them relevant as a part of human history by means of a holistic approach and analysis.

2 FROM UNCONSTRAINED TO DENSITY-DEPENDENT GROWTH: 900 YEARS OF PUEBLO PRE/HISTORY

Abstract author(s): Kohler, Tim (Washington State University; Santa Fe Institute; Crow Canyon Archaeological Center) - Gillreath-Brown, Andrew - Bird, Darcy (Washington State University) - Bocinsky, R. (Montana Climate Office, University of Montana; Division of Earth and Ecosystem Sciences, Desert Research Institute; Crow Canyon Archaeological Center)

Abstract format: Oral

The Pueblo portions of the US Southwest underwent rapid population growth throughout the first millennium CE and up to ~1100 CE. During that time there were several increasingly large societal transformations that seem to have had causes that were jointly social and climatic in nature. These coincide with the ends of the BMIII (~700), PI (~900), and PII (~1140) periods in the standard Pecos taxonomy and in many places resulted in disaggregation of villages and changes in architecture and other technologies, spikes of violence, declines in wealth inequality, and minor population movements. The end of the PIII period, ca. 1280, was different in character and more clearly connected with external rather than social causes. Significant climatic variability limiting maize production, and the likely intrusion into the Southwest of hunter-gatherers who possibly focused their negative reciprocity on Pueblo people, were leading causal factors. The result was a real collapse, resulting in tens of thousands of people moving hundreds of kilometers to new homes to the southwest, south, and southeast areas where Pueblo people still thrive today. These movements apparently took place over several decades. In these new areas, Pueblo peoples transitioned to a low-growth demography, with lower crude birth rates and life expectancies. This migration and changed demography were connected with very significant culture change, which we review. This entire history does not cleanly correspond to either a Malthusian or a Boserupian process, though Malthusian elements are relatively prominent in the early portions of the sequence. In the same way that we have to go beyond the caricatures of cyclic processes provided by resilience theory, paleodemographic approaches in archaeology can usefully reference both Malthus and Boserup but ultimately have to take from simple models what they have to offer while ending at a real encounter with history.

3 THE LIMITS OF LATE MESOLITHIC POPULATION IN NORTHERN GERMANY – WOODLAND DENSITY AND GAME DENSITY AS BASE FOR POPULATION GROWTH

Abstract author(s): Doerfler, Walter (Institut fuer Ur- und Fruehgeschichte Kiel)

Abstract format: Oral

Late Mesolithic Hunter-gatherer-fisher communities at the Baltic coast were semi-sedentary people with a wide range of food resources. At the interstice between marine, limnic and terrestrial environments they had seasonally specific opportunities for gathering (plants, shellfish, snails and eggs) hunting (seals, birds, red deer, roe deer, wild boar, elk and many small species) and fishing. Nevertheless, these resources were not endless and had to be explored carefully for a sustainable economy. A quantitative model of the density of potential game, based on archaeological, zoo-archaeological and palaeoenvironmental data shows the potential proportion of meat for the nutrition. According to the calculations the population growth was limited by the carrying capacity at a value

of 0,11 persons per km². Whether this population density was reached and if so, what mechanisms regulated the 'dynamic equilibrium' offers space for speculation. A higher productivity of the landscape could be reached with exploitation of formerly not reachable resources. Animal husbandry and leaf foddering were the first reasons for the success and spread of the Neolithic economy.

4 ESTIMATING ABSOLUTE POPULATION NUMBERS USING BAYESIAN DEMOGRAPHIC MODELLING

Abstract author(s): Hinz, Martin - Heitz, Caroline (Institute for Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research, University of Bern) - Kolář, Jan (Department of Vegetation Ecology, Institute of Botany of the Czech Academy of Sciences, Brno; Institute of Archaeology and Museology, Masaryk University, Brno)

Abstract format: Oral

One of the greatest challenges for estimating population numbers and densities in prehistory is to properly take into account the nature, potentials and challenges of the archaeological record. We have only very thin and heterogeneous indicators at our disposal, which are poorly understood in their relationship to the parameter to be measured and their internal error. Concentrating on only one of the possible indicators, for example sum calibration of a large number of radiocarbon dates, means that there is a great danger of interpreting the ups and downs of the curve directly as boom and bust phases. But how can different indicators be meaningfully related to each other in order to mutually validate and substantiate the individual significance? How can the uncertainty of the individual indicators be estimated in order to check whether phases of increased or decreased settlement activity are actually evident? Finally, how can we arrive at absolute figures to interpret these demographic dynamics in prehistoric societies?

For us, Bayesian statistics seems to be a well-established way to address these challenges. In this talk, we will present our approach of using a simple Bayesian model to combine a wide range of indicators to arrive at estimates of absolute population trends that, on the one hand, do justice to the source data and their uncertainties and contradictions, and, on the other hand, provide a robust basis for further interpretations about the nature of boom and bust phases and the significance of long- and short-term demographic trends. We believe that the method, which has revolutionised the evaluation of radiocarbon dating over the past 20 years and has put quantitative evaluations and predictions on a completely new footing throughout the scientific world, represents an enormously promising approach to one of the most pressing questions in prehistoric archaeology.

5 PREHISTORIC DEMOGRAPHY OF CENTRAL EUROPE IN A MULTI-PROXY PERSPECTIVE. WHICH PROXY IS THE BEST FOR STUDYING THE BOOMS AND BUSTS?

Abstract author(s): Kolar, Jan (Institute of Botany of the Czech Academy of Sciences; Institute of Archaeology and Museology, Masaryk University) - Macek, Martin (Institute of Botany of the Czech Academy of Sciences) - Abraham, Vojtěch (Institute of Botany of the Czech Academy of Sciences; Charles university) - Tkáč, Peter (Institute of Botany of the Czech Academy of Sciences)

Abstract format: Oral

Archaeology nowadays works with several demographic proxies providing us with absolute or relative numbers of the population in past. Nevertheless, with all the current advances in the theory behind, in computational methods and capacities and emerging large-scale datasets, these estimations can still be tricky. We can calculate our models of population dynamics based on number of sites, summed probability distributions of radiocarbon dates or number, age structure of the excavated deceased or even area of inhabited houses. How do the estimations from different proxies differ? And how do we decide which should we use? Are some of them regionally or chronologically specific or can all the proxies be used universally? Are some of them biased by social transformations in the past? Or by history of archaeology in general? This paper will explore these questions within a multi-proxy study covering the area of Czech Republic and will discuss the results from a long-term perspective.

427 ISLAND SUSTAINABILITY AND RESILIENCE IN EUROPE: ARCHAEOLOGICAL, PALAEOECOLOGICAL AND HISTORICAL APPROACHES

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Brown, Antony (Tromsø Museum, Arctic University of Norway) - Downes, Jane (University of the Highlands and Islands, Archaeology Institute) - Wickler, Stephen (Tromsø Museum, Arctic University of Norway) - Martinsson-Wallin, Helene (Department of Archaeology and Ancient History, Uppsala University, Campus Gotland)

Format: Regular session

Islands present archaeologists and historians with an unrivalled opportunity to study the sustainability and resilience of complex socioecological systems. This is facilitated by their semi-permeable boundaries and their often high degrees of self-sufficiency in basic subsistence terms. In many cases their relationship to a motherland or mainland is also critical, and sometimes recorded, and it can be argued that in some cases, especially on inland lakes, islands can be 'central places' (Bäck 1997). But do they inherently lack socioecological resilience (Petzold 2017) or is this contextual and fluid, and if so what are the critical factors. This is highly relevant to the problem of sustaining small island communities faced by many European countries today. Archaeological, palaeoecological and historical evidence can all be brought to bear on this problem. This session will examine these question with particular attention to small-medium sized European islands and archipelagos using evidence ranging from archaeological excavation though palaeo-environmental studies to the use of documentary sources. A range of methodologies is highly appropriate due to the mixed marine-land economies and variable dependency on importation both in time and space. Papers exploring the potential

of new techniques will be encouraged including traditional proxies, biomarkers, aDNA, remote sensing, geoarchaeology, and novel dating methods. As well as particular opportunities island also present a range of challenges from a lack of suitable sites to a lack of administrative identity. The identification of critical factors in the trajectories of population and well-being on islands is highly relevant to present policies which grapple with how relatively small populations can be maintained in the face of both ecological and equity considerations. This session will present a variety of studies from different areas of Europe addressing these themes and highlighting the importance of island archaeologies.

ABSTRACTS:

1 ISLAND-RESILIENCE-IN-THE-FACE-OF-VIKING-RAIDS-AND-POLITICAL-RESTRUCTURING-DURING-THE-1ST-MILLENNIUM-AD: COMBINING-ARCHAEOLOGICAL, HISTORICAL-AND-PALAEOECOLOGICAL-APPROACHES-TO-BETTER-UNDERSTAND-SOCIAL-TRANSFORMATIONS-ON-THE-ISLAND-OF-IONA

Abstract author(s): Jones, Samantha (University of Aberdeen) - Allison, Enid (Canterbury Archaeological Trust) - Campbell, Ewan (University of Glasgow) - Evans, Nick - Mighall, Tim - Noble, Gordon (University of Aberdeen)

Abstract format: Oral

This paper examines the early monastic site on the island of Iona, which was founded following the arrival of St. Columba in AD 563. For over 200 years the monastic site was one of peace and prosperity. It became a renowned centre of learning and the spread of Celtic Christianity throughout many parts of Scotland and northern England. During this period Iona was also a focus of culture, legal knowledge, literature, art, and learning. Important works were produced in Latin and Gaelic, ranging from poetry to chronicles, saints' lives, legal texts and perhaps the lavishly decorated gospel book known as the Book of Kells. However, crisis struck the island from the AD 790s, when a series of Viking attacks over a thirty-year period had a potentially devastating impact on the monastic community and from about AD 800–1100 the western seaboard and isles of Scotland were settled and conquered by Scandinavians. While the documentary sources provide some evidence for the history of Iona, especially across the period from AD 563–740, the socio-environmental impacts of Viking attacks on Iona and other ecclesiastical and political upheavals between the 8th–13th centuries were unclear. Here we present the results from integrated historical, archaeological and palaeoenvironmental analyses (pollen, non-pollen palynomorphs and beetles) of sediments extracted adjacent to and from recent archaeological excavations of the monastic banks and ditch to fill in some of the gaps in knowledge regarding early monastic settlement and the socioenvironmental impacts of Viking raids and Scandinavian influence.

2 THE NATURE AND DISTRIBUTION OF DEEPENED RIGGED AGRICULTURAL LANDSCAPES WITHIN LOCH/ LOUGH CATCHMENTS ACROSS ISLANDS IN THE SEA OF MOYLE

Abstract author(s): Pears, Ben (University of Southampton) - Brown, Antony (Tromsø Museum, UiT, Tromsø, Norway; University of Southampton) - Fonville, Thierry (University of Southampton)

Abstract format: Oral

Deepened 'rigged' soils across islands provide essential information as to the nature and extent of historical agriculture and land use. Such deposits have been readily identified across the globe including mainland Europe, Ireland and the northern extremities of the UK (Orkney, Shetland and Outer Hebrides). However, very little research has been conducted upon the Inner Hebrides and the Sea of Moyle between Scotland and Ireland and comparisons in this area can greatly improve the understanding of loch/lough catchment land use history, soil development and erosion and inter-island connectivity.

Soil and sediment sampling across four islands in the Sea of Moyle (Islay, Colonsay, Lismore and Rathlin) have demonstrated distinctive areas of deepened agricultural soils across rigged fields associated with former settlement. In each case these sequences are more extensive than areas of 'natural' uncultivated land and demonstrate distinctive horizonation and sedimentological evidence of inorganic and organic additions.

The soil sequences from each catchment are also analysed against loch/lough sediment sequences and the increasing presence of distinctive coarse texture horizons are likely to be indicators of phases of enhanced landscape clearance, agricultural activity and sediment erosion from terrestrial to lacustrine source ultimately through the intensification of the rigged arable process.

3 RECONSTRUCTING POPULATION DYNAMICS USING FAECAL LIPID BIOMARKERS TO CHARACTERISE WAVES OF COLONIZATION IN THE SEA OF MOYLE

Abstract author(s): Mackay, Helen (Durham University; Newcastle University) - Henderson, Andrew (Newcastle University) - Fonville, Thierry - Pears, Ben (University of Southampton) - van Hardenbroek, Maarten (Newcastle University) - Plunkett, Gill - Gleeson, Paddy (Queen's University Belfast) - Alsos, Inger (Tromsø Museum, Arctic University of Norway) - Brown, Tony (Tromsø Museum, Arctic University of Norway; University of Southampton)

Abstract format: Oral

The Sea of Moyle (Sruth na Maolie), located between Northern Ireland and Scotland, contains a group of small islands that have experienced multiple waves of colonization and population change over the prehistoric, Medieval and Post-Medieval periods. Whilst many of these islands have comparable colonization histories and archaeologies, their physical geographical characteristics differ.

For example, Islay and Colonsay are separated by <10 km of water, but their size varies by an order of magnitude and Islay soils are considered more fertile. These islands present an excellent case study to examine long-term relationships between landscapes and population dynamics, and assess the extent to which they contribute to island socioecological resilience.

Our research aims to test whether faecal lipid biomarkers, extracted from lake sediments, can be used to reconstruct the presence of humans and domesticated animals over the last 1500 years; this would extend the record of population histories in island communities beyond written documents. Faecal steroid biomarkers have been detected in lake sediments from Loch Finlaggan (Islay) and Loch Fada (Colonsay) covering the last 1500 years. Ratios of faecal steroid compounds indicate a temporal difference in the presence of humans and use of animals in the lakes' catchment. The ability of steroids to provide evidence of population change is demonstrated by comparisons with historical population records, archaeological evidence and other proxies of anthropogenic-induced nutrient changes (e.g. diatom-inferred phosphorus and biogenic silica) characterised from the lake cores. Our lacustrine data highlight differences in the persistence of human occupancy between the lake catchments, which correspond with settlement changes during the Viking and Medieval periods. This application of lacustrine faecal steroid analyses extends understandings of population dynamics on the islands of Islay and Colonsay, but also highlights key steroid taphonomy questions, which must be explored before quantitative population reconstructions can be obtained using this approach.

4 HUMAN-ENVIRONMENT DYNAMICS AND MARITIME IDENTITIES IN ARCTIC NORWAY'S SEA OF ISLANDS SINCE THE IRON AGE

Abstract author(s): Wickler, Stephen Kent (The Arctic University Museum of Norway, UiT The Arctic University of Norway)

Abstract format: Oral

Marine resources have always been critical for sustaining coastal settlement in northern Norway where a myriad of islands provide essential nodes in a complex web of maritime interaction and interdependence. Ongoing integrated archaeological and paleoenvironmental investigations in the Lofoten archipelago reveal the impact of climate changes on marginal agricultural environments and relative sea-level variations on maritime communities (harbor access, site distribution) during the Iron Age (500 BC – AD 1050). Recent maritime archaeological projects have demonstrated the central importance of small to medium sized offshore islands since the Viking Age (AD 800-1050) in maintaining an islander identity dependent on marine resources and proximity to fishing grounds. Although these islands may appear inhospitable, barren, and remote to the modern-day population, they were the focus of intensive fishing related settlement characterized by seaborne connectivity rather than insularity into the 20th century. The material expressions of an islander perspective are critically examined and assessed within a dynamic framework of expanding networks of interaction and exchange from the Iron Age through the Early Modern Period. This includes recently analyzed boat remains from offshore island bogs providing the earliest evidence for plank-built boats and rowing in Scandinavia at the transition from the Bronze Age to Pre-Roman Iron Age. The depopulation of numerous once intensively occupied offshore islands since the 1940s underscores the dramatic transformation of island-based socioecological systems from centrality to marginality.

5 'A CHALLENGING ENVIRONMENT': SOILS AND LAND USE HISTORY ON TORY ISLAND/OILEÁN THORAÍ, CO. DONEGAL

Abstract author(s): Brown, Antony (University of Southampton; Arctic University of Norway, Tromsø) - Pears, Ben (University of Southampton) - Gleeson, Patrick (Queens University Belfast) - Ice, Brendon (Digventures Ltd.)

Abstract format: Oral

This paper examines the enigmatic Tory Island, 14 km off the north coast of Co Donegal. Combining archaeological, historical and palaeoecological analyses, it will explore the island's development during the later Holocene. In 1937, R.L. Praeger remarked that Tory was "The most remote and exposed of the Irish Islands...it is utterly windswept... it is strange to find that such a desolate place has been so long inhabited". Its population of nearly 300 gave a density of over 80 persons per km² in 1937 CE, making Tory the most densely populated island around the Sea of Moyle (north coast of Ireland). By contrast with this intensity of human occupation, Tory has an unusual climate: mild with rare frost and little sunshine but a high level of precipitation (1076 mm) with rain falling on average on 226 days per year. Additionally and most importantly the mean monthly windspeed is 15.6 knots and on average Tory Island has 65 days per year with gales. Given the small size of the island and the westerly prevailing wind direction this means that most of the rainfall is salt-laden. Very little archaeological work has been done on the island but it has Bronze Age field systems, two Iron Age hill forts and was an early ecclesiastical site. It is also known for the late survival of the Rundale tenure system. This paper uses a combination of soil patterns, history and archaeology, together with the first pollen analysis to better understand the environment, ecological impact and resource base of the inhabitants during. A particular focus is the transition from the later Iron Age, with a medieval ecclesiastical settlement, was established down to the present day. During this period, the landscape was drastically altered, and the island underwent considerable change.

6 DNA EVIDENCE IN LAKE SEDIMENTS USED TO RECONSTRUCT LONG TERM LAND USE CHANGES ON SCOTTISH ISLANDS

Abstract author(s): Fonville, Thierry - Pears, Ben (University of Southampton) - Alsos, Inger (Tromsø Museum, Arctic University of Norway) - Mackay, Helen (Durham University) - van Hardenbroek van Ammerstol, Maarten - Henderson, Andrew (Newcastle University) - Plunkett, Gill - Gleeson, Patrick (Queen's University Belfast) - Brown, Antony (University of Southampton; Tromsø Museum, Arctic University of Norway)

Abstract format: Oral

Sedimentary ancient DNA (sedaDNA) is the analysis of DNA fragments archived within sediments. By sequencing chloroplast DNA fragments and comparing these to databases of known plant DNA sequences, it is possible to reconstruct long term vegetation patterns. In combination with radiocarbon dating and more traditional palaeoenvironmental techniques such as geochemical, pollen and diatom analysis we are able to reconstruct past land use changes, such as the creation of meadows or crop cultivation. By applying these techniques to island lake sediments we can disentangle how land use has changed over time due to population dynamics and socio-cultural factors.

The Sea of Moyle (Sruth na Maoile) project looks at the historical and socioecological resilience of island communities around the narrow sea between Scotland and Northern Ireland. Although ownership has changed since The Kingdom of the Isles centuries ago, the islands are still closely inter-connected, not least because they are within sight of each other. These islands provide a unique opportunity to reconstruct cultural and ecological change over long periods of time, due to their well-defined boundaries and their importance in cultural exchanges between the islands of Ireland and Britain.

Loch Finlaggan on the Isle of Islay is a medium sized lake, which reveals an extensive occupation history in lake sediment cores, with evidence of prehistoric crannogs, medieval and later royal and ecclesiastical occupation. Plant community shifts over time have been sequenced from the sedaDNA records, tracking many of these settlement phases into modern times, where surrounding farmsteads currently lie abandoned. The evidence from Finlaggan and other sites can be compared to other records such as census and historical data to track long term environmental change and the impact of population dynamics on the landscape.

7 LATE-HOLOCENE ANTHROPOGENIC DISTURBANCE ON ISLAY, INNER HEBRIDES: A PALYNOLOGICAL RECORD FROM LOCH FINLAGGAN

Abstract author(s): Ellis, Natalie (Newcastle University) - Pears, Ben (University of Southampton) - van Hardenbroek, Maarten (Newcastle University) - Henderson, Andrew (Newcastle University) - Scaife, Robert (University of Southampton) - Langdon, Catherine - Fonville, Thierry - Brown, Tony (University of Southampton)

Abstract format: Oral

We present palynological and geochemical evidence for anthropogenic impact in Loch Finlaggan. Data are derived from a lake sediment core collected adjacent to the archaeological site of Finlaggan on Islay. Archaeological evidence suggests occupation of Islay between 1200-1400 AD during Eilean na Comhairle, the Lordship of the Isles. We compare a core collected in the central part of the lake with a core taken directly adjacent to Finlaggan. Comparing these records allows interpretation of the causes, the degree of local and regional human impact and additionally determines the periods in which anthropogenic activity peaked. Results from the central core show a post-glacial sequence with an initial increase of arboreal pollen, followed by its decline due to forest clearance and grazing (Poaceae and *Plantago lanceolata*) in the upper part of the record. This is supported by a simultaneous increase in charcoal particles and two peaks in Ti, K and Zr, suggesting higher mineral particle input from erosion/run-off or groundwater/building activity. This pattern is even clearer in the core taken adjacent to the archaeological site, which spans a shorter time period and likely includes both the Viking and Medieval periods. This near-site core also contains two peaks in Ti, K and Zr indicating erosion/building. In this core, both peaks are accompanied by higher charcoal counts and further evidence of anthropogenic disturbance is inferred through the presence of *Cerelia* pollen, indicative of more intensive use of the landscape. This study enriches the archaeological evidence on Islay, providing further context to other proxy-evidence for on-site activity (e.g. sedimentary DNA and faecal biomarkers) as well as human impacts on the local and regional environment.

8 LANDSCAPES OF CHANGE: ARCHAEOLOGIES OF HISTORIC PERIOD CHANGE ON THE ISLAND OF ROUSAY, ORKNEY

Abstract author(s): Harland, Jennifer - Mainland, Ingrid - Gibbon, Sarah Jane (University of the Highlands and Islands)

Abstract format: Oral

The settlement of Skail, Westness, Rousay, inhabited from the Norse period to the 19th century, has seen considerable socio-cultural and climatic change during its occupation. Recent multi-faceted archaeological investigations into long term occupation and change are revealing complex buildings, rich artefact assemblages, significant environmental evidence, and unpublished archival records.

This paper will use Skail as a case study to examine sustainability and resilience in a small island context by using archaeological, palaeoecological, and historical evidence to explore oscillating powers relationship of ownership alongside self-sufficiency of occupiers of a shoreside farm. Fishing and agricultural production played a key role in the economies of the Scottish isles over our thousand year occupation sequence, but the relationships between people and the land and the sea changed dramatically during

this time. We'll be examining how local dietary customs change orientation, from a Scandinavian focus in the Norse period, towards an increasing orientation towards mainland Scotland by the early modern period.

This presentation will discuss our unpublished findings alongside our methodological approach, developed and implemented to undertake this archaeology-led community-based investigation of long term environmental and landscape change.

9 LINDISFARNE – ISLAND IN THE STREAM

Abstract author(s): Wilkins, Brendon (DigVentures; University of Leicester) - Petts, David - Kahlenberg, Raphael (Dept. of Archaeology, Durham University)

Abstract format: Oral

Lindisfarne is a small tidal island off the coast of NE England. It is most celebrated as a major early medieval ecclesiastical centre (c.AD630-875), and is particularly associated as the site of the creation of the elaborate 8th century Lindisfarne Gospels. The early Northumbrian church seems to have had a particular affinity with coastal and island sites – and Lindisfarne is just one of a series of early monastic sites in such locations. Such insular locations have often been framed in terms of isolation and separation, and fitted into a narrative of early monasticism being situated in remote or deserted locations. In this short paper, based on on-going research, we aim to reframe our understanding of the site, as a nodal point within a complex web of ecological and human relationships at a variety of scales, ranging from evidence of exploitation of the island's own terrestrial resources, its wider maritime hinterland and the national and international context of exchange and communication within a vibrant social, political and religious world that spans the North Sea.

10 MAKING VISIBLE THE INVISIBLE. THE ROLE OF GEOARCHAEOLOGY TO RECONSTRUCT PAST HUMAN-ENVIRONMENT INTERACTIONS IN MEDITERRANEAN ISLANDS

Abstract author(s): Revelles, Jordi (Institut Català de Paleoeologia Humana i Evolució Social - IPHES-CERCA / Universitat Rovira i Virgili) - Ghilardi, Matthieu (CEREGE, CNRS UMR 7330, Aix-Marseille University, IRD, Collège de France, INRAE)

Abstract format: Oral

Changes in the archaeological record are used to assess the chronology and continuity of human occupation at different scales, suggesting the succession of phases of higher/lower demographic density or settlement intensity, the abandonment of sites or, even, the depopulation of certain areas. However, sometimes these changes are affected by taphonomic issues, changes in mobility patterns or lack of radiocarbon dates in old excavations. In addition, bioarchaeological data is limited in regions where most part of sites were excavated long time ago, causing a methodological bias and confirming that past human settlement dynamics and economic activities cannot be described based exclusively on the in-site archaeological data. The geoarchaeological research emerges as the ideal source to fill these gaps. The application of palaeobiological studies in natural deposits allows reconstructing past human-environment interactions, shedding new light for evidence of farming activities and redefine archaeological territories and human occupation temporalities.

In that context, coastal wetlands in Mediterranean Islands provide the opportunity to reconstruct the palaeoenvironmental evolution and evidence of human impact, especially since the adoption of farming activities during the Neolithic. In this work we show the reconstruction of Middle and Late Holocene socio-environmental history in Corsica, providing a detailed history on the impact of farming activities (agriculture and husbandry) in coastal wetlands based on pollen records from different wetland areas along the Island. The evidence of the impact of farming activities on the landscape in Corsica is attested since Neolithic (ca. 7400 cal BP) and increased exponentially from the Iron Age onwards. Finally, this study shows the importance of wetland areas preservation in Mediterranean Islands, not only by the ecosystem services they provide, also for their value as a historical record of past human-environment interactions.

11 DELOS, A SMALL ROCK ISLAND: THE RELATIONS BETWEEN THE ESTABLISHMENT OF THE PAN-HELLENIC SANCTUARY AND THE USE OF NATURAL RESOURCES

Abstract author(s): Angliker, Erica (University of London, Institute of Classical Studies, Research Associate)

Abstract format: Oral

The island of Delos became famous in Antiquity despite its small size because it housed one of the most important and busiest sanctuaries in the Aegean. Scholars have spent much time debating the political disputes over Delos and the development of the sanctuary. This paper, by contrast, considers the establishment of the major Pan-Hellenic sanctuary on Delos by focusing on the uses made of the island's natural resources. It begins by discussing the strategic geographic location of Delos in the middle of the Aegean between Asia Minor and Mainland Greece, which make it a suitable nodal point for those crossing the Aegean. It then looks at the relation between the major sanctuary's growth and the exploitation of natural resources such as the island's plentiful store of fresh water and its large natural harbour that enabled it to accommodate many ships. Finally, the paper discusses Delos's agricultural use of the land of the neighbouring island of Rhenium, thereby showing how the survival and subsistence of a small island like Delos was possible thanks to the natural resources of a neighbouring island.

TRANSPORTED LANDSCAPES AND SOCIAL RESILIENCE IN THE BALEARIC ISLANDS SINCE PREHISTORY. THE STUDY-CASE OF SANTA PONÇA (MALLORCA, WESTERN MEDITERRANEAN)

Abstract author(s): Servera-Vives, Gabriel (Laboratorio di Palinologia e Paleobotanica. Dipartimento di Scienze della Vita. Università degli Studi di Modena e Reggio Emilia; ArqueoUIB, Departament de Ciències Històriques i Teoria de les Arts, Universitat de les Illes Balears) - Snitker, Grant (Department of Crop and Soil Sciences, College of Agricultural and Environmental Sciences. University of Georgia) - Gómez-Pujol, Lluís (Earth Sciences Research Group, Dept. of Biology. University of the Balearic Islands) - Picornell-Gelabert, Llorenç (ArqueoUIB, Departament de Ciències Històriques i Teoria de les Arts, Universitat de les Illes Balears) - Fornós, Joan J. (Earth Sciences Research Group, Dept. of Biology. University of the Balearic Islands) - Florenzano, Assunta (Laboratorio di Palinologia e Paleobotanica. Dipartimento di Scienze della Vita. Università degli Studi di Modena e Reggio Emilia) - Calvo Trias, Manuel (ArqueoUIB, Departament de Ciències Històriques i Teoria de les Arts, Universitat de les Illes Balears) - Mercuri, Anna Maria (Laboratorio di Palinologia e Paleobotanica. Dipartimento di Scienze della Vita. Università degli Studi di Modena e Reggio Emilia)

Abstract format: Oral

Islands are fragile environments that may throw light on long-term cultural and environmental dynamics by amplifying geographical and cultural factors. The Balearic Islands are crucial for the study of these interactions during the Holocene due to their presumably late human colonisation at ca. 2500-2300 BC, compared to other Mediterranean islands. The EU-funded OLEA-project (G.A.-895735) aims to focus on the drivers and timing of the spread of *Olea macchia* as a central feature of the current Balearic mosaic landscape. This work will try to move forward the research on mosaic landscape formation in the Mediterranean in relation to human, climate, and environmental drivers. This research also benefits from the research project Mobility and connectivity of prehistoric communities in the Western Mediterranean during the Late Prehistory (University of the Balearic Islands, PID2019-108692GB-I00; and CGL2016-79246-P -AEI-FEDER, UE-), which addresses a diachronic analysis of mobility and connectivity of prehistoric communities in the Balearic archipelago.

To do so, we will present the results of the paleoenvironmental study of the coastal lagoon sequence of Santa Ponça. This area is rich in archaeological sites ranging from the Bronze Age to Modern Times, so providing a record of landscape transformation associated with cultural changes. We will combine off-site paleoenvironmental data (pollen, non-pollen palynomorphs, sedimentology, sedimentary charcoal) and on-site archaeobotanical and archaeological data, to understand socioenvironmental interactions, how newcomers produced new types of landscapes and how humans faced societal and climate challenges throughout history. Also, new indicators for the Balearic landscape and human activities will be based on modern pollen and NPPs to further precise the causality and intensity of landscape changes.

ASSESSING HUMAN DIET AND FOOD PROCESSING THROUGH ORAL HEALTH AND STABLE ISOTOPES DURING THE COLONIAL PERIOD IN GRAN CANARIA

Abstract author(s): Morquecho Izquier, Aarón - Brito-Mayor, Aitor - Santana Cabrera, Jonathan (G.I. Tarha. Department of Historical Sciences. University of Las Palmas de Gran Canaria)

Abstract format: Oral

The Canary Islands were conquest and colonised by the Kingdom of Castile at the end of the 15th century AD. These islands were previously inhabited by farming Indigenous people that arrived around the 2nd century AD from North Africa. The Canarian colonial economy combined European and indigenous subsistence strategies. Europeans brought to the islands their domestic plants and animals and adapted their technological skills to these island environments. Moreover, they introduced new food processing techniques and food habits different from the indigenous period. This study presents a comprehensive analysis of oral health and stable isotopes from seven colonial sites in Gran Canaria Island (n= 120 individuals), to illustrate the potential contribution of bioarchaeology to understanding the human diet and food processing changes in the Spanish colonial experience in the Canary Islands. The results of our study, interpreted jointly with historical records and archaeological evidence, suggest that colonial dietary habits did not significantly differ from the indigenous period. However, these results highlight the introduction of new food resources and food processing techniques. This pattern reflects reliance on local resources and indigenous subsistence strategies, despite historical evidence of a new agricultural economy. Our study provides a new perspective on colonial life in the Canary Islands and human adaptation to oceanic islands.

FIRST STAGE ABROAD: NEW INSIGHTS INTO THE ANIMAL HUSBANDRY OF THE SPANISH COLONIAL PERIOD FROM SAN MARTIN (GRAN CANARIA)

Abstract author(s): Brito-Mayor, Aitor - Morquecho-Izquier, Aarón (G.I. Tarha. Department of Historical Sciences. University of Las Palmas de Gran Canaria) - Moreno-Benítez, Marco (Tibicena, Arqueología y Patrimonio) - Santana-Cabrera, Jonathan (G.I. Tarha. Department of Historical Sciences. University of Las Palmas de Gran Canaria)

Abstract format: Oral

The Canary Islands were inhabited by farming Indigenous people that arrived around the 2nd century AD from North Africa. They were conquest and colonised by Castilian people at the end of the 15th century AD. These islands played a significant role in the European expansion in the Atlantic as they were in the maritime routes between Europe and America during the Early Modern period. European colonisers translocated Old World animals into the Canary Islands and made use of indigenous livestock, yielding a new pattern of

animal husbandry. This study presents the first zooarchaeological analysis of the Spanish colonial period of the Canary Islands using the zooarchaeological assemblage of the historical hospital of San Martín. This facility is in Las Palmas de Gran Canaria city (Gran Canaria Island) and dates from the early 16th to late 17th centuries. Zooarchaeological data and stable isotope analysis were used to investigate animal translocation and animal husbandry practices. Historical, archaeological, and zooarchaeological evidence provide a glimpse of the human-animal interactions in the first stages of the European colonial experience in the Atlantic world.

CORSICA BETWEEN LAND AND SEA: ENVIRONMENTAL RESOURCES AND PRODUCING DYNAMICS

Abstract author(s): Piccardi, Eliana (Independent researcher)

Abstract format: Poster

Corsica island is not a small sized European island; nevertheless, it may offer multifold patterns about the environmental resources use and their inside or external management involving, somehow, sustainability and trade issues during Iron Age and the Roman Period.

The rare literary sources and the past investigations without modern scientific analyses have long time affected the reconstruction of the ancient landscape and of the exploiting frame; nevertheless, in the last years, modern system of analysis have begun to be employed about the island evidence belonging to this chronological arch: some examples may be given.

The Late Iron Age glass artifacts named as 'anneaux porcelaniques' in the archaeological literature were probably locally made, although the arrival of the rough material itself to the island postulate interesting external connections. About the use of land resources we still have scattered evidence of the last millennium BC before the Roman period (e.g. Tavera) and an increasing horizon of older and new evidence about the Roman Period (e.g. in the Early Empire rural site around Mariana). Besides, the mention of some war redemption due to the Romans shows silvo-agro-pastoral materials exploited on the island, like wax and pitch.

The evidence likely related to sea-resources, beyond short mentions for the Roman Period in the written documents, is still to be explored by the archaeometric methods in its whole, and it is mostly related to ancient and nowadays coastal lagoons landscape: e.g. at Cala, at M. Bughjo feet, in the surroundings of Mariana, in the pond of Diana nearby Aléria. Here, a small island has been created by shell layers due to the continued exploitation since antiquity and in some Etruscan tombs were found shells and glass beads, while old oral sources refer about the finding of fishes inside of containers or fountains in the Roman site.

ADULT AGE-AT-DEATH IN PAST POPULATIONS: WIDENING HORIZONS OF METHODS, APPROACHES AND INTERPRETATIONS

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Fuchs, Katharina - Müller-Scheessel, Nils - Rinne, Christoph (Kiel University) - Séguy, Isabelle (French Institute for Demographic Studies)

Format: Regular session

After experiencing childhood and adolescence a person goes through different stages of life in adulthood, defining their roles in respective social, biological and economic systems. Fertility and reproduction, acquired life experience and skills or physical impairments caused by age and illness strongly influence these roles, and vice versa. Adulthood is thus a key aspect for understanding the life of past societies and of special significance for research on palaeodemography, social archaeology, palaeopathology or palaeoepidemiology. However, we all face the same problem: estimations of adult age-at-death are inaccurate. Due to the osteological reality (skeletal preservation, age marker specificity, reference collections), the information we deal with are often wide-spanning age ranges, hampering supraregional and diachronic population studies. Furthermore, recent research suggests that osteological methods that have been used for decades determine 'the young too old, and the old too young', implying shifts in mortality structures. These shifts cause discrepancies in life expectancy across different cultural and socioeconomic backgrounds. The consequences of these discrepancies for past, present and future research are poorly understood. Thus, central aims of this session are to:

- discuss innovative disciplinary and interdisciplinary methods for determining or calibrating adult age-at-death in order to improve the accuracy,
- examine potential shifts in mortality with respect to analytical approaches and interpretation,
- challenge and diversify the concept of 'adulthood' in its biological social, and economic meaning,
- explore synergies between experts from different disciplines to raise the discussion on this complex and significant topic to a new level.

We welcome theoretical and applied contributions, including methodological, qualitative and/or quantitative studies on ancient populations across time and space. We invite a broad scientific audience from the fields of biological, forensic and archaeological anthropology, palaeopathology, prehistoric and historical archaeology as well as those interested in aDNA research and other disciplines.

ABSTRACTS:

1 ADULT AGE-AT-DEATH ESTIMATION ACCURACY – WHAT IS THE ISSUE?

Abstract author(s): Fuchs, Katharina (Kiel University, Institute of Clinical Molecular Biology)

Abstract format: Oral

In the study of past societies, determination of the biological age-at-death of skeletonized individuals is the starting point for further investigations, such as paleodemographic processes, associations between age and disease, osteobiographies and personhood, as well as individual and collective sociocultural and socioeconomic developments. Thus, the existing methodological inaccuracies in estimating adult age, the large variability in age classifications, and the resulting application of age-at-death classes for adults are problematic. Moreover, the definition of 'age' in the term age-at-death depends on the perspective described by chronological, biological and social age constructs which are not necessarily consistent within or between populations.

This paper is intended for the opening of the session as it briefly reviews the history of research on adult age-at-death estimations and interpretations in diverse fields of bioarchaeological research. It focuses on the efforts undertaken to overcome the discrepancies between different definitions of age and ageing. Issues such as 'The Grandmother hypothesis' and 'The invisible elderly' will exemplarily be discussed regarding their significance for studies of past populations. The paper also discusses the issue of shifts in mortality structures of adult cohorts and the implications given for paleodemography that might be expected when re-evaluating existent estimations.

The presentation illustrates why this topic must continue to play an important role in the study of past societies and which avenues should be explored for further developments.

2 ADULT AGE-AT-DEATH IN THE WINTHIR REFERENCE COLLECTION MUNICH – EVALUATION OF CURRENT ANTHROPOLOGICAL METHODS

Abstract author(s): Trautmann, Bernd - von Heyking, Kristin - Lee, Janette - Schratzenstaller, Barbara (The Bavarian Natural History Collections - SNSB, State Collection for Anthropology and Paleoanatomy Munich - SAPM) - Degenhart, Simon - Paulus, Christof (Ludwig-Maximilians-University Munich - LMU) - Harbeck, Michaela (The Bavarian Natural History Collections - SNSB, State Collection for Anthropology and Paleoanatomy Munich - SAPM)

Abstract format: Oral

The determination of age-at-death of adult individuals is still a challenging field within physical anthropology as well as forensic studies. New methods have been established for the last couple of years that make these age-at-death determination more precise. However, most of these methods are laboratory approaches that are still complex and expensive. In physical anthropology the main methods still base on macroscopic identification of features on dry bone that are quick and easy however more imprecise. The newly established Winthir collection housed at the State Collection of Anthropology and Paleoanatomy in Munich offers the possibility for evaluation and further development of these methods. This collection consists of 248 individuals (94 subadults, 154 adults) of known sex, age-at-death, occupation as well as a great amount of other personal information about every single individual. All of these people were buried in the period of 1883 to 1904. A multidisciplinary project started in February 2020 has the goal to establish this collection as a reference series that is accessible to the research community in the future. In a first step, every individual was evaluated anthropologically for sex, age-at-death, paleopathology and other visible skeletal changes with established methods without knowledge of the historical data. In further work steps we included the historic data derived from ecclesiastical and municipal sources (parish registers, civil registers, municipal registration records ecc.) to correlate it with age-specific changes in the human skeletal material and check the used methods for accuracy and handling to evaluate their usability for future anthropological work. The evaluated methods include changes in the facies symphysialis and auricularis of the pelvis and the obliteration of cranial sutures. First results show, that in general, difficulties arise especially with older individuals. But also younger women of the Winthir collection are regularly overestimated in age with osteological methods.

3 AS OLD AS YOU'RE TOLD. BIOARCHAEOLOGICAL APPROACH TO AGE-AT-DEATH AND AGE CLASSES. A CASE STUDY FROM TAYMA, NORTHWEST ARABIA

Abstract author(s): Petiti, Emmanuele (DAI - Deutsches Archäologisches Institut)

Abstract format: Oral

Although the bioarchaeology of sex and gender has been a leading research avenue in the last 25 years, the "bioarchaeology of adulthood" remains a still poorly trodden path and the main interpretative models for the cultural meaning of age classes are hardly critically approached, ultimately determining conservative choices also for the methodologies of assessment of the age at death. The case presented here aims to challenge such models and outlines a direct link between new interpretation models for age classes and more focused methodological choices.

Our contribution presents the results of the bioarchaeological analyses on the human remains from a burial ground in the oasis of Tayma, Northwest Arabia (DFG project no. 63608405), which had its main occupation phase in the 4th and 3rd centuries BCE. The bone specimens, belonging to 63 individuals, mostly from single burials, were poorly preserved, presenting challenging conditions

for the assessment of sex and age at death. Yet, the generally good preservation of their pubic symphyses provided an array of data which served as base evidence to define age-related models for degenerative changes, such as arthropathies and tooth loss.

The results, broken down by sex classes and burial types, frame the question as to whether the cultural meaning of the aging process should play a role in defining the methodological strategies for age at death assessment. At the same time, adolescents, from 8 years old onwards, were buried according to patterns normally attested only for adults, suggesting that "biological age" and "cultural age" did not necessarily overlap.

4 ANTE MORTEM TOOTH LOSS (AMTL) – VALID AGE ESTIMATOR AT DEATH FOR ADULT INDIVIDUALS OR TOOTHLESS TIGER?

Abstract author(s): Müller-Scheeßel, Nils - Rinne, Christoph (Institute for Pre- and Protohistory, Kiel University) - Fuchs, Katharina (Institute of Clinical Molecular Biology, Kiel University)

Abstract format: Oral

It is long known that the rate of tooth loss highly correlates with age. However, and in difference to tooth abrasion, to the best of our knowledge so far no serious steps have been taken to make ante mortem tooth loss (AMTL) a candidate for the estimation of age at death. While the reasons for this seem to be quite obvious – AMTL is supposed to be due to a number of factors, not least cariogenic diet which is highly culturally specific as well as inflammation that itself can be due to different causes, and AMTL is also varying from individual to individual – the advantages warrant at least an attempt. In contrast to almost all other indicators of age, it is more or less binary – a tooth is lost ante-mortem with subsequent remodelling of bone or not – and therefore fairly unambiguous, thus it can be assessed even by the untrained eye, and it can hence potentially also applied to legacy data. Moreover, if AMTL proves to be an age estimator correlating linearly with age, it has the potential to give age estimates even for very old adult individuals, a task where most other methods of age estimation fail miserably.

In this paper, we will first introduce AMTL as inferred from modern data with known age, and then transfer these insights to archaeological case studies from the Neolithic to the Metal ages. We will show that it is possible to give linear regression formulas for the correlation between age and AMTL. With the help of Monte-Carlo-simulations, we will discuss the effects of random variation in AMTL between individuals. Further research will have to show if AMTL is a valid estimator for individuals or if it should only applied to arrive at age distributions of skeletal populations.

5 PALEORADIOLOGY AND THE ARCHAEOLOGY OF AGING: NEW TOOLS TO ANSWER OLD (AGE) QUESTIONS

Abstract author(s): Van Schaik, Katherine (Harvard Medical School)

Abstract format: Oral

As Appleby (2017), DeWitte and Stojanowski (2015), and others have noted, a longstanding methodological focus on identifying a skeleton's chronological age has compromised efforts to evaluate and to understand assessment of biological age in archaeological contexts. As medical and scientific techniques are increasingly used to provide more thorough assessment of the archaeological remains of past populations, new opportunities are emerging to address gaps in knowledge, including those related to advanced age. Using a skeletal reference collection for which chronological age was known through coffin plates, this study places two methods of skeletal analysis – assessment by an osteologist, and analysis of X-ray images by a radiologist – into dialogue with one another. Lesion distribution and lesion burden, with reference to chronological age and sex, were compared in order to identify (1) pathologies that each methodology may overlook or misidentify, (2) how results produced by these two analytical modalities are affected by an individual's sex, and (3) how data from osteological analysis and radiological analysis may be combined to provide more thorough and accurate assessment of the aging process in skeletons from past populations. Results demonstrated that radiographs, especially when assessed by an individual trained in musculoskeletal radiology, provided enhanced assessment of bone cortex and reduced the likelihood that interpretation of lesion burden would be unduly affected by taphonomic decay. The study provides a model by which interdisciplinary analysis and the tools of advanced medical imaging may be used to redress longstanding biases in the study of human remains from the past.

6 THE INVISIBLE 'ELDERLY': ESTIMATING MATURE AGE-AT-DEATH IN BURNT ADULT HUMAN REMAINS USING THE FALYS-PRANGLE METHOD

Abstract author(s): Veselka, Barbara (Maritime Cultures Research Institute, Department of Art Sciences and Archaeology, Vrije Universiteit Brussel; Research Unit Analytical, Environmental & Geochemistry, Department of Chemistry, Vrije Universiteit Brussel) - Hlad, Marta (Maritime Cultures Research Institute, Department of Art Sciences and Archaeology, Vrije Universiteit Brussel; Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles) - Wolfe Steadman, Dawnie (Forensic Anthropology Center, Knoxville) - Annaert, Rica (Flemish Heritage Agency) - Capuzzo, Giacomo (Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles) - Dalle, Sarah - De Mulder, Guy - Sabaux, Charlotte (Department of Archaeology, University of Ghent) - Salesse, Kevin (Anthropology and Human Genetics, Department of Biology of Organisms and Ecology, Université Libre de Bruxelles; PACEA De la Préhistoire à l'Actuel: Culture, Environnement et Anthropologie, Université de Bordeaux) - Snoeck, Christophe (Maritime Cultures Research Institute, Department of Art Sciences and Archaeology, Vrije Universiteit Brussel; Research Unit Analytical, Environmental & Geochemistry, Department of Chemistry, Vrije Universiteit Brussel; G-Time Laboratory, Université Libre de Bruxelles)

Abstract format: Oral

The Falys-Prangle method assesses age-related morphological changes to the sternal clavicle end (SCE), enabling the observation of mature adults from the 5th decade onwards in unburnt human skeletal remains. The aim of this study is to investigate the applicability of the Falys-Prangle method on burnt human remains. This is achieved by evaluating 52 SCE of 40 cremated individuals (out of 86) from the William M. Bass collection of the Forensic Anthropology Center (Knoxville, Tennessee) of known age-at-death and sex. Surface topography, porosity, and osteophyte formation are evaluated, after which the calculated composite score is associated with the corresponding age range as described by Falys and Prangle. The method is also applied on an archaeological case study from Oudenburg, Belgium, dating to the Roman period. The assessed age ranges strongly agree with the true age ranges ($\alpha = 0.828$), suggesting the Falys-Prangle method to be applicable on burnt human remains. The case study from Oudenburg yields markedly improved age-at-death estimates, significantly enhancing our understanding of the age distribution within this community. Information on age-at-death is key in the construction of biological profiles of past individuals. The mature adult is often invisible in the archaeological record since most macroscopic age estimation methods do not distinguish beyond 46+ years old. Our study stresses the usefulness of a large-scale application of the Falys-Prangle method, which will increase the visibility of mature adults, especially in archaeological burnt human skeletal collections, where such information is, at present, extremely difficult to obtain.

7 AGE-AT-DEATH, CONSANGUINITY AND ARCHAEOLOGY: LEVERAGING HUMAN REMAINS FOR CHRONOLOGY AND CHOROLOGY

Abstract author(s): Rosenstock, Eva (Freie Universität Berlin, Einstein Center Chronoi)

Abstract format: Oral

The READ technique to identify consanguinity not only opens new ways to calibrate ^{14}C dates derived from the respective skeletons. As a proxy for temporal relationships between skeletal individuals found in archaeological contexts, consanguinity data can also inform us about temporal relationships between stratigraphic units that contain human remains or the duration of artefact types they are associated with. However, we currently lack the necessary precision to fully embrace the potential of human remains, their individual biographies and their genetics, as long as age-at-death, an important model proxy, is anthropologically only given as broad spans of several decades or even largely biased for adult skeletons as the majority of human remains. Using Neolithic cases from settlements such as Çatalhöyük, cemeteries such as Stuttgart-Mühlhausen or Trebur and reanalyses of pooled individual data, the paper outlines in a "what-if-we..." fashion how more precise anthropological age-at-death determinations could enhance our understanding of chorology and chronology of sites, individuals and artefacts in future multi-disciplinary approaches combining age-at-death with consanguinity, stratigraphy and typology.

8 R PACKAGE MORTAAR – LIFE TABLES AS ANALYTIC TOOL

Abstract author(s): Rinne, Christoph - Müller-Scheeßel, Nils (Kiel University)

Abstract format: Oral

Accessing age at death of each individual of a skeletal population is challenging enough. To convert these data of death into more useful data to foster archaeological interpretations of the once living population, Acsádi and Nemeskéri introduced the life table approach into the archaeological discussion. Since then, more than 50 years of discussion, critique and modifications have accompanied the undoubted need of archaeologists of the information provided by life tables.

The number crunching needed for arriving at life tables is often executed within spreadsheets and in many cases forms the end of the efforts in archaeology. Instead, such life tables should be a starting point to review the information, check proposed modifications, e.g. child deficit, age class interpolations, variations by slightly changed age estimations or demographic calculations. Thus fast forward data manipulation and easy life table calculation is crucial for a fruitful investigation of age at death data lists. The "Initiative for Statistical Analysis in Archaeology Kiel" (ISAAK) has developed a R-package to allow fast and easy calculation. This R-package mortAAR, presented in this paper, facilitates a reflective practice, multiple models and subsequent analyses of the expected living population. In addition, effects of the occupancy of different age classes and their impact on the population estimate can be easily tested.

9 BAYESIAN APPROACHES IN PALEODEMOGRAPHY: ANSWERING THE QUESTION OF POORLY PRESERVED SKELETAL REMAINS

Abstract author(s): Lukasik, Sylwia (Institute of Human Biology and Evolution, Faculty of Biology, Adam Mickiewicz University in Poznań) - Bijak, Jakub (Department of Social Statistics and Demography, University of Southampton) - Krenz-Niedbała, Marta (Institute of Human Biology and Evolution, Faculty of Biology, Adam Mickiewicz University in Poznań) - Sinika, Vitaly (Archaeological Research Laboratory, Pridnestrovian State University named after T. G. Shevchenko)

Abstract format: Oral

Paleodemographic research requires having an accurate assessment of age-at-death, which, however, is hampered by poor preservation and completeness of skeletal remains. Excluding individuals with imprecise age estimations reduces the small skeletal sample sizes further. Here, paleodemography can benefit from using Bayesian methods as an alternative approach to deterministic life tables based on well-preserved osteological material, assessed according to only one or two aging methods. The aim of this study is to explore the usefulness of a range of Bayesian methods for estimating age-at-death distributions based on fragmented and incomplete skeletons, aged with several criteria. Especially for adults, such methods can allow incorporating expert opinion in the estimates through prior reference population assumptions.

In total, 312 Scythian individuals (93 children and 219 adults) from the Black Sea region were included in the study, dated to the 5th–2nd century BCE. Age-at-death was assessed using six methods depending on the availability and preservation of the skeletal material. Age categories were unified and adjusted to different aging methods to allow for application of a probabilistic assessment of age categorization. An extension of the hierarchical Bayesian model of Caussinus and Courgeau (2010) was applied, with three alternative reference populations: a hypothetical, subjective one, a real reference population, and no reference. Young adults were found to likely exhibit a high probability of death, which could result from Scythian lifestyle, conflict and wars.

Our study shows that Bayesian approaches can provide a more realistic representation of age structures based on incomplete human remains than the classical life tables, though at the expense of increased uncertainty of the estimates. The results, especially for small samples, proved sensitive to the model specification. The value added of the proposed approach for assessing age-at-death, especially for adults, is an honest acknowledgement of various sources of uncertainty in the estimation.

10 INDIRECT AGE ESTIMATION OF AN ADULT BURIED POPULATION

Abstract author(s): Seguy, Isabelle (Institut national d'études démographiques - Ined; Université de Nice Côte d'Azur, CNRS, CEPAM) - Batista Goulart, Luana (Université de Nice Côte d'Azur, CNRS, CEPAM) - Caussinus, Henri (Université Paul Sabatier, Toulouse) - Courgeau, Daniel (Institut national d'études démographiques - Ined)

Abstract format: Oral

Paleodemographers have used various methods to estimate the age structure of a buried population, for which only biological indicators are available. These methods use a reference population whose age and biological indicators are known, and make various hypotheses. They raise a number of problems, both in their underlying hypotheses and the estimates they provide, which are discussed.

We present a new fully Bayesian method which considers the frequencies observed both in the reference population and at the archaeological site under study to be random, on the hypothesis of biological uniformity between the two populations. The principles of this method are briefly presented and contrasted with those of earlier methods. The method is then applied to some archaeological cemeteries of modern France. Once the age structure at death of the site is known, it becomes possible to estimate the individual age at death of these buried people. An example is given with the plague cemetery of Martigues.

11 AN AORISTIC APPROACH TO POPULATION DEMOGRAPHY. DEALING WITH VARYING PRECISION IN AGE-AT-DEATH ESTIMATION IN AN EARLY MODERN POPULATION FROM SWITZERLAND

Abstract author(s): Moser, Daria (Institute of Clinical Molecular Biology, Kiel University) - Leder, Cora (Faculty of Archaeology, Leiden University) - Rindlisbacher, Laura (Integrative Prehistory and Archeological Science, University of Basel; Archäologische Bodenforschung Basel-Stadt) - Pichler, Sandra (Integrative Prehistory and Archeological Science, University of Basel)

Abstract format: Oral

Traditional methods of estimating age-at-death in human skeletal remains pose various problems, one of which is the degree of precision. This varies widely according to individual age and bone preservation, especially in adults. While we may be able to narrow down the age of a well-preserved infant to within a few months, older, poorly preserved individuals may only be assigned very broad age ranges spanning 20 years or more. This poses a significant challenge to demographic insight into past populations, as population-wide pooling of data is not possible unless data is categorized consistently.

We present a new solution to this problem by introducing an aoristic approach which combines existing demographic methodologies in handling age ranges of varying lengths and concepts of mortality and survivorship. Our approach proposes splitting the inconsistent age data gleaned from the osteological sample into consistent age groups of uniform length as required by the specific topic and calculate mortality for each group as proposed by Boldsen 1988 for his proportional method. To address issues raised against this method regarding the non-uniform probability of dying within the age ranges, we propose a correction through an interval censored data approach informed by known broader time- and location-specific mortality patterns (e.g. model life tables).

Our new aoristic approach thus allows for the inclusion of all individuals in demographic analyses, regardless of the precision of specific age determinations, and mitigates distortion caused by outliers. Using our new approach, we were able to show that the unusual age distribution in an Early Modern Swiss cemetery represents a catastrophic rather than an attritional mortality profile and was likely caused by an epidemic.

A. AGE-AT-DEATH ESTIMATION FROM THE SKELETON: DEEP ANALYSIS OF PELVIC ARTICULAR SURFACES USING DATA MINING AND MACHINE LEARNING METHODS

Abstract author(s): Koterova, Anezka (Department of Anthropology and Human Genetics, Faculty of Science, Charles University) - Buk, Zdenek - Stepanovsky, Michal (Faculty of Information Technology, Czech Technical University in Prague) - Bruzek, Jaroslav - Velemínska, Jana (Department of Anthropology and Human Genetics, Faculty of Science, Charles University)

Abstract format: Poster

Age-at-death estimation of adults remains one of the most challenging biological profile estimation parameters in both past and current populations. Many efforts have been made to develop methods that are accurate and reliable at the same time. Current research involves the 3D representation of joint surfaces and the use of geometric morphometry methods. It is assumed that such an approach offers a more objective evaluation of age-related changes than traditional visual methods often dependent on observer experience. Our contribution aims to find the most appropriate approach of data preprocessing (surface representation) and extraction of age-related pattern to estimate the age of a skeleton. We have 3D scans of several hundred of adult pelvic bones from four European and one Asian identified skeletal collections at our disposal. Several approaches were used to preprocess 3D data, such as depth map, 3D point cloud, 3D voxel representation, geometric transformation and so-called fingerprint based on surface variation or transformation according to the dominant shape of the articulation surface. We extracted patterns that might be suitable for age estimation from such pre-prepared data in the following ways. 1) Calculation of the surface variation of the scanned surface; 2) Approximation of the scanned surface by various functions to recognize the characteristic shape of this surface; 3) Determining the representative height of the scanned surface profile, and 4) Detection of significant lateral profile elevation in the scanned surface. The best approaches for surface representation and extraction of the age-related pattern will be chosen to propose an age prediction models. Preliminary results indicate that age-at-death can be estimated at narrower age intervals than the current three age classes (young adults, mature adults, and old individuals).

432 PERSPECTIVES ON BRONZE AGE CHANGES

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Schaefer-Di Maida, Stefanie (Institute of Pre- and Protohistoric Archaeology, CAU Kiel; CRC 1266) - Raese, Hendrik (Institute of Pre- and Protohistoric Archaeology, CAU Kiel) - Filipovic, Dragana (Institute of Pre- and Protohistoric Archaeology, CAU Kiel; CRC 1266) - Melheim, Anne Lene (Museum of Cultural History Oslo, Department of Archaeology)

Format: Regular session

The goal of this session is to consider changes in the European Bronze Age from different, multi- and interdisciplinary perspectives and to compare them across temporal and spatial constraints.

Our session is interested in contributions, that deal with cultural developments, which unfolded in Europe during the Bronze Age. These are often conceived as similar from region to region. For instance, the shift from inhumation to cremation was a fundamental change in funerary customs, signaling also a transformation in ideology. Moreover, we see signs of significant changes in subsistence economies and land uses: new animals and plants came into use, new storage and cultivation techniques were applied. New forms of material culture – tools and objects, such as new types of weapons - were widely distributed through dynamic and shifting networks, as documented, for example, by the numerous finds of hoards. Changes in world-view are evidenced by the spread of new rites (e.g. use of cooking pits and new burial customs) and new symbolic grammar (e.g. sun-animal symbolism).

However, these and other changes did not happen in all and every region of the continent and not at the same time or at the same pace. Clearly, Bronze Age developments took different pathways in different regions, evolving in both uniform and opposing ways.

In this session, we want to bring together and compare the developments in subsistence, society, ideology, economy, ecology, in order to get a more nuanced understanding and to lay the foundation of a chrono-sequence of changes in Bronze Age Europe. We propose to do this within the frame of human-environment relationships, as both cultural and environmental context may have influenced if and how these changes were played out in space and time. We invite contributions from, but do not limit them to, archaeology (including subdisciplines), anthropology, environmental science and geosciences.

ABSTRACTS:

1 CHANGES IN TEXTILE PRODUCTION IN THE BRONZE AGE AEGEAN

Abstract author(s): Siennicka, Malgorzata (University of Göttingen, Institute of Archaeology)

Abstract format: Oral

Textiles are hardly ever preserved in the Bronze Age Aegean (c. 3000-1200 BCE), and only a small number of mineralised textiles were discovered in the Late Bronze Age contexts. Nevertheless, we are aware that both vegetal and animal fibres and products made of skins, furs, and wool have been exploited for thousands of years to make clothes and other household items. Along with a number of cultural, social, political, technologic, and economic changes that occurred during the Bronze Age, also textile manufacture and industry transformed in many ways. With time passing, textiles and textile production have gained a new social and economic significance, and – as the Late Bronze Age written sources demonstrate – became one of the most important industries of the palatial societies. The aim of this paper is to review the changes of textile production in the Early, Middle and Late Bronze Age Greece, basing on archaeological, textual and iconographic evidence.

2 SALT IN THE CENTRAL AND NORTH-CENTRAL ANATOLIA DURING THE BRONZE AGE

Abstract author(s): Dardeniz, Gonca (Istanbul University; Department of Protohistory and Near Eastern Archaeology)

Abstract format: Oral

Salt is a key mineral for human history. Studies on salt in Anatolia, one of the resource-rich areas of the ancient Near East, have largely focused on determining the geological localization and capacity of the reserves. However, procurement and use of salt received limited attention especially in Anatolia. Inhabited as early as the Paleolithic, there is no doubt that the settlers of the region have been benefiting from salt through millennia.

This talk will review geological, archaeological, ethno-archaeological, and textual data to assess the role of salt within the larger economic, social, and political setting of the Bronze Age Anatolia (c. 3000–1200 BCE). While presenting estimates for the consumption for the Early Bronze Age (c. 3000–2000 BCE), when no textual records are available, for the Middle and Late Bronze Age (c. 2000–1200 BCE), my discussion of the economic value, transportation methods, and people who may have been involved in salt work is based specifically on the available textual records.

As extrapolations for the consumption based on recent fieldwork validate significant utilization during the Bronze Age, the easy accessibility of rock salt and solar-evaporated salt pans ranks salt lower among the strategically controlled materials. Even though salt appears as a circulating commodity in the textual records of the Old Assyrian Colony Period (c. 1970/1950–1750/1700 BCE), and a certain political control especially over saltlicks is documented in the Hittite Empire period accounts (c. 14th–13th centuries BCE); the centralized system molded around the powerful economic trade network and well-established economic institutions did not demonstrate any ‘visible’ demand on salt. While politically transforming from chiefdoms to empire, this seemingly insignificant demand for salt portrays Bronze Age Anatolian salt economy as different to its Mesopotamian and European counterparts.

3 A MULTIDISCIPLINARY APPROACH TO COMMUNITY, SETTLEMENT AND SUBSISTENCE IN THE UPPER SEINE VALLEY (FRANCE) DURING THE BRONZE AGE

Abstract author(s): Peake, Rebecca (Inrap; UMR 6298) - Herrscher, Estelle (Aix Marseille Univ; LAMPEA) - Auxiette, Ginette (Inrap; UMR 7041) - Balter, Vincent (Ecole Normale Supérieure de Lyon; LGL-TPE) - Delattre, Valérie (Inrap; UMR 6298) - Gouge, Patrick (Département de Seine-et-Marne; UMR 6298) - Mordant, Claude (Université de Bourgogne; UMR 6298) - Roscio, Mafalda (Eveha; UMR 5138) - Toulemonde, Françoise (UMR 7209, Archéozoologie, Archéobotanique: Sociétés, Pratiques et Environnements) - Varalli, Alessandra (CaSEs Research Group, Department of Humanities, Università Pompeu Fabra)

Abstract format: Oral

Tell me what you eat and I will tell you who you are!

The Upper Seine valley has been the focus of large-scale archaeological investigation for several decades and is now one of the most intensively researched and best understood areas of France still yielding important new information each year. Bronze Age and early Iron Age sites are numerous and well preserved, with over 70 settlements and 40 cemeteries excavated in the area forming a coherent and spatially dense pattern during this period. The area has therefore provided an abundant resource for ongoing research.

A new project set up in 2019, the Project Bronze Pal, has focused on studying food production and consumption, diet and mobility in this area throughout the Bronze Age using a multi proxy biochemical analysis. Carbon, nitrogen and sulphur stable isotope analyses have been performed on 40 human bone, 36 animal bone and 34 cereal samples from Early, Middle and Late Bronze Age contexts (2100 – 900 cal. BC). First results suggest significant changes in diet and farming practices during this period, like the transition from a C3 plant based diet to one mainly based on C4 plants like millets and an increasing animal protein consumption during the Late Bronze Age. Furthermore, preliminary sulphur data seem to highlight the presence of individual mobility, likely more significant for men. This paper is a preliminary presentation of a multidisciplinary project that purposes to combine archaeological and isotopic data in a comprehensive approach towards a greater understanding of Bronze Age communities of the Upper Seine Valley.

4 BRONZE AGE INNOVATIONS IN THE EUROPEAN FOOD-PRODUCTION SECTOR: AN ARCHAEOBOTANICAL VIEW FROM NORTHERN GERMANY

Abstract author(s): Filipovic, Dragana - Schaefer-Di Maida, Stefanie - Feeser, Ingo (Institute of Pre- and Protohistoric Archaeology, Christian Albrecht University, Kiel) - Dreibrödt, Stefan (Institute for Ecosystem Research, Christian Albrecht University, Kiel) - Alsleben, Almuth (Akademie der Wissenschaften und der Literatur, Mainz) - Kneisel, Jutta - Kirleis, Wiebke (Institute of Pre- and Protohistoric Archaeology, Christian Albrecht University, Kiel)

Abstract format: Oral

Previous large-scale evaluations of European archaeobotanical datasets unveiled the dynamic history of plant-food provisioning during the Bronze Age, which included introduction of new crops and development of new production methods. They found evidence of these changes in different parts of Europe and proposed mechanisms including trade/exchange, mobility, colonisation, merging of cultures as enabling the spread of innovations in plant economies around the continent.

This presentation examines archaeobotanical data from Bronze Age sites in northern Germany, collected or produced within the Collaborative Research Centre 1266 in Kiel. Although culturally and climatically distinct, and with asynchronous Bronze Age sequence to much of Europe, the region saw food economies experiencing similar type of changes witnessed Europe-wide. This confirms the observed convergence of local, regional and supra-regional patterns in plant-food production in the Bronze Age. The presentation then singles out several of these similar developments – the increased importance, or start of cultivation of certain crops and application of certain agricultural practices – and looks at their regional cultural and environmental contexts. It shows that changes in the food-production sector proceeded amid expanding production and circulation of diverse raw materials (from amber to metal) and objects (e.g. status symbols), socio-political reorganisation (materialised in architectural forms, grave and house inventories) and growing environmental impact of Bronze Age communities. Were the innovations in plant economies a cause or a consequence of these general developments?

5 CHALLENGE OR CRISIS? – ABOUT STABILITY AND CHANGE OF COPPER CIRCULATION IN LATE BRONZE AGE SOCIETIES

Abstract author(s): Nessel, Bianka (Institute for Pre- and Protohistory, Johannes-Gutenberg University Mainz)

Abstract format: Oral

During the Bronze Age, copper production underwent several changes. A change in the use of fahlore and copper pyrite is shown by material analyses of bronze products. After the extensive exploitation of copper pyrite, central European communities faced an abrupt shortage of raw materials in the middle of the 12th century BC. This produced a reaction in economic and social terms, which is visible through the use of substitutes. This study focuses on the challenges entangled with these changes in particular regions as well as certain social and economic networks. In selected regions, the archaeological indicators of this raw material switch are examined on a supra regional level as well as strategies for coping with both short-term supply bottlenecks and the introduction of a fully functional replacement material. Human coping strategies are not seen as being characterized solely by special turning points that require an abrupt change from established behavioural patterns. Rather, it is investigated how slow and gradual transformations in human activity can be identified, mapped and correlated through analysis of aspects of communal thinking and acting, such as settlement structure, burial customs, hoarding patterns and the economic orientation of the communities in question as well as their participation in multilevel networking.

6 ASPECTS OF MIDDLE BRONZE AGE INTERCOMMUNAL INTERACTION AND MATERIAL CULTURE APPROPRIATION IN CENTRAL AND EASTERN EUROPE

Abstract author(s): Staniuk, Robert (Institut für Ur- und Frühgeschichte CAU Kiel) - Romaniszyn, Jan - Makarowicz, Przemysław (Faculty of Archaeology, Adam Mickiewicz University in Poznan)

Abstract format: Oral

The mid second millennium BC represents a transition towards new forms of expressing cultural identities across different groups. The visual differentiation of standardized forms allows determination of regional fashions, while the similarity of artefacts found across culturally distinct groups points towards continued interests in maintaining ties in spite of possible cultural differences. However, the investigation of such phenomena is often challenged by the persistent reliance on classifying groups following material culture (dis-)similarities, instead of focusing on common notions of practices and their manifestations.

The focus of this paper is to overcome these challenges, by the statistical evaluation of the temporal and typological aspects of metal and pottery artefacts found in the Central and Eastern Europe (parts of the North European Plain, the Baltic-Pontic zone, Central Uplands, Carpathian Basin). Archaeologically, this corresponds to the groups such as the Tumulus culture, Vatyá, Otomani/Füzesabony, and the Trzciniec Cultural Circle.

The investigation aims at determining whether identical or similar artefacts were treated in a related fashion or whether communities appropriated artefacts for their specific cultural practices.

7 SETTLING DOWN SOMEWHERE ELSE. CHANGING SETTLEMENT PRACTICES FROM THE LATE NEOLITHIC TO THE EARLY BRONZE AGE IN THE SOUTH-WEST BALTIC

Abstract author(s): Raese, Hendrik (Institute of Pre- and Protohistoric Archaeology, Kiel University)

Abstract format: Oral

Extensive archaeological field work in the course of large linear infrastructure projects (e. g. motorways and pipelines), in combination with additional site-based research, revealed a number of settlements with house structures from the very end of the local Late Neolithic and the Early Bronze Age (2200-1600 BCE) in north-eastern Germany. These are indicators for a predominantly sedentary life and long-term use of settlement areas. On the other hand, there are only few signs of permanent or intensive settlements for the greater part of the preceding Late Neolithic and for the subsequent Middle Bronze Age. Those that have been found can usually be assigned to the spatial and temporal fringes of the researched time and space. A simple explanation like emigration is not applicable in the light of numerous burial sites and stray finds from these phases. This development is comparable to the neighboring regions of the Polish Lowlands but in contrast e.g. to southern Scandinavia. Based on environmental (e.g. terrain-based, paleoclimate) and socio-cultural (e.g. visibility, transport networks, food production) data, the selection of settlement locations for the Early Bronze Age is in contrast to the preceding and subsequent time slices shall be analysed. This should help to identify different cultural trajectories and to formulate hypotheses about the change in settlement intensity and longevity.

8 AT THE EDGE OF THE BRONZE AGE WORLD: A NEW APPROACH TO NORWAY'S POPULATION HISTORY

Abstract author(s): Melheim, Lene (Museum of Cultural History University of Oslo) - Skar, Birgitte (NTNU – Norwegian University of Science and Technology) - Armstrong-Oma, Kristin (Museum of Archaeology, University of Stavanger)

Abstract format: Oral

In an era characterized by innovation, high mobility and connectivity, Norway was situated at the fringes of the grand Eurasian trajectories. So far, few biomolecular studies have been undertaken to understand the population history of Norway. Awaiting such analyses on Bronze Age material, this paper will address how a perspective from the fringe may inform current Bronze Age debates. We argue that demographic and social changes are potentially more visible at the fringe compared to the grand European melting pot.

In Norway, a second wave of farming led to a broad agro-pastoral transition c. 2500 BCE, which was accompanied by changes in settlement, ritual behavior and other material expressions including metallurgy, timber-built long-houses, and plank-built boats, and more hierarchical societies geared towards exchange and alliances. These socio-material changes have been described as a 'cultural package' but the demographic and social mechanisms leading to such pointed covariations in data are poorly understood. In a landscape where preconditions for farming and pastoral activity vary greatly, the region of today's Norway was a meeting point between Eurasian cultural impulses and knowledge systems derived from foraging dependence. The societies living at the far end of the European Bronze Age world showed a high degree of regional diversity. While immigration by expansive groups from the European continent may have triggered social change, the extent and character of actual migrations of foreign people into Norway are unknown.

This paper will approach processes of cultural transfer in an original way through a focus on knowledge systems, thus breaking down academic divisions between categories of material evidence. It is argued that a systematic investigation of knowledge systems offers a new and uncharted avenue to approach cultural complexes, cultural entanglement and societal change.

9 THE LAST SEQUENCE OF THE BRONZE AGE IN TRANSYLVANIA IN A EUROPEAN CONTEXT

Abstract author(s): Wittenberger, Mihai (National History Museum of Transylvania)

Abstract format: Oral

With an area of 102.834 km² of which 190 km² are the Carpathian Mountains is one of the richest historical provinces of Romania (238 397 km²). With a current stable population of 7-8 million, it provides 2/3 of GDP.

Going back to prehistory when between 50,000 and 100,000 inhabitants lived in the same perimeter, we can get an idea of how rich and powerful they were. The mineral riches of Transylvania are: salt, gold, copper and tin. But the most important wealth was and are PEOPLE!! Animal husbandry and agriculture are other notable resources.

The middle bronze cultures of the Carpathian space were: Wietenteberg (central and NW Transylvania) Ottoman NW, Costisa and Monteoru (east). Around the middle of the second millennium ICh appears the Noua culture with new elements of metallurgy.

The departure of the "peoples of the sea" disturbed the whole of Europe: the disappearance of the goals from present-day Hungary, the attempted invasion of Egypt, the disappearance of the Hittite empire. However, Transylvania is seen differently. There were no fortified settlements throughout the Middle and Late Bronze Age. In other words, we can't talk about invasions.

The people of Transylvania were rich and strong enough militarily to reject anyone or to make peace! The presence during this period of over 7,500 artifacts (glass, amber, ceramics, bronze) in the cave of Cioclovina, present in Uioara hord more like 6000 bronz objects is proof that production and trade routes continued to operate uninterrupted from the Minoan era until the end of the Bronze Age.

UP IN FLAMES: COMPARING PROVENANCE AND CONTEXT IN EARLY AND LATE BRONZE AGE CREMATION BURIALS FROM SEVERAL AREAS IN DENMARK

Abstract author(s): Reiter, Samantha (National Museum of Denmark) - Møller, Niels (Museum Thy) - Nielsen, Bjarne (Vestthimmerlands Museum) - Bech, Jens-Henrik - Olsen, Anne-Louise (Museum Thy) - Schjellerup Jørgov, Marie (Copenhagen Univesity) - Kaul, Flemming - Mannering, Ulla - Frei, Karin (National Museum of Denmark)

Abstract format: Oral

Oestigaard describes cremation as “not one, but many funeral practices” (2013: 497). Over the course of the Nordic Bronze Age, the many nonstandard configurations of cremation burials from the early periods settled into the stricter, less varied pattern we recognize from the Late Bronze Age. In this way, there was an evolution from many ‘ways’ of depositing cremations into one more standardized pattern. In order to shed light on the uptake of cremation as a new burial practice and its eventual integration as the dominant mode of funeral deposition, this paper presents data from 19 new provenance analyses from Early and Late Bronze Age contexts within Denmark from the regions of Thisted County and Vesthimmerland (both from Jutland) and the island of Zealand. These data are compared with data from other extant relevant studies, including those from Late Bronze Age Fraugde on the Danish island of Fyn. By addressing habitus in relation to the deposition of cremations as juxtaposed with these provenance data, we hypothesize several potential pathways for the uptake of cremation as a new cultural practice within the Danish Nordic Bronze Age.

RITESCAPES AT THE EDGE OF THE BRONZE AGE WORLD

Abstract author(s): Henriksen, Merete (NTNU University museum, Department of Archaeology and Cultural history) - Brück, Joanna (University College Dublin)

Abstract format: Oral

This paper will examine how intercultural encounters at the edge of the Bronze Age world are reflected in ritual practice. Taking as our focus Late Neolithic and Early Bronze Age sites in central Norway, including depositions of human bone and other artefacts in mortuary, bog and cave contexts, we will address cultural diversity and syncretism in the ritual expressions of hunter-gatherer and farming communities as they negotiated a period of profound social and economic transformation. Population change at the start of the Bronze Age is often invoked to explain the marked turn to agriculture at this time. Yet, sites such as the rock shelter on the island of Lines, which produced ornaments of reindeer antler that mimic similar artefacts of amber made by farming communities further south, suggest that processes of change were not unidirectional but involved complex forms of intercultural engagement and interaction. Current models of Bronze Age cosmographies take relatively little account of local and regional variability in ritual practice, and have as yet to explore how communities adopted and adapted novel ideas to fit their own particular material and historical conditions. This paper will examine how ritual practices allowed different groups to make sense of their lives during this major period of lifestyle change as well as to negotiate new social and political relationships.

PLANTS AS FOOD AND FUEL IN THE YOUNGER BRONZE AGE: THE EVIDENCE FROM DOBBIN, NORTH-EASTERN GERMANY

Abstract author(s): Oelbüttel, Merle (Institut fuer Ur- und Fruehgeschichte Kiel) - Schroedter, Tim (freelance) - Kneisel, Jutta - Kirleis, Wiebke (Institut fuer Ur- und Fruehgeschichte Kiel)

Abstract format: Poster

The Younger Bronze Age in northern Germany (c. 1100 – 500 BCE) witnessed an exceptional diversity of cultivated and gathered plant resources. The archaeobotanical records from this period show presence of crops and gathered plants not seen in the assemblages from preceding periods (e.g. broomcorn millet, faba bean, gold-of-pleasure). Moreover, some previously minor crops (e.g. pea and flax) may have gained in importance at the end of the 2nd millennium BCE.

The Younger Bronze Age site of Dobbin 27, located in north-eastern Germany (Mecklenburg-Vorpommern) is situated on a sandy hill surrounded by lakes and lowlands. It preserved remains of a residential structure and domestic activity, such as postholes, pits and fireplaces. From these features, charred seeds and fruits, and wood charcoal, were extracted through sampling and flotation, and analysed.

The site yielded an archaeobotanical assemblage that very well documents the evolution to a wide selection of plant resources characteristic of the larger region. Besides crop cultivation, also attested through the presence of weed seeds, gathering of wild plants is evident based on the finds of, for instance, hazelnut.

The charcoal assemblage is similarly diverse, particularly in the pits, where the remains of wood used as both fuel and raw material are preserved. Charcoal record from the fireplaces, presumably representing their last use only, is taxonomically less rich and includes species used as fuel. The combined archaeobotanical and anthracological evidence vividly illustrate the broad spectrum of plant food and fuel resources and their changes in the Younger Bronze Age, demonstrating the importance of both wild and cultivated parts of the landscape.

POST-MEDIEVAL EUROPE AND WIDENING HORIZONS

Theme: 4. Globalisation and archaeology

Organisers: Mytum, Harold (University of Liverpool) - Larsson, Anton (Stockholm University)

Format: Regular session

Post-medieval Europe experienced profound social, economic and cultural change which was both represented in material culture and landscapes. Moreover, these changes were in part communicated and mediated through the material world. This session investigates comparative experiences of such changes across the period from the 16th to the 20th century, and across the varied regions of Europe. How were new religious horizons expressed materially, and what ways were in the processes and effects of the Reformation and the Counter-Reformation reflected in archaeological remains? To what extent are the new beliefs and behaviours, and the ways in which confiscated church resources were reallocated and used in the early modern, visible in the archaeological record? Widening horizons and the expansion of contacts with, and exploitation of, the rest of the globe transformed economies across Europe. What were the impacts in eastern European and the Mediterranean world compared with those of western and some northern European countries? Does archaeology reveal how new horizons in science and technology led to the transformation of production and consumption of goods? Widening horizons of possession and materialism, partly also fed by colonialism and migration, led to industrialisation and the effects on the climate that we see today; how do artefact studies increase our understanding of these processes? Post-medieval and historical archaeologists widen archaeology's horizons to understand the present in the light of the last half millennium of our history.

ABSTRACTS:

THE RISE AND FALL OF THE ICELANDIC EARLY MODERN ROTARY QUERNSTONE AND ITS ARCHAEOLOGICAL PRESENCE 100 YEARS LATER

Abstract author(s): Beck, Sólveig (University of Iceland)

Abstract format: Oral

The aim of this paper is to relate the story of the Icelandic Early Modern rotary quern from its revival in the late 18th century to its abrupt abandonment in the early 1900s, and demonstrate how history is physically represented in the remaining Icelandic quernstone collection. The analysis is based on seven years of PhD research into available historical sources regarding the quernstone revival and its execution, into the general availability of indigenous raw materials, quernstone import and detailed analyses of the Icelandic 18th-20th century quernstone collection. In late-18th century Iceland a governmental decision was made to start importing unground grain and revive indigenous quernstone production. Rotary quernstones had not been imported to the island for a long time and local production of querns was minuscule and highly localised. Fairly quickly local quernstone production was taken up and maintained by subsistence farmers and farming craftsmen all around the island and import of foreign querns and millstones began. Quernstones could be acquired at varied prices, depending on their origin and level of complexity in their material composition. This made them accessible to all levels of Icelandic rural society and the rotary quernstone became an integral part of daily life. As import of cereals increased after the early 19th century, more modern European milling technologies and traditions were slowly finding their way to Iceland, but they were abandoned fairly quickly as ocean transport capabilities improved and the Roller Milling Revolution changed cereal processing drastically and irrevocably on both sides of the North-Atlantic.

THE WASTE RESERVOIRS: FROM EARLY MODERN PROTO-ECOLOGY TO PRESENT-DAY BIOARCHAEOLOGY

Abstract author(s): Larsson, Anton (Stockholm University)

Abstract format: Oral

As the natural sciences developed in the Early Modern period, what can be described as a proto-ecological vein was born among some naturalists, often sparked by colonial interactions. Other scholars instead favoured the unrestricted exploitation of the natural world. These competing trends would have consequences on the Swedish West Coast, where the hundreds of factories built in the mid-18th century following a boom in seasonal herring migrations spawned an intense fear of marine pollution. Although not known in such terms, what we now know as cultural eutrophication was successfully identified and targeted in fierce arguments between proto-ecologists and industrial lobbyists, the latter of which eventually saw defeat. The first environmental debate and subsequent regulations of Sweden would have material consequences well into the 19th century, leaving dozens of surviving sites behind to be studied today. This paper presents the archaeological remains of this decade-long conflict, which now two centuries on can serve as vital sources of bioarchaeological data.

3 WIDENING HORIZONS IN POST-MEDIEVAL IRELAND: AN INVESTIGATION OF FOOD CULTURES

Abstract author(s): McClatchie, Meriel (University College Dublin) - Flavin, Susan (Trinity College Dublin) - OCarroll, Ellen (University College Dublin)

Abstract format: Oral

The 16th and 17th centuries in Ireland were a period of increasingly globalised trade. New foods arrived in Ireland, some of which, such as the potato, eventually became dietary staples. Irish food cultures were also influenced by neighbouring Britain, but some food choices reflect the persistence of more local traditions, such as the predominance of oats in certain social contexts. The ERC-funded "FoodCult" research project (<http://foodcult.eu>) is seeking to understand the nature and meaning of food in Ireland during this period, and how the material expression of food can provide new insights into beliefs and behaviours. FoodCult is collating and analysing data from archaeobotany, zooarchaeology and artefact studies (such as cooking and eating utensils), reflecting remains that have been recovered from a wide variety of urban and rural excavations. FoodCult is also undertaking new scientific investigations, including stable isotope and lipid analyses. These new archaeological and scientific analyses are being integrated with evidence from historical sources, providing a ground-breaking new approach to understand food and identity in a complex society. This paper will explore evidence from plants, focusing on cereals and fruits, highlighting the challenges of an interdisciplinary approach, key gaps in knowledge, and how the FoodCult project is addressing these issues.

4 WIDENING HORIZONS: EXPLORING HEALTH, DISEASE, AND DIET IN INDIVIDUALS FROM THE POST-MEDIEVAL RIVERSIDE VILLAGE OF SARILHOS GRANDES (MONTIJO, PORTUGAL)

Abstract author(s): Pereira, Paula (Independent Resercher) - Jesus, Roger (CHAM - FCSH-NOVA; CHSC - UC) - Santos, Ana Luísa (Research Centre for Anthropology and Health, Department of Life Sciences, University of Coimbra) - Magalhães, Bruno (Department of Life Sciences, University of Coimbra)

Abstract format: Oral

Two excavation campaigns (2008 and 2020) in the São Jorge's church graveyard established the basis for the research project SAND (Sarilhos Grandes: Between Two Worlds) concerning the role of this village, located in the south bank of the Tagus River overlooking the city of Lisbon, in the Portuguese maritime expansion (15th-17th centuries). This work aims to investigate the archaeological contexts and the architecture of death, the social and cultural behavior; health/disease, and diet of its population revealed by skeletal remains and historical documentation. A minimum number of more than 100 individuals was identified amongst the 41 burials (15 non-adults, 24 adults, two undetermined; eight males, seven females, 26 undetermined) and commingled remains in a still ongoing project. All were macroscopically inspected and isotopic, paleoparasitological, and calculus analyses were undertaken. The individuals analyzed present evidence of several diseases such as syphilis, smallpox, benign tumors, nutritional stress, different patterns of fracture, or oral pathology. Isotopic analysis has shown a varied diet of the four individuals studied, which were confirmed by the historical and paleoparasitological investigations, the last also giving new insights concerning the introduction of the potato in Europe. The fungus *Candida albicans* was identified in the calculus of one individual (the fungus may give origin to caries, a type of lesion present in the individual's dentition), as well as eggs of a parasite from the *Trichostrongylus* genus, that had not yet been identified in European past populations. The results point to an early contact between Sarilhos Grandes and the New World and additional analyses are currently being developed to expand this study.

5 COFFIN PLATES AND ABOVE-GROUND MEMORIALS: TWO FORMS OF IDENTIFICATION COMPARED

Abstract author(s): Mytum, Harold (University of Liverpool)

Abstract format: Oral

Crypts and their contents sit within a wider set of material culture associated with death, and need to be considered as part of the wider expenditure associated with a death, the funeral and any subsequent commemoration. Many coffins within crypts and brick or stone-lined graves can have well-preserved coffin fittings, including name plates. In Britain, these can be part of an elaborate assemblage of items that comprise the coffin, and these will be briefly described. The main focus of the paper, however, will be to compare the text and symbolism of coffin name plates with those of above-ground memorials, both internal and external. There are some significant similarities but also differences. These are in part because of their varied functions of coffin name plates and memorials. More significant, however, are the different power relationships between the bereaved and the undertakers very soon after the death, compared with the bereaved and the monumental mason often many months after interment. The bereaved are in a state of shock and have little opportunity to have high levels of influence on the coffin fittings beyond an agreement of a price, which then dictated the elaboration of the fittings. In contrast, the bereaved have greater agency and influence on the material product that appears as a memorial, and in particular drive stylistic change which is limited in the case of fittings.

436 CREATIVITY AND RESOURCEFULNESS ONLINE: HOW ARCHAEOLOGISTS AND HERITAGE EDUCATORS OVERCAME THE PANDEMIC AND REACHED THE PUBLIC IN NEW WAYS

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Fonseca, Sofia (Teiduma, Consultancy on Heritage and Culture; German Archaeological Institute; ICArEHB- UAlg) - Thomas, Ben (Archaeological Institute of America)

Format: Regular session

Even before the COVID-19 pandemic, online learning and outreach efforts were on the rise. The pandemic highlighted the importance of virtual tools for providing information and resources and for allowing people to stay connected with each other. Transitioning to an exclusively online world was particularly hard for archaeological outreach and education activities that rely heavily on in-person programs.

Responses to the pandemic were varied. The rapidness of the onset of pandemic-related lockdowns and quarantines, in many cases, did not allow for a careful and methodical transition. Many organizations tried to adapt their programs for a virtual world. Over time, the approach to online education and outreach changed. As people became more familiar with online tools and their potential, they adopted creative approaches to engaging and educating their audiences. They also realized that the virtual world was accessible to a larger audience. As a result, we were made aware of programs that utilized online and virtual resources to engage new publics, transmit knowledge, create accessible online courses, organize international events, and even increase the number of visitors or members at museums and cultural associations.

In this session, we plan to discuss several new and different approaches adopted, created, and implemented by individuals and organizations to communicate with the public during the pandemic. We want to hear about specific programs, how they worked, evaluate success (or failure), and discuss the future of online programming. While we believe that in-person programs will once again be offered in the future, it is clear that online programming is here to stay and who organize outreach programs and activities will consider hybrid approaches addressing the needs of in-person and online audiences. We invite anyone who planned, organized, and implemented online and virtual programming during the pandemic to share your thoughts and insights with us.

ABSTRACTS:

1 NOT THAT NEW, BUT STILL BETTER: ONLINE ENGAGEMENT DURING THE FIRST CONFINEMENT OF THE COVID-19 PANDEMIC IN SPAIN

Abstract author(s): Almansa-Sanchez, Jaime (Incipit, CSIC)

Abstract format: Oral

During the first week of the confinement in mid-March 2020, I started receiving a lot of cultural offers online. These offers included free access to repositories of films, theatre, books, as well as some virtual tours and resources for archaeological museums and sites. I decided that this was the perfect moment to evaluate the reach and reception of such offerings and conducted a small survey for the Spanish audience.

This shows the main results of the survey, as well as the reflections they encouraged. It focuses on three aspects:

- Reach: Did the offerings reach new audiences?
- Experience: Did people enjoy the offerings?
- Potential: Were the offerings any different?

Although the general results are good, a closer look to the data offers a more critical perspective of the reality of those first weeks (and further on), that should help us to consider better forms of digital engagement for the post-pandemic era.

2 A GLOBAL EVENT DURING A PANDEMIC: CELEBRATING INTERNATIONAL ARCHAEOLOGY DAY THROUGH ONLINE ACTIVITIES AND CONTENT

Abstract author(s): Langlitz, Meredith - Thomas, Ben (Archaeological Institute of America)

Abstract format: Oral

International Archaeology Day (IAD), 2020 had to be transformed from a global celebration that typically features in-person community activities to a virtual event because of the COVID 19 pandemic. Even before the pandemic, the AIA used to organize online activities for IAD to make the programming more accessible to a broad audience. Little did we know that this shareable digital approach would become a necessity for us and so many of our collaborators. The suddenness of the pandemic-related shutdowns did not give us much time to adjust and adapt to a new reality. Realizing that many people were looking for activities that they could do from home we decided to organize a series of virtual experiences and activities, some of which had been planned for the fall as supplements and complements to IAD activities. In this paper we will discuss several of these initiatives, the lessons we learned from them, and the future of these programs that were developed or repurposed for the pandemic. We created several new programs for this effort including Build Your Own Monument, Tweetathons, and ArchaeoDoodles. We repurposed existing program like our Lecture Program, transforming it from an in-person program to a series of webinars. We also partnered with existing programs like Skype a Scientist to create an archaeology week that featured five archaeology lectures on a range of topics and with the Veterans Cura-

tion Program to create virtual content by hosting an “Artifact of the Day” feature through social media. These efforts allowed us to increase our online content, collaborate with and showcase the work of our partners and collaborators, and experiment with online programming in a manner that we had not tried before.

3 COMMUNITY AND NETWORKS IN A DIGITAL AGE: COMING TOGETHER TO LEARN NEW WAYS TO PRESENT PUBLIC PROGRAMS DURING A PANDEMIC

Abstract author(s): Thomas, Ben - Langlitz, Meredith (Archaeological Institute of America)

Abstract format: Oral

In 2020, prior to the onset of the COVID 19 pandemic, the Archaeological Institute of America (AIA) was looking forward to celebrating the 10th anniversary of International Archaeology Day (IAD). Typically, IAD features locally organized community events presented by a variety of archaeological organizations across the globe. These organizations join the celebration as collaborators with the AIA. We were planning for the 10th anniversary to be the largest celebration to date, expecting to add more collaborators and more events to provide as many people as possible throughout the world the opportunity to partake in local events. The pandemic changed all our plans. Many of our collaborating organizations had to close their facilities and cancel programs. Staff were furloughed or in some cases let go. Organizations that relied heavily on in-person activities and programs had to find ways to continue operating while in a shutdown. As we faced the reality of the pandemic, we grew concerned about our collaborators: how were they faring with most public facilities closed? Were they able to continue working or were they subject to furloughs and budget cuts? How do you present public programming when the public cannot come to your facility and in-person interactions are inadvisable? Beginning in May of 2020, the AIA reached out to its network of Collaborating Organizations through a series of listening sessions. We hosted 19 online listening sessions with over 150 participants. We started with broad conversations about challenges and how people were adapting. Over time, we transitioned to themed sessions with specific goals such as troubleshooting common problems; sharing technical experiences and expertise; and facilitating conversations about critical issues. In this paper we discuss what we learned through these sessions about archaeological programming, but more importantly, about the importance of a supportive community.

4 THE HERISTEM (STEM IN HERITAGE SCIENCES) PROJECT: COMMUNICATING ARCHAEOLOGY DURING THE PANDEMIC

Abstract author(s): Vukovic, Jasna (Department of Archaeology, Faculty of Philosophy, University of Belgrade) - Šošić Klindžić, Rajna (Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb) - Babić, Staša (Department of Archaeology, Faculty of Philosophy, University of Belgrade) - Novaković, Predrag (Department of Archaeology, Faculty of Arts, University of Ljubljana)

Abstract format: Oral

The HERISTEM project (funded by the ERASMUS+ program) is designed as a strategic partnership of universities, museums, institutes for the protection of cultural heritage and small private enterprises mostly from the area of the former Yugoslavia (Belgrade, Zagreb, Ljubljana, Sarajevo), and complemented by the University of Cambridge. The project's principal aim is to share expertise and experiences in applying various STEM sciences to archaeological academic and preventive research, public presentation of heritage, and business models in the heritage-related sector. To this end, project designers planned a series of workshops, practical training courses, staff and student exchange grants, joint publications, seminars, and conferences.

The project started in October 2019, but due to the COVID-19 breakout, much of its activities were stopped. The project's program and its implementation had to be reconsidered. What was left open was the internet, and new ideas were needed to fill in the gap. How could we make the project's 'zooms' more interesting and engaging than 'everyday zooming'? Some answers came spontaneously rather than being programmed in advance. The first such spontaneous initiative was the Archaeological Dialogues Without Isolation – a video conference, that grew from the few initial 'dialogues' organized once a week, into 21 discussions over four months combined with more than 30 hours of videos. Another challenge was the European Researcher's Night. With more than seventy 2-3 minutes long videos explaining bioarchaeology and archaeology of food to a lay audience, the project hoped to find a niche that distinguished it from the mass of video presentations available at this event. Another challenge was how to make an engaging virtual exhibition for an audience that had tens of thousands of different content just one click away? In this discussion, content produced for the HERISTEM project will be presented.

5 INNOVATIVE WAYS OF EXPLAINING ARCHAEOLOGICAL HERITAGE IN TIMES OF COVID-19: THE USE OF DIGITAL MODELS AND 3D-PRINTING IN UNIVERSITY EDUCATION

Abstract author(s): Díaz-Navarro, Sonia (University of Valladolid) - Sánchez de la Parra-Pérez, Santiago (University of Salamanca) - Tejedor-Rodríguez, Cristina - Rojo Guerra, Manuel (University of Valladolid)

Abstract format: Oral

On subjects related to Prehistory, the study of Archaeological Heritage is a fundamental pillar for learning about how societies that left no written trace lived. Normally, students receive an explanation of the material culture accompanied by 2D graphic resources –photographs, videos, or slides– and complemented by field trips to museum institutions or archaeological sites. Since 2020, the COVID-19 pandemic has avoided the development of such practices through which students can understand archaeological context and see the most significant artefacts. From this premise arises the Teaching Innovation Project of the University of Valladolid

-“Archaeological Heritage in your hands. 3D replicas to deepen the knowledge of Prehistory”, the main objective of which is to ensure the optimal development of the subjects of Prehistory; replace fieldtrips; and promote active learning of Archaeological Heritage through the creation of reference collections, both digital and physical, of the main artefacts of the material culture of European prehistoric societies. To this end, the blended lectures have been complemented with 3D digital models of the artefacts present in free web repositories. In addition, 30% of the final mark was based on the students' mastery of the Sketchfab web platform, in which they had to create reference collections according to their chronocultural context, typology, raw materials, etc. Later, they could touch and manipulate some of these iconic objects thanks to the 3D printing and post-processing of replicas on a real scale. Finally, the students were able to manipulate some of these objects on a real scale thanks to 3D printing and post-processing of the most significant ones. This project has allowed the development of the Prehistory subjects in a normal way, encouraging the use of new technologies in the university lectures, and facilitating the chronocultural identification of each artefact.

6 RECRUITING NEW STUDENTS DURING THE LOCKDOWN

Abstract author(s): Novakovic, Predrag (University of Ljubljana)

Abstract format: Oral

I don't recall that the EAA ever discussed how the high school students were approached to enrol in the universities to study archaeology. Traditionally, for this purpose served different types of 'open days' or 'information days' where potential students could visit the archaeology departments, listen to some introductory presentation, participate in a demonstration of archaeological work etc. Some online presentations accompanied such events, but the universities considered the 'open days' the most important activity in recruiting new students. With the COVID-19 lockdowns which prevented the actual visits of new students, the situation has changed considerably.

Slovenia has one of the longest lockdowns in Europe, with schools forced to teach online since mid-March 2020. The most affected are the final-year (4th) high school students who studied online the whole second semester of their 3rd year and first semester of the 4th year. In addition to this, they had to finish the high-school graduation exams and decide what to study and where.

Department of Archaeology, University of Ljubljana, attempted a new approach to the 'overzoomed' high-school students. Information about the curricula, admission conditions and other important issues concerning the studies, prioritized in the in-vivo meetings was placed behind short introductory/promotional videos. The videos were intentionally made more 'elliptic'; to 'represent' the subjects in a more entertaining way, with short and catchy slogans and phrases, dynamic intros with music, in a graphic and visual style closer to the senior teenagers. The idea was to 'catch' the attention with engaging content and steer the visitors into more 'serious' topics. The results exceeded our expectations. In four days of the Information Days peak, our internet media attracted ten times more visitors than ever before. We are aware that they were not all high-school students; the videos greatly impacted the present students and alumnae.

438 TRACING BAPTISM IN THE ARCHAEOLOGICAL RECORD

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Donnelly, Colm (Archaeology & Palaeoecology, School of Natural & Built Environment, Queen's University Belfast) - Guillon, Mark (Inrap & PACEA UMR 5199 CNRS Université de Bordeaux) - Murphy, Eileen (Archaeology & Palaeoecology, School of Natural & Built Environment, Queen's University Belfast) - Portat, Émilie (Direction de l'archéologie, Chartres Métropole UMR - CNRS 7041 ArScAn, TranSphères)

Format: Regular session

Baptism is a sacrament of critical importance within the main Christian denominations. Within the early Christian church it was considered essential to cleanse a person of Original Sin, the sin committed by Adam and Eve in the Garden of Eden and subsequently inherited by humankind ever since. If baptism did not occur, however, then the sin remained in place and, as such, the unbaptised were condemned to Hell. A strong advocate for this position in the early church was St Augustine of Hippo (AD 354–430) who believed that all infants should be baptised as soon as possible after their birth in order to avoid potential eternal damnation should they die unbaptised. This harsh doctrine was later modified by moderate theologians within the Medieval church who advocated the existence of Limbo. By the late 16th century, however, baptism had become a contentious issue between the Catholic Church and the Reformed Churches, and also within Counter-Reformation Catholicism with certain theologians placing extreme importance on the teaching of St Augustine and his views on what happened to the souls of the unbaptised after death and their burial in unconsecrated ground.

It is the intention that this session will provide new insights and challenge existing paradigms on baptism through approaches that include material culture, scientific, theological, historical, and architectural perspectives and approaches. Papers are invited to cover issues such as burial rites and practices for the unbaptised (e.g. children's burial grounds), the material culture associated with baptism (e.g. religious objects and clothing), and the architectural expression of baptism (e.g. sanctuaires à répit [respite sanctuaries], shrines, and baptismal fonts). Papers that focus on the scientific analysis of infants that might provide insights concerning whether or not they were live or still born and hence potentially baptised are also welcome.

1 **AN INNOCENT SOUL BECOME AN ANGEL. NEWBORN BURIALS IN MEDIEVAL AND POST-MEDIEVAL BOHEMIA**

Abstract author(s): Cechura, Martin (The Museum of west Bohemia, Pilsen)

Abstract format: Oral

Graves of infants and children belong to a specific category of medieval and modern-age burial culture. Special zones have been identified at a number of archaeological sites in Czech Republic dedicated to burying new-born babies. These zones are often located near a church, but their location is quite variable. However, there are other specific places in the cemetery area. The most important of these are burial places near the cemetery wall, both inside and outside, or even in recesses of the cemetery wall. There is also a special case of desecrated or more or less dilapidated churches. Specific are also multiple graves of a child and an adult. In interpreting the archaeological facts it is necessary to use other types of sources, especially written and ethnographic, bearing in mind the great variability of the written sources, which for each archaeological phenomenon offer more varieties of interpretation. The result of the archaeological analysis is the finding that the burials of deceased new-born babies required special treatment and were given great attention. Whatever the reasons, this fact illustrates a clear understanding of the childhood category since birth, and the strong emotional bond linking parents and deceased children. In these examples we see a strong effort to secure the newborn a respectable funeral in the cemetery.

2 **IDENTIFYING BAPTISM IN LATE MEDIEVAL AND THE EARLY MODERN CATHOLIC WORLD FROM EXCAVATIONS. APPROACHES FROM HISTORY, ARCHAEOLOGY AND PHYSICAL ANTHROPOLOGY**

Abstract author(s): Guillon, Mark (Inrap; University of Bordeaux) - Portat, Emilie (Chartres City France; University of Paris 1) - Partiot, Caroline (University of Bordeaux)

Abstract format: Oral

This paper will deal with the possibilities of identifying baptism in the late middle ages and early modern period, crossing results from historical sources, archaeology and physical anthropology. Historical sources are texts, parish registers plus religious architecture and topography. Archaeology and physical anthropology consist of the study of graves (mortuary gestures, coffins, shrines) and human remains of fetuses, perinates and infants. We begin with the results from the excavation and study of the Catholic church and graveyard of Saint-Ayoul (Brie county, France) near Paris. The presentation focuses on the problem of how to prove baptism for very little ones from archaeological samples in the early modern Catholic world. We will also make a point on the biological possibility of proving if a baby was live born. Apart from the research being developed, but not validated, on the biochemical alterations specific of post-partum acquired bacteria, the only reliable indicator remains, up to now, the neonatal line, a disruption in the formation of tooth enamel due to birth-induced stress. As this analysis requires time-consuming and destructive histological protocols, it is far from being applied regularly. However, new approaches based on the plasticity of the perinatal development aim to investigate the impact of the transition from intrauterine to extrauterine environment on both skeletal growth and musculoskeletal maturation processes. Is a holistic approach possible around the problem of catholic baptism?

3 **'EAVES -DRIP-BURIAL' AND RETROACTIVE BAPTISM: VALID INTERPRETATION OR INSUFFICIENT CITATION PRACTICE?**

Abstract author(s): Hausmair, Barbara (University of Innsbruck)

Abstract format: Oral

In Christian cemeteries across medieval and modern-period Europe burials of perinates, neonates and infants are frequently found close to the church walls, which has led to their denomination as 'eaves-drip burial'. Although this term adequately describes the position of such burials under the church's eaves, it has become common to also use it as a proxy for the interpretation of such practices as attempts to provide a kind of retroactive baptism through rainwater dripping from the church roof onto the graves of presumably unbaptized children. A thorough review of recent research shows that this interpretation is widely employed in archaeological research regardless of the chronological (medieval, modern-period), geographical (West, Central and Southern Europe) or cultural context (medieval Latin Christianity, modern period reformed or counter-reformed contexts) of specific case studies. Yet, a close look reveals considerable differences in age distribution and spatial patterns of 'eaves-drip burials' in different regions and time-periods. Additionally, primary sources that would support the 'eaves-drip burial = retroactive baptism' equation stem almost exclusively from protestant and reformed areas (16th century onwards) and are rarely referred to in archaeological scholarship. It is the aim of this paper to draw attention to the risk of creating circular arguments within academia and producing historical narratives that are difficult to support if our interpretations are solely based on secondary literature form within archaeology. A chronologically, structurally and bioarchaeologically sensitive approach towards 'eaves-drip burial' together with a more thorough consideration of contemporary written sources on folk beliefs and baptism practices is proposed in order to critically review the notion of retroactive baptism and to gain more nuanced insights into the broad variety of beliefs and burial practices related to 'eaves-drip burial', baptism and mortuary space in different time-periods and regions.

4 **UNBAPTISED AND BAPTISED INFANTS AND THEIR BURIALS IN EARLY MODERN FINLAND AND SWEDEN**

Abstract author(s): Lipkin, Sanna (University of Oulu)

Abstract format: Oral

Attitudes towards unbaptised children and their burial varied in Finland and Sweden through time. In rural areas, the parents were instructed to bring their children to be baptised as soon as possible; even one week was considered to be too long a waiting period. Between the 17th and 19th centuries, the attitudes of the parish priests were important. Some unbaptised newborns were buried in silence whereas others received full funeral sermons. Until the 19th century, at some church yards newborns were often buried separately from others, close to the church fence. Both ethnographic and archaeological evidence implies that some prematurely born infants were buried in small cases inside church fences and walls. Similar cases have been found under several churches both in Finland and Sweden. Their presence suggests that baptism was not a prerequisite to burial under the church floor. Examples below the church floors also imply that prematurely born infants and newborns were buried close to the elderly probably to seek protection from them. Some unbaptised infants were also hidden under funerary clothes or bedding in adults' coffins. This presentation will consider the burial customs of both baptised and unbaptised infants both through burial location and funerary attire (christening gowns, caps and belts as well as silk tapes and laces). Even though in the eyes of the church, the baptised infants were treated as a part of the parish, the burials of the unbaptised infants indicate that care and dedication was also given to their burials.

5 **BURIAL BEFORE BREATH: A MULTIDISCIPLINARY INVESTIGATION INTO THE SOCIAL IMPACT OF FOETAL AND MATERNAL MORTALITY DURING THE INDUSTRIALISATION OF ENGLAND**

Abstract author(s): Knox, Elizabeth (The University of Sheffield; Museum of London Archaeology - MOLA)

Abstract format: Oral

Burial Before Breath is an Arts and Humanities Research Council funded collaborative doctoral partnership between the University of Sheffield and Museum of London Archaeology (MOLA) examining the social impact of foetal and maternal mortality during the industrialisation of England. This presentation will introduce one aspect of the author's research, to investigate the funerary rites and rituals, or lack thereof, associated with unbaptised infants, specifically foetal remains excavated from multiple archaeological sites across England dating to the Industrial period.

The burial of unbaptised infants, including stillborn and neonates dying shortly after birth, was prohibited within consecrated grounds. However, skeletal remains archaeologically excavated from burial sites across England suggest this rule was not always followed or was creatively stretched to allow their inclusion. Preliminary observations regarding how the burial of foetal remains within Christian burial grounds differed from older children and adults will be discussed as well as the impact this had on the Industrial English family, as demonstrated through written primary records and historical texts.

This presentation will introduce how my project will delve into the alternatives to Christian burial available for families of unbaptised infants across England; including non-traditional burial forms and the sale of foetal remains to anatomy schools, with the aim of presenting a social and cultural understanding of foetal and perinatal death during the Industrialisation of England.

6 **LANDSCAPES OF BAPTISM: CHILDREN'S BURIAL GROUNDS (CILLÍNÍ) AND HOLY WELLS IN IRELAND**

Abstract author(s): Murphy, Eileen - Donnelly, Colm (Queen's University Belfast)

Abstract format: Oral

Cillíní (children's burial grounds) are a recognised class of Irish archaeological monument that were used for the interment of unbaptised infants and others not permitted burial in consecrated ground due to the teachings of the Roman Catholic Church. The archaeological evidence suggests that these sites proliferated from the 17th century and can be linked to the efforts of the Counter Reformation in Ireland, and a re-affirmation of the strict teachings on the need for baptism expounded by St Augustine of Hippo. At least 1600 of these poignant sites have been recorded across Ireland and they occur at a diverse range of locations, including natural landmarks, archaeological monuments, and abandoned Medieval ecclesiastical sites. The latter locations can be explained as a symbol of the hope of the bereaved families that burial in a formerly holy site would confer a degree of sanctity on the dead. The evidence for the relationship between cillíní and the island's 3,211 recorded holy wells (also used by Catholics during this period) has not been previously explored. To what extent, however, do we find a juxtapositioning of holy wells – associated with baptism – with cillíní – associated with the unbaptised? The paper examines the level of evidence for such an association through a study of the sites in three Irish counties – Clare, Cork and Donegal.

7 **THE UNBAPTISED IN THE ARCHAEOLOGICAL LANDSCAPE: FINDING AND RECORDING IRELAND'S CILLÍNÍ (CHILDREN'S BURIAL GROUNDS) USING GIS**

Abstract author(s): Mundt, Courtney (Queen's Univeristy Belfast)

Abstract format: Oral

The term cillíní refers to the unconsecrated burial grounds used primarily for unbaptised and stillborn children from the late medieval into the early modern period in Ireland. There are over 1,400 cillíní

recorded across the island, with the highest concentration (957) on the west coast. Cillíní are often associated with a variety of archaeological and natural sites. Perhaps due to their more modern usage or because of the sensitivity of the subject, these archaeological sites are not as well studied and analysed as other archaeological monuments in Ireland, particularly when it comes to understanding their relationship with the surrounding landscape. Less than a handful of researchers have mapped cillíní, with most of them either studying their general locations or focusing on one specific county (e.g. Galway and Kerry). Previous studies have focused primarily on how these monuments relate to other archaeological monuments and anthropogenic boundaries, with their relationship to natural landscape features (e.g. rivers, lakes, boglands), underlying soil, geology or topography studied to a lesser extent. This lack of knowledge could negatively affect the preservation and recording of cillíní, and it was with this in mind that a landscape study of County Mayo, which has the third largest amount of recorded cillíní (211) was undertaken. The presentation will provide an overview of the research and discuss how

the findings will be used in further cillíní research to raise the profile of these poignant monuments and help ensure their identification and preservation for future generations.

8 AN EARLY CHRISTIAN CHURCH, MARTYRIUM AND BAPTISTERIUM AT HORVAT MIDRAS, ISRAEL

Abstract author(s): Zissu, Boaz (Bar-Ilan University)

Abstract format: Oral

Horvat Midras is located in the Judean Foothills, ca. 6 kms NE of Bet Guvrin – Eleutheropolis, and ca. 40 kms SW of Jerusalem. The church was erected in the 4th century CE in the centre of the ancient site. Earlier layers, found underneath its floor, and dated to the Early Roman period were destroyed during the Second Jewish Revolt (132-136 CE). After a hiatus during the 2nd and 3rd centuries CE, the vestiges of the earlier buildings were levelled, and a new basilical structure, paved with a white mosaic floor was erected. Its construction, in the 4th century CE, was associated with a venerated tomb, perhaps the *raison d'être* of the complex. This tomb was initially an underground ritual bath (mikveh) serving the 1st-2nd c. CE Jewish settlement, repurposed into a burial chamber during the 4th century CE. In the next stage, a basilical church adorned with marble columns, capitals and multicolored mosaic floors was erected. The church was built within the former basilical structure and reused some of its architectural elements. The apse was built just above the burial chamber – apparently showing that this tomb inspired the construction of the church. We identified at least two architectural stages in this church, both paved with multicoloured mosaic floors; the second was marked by the construction of a room housing a baptismal font, above the stepped corridor of the venerated tomb. Because this room laid above and permitted access to the venerated tomb, it was termed a “martyrium”. This stage is dated to the third quarter of the 6th century CE and the structure remained in use until an earthquake in 749 CE. The lecture will present this architectural complex, its stages and formation, focusing on the martyrium and baptisterium.

9 ARCHAEOLOGY OF INITIATION: EARLY BAPTISMAL FONTS IN MEDIEVAL ENGLAND

Abstract author(s): Twomey, Carolyn (St Lawrence University)

Abstract format: Oral

The material culture of Christian baptism has influenced the performance and interpretation of the rite of initiation since the days of the late antique Church. Unlike continental contexts, the islands of Britain and Ireland do not share the rich history of baptistery building familiar to Christian contemporaries in Mediterranean regions. The Insular world is a fascinating region in which to examine the development of other diverse forms of baptism prior to the standardization of the baptismal font form in the eleventh and twelfth centuries. Some early fonts in England (e.g. Wilne, Melbury Bubb, Dolton, etc) bear figural and zoomorphic decoration from their former lives as standing crosses, a recycling that has challenged both church and art historians. This paper reconsiders these early fonts by integrating them into the broader history of baptismal sculpture and iconography from Wales, Scandinavia, and Frankia to elucidate the local and European contexts for font production at this time before a universal experience of the rite of initiation. This archaeological, historical, and art historical approach challenges traditional explanations for the origins of stone baptismal fonts that root this material change in the development of sacramental theology in twelfth-century Paris. Focusing on the act of re-use, I show how standing cross fragments were purposefully adapted for baptism due to the monumental meanings of their original ‘living stones.’

440 ‘TOUCHING OBJECTS, FEELING MATERIALS’: MATERIAL TRANSFORMATIONS, TECHNOLOGY AND SENSORIALITY IN ANCIENT MATERIAL CULTURE

Theme: 6. Material culture studies and societies

Organisers: Perna, Simona (Institut Català d’Arqueologia Clàssica - ICAC) - Di Febo, Roberta (Universitat Autònoma de Barcelona - UAB); Institut Català d’Arqueologia Clàssica - ICAC) - Casas, Lluís (Departament de Geologia, Universitat Autònoma de Barcelona - UAB)

Format: Discussion session

Material culture studies have progressively become immaterial. Matter is the core of material culture and by neglecting artefacts’ constituent materials, the gap between these, the material world and, eventually, the human component risks being amplified. We aim to fill this gap by putting forward an interdisciplinary debate which starting from objects’ materials seeks to combine the latest

analytical methods with socio-anthropological and experimental approaches to understand how materials were ‘transformed’ into artefacts in the past and the effects these had on people – makers, users and alike.

Broadly inspired by Ingold’s idea that materials ‘flow mix and mutate’ (2007:14), this session seeks to explore ancient artefacts from the perspective of their material properties, qualities and possibilities (Ingold 2013) to better understand objects’ uses and productions through their affordances (Gibson 1976) and ‘sensorial assemblages’ (Hamilakis 2017). Papers will address research and scientific (e.g. archaeometric, experimental) analyses on object materials by considering one or more of the following aspects: material properties, origins, sourcing and environmental impact (e.g. from access and procurement to pollution); the technical expertise and technological innovation behind the transformation and manipulation of the materials (including reuse and recycling or by-products) and value attribution; conservation and reception in later periods; sensoriality or sensory awareness: how materials were sensed (colour, texture, feel, smell) by people and how this impacted artefact creation, design and meaning especially in relation to intended use, contexts or landscapes. We intend to cover multiple media and forms of material culture from the Greco-Roman world, although earlier or later periods are welcome.

Analysing material culture from its ‘inside’ has the potential to provide deeper insight into objects’ affordances and people responses. With such a perspective, our aim is to widen the horizon of material culture studies by bringing the material component back into it.

ABSTRACTS:

1 TESTING THE POSSIBLE FUNCTIONS OF THE UNIO SP. VALVE IN THE HAMANGIA CULTURE (MILL. V CAL BC)

Abstract author(s): Margarit, Monica (Valahia University of Targoviste; “Vasile Parvan” Institute of Archaeology, Romanian Academy) - Radu, Valentin (National Museum of Romanian History) - Voinea, Valentina (Museum of National History and Archaeology Constanta)

Abstract format: Oral

In this study we discuss the possible uses of the Unio valves by the Eneolithic communities from Cheia (southeast Romania, 5th millennium cal BC). The assemblage consisted of 225 valves, of which 101 valves exhibited various use-wear marks.

The methodology used relied on both macroscopic and microscopic analysis of the use-wear marks present on the archaeological artefacts, supplemented by experimental data. The pattern of the use-wear development, including the deformation of the original volume and the removal of the external structure of the valves was systematically analysed. Our experimental project covered various aspects such as identifying the means of gathering/obtaining the raw materials, the times required for each operation in the technological chain, and the materials processed (e.g. wood, skin, clay, fish and bone). All these parameters were precisely recorded in our database.

The results indicated that: 1) the manner these materials were sensed - they could be easily held in the hand and manipulated - did not require important technological modifications, e.g. retouching was not necessary because the edge morphology of the valves was already optimal for carrying out a large range of activities. 2) among the various experiments, the one focusing on the surface treatment of dry clay vessels yielded marks most similar to the ones present on the archaeological artefacts.

The Cheia assemblage provides a good example of a community turning certain raw materials into tools, without any technological investment. They knew exactly where to find and collect them from and simply exploited their natural characteristics.

Acknowledgments. The work presented here was supported by the grant of the Romanian Ministry of Education and Research, CCCDI - UEFISCDI, project number PN-III-P2-2.1-PED-2019-1279, within PNCDI III and by the grant from the Recurring Donors Fund of the Romanian Academy managed by the Patrimoniul Foundation (project no. GAR-UM-2019-II-2.1-1/15.10.2019).

2 BRONZE IN THE IRON AGE: VARIATIONS IN FE IN ITALIAN BRONZE ARMOUR C. 400 BCE

Abstract author(s): Armstrong, Jeremy - McAlister, Andrew - Emmitt, Joshua (University of Auckland)

Abstract format: Oral

This paper will present new pXRF data on bronze military equipment finds from across the Italian peninsula dating to the period c. 800 to c. 300 BCE. Data were acquired on 40 objects in 2019, and are here coupled with historical pXRF data as well as stylistic and visual analysis of a wider set of items. We argue that there is a growing body of evidence supporting the introduction of a new type of copper alloy c. 400 BCE in Italy which featured slightly higher levels of Fe and which was associated with new production techniques. The appearance of this relatively high-Fe alloy runs against the general trend towards less Fe in bronze in produced in Italy, seen in the preceding centuries, and has so far been found only in particular types of pieces which were produced through casting. The high-Fe military equipment is also associated with new forms of armour and featured fundamentally different physical characteristics to previously produced bronze military equipment. We will contextualize this data within the wider picture of bronze armour production during this period and discuss how the use of the proposed new alloy would have altered the associated industries, changing the nature and experience of bronze military equipment production. Both time and the available data currently preclude a detailed discussion of the materiality/sensoriality of these items for their end users, although some initial suggestions, based on ongoing experimental work, will be offered.

3 THE MATERIALS OF LIGHT: OBSIDIAN ‘MIRRORS’ IN THE HOUSES OF POMPEII

Abstract author(s): Anguissola, Anna (University of Pisa)

Abstract format: Oral

A small set of slabs made of dark stone (likely obsidian) have been recovered from the houses of Roman Pompeii. There, panels of a dark stone were typically included in black painted walls and surrounded by painted frames as ‘mirrors’. Notwithstanding the wealth of information about the Roman knowledge, use, and interest in obsidian and other dark stones as part of domestic displays, the evidence from Pompeii is unparalleled in other sites and areas of the Roman world. The black panels from Pompeii all belong to mid-first century C.E. contexts, as part of elaborate decorative systems including different materials (black stones, marble, gold, pumice, plaster) and colors. The paper explores the function and meaning of these artefacts in light of the Roman discourse on matters and their qualities, both physical and ethical. In particular, the paper argues that the owners and decorators of the houses of Pompeii chose these pieces in light of both their exotic flavor and, more importantly, of their potential to stage a network of sensual similarities and contrasts to a variety of other materials and techniques (such as water, marble, silver, gold, and wall plaster). The argument relies on the results of a campaign of on-site study of the evidence, including characterization of the panels by means of both Raman Spectroscopy and Portable X-ray Fluorescence (pXRF). By assessing the identity of the stones, their provenance, and the production techniques used to cut, shape, and polish them, this research provides the first full account for the supply, technologies, sensual appreciation, and meanings of obsidian and (optically) related materials in the Roman antiquity.

4 INSIDE THE GLASS CRAFTSPERSON MIND: MAKING OF ROMANO-BRITISH GLASS BANGLES

Abstract author(s): Ivleva, Tatiana (Newcastle University)

Abstract format: Oral

The main aim of the paper is ‘to bring the makers out of the shadows and to celebrate the creativity of their achievements’ (Ingold 2013, 22). The case-study concerns Romano-British glass bangles, seamless ring-shaped adornments made of coloured glass. Glass bangles appeared in Britain in the mid first century AD, coinciding with the Roman conquest of the southern regions of England. Prior to the Roman invasion, Britain had no history of seamless glass bangle production, although on the Continent glass bangles had been in circulation already for two and half centuries. Various ethnographic studies have provided clues to how a glass bangle can be made seamlessly. The information from these studies was used by a French team that tried to replicate Late Iron Age glass bangles by following a number of the techniques currently known. In this paper, the author has worked with an experienced glass artisan, who was commissioned to make replicas of Romano-British glass bangles. The questions addressed were: a) what does the maker of a replica of an archaeological artefact have to stay about how he experienced the production of a glass bangle; and b) as the craftsman had never before produced a seamless glass bangle and only attempted it with the author’s guidance, how might his experience inform us about training of craftspeople and the craft development in Roman Britain?

5 SILK TEXTILES FROM PALMYRA: MATERIAL IMPORTATION TO TECHNOLOGICAL INNOVATION

Abstract author(s): Zhou, Junjie (LMU Munich)

Abstract format: Oral

Roman Palmyra was not only a hub of cultural transmission but also a hotbed of integration and creation. In the field of textile archaeology, Palmyra preserved one of the largest collections in the Graeco-Roman world, among which ca. 100 fabrics made from Chinese silk survived. This paper aims to analyze how the unique properties of silk were appreciated by the Palmyrene, adapted to their local costumes, and eventually led to a new technique of damask weaving during the first two centuries CE. I shall first briefly introduce silk production in China, its material qualities, and its identification under the Scanning Electron Microscopy. Then different categories of silk textiles from Palmyra will be examined to differentiate between Chinese imports and local products. Finally, the technological development will be traced of how the imported “Han-damask” evolved into the innovative 3-1/1-3 damask weaving. Through the specific case study of silk textiles from Palmyra, this paper hopes to reflect on a broader picture of how the material transformation was embedded in the technological evolution and how it contributed to the “weaving” of the material culture.

6 A PAIR OF STOCKINGS? MATERIALS, CRAFTS METHODS AND USEFULNESS IN PRE-MODERN BURIAL FOOTWEAR

Abstract author(s): Ruhl, Erika (SUNY at Buffalo)

Abstract format: Oral

Burial clothing in northern Finland between the 17th and 19th centuries can be broken into two categories: (1) re-purposed items, used first in life later as burial clothes, and (2) re-made items, crafted from second-hand materials specifically for burial. Some items, like burial robes, are constantly re-made, while other categories, such as the stockings, contain both re-made and re-purposed items; the focus here will be on the stockings.

This dichotomy introduces an overarching question: Were these stockings comfortable? This question is considered in the context of two specific performance characteristics: whether the items were warm, and were they well-fitted? Although both categories are present in burial clothing, re-purposed items retain features that made them warm, well-fitted, and thus comfortable in life, while

re-made items are often hastily assembled from less-suitable materials, and lack these performance characteristics. As such, this paper explores what it means to provide for the dead on symbolic and practical levels.

Based in Design Theory and Material and Technological Choice, these stockings are analyzed “from the ground up,” starting with the materials selected, through the crafting methods, and stockings’ resulting performance characteristics. The materials range from knit silks and wools to woven bast fibers; some are clearly hand-crafted, while others tell very different tales about the impacts of industrialization and handcrafting professionalism on textile materials; in contrast, several re-made stockings are stitched from woven bast fibers. This in turn introduces questions about the experience of creating, using, re-using, and finally interring these materials.

7 ARUNDO DONAX: REINSTATING A NEGLECTED MATERIAL IN CLASSICAL ANTIQUITY

Abstract author(s): Foxhall, Lin (University of Liverpool)

Abstract format: Oral

One of the great difficulties of studying the material world of classical antiquity (or indeed any ancient period) is that as archaeologists we may overestimate the importance of the imperishable material remains that we possess, neglecting the potentially even greater significance of perishable materials in the practices and sensorial experiences of everyday lives. This paper focuses on one incredibly versatile material resource, reeds, notably the giant reed, *Arundo donax*. This is a common plant which grows abundantly in coastal areas and wetlands across the Mediterranean, even in areas which are semi-arid. Never deliberately cultivated (though probably sometimes managed), it was ubiquitously exploited to create an enormous range of different kinds of objects (including tools to make other objects). Its properties of strength, sharpness, flexibility and durability, as well as its easy accessibility for many people, were key to its versatility. I will investigate the ways in which the physical properties of *Arundo donax* shaped both the choices and sensory experiences of the makers and users of things. I will also explore the numerous ways that this plant was entangled with human lives in classical antiquity, advocating the need to reinstate it to a central position in our reconstructions of ancient material worlds.

8 SENSORY ENGAGEMENTS WITH HOUSEHOLD POTTERY IN LBA CYPRUS

Abstract author(s): Steel, Louise (University of Wales Trinity Saint David)

Abstract format: Oral

This paper explores people’s daily sensorial engagement with pottery in LBA Cyprus, both production and consumption. The focus is on embodied encounters with kitchen equipment – the Plain ware pots, pans, basins and pithoi – used on a daily basis in the production and consumption of food and drink. Although Plain ware typically comprises the greater part of a Late Cypriot ceramic assemblage, this class of pottery tends to be overshadowed by the more visually appealing tableware – White Slip and Base Ring – even though these have a more restricted distribution within settlement contexts. Nonetheless, I would argue that for most Cypriots in the LBA, daily material engagements with pottery were primarily mediated through Plain ware. The focus on this paper is a discrete group of vessels excavated in storerooms in Building 1 at Arediou, a space apparently associated with processing and consumption of foodstuffs at an extra-household level. This paper considers the capacities (agency and vitality) of the clays used to make these vessels and how these enabled or constrained the actions of the potters who created them; similarly, it examines the interaction and the experiences of people working with pottery on a daily basis within the settlement. Focusing on material engagements and the myriad intersections between human and non-human; allows us to think about the materiality of the Late Cypriot social world and specifically the tactile experiences involved in working with pottery.

9 THE MANIFOLD MATERIALITIES OF ARCHAIC GREEK CULT STATUES

Abstract author(s): Martin, Daphne (University of Cambridge)

Abstract format: Oral

This paper explores the range and variety of materialities that constitute archaic cult statues, as well as their sensorial impact on the sanctuary visitor. Made of ivory, gold, wood, and stone, with inlays of precious materials and intricately embroidered textiles, I consider how the statues’ sacrality is embodied in and expressed through their composite and multi-medial nature.

I focus first on the chryselephantine statues from the Halos deposit, found in a votive trench under the Sacred Way at Delphi in 1939. These are commonly identified by scholars as Apollo and Artemis. With faces and limbs made of luxurious ivory, and hair, jewelry, and clothing appliqués made of thin sheets of hammered gold, these statues would have overwhelmed the viewer by their sheer sensorial splendor. Through analysis of the properties of the individual materials, and then their overall effect (and affect), this paper re-constructs the visual and sensorial power of the cult statues through the lens of their composite materiality.

I then go on to consider another material, cloth, through two cult statues for which we have evidence for textile dedication: Athena Polias at Athens and Apollo at Amyklai (Vlachou 2017). By considering both the sacrosanct process of weaving and the religious festivals in which such objects were dedicated, this study identifies textiles’ particular religious affordance in the link between the human hands which would have woven and carried the textiles, and the cult statues for which they were made.

In considering the materiality of archaic cult statues, this paper aims to bring into focus the myriad ways in which material would have mediated the visual and haptic experience of divinity in the ancient Greek sanctuary context.

MOSAIC AS SENSORIUM: A HAPTIC APPROACH TO THE PAVEMENTS OF ANTIOCH

Abstract author(s): Miranda, Amy (Aarhus University)

Abstract format: Oral

Mosaic floors are walked upon and not necessarily viewed through direct vision. Rather, they are viewed through peripheral vision (which Juhani Pallasmaa convincingly attributes to the haptic sense), not quite in focus, but crucially completing a space. The twitches and undulations of floor mosaics are experienced somewhat visually, but also haptically. With the haptic, mosaics deeply affect an individual through the illusionistic dimensions of a mosaic surface that I suggest create a topographical map that delineate the floor and describe the space. This is perhaps most readily demonstrated through the ornamental and material components of mosaic pavements which, I suggest, unite compositions to create a holistic surface. As a case study, I look to some of the mosaics from ancient Antioch in present-day Antakya, Turkey. Dating to the second and third centuries CE, these pavements are a testament to how decoration connects with individuals through its sensorial potentials, which contribute to a synaesthetic pleasure. The houses of Antioch, with their mixing of figural and ornamental motifs, are then developed as sensuous, synaesthetic spaces through experiences of materiality and color. The stone and glass tesserae play with texture and weight as well as the effects of light to go beyond what can be seen. I draw upon recent work in architecture and geography on space and texture (Pallasmaa, as well as Kevin Hetherington and Mark Paterson) and suggest an investigation into the tactility of the tesserae's material (stone and glass) and hapticity of the floor surface. The synaesthetic topography an individual travels through as one steps upon the floor contributes to the surface's allure. The materiality of mosaics, the physicality of the tesserae, their colors and reflections, draw particular attention to how architecture functions beyond the visual as they act with the haptic and other senses to build an immersive environment.

SENSING WHAT CANNOT BE SEEN: ENGRAVED GEMS AND DIVINE REPRESENTATION

Abstract author(s): Allen, Ruth (Michael C. Carlos Museum, Emory University)

Abstract format: Oral

Engraved gemstones have long been considered too small, too frivolous, and too luxurious to be considered much more than beautiful, and remain largely absent from accounts of ancient Mediterranean visual culture, or else are sidelined as ancillary to the study of monumental art. But even those scholars who have understood gems' potential have given them little meaningful agency beyond their capacity to stamp: engraved gems are, by and large, seen only as tools for sealing, and their images consequently given more importance in impression than on the stone. This paper aims instead to take gems seriously as objects whose material qualities – their colour, shine, and “touch-capacity” – were as integral to their function as their iconography, recognising that engraved gems were used, adored, and examined as decorative objects seen and worn on the body, and bringing ‘ornamental’ gems into conversation with those typically classed separately as ‘magical’ or amuletic.

Its focus will be on the relationship between gems and the divine. We will look at the use of gems in the adornment of cult-statues, and the ways in which the special material qualities of the stone played an important part in the performance of divine presence. We will then explore how the engravers of gemstones exploited these material associations, promoting the sensual as much as the visual in order to turn engraved gems into miniature sites of divine encounter. In so doing, this paper aims to show the ways in which the agency of the gem-image was enhanced by the material and aesthetic qualities of the stone and animated by the act of wearing, which created further meaning in the tensions between seeing and not seeing, looking and handling, intimacy of scale and the flashy, look-at-me brilliance of the stone.

THE MATERIAL LIFE OF LINEAR A: A STUDY OF OBJECTS BEARING AN UNDECIPHERED SCRIPT FROM MINOAN CRETE (C.1800-1450 BC)

Abstract author(s): Rice, Mnemosyne (Trinity College Dublin)

Abstract format: Oral

Objects bearing Linear A inscriptions are not merely textual documents; they are material objects which are transformed by the addition of writing, mutually entangling text and material. This paper aims to understand this underexplored relationship, and how Linear A text contributed to the multiple meanings of objects through two case studies: 1) the stone vessels or ‘libation tables’ found in ritual deposits and 2) the clay (administrative) tablets found in the palaces. These examples showcase the spectrum of affordances which inscribed artefacts offer.

Some of the stone vessels appear to have been designed to receive inscriptions, while the clay tablets are thought to be palimpsests; these differences in engagement with Linear A are dependent on material properties, but more importantly, are the result of deliberate choices made by their creators. Stone vessels had potentially very long use-lives and human agents interacted with them in multiple contexts (from production to religious events), suggesting a multiplicity of sensorial experiences. Because clay tablets are interpreted as ‘reusable’ records which could be erased and reinscribed, the sensorial ‘moments’ would have happened more frequently and over shorter periods. In both cases, the materials (various types of stone and clay) and their accompanying text would have evoked multiple, simultaneous meanings for their human interlocutors.

This paper draws on Piquette and Whitehouse's (2013) framework for analysing ‘graphical artefacts’, and studying their production as a craft. This approach reveals the inscription of objects as a crucial step in the production process. It also foregrounds the human agents responsible for creating the artefacts, and their requisite knowledge and experiences (e.g. knowledge of materials’ proper-

ties, skill in specialised tool use, and varying levels of literacy). Through detailed analyses of the inscriptions and their interaction with the whole, this paper reassesses Linear A graphical artefacts from a material perspective.

WATER, ARCHITECTURE, AND THE SENSES: EXPLORING THE MATERIALITY OF AQUATIC LANDSCAPES IN THE ROMAN WORLD

Abstract author(s): Rogers, Dylan (University of Virginia)

Abstract format: Oral

The Roman world was full of water in various contexts, from splashy fountains, to immersive bathing complexes, to underground drainage networks. Water-displays, though, afford us with an important avenue of inquiry into the nature of sensory experience in Roman society, both in private and domestic contexts, as we can piece together ancient reactions to the multisensory pleasure of flowing water attested through literary and archaeological evidence. This paper, thus, explores how we can consider how water had the ability to oftentimes drastically alter the built environment in a variety of spaces in the Roman world. In sensory archaeology, by using the framework of the sensorial assemblage (or sensory field), which considers the built environment, substances, artifacts, and memories, we can begin to understand the reason behind fountain construction, as it had the ability to change the experience of a space and create new memories for ancient Romans. Because water, especially moving water, is inherently ephemeral, structures built to harness this element are interesting case-studies for reconstructing past sensory experiences. As such, if we consider the materiality that is inherent in water, we can reimagine these spaces—along with repopulating them with ancient Romans. An important aspect of this research is how, despite geographical location and climate zone, there was a propensity across the Roman empire to display water—which helped forge a common Roman sense of identity—that, in a way, was intimately tied to the senses themselves. This paper will consider a few examples of water-displays from the Roman world, especially those found at the site of Jerash (modern Jordan), in order to elucidate the sensorial impact of water throughout various Roman landscapes.

BRIGHTNESS - ΣΙΓΑΛΟΕΙΣ - SENSED AND ITS TRANSFORMED METAPHORICAL FUNCTION WITHIN HOMERIC POETRY

Abstract author(s): Saito, Yukiko (University of Liverpool / Kyoto Seika University)

Abstract format: Oral

This paper, focusing on the use of σιγαλόεις (bright, shining), pursues two aims. First, distilling the subtle, unseen nexus between colour/light, touch, and motion. Second, elucidating how viewers' sensory experiences might be affected by colour or its bright-hued aspects, through cognitive exploration. Brightness encompasses human life itself. How can the sense or aspects of brightness associated with materials be most effectively delineated? Characters are portrayed as being amazed (θεάομαι; Od. 19. 229 and 235) on seeing Odysseus' bright appearance. So are we, i.e., viewers. Odysseus wears a shining tunic with the sheen of dry on-ion-skin, which shines radiantly as the sun shines (Od. 19. 231-233). Σιγαλόεις is used in describing various materials such as when Andromache discards her shining headdress (Il. 22. 468), Nestor takes up shining reins (Il. 8. 116), Penelope enters the bright upper chamber (Od. 16. 449), and so forth. They illuminate the intriguing nature of brightness. Its religious significance was profound for society in antiquity (e.g., Parisinou (2002); Christopoulos, Karakantza and Levaniouk (eds.) 2010; Platt 2011). Viewers, ourselves included, seem to be always attracted to bright light and gaze in wonder at it. I should like to go one step further, to discern the deeper aspect of visualising brightly-coloured scenes as multisensory experiences (e.g., Hölscher 2018; Witcombe 2018; Butler and Bradley (eds.) 2019). Examining how various σιγαλόεις-related scenes are associated with each other, I investigate what kind of function(s) those shining materials could be seen to be performing, while seeking σιγαλόεις' metaphorical, transformed representation. Spotlighting σιγαλόεις, whose materials indicate the radiant colour-hue's effect on viewers' recognition, my goal is to unveil the poet's aesthetical skill in composing his story, like the textual sounds of a unified, harmonious ensemble. Then the social significance of the realisation of ancient colour-sense is unfolded, accordingly.

THE ARCHAEOLOGY OF COASTAL COMMUNITIES

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Wouters, Barbora (Vrije Universiteit Brussel) - Hansen, Gitte (University Museum of Bergen) - Lo Russo, Sarah (Vrije Universiteit Brussel; University of Basel)

Format: Regular session

Coastal zones, including riverine estuaries, have always constituted contact zones where people connected and interacted, thereby exchanging thoughts and goods. This connectivity as well as the dynamic coastal environment made these communities highly responsive to change and innovations. People continuously adapted to new situations and influences (trade, migration, climate, sea-level rise...), which stimulated the social resilience and the adaptation of changes in lifestyles. Both are embodied in the material features of the coastal landscape and its landing and meeting places, which acted as hubs for trade and ideas. Different authors, including Gordon-Childe, have in the past addressed the evolution of these centres and the related issue of urbanisation. We approach this question of connectivity from different angles: the study of the exchange of artefacts, the changing environment and use of space, all the way to the environmental archaeology of the coastal communities. This session wants to further explore the responses to this dynamic connectivity by focusing on the archaeology of the landing and meeting places from a variety of regions

and periods, not limited to urban settlements. We invite contributions spanning different sub-specialisms of archaeology, including studies presenting new findings, theoretical or scientific advances or applications.

ABSTRACTS:

1 THE CHANGING ENVIRONMENT OF TYRRHENIAN COAST AND THE CHANGING FORTUNE OF LANDING PLACES OVER TIME

Abstract author(s): Citter, Carlo (University of Siena)

Abstract format: Oral

The Tyrrhenian coast between Rome and Pisa has changed much over time. The major rivers (Tevere, Ombrone and Arno) used to shape it together with sea level fluctuations. When dealing with landings and main harbours in this region, we need to reconstruct the most likely scenario of the period we are studying. Most areas that look as fertile plains today, used to be lagoons for the whole antiquity. Thus, providing opportunities for inner, safer landings. But they turned to marshes in modern era. The recorded changes contribute to understand the trajectory of many settlements, including riverine towns, harbours, market-places. Of course, the changing fortune of these settlements cannot be caused only by environmental changes. But they impacted much and recent literature acknowledges this as one of the main causes. We will provide an overview on the long durée because some major Etruscan sites declined in the Roman period, others persisted until the early middle ages. Only a few proved to be resilient over time.

2 HUMAN-ENVIRONMENT INTERACTIONS IN NORTHERN DENMARK DURING 3000 YEARS OF COASTAL AND RESOURCE CHANGES

Abstract author(s): Kristiansen, Søren - Ljungberg, Thomas (Department of Geoscience, Aarhus University) - Christiansen, Torben (The Historical Museum of Northern Jutland) - Dalsgaard, Kristian (Department of Geoscience, Aarhus University) - Haue, Niels (The Historical Museum of Northern Jutland) - Greve, Mogens (Department of Agroecology, Aarhus University) - Nielsen, Bjarne (Vesthimmerlands Museum)

Abstract format: Oral

New refined understanding of the global relative sea level (RSL) has contributed to much more precise estimates of the rates of the paleo-coast change worldwide. This rapidly evolving understanding therefore holds major potential in relation to onshore human-environment interaction studies at local and region levels. However, changes of coastlines and their consequences for prehistoric societies living in glacio-isostatically uplifting areas have not been assessed on a larger scale and based on high-precision modelling of the slow changes of the coastal ecosystems as meadows, marshes and lagoons.

In this paper we present new results which highlights how high-resolution models of coastal and settlement development during the last 3000 years in the central Limfjord area (Northern Denmark) are correlated with archaeological evidence. The methods include optically stimulated luminescence (OSL), geo-archaeology, correlation with archaeological databases, and upscaling using paleo-landscape modelling and remote sensing (lidar) data.

This new temporal and spatial model of coastal development shows that only few of the new land areas were colonized, and only for a short period during the Late Roman Iron Age until 400 CE. Although the new marine forelands constituted rich grassing lands, Bronze and Iron Age settlement locations were little influenced by the steady growth of these. In addition to improving the understanding of the current archaeological record, the high-resolution model may serve as an important base for qualification of future research and for monitoring and protecting archeological sites in the region. Combined, this provides new knowledge of relevance for both the paleo-environment changes and the humans living along the ever changing coasts.

3 A HUNDRED DIFFERENT WAYS TO THE BEACH: WHY THE PATH TO THE SHORE MAY BE MORE SIGNIFICANT THAN YOU THINK

Abstract author(s): Johnson, Andrew (Manx National Heritage)

Abstract format: Oral

The Isle of Man has a varied coastline extending 160km and ranging from wide, open beaches, through small coves and rivermouths, to impenetrable cliffs. Today the island is served by seven small ports and harbours, but these represent just a tiny proportion of the landing places historically used by a once largely rural population.

Today the islanders take access to the shore for granted, but the routes by which they reach the coast, and the reasons for their existence, go largely unregarded. The physical character and legal status of these routes are often significant in betraying their former purpose: some exist as footpaths, some as tracks leading only as far as the nearest farmstead, whilst others have been transformed into public highways.

Perhaps even less appreciated is the extent to which the shore, both intertidal and above the strand-line, has been adapted or altered to improve safety or ease of use. It is sometimes possible to glean from this the reasons individual landing places were exploited: fishing and the collection of seaweed as manure are amongst the most obvious uses.

Much less obvious are landing places connected with medieval chapels, burial grounds and holy wells, some of which persist as little more than folk memories. These sites in turn were once connected with communications from across the sea, small-scale trade, local fairs and beach markets.

The recovery of these former uses of the coastline has been greatly aided by map regression and place-name study, allied with long-term fieldwork, and presentation by means of GIS.

4 2500 YEARS OF HUMAN INTERACTION WITH THE SHORELINE AT TRONDHEIM, NORWAY

Abstract author(s): Cadamarteri, Julian (NIKU - Norwegian Institute for Cultural Heritage Research)

Abstract format: Oral

This paper presents and discusses data relating to settlement and natural topography derived from archaeological excavations in the medieval town of Trondheim, Norway. Trondheim is situated at the estuary of the river Nid and is the northernmost medieval city in Norway, growing from a small Viking Age regional and inter-regional coastal trading centre established during the 10th century AD. As such it played an important part in Norwegian history and was the seat of the Norwegian kings until 1217. And the seat of the Norwegian archbishop until 1537. Recent archaeological finds document the presence of an agrarian settlement here since the early Pre-Roman Iron Age at c. 500 BC. Throughout this long period, the local population lived in a changing natural environment created by ongoing interrelated formation processes, including isostatic recovery, alluvial deposition and a landslide which covered part of the peninsula with a thick body of clay. The archaeological material show that the peninsula and especially the shore seem to have been used for gatherings dating back to the first century AD. The settlement established in the 10th century was also located near the shore and a medieval Thing, a law assembly, was regularly held on the beaches. The archaeological material demonstrate the close interaction of natural processes and human actors in the formation and use of the landscape. The dynamics of human settlement practices in the context of the natural environment, both terrestrial and marine, are highlighted. The settlement history is discussed in the wider context of local and regional developments during the Norwegian Iron Age.

5 THE OLD “BAYE DE BRETAGNE”: A MARITIME CULTURAL LANDSCAPE OF ATLANTIC FRENCH COAST

Abstract author(s): Gaëlle, Dieulefet (UMR CRéAAH-LARA, Université de Nantes) - Pouzet, Pierre (UMR 6564 LETG, Université de Nantes)

Abstract format: Oral

This research deploys an maritime and coastal approach, combining archeology and marine geosciences on the old “Baye de Bretagne” localised in Loire-Atlantique (France). In medieval and modern times, this bay was an important salt supply center for merchants and fishermen in Northern Europe, then a large anchorage linked to Nantes and to the maritime route between Saint-Malo, Lorient and La Rochelle. But, at the end of the medieval period, the evolution of the environment and the use of space conditions the reorganization of nautical and maritime activity. And now, what are the archaeological markers of this activity on land and under the sea? And what can they teach us about the resilience of coastal populations?

The oceanic coastal societies of the past have succeeded in exploiting resources, creating port facilities and navigation techniques for their growth by seizing the coastline and adapting to changing constraints. They thus produced a “maritime cultural landscape”. The Land-Sea continuum has become a vast and complex maritime network with urban, port and artisanal areas interconnected with maritime routes. The challenge of this proposal is therefore to indentify the construction and evolution of the maritime landscape.

6 HUMAN ADAPTATION TO LAKE LEVEL CHANGES IN THE LATE-HOLOCENE: KURSI BEACH AS AN EXAMPLE (SEA OF GALILEE, ISRAEL)

Abstract author(s): Giaime, Matthieu (Hatter Laboratory, Recanati Institute for Maritime Studies, Department of Maritime Civilizations, University of Haifa; Institut de Ciència i Tecnologia Ambientals - Universitat Autònoma de Barcelona) - Artzy, Michal - Cohen, Haim (Hatter Laboratory, Recanati Institute for Maritime Studies, Department of Maritime Civilizations, University of Haifa)

Abstract format: Oral

During the Holocene, the Jordan Valley was a cradle of human occupation where the emergence of the first complex societies was noted. Local populations benefited from a particularly favourable environment, fertile agricultural lands and plentiful of water from the Jordan River. Along the valley, the freshwater lakes attracted local inhabitants to their shorelines and they, in turn, closely interacted with their natural environment. These anthropogenic legacies, modified over the millennia constitute the cultural heritage of the region. Lake of Galilee/Kinneret’s ancient coastal settlements have kept international interests due to the Christian world concern as the area where Jesus performed several miracles.

Using geomorphological and archaeological indicators, we aim to highlight the importance of Galilee lake level changes during the Late-Holocene period. Several structures excavated at Kursi Beach – including a breakwater and fishponds – dated to between the Iron Age and the Byzantine period provide evidence of pluri-metric lake level changes during the 1st Millenium BCE and the 1st Millenium CE. Our data is comparable with archaeological indicators originating from other Lake of Galilee excavation sites to better constrain lake level changes during that time period. Understanding lake level changes is of high interest to contextualise archaeological discoveries and to analyse the importance of human adaptation to environmental changes during a key period in this region.

7 DYNAMISM AT THE EDGE: CONNECTIVITY AND ISOLATION IN OILEÁN CHLÉIRE'S SEASCAPE

Abstract author(s): Kerr, Sarah (Aarhus University)

Abstract format: Oral

This paper introduces the coastal zone of Oileán Chléire (Clear Island), Ireland, and traces its spatial and temporal connectivities that exist in juxtaposition with its cultural and physical isolation. Oileán Chléire is Ireland's most southerly inhabited island located approximately 13km from the mainland, in a seascape called Roaringwater Bay. In the late-medieval period, the Bay was controlled by the O'Driscolls who built a constellation of twelve tower houses (small castles) along the coast and its islands. On Oileán Chléire they built Dún an Óir tower house, the furthest castle from their centre of activities with architectural anomalies that suggest it was of comparative low status. Heightening the peripheral sense of Dún an Óir is its location on a promontory, facing towards the Atlantic Ocean rather than the Irish mainland. Today, there is a feeling of reaching the edge of Ireland, perpetuated by the promontory inaccessible at high tide.

This narrative is balanced with the evidence for late-medieval connectivities. Further architectural evidence indicates Dún an Óir's role in connecting Oileán Chléire to Roaringwater Bay, Southern England, and South-West Europe. Furthermore, there is landscape and placename evidence to suggest temporal connectivities. It will be argued that Dún an Óir's promontory was occupied from the early medieval period and its abandonment in the 17th century should be considered part of a transformation in the island's connection with further afield, rather than deterioration. Therefore, taking a broader temporal view of Dún an Óir reveals resilience and adaptation in the face of challenges which included battles with the English and pirate raids. The challenges facing Oileán Chléire and Dún an Óir have changed but not ceased: today, both are threatened by storm surges, sea-level rise, and high winds. This paper will close on the local community's continued resilience, particularly that of the current O'Driscoll clan.

8 PORT COMMUNITIES AND THE TRANSFORMATION OF PORT CITIES AND HARBOURSIDES IN BRISTOL AND COPENHAGEN

Abstract author(s): Whatley, Stuart (University of Bristol; University of Cardiff)

Abstract format: Oral

Between the years 1400-1700 increased commercialisation, consumption and consumerism had transformed many regions around the globe. The effect of these changes led to urban development, which was especially visible in port cities. Urban excavations at these port cities have revealed consumption of comparable types of goods suggesting similar social and cultural practices occurring within harbourside communities.

In northern and western European coastal cities, this transformation was even more apparent. The harbourside communities were found to comprise an ever-changing array of finds linked to daily life, industry and public eating. This occurred in areas comprising a wide range types of buildings linked to maritime trade, small-scale industry, and the domestic community. Meanwhile, the physical harbour areas were constantly redeveloped to undertake and administer trade, store goods, and enable transport of people.

This talk will use information from case studies of international harboursides at Bristol in England and Copenhagen in Denmark to discuss this information. It will utilise artefactual, structural and built remain evidence alongside environmental remains.

9 DESTRUCTION AS CREATION. LAND DEVELOPMENT IN THE DESERTED 10TH-17TH CENTURY TOWN BORGUND, NORWAY

Abstract author(s): Hansen, Gitte (University Museum of Bergen, University of Bergen)

Abstract format: Oral

Driving through small towns in the periphery of Scandinavia, closed down stores and houses for sale are commonplace. The depopulation of marginal districts is disturbing today, but such developments are not new. The Borgund Kaupang, by Aalesund on the west coast of Norway, emerged as a thriving urban community in the late Viking Ages but was deserted some 300-500 years later in the late Middle Ages. The town is a model example that throughout history once-prosperous settlements have also fallen into decay. Borgund was one of Norway's 16 medieval towns. It was located on the threshold between land and sea along the north-south going sailing route between arctic resource areas and the large town of trade Bergen to the south. Rich marine and inland resources in the hinterland, were probably also of essence for the survival of the town. We know little about Borgund from written sources, but from the mid 1950's and on archaeological investigations took place here for more than 30 field seasons. Today Borgund boasts the largest assemblage of medieval archaeological sources in Norway, outside the large existing towns. In this talk legacy data from the dawn of medieval archaeology in Norway are addressed to explore destruction and creation as a means to renegotiate and re-define places in face of environmental and political changes. The Borgund kaupang is the case.

10 INVESTIGATING SOCIAL RESILIENCE IN A LONG TERM PERSPECTIVE

Abstract author(s): Nordström, Annika (Dept of Archaeology and ancient history, Uppsala Univ)

Abstract format: Oral

Ten years ago, major archaeological excavations revealed new evidence concerning the development of the coastal town Nyköping in Sweden. Among other things, the excavations revealed two large, previously unknown boathouses (30x12 m, fitting the Gokstad

ship) dated to c. 650-1050 CE, and a regulated town plan, dated to the late 11th century. Located in an estuary by the Baltic, high medieval Nyköping was the administrative center of the county of Södermanland, and an important market and meeting place, well situated in the landscape and several seaways. Previous research (building on written sources and available archaeological records) have categorised the town in a group of (mid-Swedish) urban places founded in the mid-13th century. Previous archaeological excavations have also indicated indistinct remains from the 12th century.

In this paper, I will discuss social resilience in a long-term perspective in Nyköping. For the purpose of this study, I define social resilience as the ability of a community to cope with, and adjust to, environmental and sociopolitical change. By using a set of identified breakpoints in the archaeological records, I analyse if and how the event(s) in the breakpoints helped to push the community in a new or different direction – and if and how this coincides with overarching changes in society. The breakpoints range from; the power expressed by the boathouses; the design of the regulated town plan; a cataclysmic landslide or the construction of a town square. How people in the community responded to the changes is analysed in association with the contemporaneous material culture and archeobotanical remains. The ambition is that the result of the analyses can be used to compare development strategies in contemporary places around the Baltic. The study is part of my ongoing PhD-project, and is largely influenced by assemblage thought and social practice theory.

11 THE EMERGING CERAMIC CRAFTSMANSHIP AT ROMAN PATRAS IN AN ERA OF MAJOR SOCIO-CULTURAL CHANGE

Abstract author(s): Kougia, Nickoula (Department of Geology, University of Patras; ERAAUB, Departament d'Història i Arqueologia, Facultat de Geografia i Història, Universitat de Barcelona) - Reynolds, Paul (ERAAUB, Departament d'Història i Arqueologia, Facultat de Geografia i Història, Universitat de Barcelona; ICREA, Passeig Lluís Companys, Barcelona) - Iliopoulos, Ioannis (Department of Geology, University of Patras; ERAAUB, Departament d'Història i Arqueologia, Facultat de Geografia i Història, Universitat de Barcelona)

Abstract format: Oral

Roman Patras, after its establishment as a veteran colony by the emperor Augustus in 16-14 BC, launched a new era as the provincial capital of Achaea that brought wholesale changes in social and economic life to the region. The city was favoured with political and economic privileges that promoted its forthcoming urban development, encouraged by a re-distribution of population to the new urban nucleus. This demographic growth under Augustus brought with it an increasing demand in products that would further trigger a growing consumption in locally produced artefacts. Moreover, the city's strategic location, along the axis of eastern and western Greece promoted hinterland connectivity and commercial activity, whereas its role as the main port of entry into Roman Greece through the Corinthian Gulf, with Lechaion and Kenchriae, the ports of Corinth, at its eastern end, enhanced its transformation as a key node of maritime trade in the eastern Mediterranean. The needs of the emerging local market, which integrated veterans and other colonial settlers with the local population, supplementary to commercial activity and the ports' prosperity would have led to the city's efficiency as a production center. A variety of associated crafts, including the production of ceramic table wares, common wares and amphorae as well as ceramic building materials (brick and tile) further emerged, contributing substantially to the city's economy and facilitating its role in regional and long distance trading networks. Several years of research have now documented the ceramic workshops within the city and its territory. An overall appraisal of the scale of production demonstrates that pottery craftsmanship was on a par with the major changes in the socio-cultural environment of Patras and Achaea during the Imperial Roman period. The results obtained will enrich the evidence available for the industrialized status of the city of Roman Patras.

12 APPLYING OPTICALLY STIMULATED LUMINESCENCE TO THE LATE BRONZE AGE ANCHORAGE OF MARONI-TSAROUKKAS, CYPRUS

Abstract author(s): Kapahnke, Sheri (Texas A&M University)

Abstract format: Oral

Coastal sites of trade and connectivity are often entirely or partially submerged in dynamic underwater environments. Similar complicated stratigraphic records in terrestrial contexts are analyzed using tools such as optically stimulated luminescence (OSL), which measures the last time quartz grains in sediment were exposed to the sun. OSL has not previously been applied to underwater sites, but has the potential to clarify an underwater site's formation and to what extent disturbances have affected artifact positions and associations. In the summer of 2019, OSL methodologies were applied to marine sediment samples from beneath artifacts and from cores taken at the Late Bronze Age anchorage at Maroni-Tsaroukkas, Cyprus (6.0 m depth) to test the capability of the technique to differentiate between disturbed artifacts and those remaining in situ. Combining preliminary screening, and calibrated screening methods provided a relative chronology with the possibility to extract absolute dates in the future. Preliminary screening by means of the portable OSL reader differentiated samples by high (geological, earlier than human occupation), moderate (archaeological), and low (bleached) OSL signals. Comparison between signals from sediment samples beneath artifacts and signals from the same level of sediment within cores made it possible to indicate one anchor which may have moved recently, and one which may have remained in place for considerable time. Additionally, initial stratigraphic conclusions determined factors of sedimentation that could influence interpretation of the site's artifacts: areas where sand has accumulated without continued disturbance, and differences in accumulation and erosion of silt between the sectors of the site. The results of this initial sampling program are a positive promo-

tion for use of OSL on underwater sites, and encourages the need for further exploration into the methodology in order to improve our means of studying submerged coastal sites in the face of dynamic environmental challenges.

13 COASTAL NETWORKS: THE VIEW FROM GUADALUPE, HONDURAS

Abstract author(s): Fecher, Franziska (University of Zurich) - Reindel, Markus (German Archaeological Institute) - Fux, Peter (Museum Rietberg Zurich; University of Zurich) - Cruz Castillo, Oscar (Instituto Hondureño de Antropología e Historia) - Della Casa, Philippe (University of Zurich)

Abstract format: Oral

The Atlantic coast of Honduras has been little explored archaeologically. This is despite the fact that the region is located in the overlapping space of three large culture areas: Mesoamerica, Southern Central America, and the Caribbean. Previous theoretical approaches characterize the area as "something in between", which takes a passive role and is shaped by external influences. However, for the adjacent culture areas, we know that interaction along the coasts intensified especially during the Late Pre-Hispanic period. This contribution presents the results of investigations at the coastal settlement of Guadalupe (AD 900-1525). Due to a strikingly high amount of obsidian and pottery and the presence of jade and metal objects, the settlement occupies a special position in the regional settlement pattern. Using the network approach, existing exchange networks to other sites and regions are reconstructed on the basis of material culture and social practices. The results show that the inhabitants of the pre-Hispanic settlement were involved in different, partly far-reaching networks. The exchange along the coast played an important role for these interactions. We assume that the special position of Guadalupe in the local settlement pattern results from its location on the coast and its function as a broker, presenting a hub between the different networks.

14 OBSIDIAN INTERCONNECTIONS ACROSS THE SEA: THE VIEW FROM THE ISLAND OF CYPRUS

Abstract author(s): Moutsiou, Theodora (Archaeological Research Unit, University of Cyprus)

Abstract format: Oral

Small quantities of obsidian tools appear in the Aceramic Neolithic (~8900-5300 cal BC) archaeological record of Cyprus in the Eastern Mediterranean. No geological sources of obsidian occur on the island, while an extensive geochemical characterisation programme has shown a number of Anatolian sources represented in the lithic assemblages. Since no land bridge existed between the island of Cyprus and the surrounding Anatolian/Levantine mainland, the existence of obsidian tools on the island necessitates maritime exchange networks. The risks and efforts associated with such practices suggest a conscious choice for obsidian consumption on behalf of these early insular populations and the desire to maintain long-distance interconnections between island and mainland populations. This paper discusses these early obsidian occurrences on the island of Cyprus in the context of maritime interactions and attempts to elucidate the effect of island and coastal movements on the social organisation of early insular communities in the Eastern Mediterranean.

15 SEA FLOOR SURVEY OF ANCIENT MAYA WOODEN BUILDINGS PRESERVED BELOW THE SEA FLOOR

Abstract author(s): McKillop, Heather (Louisiana State University) - Sills, Elizabeth (University of Texas at Tyler)

Abstract format: Oral

The location of the Paynes Creek Salt Works was selected by the inland Maya need for dietary salt and salted fish. Surplus household production of salt, its transport by canoe up rivers to regional marketplaces, and the presence of non-local pottery and stone tools, underscore the ongoing coastal-inland relations. Salt was made by boiling brine in clay pots over fires inside pole and thatch salt kitchens, whose wooden posts have preserved in a mangrove peat bog below the sea floor. The salt production pottery--briquetage--is ubiquitous at the underwater sites. Surface collection on land has used grids for defining specific areas for surface collection or flagging individual finds. We extended the method for sea floor survey. A program of sea floor survey, including systematic flotation over sites, flagging individual artifacts and wooden posts, and mapping them, results in an opportunity to evaluate the activities associated with salt production. This methodology allowed examination of spatial patterning of activities in different buildings. Ceramic analysis and radiocarbon dating of wooden posts Ek Way Nal, one of the largest sites, indicates use in the Late and Terminal Classic periods and then abandoned (C. E. 600-900). The dates correspond to the height of Classic Maya civilization inland where salt, a basic biological necessity, was in short supply. Analyses of artifacts associated with different buildings indicates fish processing, wood working, ritual and music, were carried out in addition to salt production. The sea floor survey provided valuable information from knowing the spatial locations of finds and will guide planned excavations.

16 WATER SYSTEMS IN RESPONSE TO ENVIRONMENTAL AND SOCIETAL CHANGES. THE CASE OF THE COASTAL SANCTUARY OF HERA AT SAMOS, GREECE

Abstract author(s): Androvitsanea, Anna (University of Applied Sciences of Lübeck)

Abstract format: Oral

The ancient extra-urban Sanctuary of Hera at Samos is situated in a coastal plain in the Southeast of the Greek island. The hydraulic infrastructure of the archaeological site as well as the performance and vulnerability of its water system since antiquity is currently studied in a joint interdisciplinary research project bringing together civil engineers, hydrologists and archaeologists.

At the Heraion, a sophisticated ancient network of wells and subsurface terracotta pipes has been excavated, which could support many thousands of people sustainably with water. A closer investigation shows that the water supply system of the Heraion was exceptionally well engineered and resilient to even prolonged droughts and moderate floods. The diachronic reconstruction of the functioning of its water system provides an insight into the implementation of different innovations in water engineering. Additionally, it provides a better understanding on how these systems were adapted to climate change and varying societal needs until they finally collapsed, were abandoned or have been modified in order to serve changing needs of water demand.

17 FISHING LINE TECHNOLOGY IN PREHISPANIC SOUTH AMERICA. TIME, SPACE AND CONTEXT

Abstract author(s): Flores Fernandez, Carola (Center for Advanced Studies in Arid Zones - CEAZA) - Torres, Jimena (Universidad de Magallanes)

Abstract format: Oral

Fishing line is an active and individual technology used by societies inhabiting the shore of lagoons, rivers, and oceans during pre-historic times. Archaeological and ethnographic publications from South America, evidence different types and forms of capture systems and constituent elements such as sliding knots, fishhooks made of shell, bone or cactus spine, and fishing weights made also of shell or stone. These technologies have been used by societies with marine, coastal and terrestrial subsistence strategies, indicating the wide context of this fishing knowledge.

By revising available archaeological literature from Ecuador, Brazil, Peru, Chile and Argentina, we aim to generate a macro regional synthesis about the time, space and context of fishing line technology around the Prehispanic South America. By focusing on archaeological records located on marine littoral environments, we aim to set a comparative framework about the origin and development of this particular technology in used during thousands of years around the Southern part of the American continent.

442 MISUSE OF THE MEDIEVAL IN THE EARLY 21ST CENTURY

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Spangen, Marte (UiT - The Arctic University of Norway) - Sindbæk, Søren (Aarhus University)

Format: Round table

The historical misuse of archaeology in order to defend and promote ideological standpoints is finding new expressions in the early 21st century, partly due to the development of communication technology and increasingly harsh debate rhetoric in politics and elsewhere. Social media and media in general are demonstrably aiding this development. This affects both the academic community as a whole and individual academics, whether these researchers are online and opposing the outputs or not. Perhaps more worryingly, various productions, commentaries, and debates based on false, skewed, and/or cherry-picked archaeological evidence influence public opinion concerning a series of central cultural-historical, social, and political issues today. This MERC roundtable session will focus on examples of misuse of the medieval in a variety of contexts and referring to a range of archaeological material and research. Furthermore, we wish to discuss the social responsibility and capability of academics to discuss and counter these tendencies in a fruitful way.

443 RE-IMAGINING HOW WE CREATE AND DEVELOP ARCHAEOLOGISTS IN A POST-COVID WORLD

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Geary, Kate - Jones, Cara (Chartered Institute for Archaeologists) - Karl, Raimund (University of Vienna)

Format: Round table

Round table of the community on the teaching and training of archaeologists.

The training and skill development of archaeologists is traditionally delivered in tried and tested ways, usually starting at university. In 2020, as the profession, like the rest of the world, tumbled into safe-COVID working practice, much of these training opportunities were either disrupted, adapted or cancelled.

2020 has seen our sector change. Like any large world-wide event, the COVID-19 pandemic has shifted our working practice and brought into sharp focus our working methodologies. Never more so than how we develop, train and upskill archaeologists. We ask if this could be a watershed moment with how we deliver this? Is this an opportunity for our profession to reflect and look for innovative solutions or working practices throughout Europe and beyond and consider how they could be adapted for our own training frameworks.

We are keen to hear from a range of organisations and practitioners (at all stages of their careers) who have considered these questions and either aspire to or have created new training mechanisms. We are also keen to hear about the adaptation of the delivery of skills and training in 2020 to minimise disruption or who have identified innovative ways to deliver training opportunities that the sector could potentially continue utilising once this immediate crisis has passed.

Ultimately, we ask if we were starting from scratch, what would be our ideal mechanisms for creating and developing archaeologists?

Theme: 6. Material culture studies and societies

Organisers: Di Maida, Gianpiero (Neanderthal Museum) - Horn, Christian (Institutionen för Historiska Studier, Göteborgs Universitet) - Schaefer-Di Maida, Stefanie (Institute of Pre- and Protohistoric Archaeology, CAU Kiel; CRC1266)

Format: Session with presentation of 6 slides in 6 minutes

The recent increase in projects based on large-scale digitization of archaeological material has made urgent a conversation which reflects critically on issues connected to cataloguing and classification of often ample amount of collected data. On the other side, studies more reliant on traditional methods often neglect digital approaches to test basic clustering in their data. Moreover whereas archaeological classifications, especially typology, have a long history behind them, being at the foundation of the discipline itself, on the other hand digital approaches seem still to be in a tumultuous developing phase. In the archaeological practice a detrimental disconnect between the two approaches, could be problematic, one way or another: by either leading to a positivist enthusiasm towards the new, dismissing well-matured archaeological methodologies, or by setting aside the opportunities digital archaeology can provide.

These issues will be the focus of this session, by discussing projects, approaches, and theories that are situated at the confluence of traditional classification and digital methods, with a specific focus on the practical and directly work-related issues connected with the classificatory work, as for instance reflection on the role of traditional classifications in the development of machine learning for the recognition or analysis of patterns or forms, geometric morphometrics, big data studies of artifacts and other archaeological material.

We are looking forward to receiving presentations from all periods, including pre- and protohistory, classical antiquity, and historical archaeology (e.g. lithics, ceramics, metal, art, burials, architecture, etc.), regardless of their geographical origin. The aim of the session will be to bring together and discuss practical experiences as well theoretical perspectives, linking classification and digital methods in a critical and constructive way, weaving together new and old methods of recording, analyzing, and interpreting the archaeological record into a more mutual-profitable interaction.

ABSTRACTS:

1 TRADIGITAL HUMANITIES. EXPERIENCES IN A CONTEXT OF CHANGE

Abstract author(s): Pérez González, Jordi (Universitat de Girona)

Abstract format: Oral

At the beginning of the 90's, Judith Moncrieff first coined the term Tradigital art to describe those artistic processes that combined traditional and computational techniques in the creation of an image (physical or digital). In this communication we will highlight, on the one hand, our experience in various projects that have gone from accumulated data to analyzed data and then we will talk about a series of new techniques used with increasing assiduity in the field of Humanities.

Although these computational techniques introduce new methods for the identification of patterns in the data, and promise to accelerate the processes of analysis of the growing mass of data, they diverge from the beginning of the traditional narrative and its methods. In this sense, recent experiences allow us to discuss the benefits and limits of the link between traditional methods and techniques with computational ones when preparing scientific papers. Thus, we believe that without losing sight of the historian's basic essence of continually immersing himself in the reading and analysis of sources, the paradigm shifts of Science can be assumed through the assumption of this new techné.

Consequently, among our main objectives is, first, to analyze the expert figure of the Data science or Chief Data Officer (CDO) within the organization chart of research development, second, to detail the processes of Data Cleaning and Data Quality of the bases of data analyzed and finally summarize the use of new tools such as Carto, Tableau, Flourish, etc. that serve to empower researchers in decision-making in their analysis processes.

2 AMULETS NEED ATTENTION! RETURNING TO THE CLASSIFICATIONS TO BETTER UNDERSTAND THE SMALL FINDS OF TELL EL-GHABA (NORTH SINAI, EGYPT)

Abstract author(s): Calomino, Eva (Instituto Multidisciplinario de Historia y Ciencias Humanas - IMHICIHU - Consejo Nacional de Investigaciones Científicas y Técnicas - CONICET; Universidad de Buenos Aires)

Abstract format: Oral

Much of the historical-archaeological approaches integrate conceptualisations and classifications for data management, database creation and their submission under qualitative and quantitative analyses. Throughout this classification process, the artefacts are included in categories that generally correspond to previously used names within disciplinary traditions specific to each area of study. In this sense, these categories sometimes have explicit definitions and sometimes do not, hence continuing with the lack of problematisation of the assumptions that said categories entail. In this way, concepts begin to work as "labels" that integrate social and functional assumptions and broader meanings. The categories tend to become diffuse, and, as such, their explanatory power decreases. Something similar has happened with the concept of "small finds" in the research from archaeological sites in Ancient

Near East. A way to remedy this situation is proposed here by presenting a definitive classification proposal for the small finds recovered from Tell El-Ghaba (north Sinai, Egypt, 10th century BC - 7th century BC). The specific and contextual study of the 964 small finds found in the domestic structures of this site seeks to describe and create ways of interpreting the activities carried out by the inhabitants and their beliefs. They were recovered in systematic excavations, and analyzed and recorded under controlled laboratory conditions (by the Argentine Archaeological Mission in Tell el-Ghaba since 1995). The analysis of this sample is carried out from the registration databases -field and laboratory registration sheets, photographs and drawings- and several related publications. This presentation proposes clear and operational tools to approach the study of the relationships between activities and material culture, presenting categories in which the sample can be organized without referring to the functional question as the primary level of object classification and hoping that this proposal can be applied at other archaeological sites in the eastern Mediterranean.

3 THE DISAPALE PROJECT: A 3D DATABASE OF PALAEO-LITHIC LITHIC TYPES

Abstract author(s): Di Maida, Gianpiero (Neanderthal Museum)

Abstract format: Oral

Hosted by the Neanderthal Museum, in the past 3 years, the DISAPALE project (a German acronym that stands for "Digital collection of Palaeolithic lithic types") has been digitally recording more than 1,000 lithic items, building thus quite an impressive 3D dataset of lithic artefacts from different periods and geographical regions.

As it is easy to imagine, the organization of the collected data required the implementation of a cataloguing system of a sort. The obvious choice - that of relying on the existing typological lists - did not come devoid of issues. Typology in fact while it constitutes a core part of the basics for students of prehistoric archaeology in colleges and universities around the world, at the same time it is far from being a fully accomplished field of study: and if this might be said for every field of study, in its case the problems run deeply to its own foundations. Contrary to other apparently similar fields (like cladistics in biology, for instance), the overall impression is that typology is still far from finding its balance.

In this paper, it will be briefly discussed the possibility that the digital recording and cataloguing of artefacts could provide a new renewed impetus to the typological analysis of lithic, with the hope to finally contribute to its more organic development in a fully, scientifically sound branch of study.

4 HYBRIDIZED METHODOLOGY IN CERAMIC SHAPE ANALYSIS: A CASE STUDY OF TYPOLOGY, GEOMETRIC MORPHOMETRICS, AND 3D DATA IN NEOLITHIC JAPAN

Abstract author(s): Loftus, James (Kyushu University; Japan Society for the Promotion of Science)

Abstract format: Oral

"Japanese archaeology is currently at a methodological turning point" has been a key phrase in the scholarship for more than two decades. With complex statistical analysis becoming the "standard" for modern analysis of shape in western scholarship, the traditional use of notions such as "attributes", and "typo-chronologies" has fallen out of favor. However, for a majority of modern archaeological study in Japan, these traditional aspects are still the favored process. While both have continued to illuminate important gaps in archaeological knowledge, this methodological gap has maintained an ever-growing wedge between Japanese archaeology and the international stage. International impact in the scholarship has continued to fall, with collaborations between domestic and international scholars few and far between.

This author believes that the solution to this precarious situation is not a complete elimination of 'traditional' methods, but instead a hybridization of methods in the analysis of shape. Utilizing a case study in the Jomon-Yayoi Neolithic transitional period, this study shows that a complex integration of typology, chronology, geometric morphometrics and 3D analysis in ceramic analysis can form not only statistically sound, but also holistically qualitative data for use in a variety of uni/multivariate analysis.

5 COMBINATION OF THE OLD AND THE NEW. CHALLENGES IN CONTEMPORARY ROCK ART STUDIES

Abstract author(s): Juszczuk, Karolina - Prusaczyk, Daniel (University of Warsaw)

Abstract format: Oral

The rock art study is one of the archaeological research areas with a wide range of possibilities in terms of the use of different research methods. Over the past years, with the development of technology, there has been an apparent dispute between the followers of traditional methods used in rock art studies and the supporters of the use of modern techniques. Currently, the prevailing trend is to combine these two approaches.

The aim of our paper is to present the research methodology we developed working on our projects in the Americas. We made an attempt to develop a new, coherent research strategy for rock art. The first project involved investigation at the Toro Muerto site in Peru, which is one of the largest repositories of rock art in the world. The second project was conducted at the Tetzcotzinco site in Mexico, where rock art is less abundant but geographically challenging to document. We will present the methods of documentation and classification of the iconography (based mainly on traditional methods), and its complementation by the use of different digital approaches, which include photogrammetry and scanning. We will also confront the traditional approach of making iconographic typologies with the method of creating digital databases. We will also present the possibilities of embedding the collected data in a GIS, taking into account the problems provided by working with big data (Toro Muerto) and synchronizing different types of data

(Tetzcotzinc). Hence, we will discuss the pros and cons of applying the same research methods at two different sites and present how different classification and interpretation results of rock art studies can be obtained using similar methods on various archaeological material.

Finally, we will present the problem of digitizing and publishing data online, which we also faced while working on the two mentioned projects.

6 A BOAT IS A BOAT IS A...UNLESS IT IS A HORSE - RETHINKING THE ROLE OF TYPOLOGY

Abstract author(s): Horn, Christian - Green, Ashley - Wählstrand Skärström, Victor - Lindhé, Cecilia - Peternell, Mark - Ling, Johan (Gothenburg University)

Abstract format: Oral

The projects "Rock art in three dimensions" and "Tracing carvers on the rocks" use traditional and 3D documentation, and granite geology to recognize motifs, styles, and utilization of the rock topography with object detection and segmentation. Simply put, these approaches cluster the data according to similarity. While the projects have concrete research questions and purposes, this clustering has also proven to be very useful for exploring the material. To identify their potential meaning any output requires careful interpretation because machine learning struggles with human creativity.

This paper argues that modern big data and machine learning can provide a powerful explorative tool, but it is only effective when typology is reconsidered. Typology was conceived based on 19th century evolutionist ideas as an archaeological tool to establish chronology which has been the major purpose of typology despite criticism and updates. However, chronology is an interpretation made on the similarity that is established by typology. Considering all this, combining typology, machine learning, and geology can create a new framework to interpret human creativity.

7 TACKLING TYPE DETERMINATION AND TYPE ASSIGNMENT WITH THE HELP OF AN APP: THE IDEA OF A DIGITAL ARCHAEOLOGICAL SLIDER PUZZLE

Abstract author(s): Roesler, Katja - Auth, Frederic - Domscheit, Wenke (RGK - Romano-Germanic Commission DAI)

Abstract format: Oral

In the context of further developing the idai.world we at the RGK are working on the digital display of norm data for archaeological objects. This includes the utilisation of virtuality to develop useful tools for the representation of the archaeological concept of type.

Vessel types usually are presented as unambiguous in archaeological publications. But the many variations of types that oftentimes have to be created, point to the vagueness that is an inherent part in the process of type determination. Furthermore, in archaeological field work ceramic finds are primarily fragmented and thus type assignment is difficult. To approach vagueness and fragmentation, we conceptualised an app under the working title Archaeological FormSlider. Inspired by <https://antlitz.ninja/> and the well-known slider puzzles, we attempt to transfer the effects of these games, that is the precise observation of features, the detection of characteristics not yet perceived, and the consideration of the not or not yet existing, into the handling of archaeological types.

Based on the example of the samian ware types of the *Conspectus formarum terrae sigillatae italic modo confectae*, we made available 1500 Sliders, each displaying parts of profiles. In a first test version of the app the user can browse through the sliders, move them and zoom in and out until they fit to a seemingly existing vessel type. By pressing the resolution-button the reconstructed exteriors of the self-created vessel pop up and the user immediately grasps if one has created an existing vessel, has come near to an existing type or drew up a "chimera", albeit a possible one. So, by bringing into focus the uncertainty both in the determination and the assignment of a type by means of virtuality we hope to make a meaningful contribution to a long overdue discussion of digital methods and typology.

8 UNSUPERVISED CLASSIFICATION OF SWISS NEOLITHIC POTTERY USING T-SNE AND HDBSCAN

Abstract author(s): Hinz, Martin (Institute for Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research, University of Bern) - Heitz, Caroline (School of Archaeology, University of Oxford; Institute for Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research, University of Bern)

Abstract format: Oral

Since 2016, in the SNSF-project 'Mobilities, entanglements and transformations in Neolithic societies on the Swiss Plateau (3900-3500 BC)', we have been using a computer-aided classification of vessel shapes to investigate completely preserved Neolithic pottery of Swiss wetland sites and neighbouring regions from the 4th Millennium BC beyond classical typologies and cultural assignments. We follow a holistic approach in which the entire vessel body has been handled as a rotational body. One side of the rasterized, filled and equally scaled profile is extracted, and via a simple transfer of the image information into a matrix, the profile line is converted into 400 measuring points. The profile information, enriched with nominal and metric values, was then classified using a combination of t-sne as ordination and dimension-reducing method and HDBSCAN as cluster algorithm. This approach was complemented by an impressionistic classification by the naked eye.

We have found that the two methods can be used to supplement each other: While computer-aided classification was able to work out more general, cross-stylistic trends, which can be interpreted concerning the functional affordances of the vessels and a consumer perspective, impressionistic classification leads to an identification of different styles, which rather open up a producer

perspective. Combining the results of both strands of analysis can serve to overcome common stereotypes and methodological counter-positions regarding qualitative and quantitative ceramic classification.

9 STATISTICAL EXPLOITATION OF MORPHOMETRIC DATA FOR POTTERY FORMAL CLASSIFICATION: VARIABLES, PROCEDURES AND DIGITAL EXPERIENCES OF SIGNIFICANT CLUSTERING

Abstract author(s): Travé Allepuz, Esther (Universitat de Barcelona)

Abstract format: Oral

Formal analysis of pottery is a commonplace for most archaeologists regardless of the area or period of study. The classification and typological study of utilitarian earthenwares is quite complex and has often been neglected or considered non-significant in pottery studies devoted to the analytical characterization of vessels. Certainly, a low degree of standardization or the regional character of some productions can jeopardize a definition of vessel typologies with some sense of universality. Despite this, global approach dealing with vessel's function or technology should also include typological aspects, as they are relevant at the microscale levels and have significance in determining technical choice or distribution.

In the last ten years, we have analysed and quantified vast amount of medieval greyware pottery assemblages. These coarse, plain and highly functional vessels fired under reducing conditions are highly homogeneous throughout the territory. The generation of complete and tidy datasets of morphometric variables and their exploitation via Principal Component Analysis (PCA) and Hierarchical Cluster Agglomeration (HCA) among other statistical approaches and graphical representations has led us to the identification of regional typologies with chronological meaning. Clusters resulting from a combined study including up to four diameters, wall thickness, absolute, preserved or reconstructed height, and vector profile measurement allowed us to determine degree of breakage and to consider this variable in its typological definition [1].

With our six-slide-short contribution, we aim at sharing our procedure and experience, and to discuss from a theoretical perspective its relevance for pottery studies in general and medieval common wares in particular.

[1] Travé E, Domingo G, Vicens J, Mauri A (2019): "Morfometría de cerámicas grises catalanas: Algunas consideraciones sobre la definición de tipos en cerámica común de época medieval y postmedieval", *Zephyrus*, 84: 161-182.

10 POTTERY, 3D IMAGING AND ARTIFICIAL INTELLIGENCE: DEVELOPMENT OF A NEW METHOD FOR THE AUTOMATIC RECOGNITION AND CLASSIFICATION OF DECORATION TECHNIQUES

Abstract author(s): Cassard, Laura (Université Côte d'Azur, CNRS, CEPAM UMR 7264) - Kaur, Jasmine - Yao, Jean-Élysée (Université Côte d'Azur) - Coli, Vanna Lisa - Binder, Didier (Université Côte d'Azur, CNRS, CEPAM UMR 7264)

Abstract format: Oral

Traditionally, the identification of the tools and gestures used to print ceramics is done by qualitative analogy between archaeological and experimental prints. To this end, in addition to direct observation of the artefacts, technical drawings, photographic records or casts are generally used to document the observations. Although it gives satisfactory results for the determination of general typologies, this method is time-consuming, often limited to selected sets and is accompanied by a certain degree of subjectivity. Recently, the development of a new method for analysing pottery decoration using 3D imaging has considerably improved the processes for identifying and classifying printing tools and gestures. This method consists in high quality scans, performed with a structured light scanner, which allow for the rapid acquisition of 3D data. Pottery series are thus fully taken into account. Thanks to the accuracy of the 3D models, analogies of shapes, as well as the dimensions of decorative prints (length, width, depth), can be directly implemented in the models. Typologies are provided with more details and the identification criteria are more relevant. However, this approach still requires the operator's judgement and does not yet exploit all the available 3D information. In addition, the use of 3D leads to an increase on the quantity of data and on the difficulties of processing. Our aim is to focus on Artificial Intelligence analysis methods in order to manage previously acquired digital data. From a dataset of experimental 3D models, we seek to characterise the whole print (shape and dimensions). We then explore the possibilities of automatic recognition and classification of the printing tools and gestures using Machine Learning methods. The creation of such algorithms aims to achieve an objective and comprehensive characterisation of the prints and thus increase the potential for data interpretation, while reducing the examination time.

11 A NOVEL APPROACH FOR NEURAL NETWORK-BASED CLASSIFICATION WITH EXPERIMENTAL BONE SURFACE MODIFICATIONS

Abstract author(s): Orellana Figueroa, Jordy (Department of Early Prehistory and Quaternary Ecology, University of Tübingen) - Sahle, Yonatan (Department of Archaeology, University of Cape Town)

Abstract format: Oral

The identification of archaeological bone surface modifications (BSMs) as anthropogenic in origin has been an important goal for zooarchaeology, with wide-ranging implications for our understanding of human evolution. Traditionally, the identification of BSM effectors (e.g. lithics or teeth) involves the examination of the morphological characteristics of experimental bone marks (where the effector is known), and the application of the insights gained to the identification of archaeological BSMs. However, there still

exists much disagreement amongst researchers regarding the different methods used, even whether equifinality makes a solid identification possible in all cases (e.g. [1]).

The debate is unsurprising, as a method capable of reliably identifying the effector of BSMs, when applied to archaeological data, could—for instance—confirm the need to push back the date of the earliest evidence for stone tool use by several hundred thousand years (e.g. [2]).

Newer approaches have focused on the application of more computationally-based methods to BSM identification—including the use of neural networks and other machine learning algorithms—with some success.[3]

We present here the methods and preliminary results of a novel approach for the application of neural network-based classification on a dataset of experimental BSMs. The BSMs were classified into two categories, based on the identified effector: 'lithic' or '(crocodile) tooth'. Through the use of data augmentation and regularisation techniques, as well as a simple neural network architecture, we obtained a mean classification accuracy of 92.60% across 30 runs. In this presentation, we discuss the advantages, disadvantages, and limitations of our methodology, and place it in context with the most recent applications of machine learning to BSM identification.

[1] Sahle et al., 2017

[2] McPherron et al., 2010

[3] Byeon et al., 2019

12 QUANTIFYING PATTERNS IN MORTUARY PRACTICES: AN APPLICATION OF FACTOR ANALYSIS TO DATA FROM THE TAOSI SITE, CHINA

Abstract author(s): Bai, Yang (Kyushu University)

Abstract format: Oral

In modern Chinese research, too much reliance on traditional qualitative typological analysis renders quantitative elements of mortuary practice data ignored. In this research, one of the famous cemeteries in China, the Taosi cemetery (2300-1900BC), has been chosen as the case to discuss the advantages and shortcomings of typology and digital methods. Extant researches adopted non-quantifiable typological methods to classify the Taosi burials, that was divided into six vertical categories, representing a pyramidal social hierarchy. However, this approach solely relied on the presence and absence of respective grave good items and the outcome was highly subjective and difficult to verify. The study applies Factors Analysis to investigate all the variables that can be extracted from the data, including both grave goods and dimensions of mortuary facilities, and their correlations in order to overcome such shortcomings. The statistical factor scores have quantified the differences in the combination of burial objects in different tombs and allowed clarification of the process of choosing burial objects and their implication for different social meanings. The result show two axial divisions in the Taosi Cemetery: vertical stratification based on hierarchy and horizontal differentiation based on social categories/identities such as soldiers and elites' servants. Compared with the simple description of typology, such a quantitative methods can reveal the characteristics of each category much more clearly, clarify the classification criteria, and extract much more detailed information about the mortuary practice and society.

13 TOOLS MODIFICATION DEGREE DEPENDING ON THE SPATIAL LOCATION (TOLBOR-21, NORTHERN MONGOLIA)

Abstract author(s): Marchenko, Daria - Rybin, Evgeny - Khatsenovich, Arina (Institute of Archaeology and Ethnography SB RAS, Novosibirsk)

Abstract format: Oral

The Tolbor-21 site in the Selenga River Basin is an important evidence of the northern Mongolia occupation by Initial Upper Paleolithic (IUP) population. It is represented by the material of archaeological horizon 4 (AH4). Two groups of combustion features (CF1 and CF2) were found in the area of the highest concentration of the findings in the Pit 2. Hearths are usually considered to be the centers of activities, determining spatial patterns of findings. The aim of the study was to examine the variability of tool-making in this area and consider the connection of combustion features with spatial patterns of the tools with different kinds of modifications.

We clustered the tools from the Pit 2 (N = 100) taking into account the secondary treatment parameters: the degree of tool edges modification and retouched part of the tool perimeter (from 1/4 to 4/4). Four groups of modification (slightly, medium, intensive, significant) were distinguished as a result of independent use of k-means and agglomerative hierarchical clustering. Distribution of these modification groups from the Pit 2 has been studied in connection with combustion features locations. We used unconstrained clustering that creates clusters according to percentage of findings. Results indicate reliable three-clusters division: two clusters are related to combustion features, and one cluster cover the rest area.

Thus, almost half of the tools have a medium modification, 20% - intensively modified, and 4% - significantly modified. Combustion features influence on spatial patterns of modification groups: significantly modified tools are related to CF1, medium modified tools predominate in CF2. Area with no combustion features has the greatest percent of slightly modified tools. This distribution suggests that CF1 was associated with an activity that required the most modified tools.

This study was supported by the Russian Science Foundation grant No. 19-18-00198.

14 COMBINING TRADITIONAL AND DIGITAL APPROACHES: APPLICATION OF STATE SEQUENCE ANALYSIS TO THE STUDY OF LONG-TERM EVOLUTION OF SETTLEMENTS

Abstract author(s): Drillat, Quentin (Ghent University)

Abstract format: Oral

Settlement patterns and networks are traditionally studied as snapshots of a landscape organization. Their structure is described based on the hierarchical levels of each settlement at a given period. These hierarchical levels are attributed considering a number of variables including characteristic artifacts, settlement size and functions, that are studied in a pure archaeological or statistical approach. Some projects already introduced the time-component including chronological variables such as total duration of occupation and date of first implantation in the considered variables when clustering settlements. However, the resulting typologies do not consider chronological variation. This paper explores the way traditional archaeological classifications of settlements can be reemployed in a quantitative approach to study the evolutionary trajectories of settlements in a long-term perspective. Evolutionary trajectories are built compiling hierarchical levels determined for each occupation period of settlements (with either a traditional or a statistical approach), and State Sequence Analysis based on Optimal Matching is proposed as a tool to measure their variability. A cluster analysis finally groups trajectories and detects trends in the long-term development of settlements. Applied to the case-study of the Anapodaris river catchment (Crete, Greece), this approach enables to study the trajectories of 6 cities known from the 9th century BC, among which 2 or 3 become independent city-states after the 6th century. Hence, State Sequence Analysis offers a new perspective in the study of the evolution of landscape organization and allows to improve the modelling of city-states territories.

A. INTERDISCIPLINARY RESEARCH OF EARLY BRONZE AGE AXE HOARD (KUKLENY, CZ)

Abstract author(s): Schimerová, Eva (University of Hradec Králové) - Havlíková, Markéta - Nosek, Vojtěch (Masaryk university)

Abstract format: Poster

The hoard of bronze axes found in Kukleny contained 56 axes, which makes it the largest Early Bronze Age hoard of axes from Czech Republic. The Hradec Králové district has always been considered as a periphery within the period. This hoard proves that this opinion is wrong and it also proves important position of the region on the intersection of routes between Poland, central Bohemia and Moravia. Our contribution introduces a set of documentation methods (Image Based Modelling – SfM, RTI, Laser Aided Profiler, Metal wear analysis), that are aimed on non-destructive and interdisciplinary research of Bronze Age artefacts. On this example we would like to present a documentation procedure that enables a complex study of artefact. It is focused on recognition of traces of manufacturing and use-wear traces (in combination with metallographic analysis). Result is a set of data that enables further analysis and preservation of information value of each artefact. Our goal is to create a platform that would enable to see correlations between other similar finds throughout Central Europe. The gained data is important not only when discussing hoards as phenomenon but also for the use-wear analysis itself and for typology of axes. The existing typologies are usually repetitive, locally based and in many cases very vague. We presume these categories represent very subjective opinion of each author. We believe that by precise documentation and comparison we can obtain important information that exceeds conventional typologies. For example by precise comparison of shape we can find out whether any of them were made in the same mold or based on the same model. We can also gain better understanding if manufacture technology. By metal wear analysis we can determine whether the axes were used as tools or weapons or if they represented a symbol of status in society.

B. AN INTEGRATED APPROACH TO 3D WEB DATA SERVER CLASSIFICATION: CORPUS VASORUM HISPANORUM

Abstract author(s): Bustamante Álvarez, Macarena (Universidad de Granada) - Angás, Jorge (Universidad de Salamanca)

Abstract format: Poster

We present the design of database that wants collect all the stamps on one of the most important ceramic categories in roman Hispania, the hispanic samian ware.

Our proposal allows us to join a relevant set associated with the information of each sigilla through a relational database. The characteristics of the developed web platform can be summarized as:

- analysis and development of a relational database with different types of information.
- generation of graphs from data sets.
- design of an interface for the front end and for the back end that allows complex searches.
- geographic representation system.
- 3D digitization of those parts that are uniquely relevant for later viewing and taking measurements using the WebGL standard specification.

So far we have collected more than 1000 stamps located in what was the former province of Lusitania.

This project becomes a pilot experience that allows obtaining typochronological data of some abundant pieces in the archaeological interventions of the ancient territory of Hispania.

EUROPEAN CRYPT BURIALS II - A HERITAGE (STILL) AT RISK BETWEEN SCIENCE AND PUBLIC DISPLAY

Theme: 6. Material culture studies and societies

Organisers: Alterauge, Amelie (Institute of Archaeological Sciences, University of Bern; Institute of Pre- and Protohistory and Near Eastern Archaeology, University of Heidelberg) - Majorek, Magdalena (Institute of Archaeology, University of Lodz) - Grömer, Karina (Department of Prehistory, Natural History Museum Vienna) - Väre, Tiina - Lipkin, Sanna (Department of Archaeology, University of Oulu)

Format: Discussion session

Church vaults were used as burial places for the European nobility, bourgeoisie and clergy between the 16th and 19th century AD. Due to the environmental conditions, the complete inventory of a crypt is often preserved, including coffins, fabrics, clothes, personal goods, botanical and human remains. These crypts give us important insights into the funeral customs, beliefs and traditions of the early modern period and allow us to investigate sepultures of the social elite in great detail. The vaults are also places of memoria, social representation, familial affiliation and resurrection, which becomes evident through the elaborately decorated and inscribed coffins. Though, crypts are often at risk due to changes to the built environment, cutting off the required ventilation to preserve organic materials. In this regard, conservational interventions are important to the preservation and potential public display of crypt burials.

Researchers from various European countries gathered during Session #375 at the EAA 2019 in Bern and presented individual case studies, resulting in a volume of the "Acta Universitatis Lodziensis. Folia Archaeologica" (2020).

The goal of the session's revival is to focus on the following aspects of crypt burial and of crypt archaeology:

- Cultural history: development and origin of crypt burial, transformation of funeral rituals;
- Archaeological evidence: crypt and coffin types, grave goods, symbols/objects of faith, inscriptions, clothing;
- Methodology: documentation techniques, methods for identification, infestation risks;
- Ethics: professionalism in crypt archaeology, handling of human remains, accessibility and current use of crypts.

Our aim is to go beyond local case studies in order to achieve a better understanding of regional and large-scale trends in early modern burial traditions.

ABSTRACTS:

1 OLD CRYPTS IN NEW SPLENDOR

Abstract author(s): Ströbl, Regina - Ströbl, Andreas (Forschungsstelle Gruft)

Abstract format: Oral

Throughout Germany numerous tombs have been investigated and restored in the past two decades.

It has been shown that interdisciplinary co-operation makes sense from the start, both scientific investigation and restoration, which leads to remarkable results.

Interplay between the disciplines of archaeology, art history, folklore, anthropology, history, botany and theology on one hand and the restoration disciplines of wood, metal, textiles and stone on the other has sometimes led to impressive results.

After severe damage by damp and looting, most of the burial tombs from the early modern period are still in a deplorable condition. But even severely devastated burial vaults with mostly rotten coffins can be restored to a dignified condition in order to make the "Gesamtkunstwerk" of the tomb experienceable for future generations and to evaluate the knowledge gained.

Co-operation is planned with colleagues from Austria, Denmark, the Netherlands and Estonia who are interested in the documentation and restoration methods developed in the past 20 years.

2 CRYPT BURIALS IN GERMANY- PAST RESEARCH AND CURRENT TRENDS

Abstract author(s): Alterauge, Amelie (University of Bern)

Abstract format: Oral

The aim of this paper on crypt burials is to provide an overview on past research projects and current trends in German crypt archaeology. Over the last three decades, several crypts throughout Germany have been documented, usually in the context of church renovations. A growing interest in historical archaeology has led to scientific investigations and conservational interventions in these crypts, even though the state of publication has not yet met the standards set for older periods.

Since the beginning of crypt archaeology in the 1980s, there has always been a strong interdisciplinary collaboration between archaeology, physical anthropology and historical sciences, including genealogy and costume history. In recent times, methods from forensic sciences have been applied, too, thus creating a deeper knowledge on individual inhumations.

Well-researched geographical areas with several documented crypts are Northern and Eastern Germany, while evidence mainly lacks for Western and Southern Germany. The reasons for this unequal distribution are a mix of historical, religious and political fac-

tors, which nonetheless call for a comparison of burial practices throughout the country. In particular, differences between Catholic and Protestant burials have been recognized regarding the crypt's location, coffin decorations as well as the grave goods.

Besides that, the growing body of evidence reveals temporal changes in burial practices, reflecting a changing attitude towards death. The individual, social and religious purposes of crypt burials can only be understood when tracing their beginnings, development and modern adaptation through time. Therefore, a global view will complement our knowledge of regional factors.

3 ON THE WAY TO A EUROPEAN COFFIN TYPOLOGY

Abstract author(s): Ströbl, Regina - Ströbl, Andreas (Forschungsstelle Gruft)

Abstract format: Oral

Six years ago, a coffin typology and terminology of coffin components was presented with the aim of uniformly recording and naming the different coffin forms from the early Middle Ages to modern times. During the examination of numerous European tombs, many different coffin types were documented and new ones are being discovered all the time.

Discussions with colleagues from Britain, Sweden, Austria, Italy and Germany have shown that an international exchange is necessary in order to standardise the scientific recording. This also applies to gravestones, tombs and epitaphs.

Such an exchange is also valuable in order to shed light on hitherto unknown relationships between European countries and cultural transfer of sepulchral culture. For example in the 17th and 18th centuries new coffin types brought to Germany from Italy and France containing Germans who had died abroad.

The extensive coffin inventory in the Catacombe dei Cappuccini in Palermo has never been studied scientifically. A project on this matter is being planned.

4 TYPES AND IMPORTANCE OF PLANTS AND FLORAL ORNAMENTAL MOTIFS IN BURIALS FROM THE CRYPTS (17TH - 19TH CENTURIES IN POLAND)

Abstract author(s): Majorek, Magdalena (University of Lodz; Institute of Archaeology)

Abstract format: Oral

Plants had a special place in the funeral rites. Their presence with the deceased was not accidental and, apart from the decorative value, was dictated by tradition, beliefs, customs or even superstitions. Thus, the set of plants or floral ornamental motifs, e.g. on coffins, had its meaning and symbolism. Archaeological research is a source of knowledge on the basis of which we can learn about the rules governing the funeral customs.

As part of my speech, I would like to present the following issues:

- plant motifs on coffins (painted, metalwork, decorative entombs),
- plant motifs on clothing and upholstery fabrics found at burials,
- plant fillings for mattresses and pillows (diasporas: seeds and fruit, flowers, leaves and plant shoots),
- bouquets and plant wreaths placed in / on coffins and during funeral ceremonies (arrangement, shape, fresh flowers, artificial flowers),
- spiritual and religious meanings built on the basis of plant elements of nature; the importance of plants.

I will rely on my own field experience gained during archaeological research of post-medieval and modern crypts and cemeteries in Poland as well as on the subject literature (archaeological, historical, ethnographic and art history).

5 MUMMIFICATION, PRESERVATION, AND DECAY IN FINNISH CRYPT BURIALS

Abstract author(s): Väre, Tiina - Lipkin, Sanna - Kallio-Seppä, Titta - Junno, Juho-Antti - Tranberg, Annemari (Archeology, University of Oulu)

Abstract format: Oral

The paper concentrates on the conditions in Finnish crypts and the preconditions of mummification of their remains. These conclusions are based on the inventories below four northern Finnish churches and one privately owned chapel at Kourla, in southern Finland.

During the 18th and early 19th centuries, particularly the elite burials were made beneath the parish churches. Later the practice became popular also among lower classes. After the ban of the church burial tradition in the early 19th century the church renovations made during the 19th and 20th centuries have destroyed much of this heritage in many churches. In other, however, the deceased and their funerary attires and decorations have preserved in a rather unique way.

As a final resting place, the church basefloors and the privately-owned chapel have some noticeable differences. In Finland mummification is often a result of freezing winters. The suitable and stable humidity below the church floors enables good preservation of both mummified remains, coffins, and fabrics. While the remains in churches were likely naturally mummified, our research indicates the mummified remains in Kourla chapel were likely embalmed. It was customary to embalm members of the elite, and indeed the church records indicate of several months long wake periods. The Church did not allow the deceased to be buried in unconsecrated land. The Kourla chapel owned by a noble family was built away from the churchyard with a separate granted right from the Crown.

The presentation also considers the later human disturbance and its influence on the decay. In the Kourla chapel the location on a private land has enabled random invades by individuals out of pure curiosity. These actions have led to different kind of changes in the remains and affected their preservation.

453 MULTIDISCIPLINARY APPROACHES TO ENVIRONMENTAL AND HUMAN FINGERPRINTS OF THE ROMAN PERIOD

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Silva-Sánchez, Noemí (Instituto de Ciencias del Patrimonio - Incipit. CSIC; EcoPast Research Group - GI-1553. Universidade de Santiago de Compostela) - López-Costas, Olalla (EcoPast Research Group - GI-1553, Area of Archaeology, Dpto of History. Universidade de Santiago de Compostela) - Jones, Samantha (School of Geosciences. University of Aberdeen) - López Barja de Quiroga, Pedro (Síncrisis Research Group - GI-1919, Univ. of Santiago de Compostela) - Mighall, Tim (School of Geosciences. University of Aberdeen)

Format: Regular session

The Roman Republic and Empire were a time of intense social and environmental transformations in vast areas of Europe, the Middle East, and North Africa. The huge impact on landscape and people's lifestyle is therefore key to understanding both the subsequent environmental and human histories of these regions. The aim of this session is to build a global perspective based on local narratives by integrating historical, archaeological and environmental research. In this session, we invite researchers to contribute to explore the environmental and human fingerprints during the period in which Rome was a Mediterranean power (200 BC -AD 500) in Roman ruled areas and their vicinities, as well as discuss together its legacy.

This Regular session is designed to transcend (mono)disciplinary studies to reach an integrative vision with examples from Roman-ruled areas. We welcome multidisciplinary approaches that encourage the comparison between historical sources, classical archaeology and environmental archaeology, including bioarchaeology and geoarchaeology approaches to build an integrative story of the human-environmental interactions during Roman times.

The type of questions this session will address are: do historical texts, (bio)archaeological data and environmental findings share a common narrative? How can a fruitful dialogue between different disciplines be established? The contributions will consider the following topics or others that fall within the scope of the session:

- Migrations (human and animal)
- Health state along time and pestilences
- Agriculture, livestock strategies and their impacts (e.g., new crops, staples, palaeodiet, pastoralism, erosion, deforestation)
- Mining, metallurgy and their impacts (e.g., deforestation, pollution)
- Impacts of social transformations on landscape and economy
- Landscape, environmental and climate change
- Regional comparisons: Atlantic vs. Mediterranean; Western vs. Eastern Roman Empire; North vs. South

ABSTRACTS:

1 PRELIMINARY RESULTS ON THE ARCHAEOBOTANICAL ANALYSIS OF PLANT MACROREMAINS FROM THE ROMAN AGE PERIOD

Abstract author(s): Apiar, Jana (Institute of Archaeology of the CAS, Brno, v.v.i.)

Abstract format: Oral

The presentation is showing preliminary results of the analysis of carbonized plant macroremains. The researched issue took into account several archeological sites of the Roman Age period. They were situated mainly in Slovakia, Moravia, and the Bohemia region. According to the main results, differences in the plant assortment were present. Cereal proportions on individual sites were variable. Therefore, the identification of wider regional groups based on the occurrence of cereals has been problematic. Between barbarian-Germanic sites and sites situated closest to the limes, a slight difference in crop product finds was discovered.

Only minor differences in crop treatment and storage were present among the sites in the early stages of the Roman Age period. The sites were similar in crop product type composition. Nevertheless, the contrast was a higher density of plant macroremains obtained from the sites situated closest to the limes. The differences were gradually deepening in the later stages of the Roman Age. Cereal products as (un)thrashed ears, and their by-product residues prevailed on some sites. On barbarian-Germanic sites, the composition of cereal product types was more balanced, with a predominance of clean grain. Early and later phases of crop processing were present at all sites.

The results are contributing to the debate of usage of the archaeobotanical methods at the excavated sites. Each analyzed site was sampled differently, with a diverse number of samples collected and unequal volume per sample taken. Formal archaeological information was of unequal quality, too. This heterogeneity itself caused that not all samples could be analyzed equally. It has also caused the results to be marked by a degree of uncertainty. Consequently, patterns of the analyzed data can also represent a sampling or methodology bias itself.

2 ECONOMIC,-SOCIAL-AND-ENVIRONMENTAL-IMPACTS-CAUSED-BY-THE-RISE-AND-SUBSEQUENT-ABANDONMENT-OF-ELITE-NODES-OF-POWER-AFTER-ROMAN-WITHDRAWAL-FROM-BRITAIN: A-CASE-STUDY-FROM-A-PICTISH-ELITE-CENTRE-IN-NORTHEASTERN-SCOTLAND-BETWEEN-THE 4TH-6TH CENTURIES-AD

Abstract author(s): Jones, Samantha - Evans, Nick (University of Aberdeen) - Martínez Cortizas, Antonio (Universidade de Compostela) - Mighall, Tim - Noble, Gordon (University of Aberdeen)

Abstract format: Oral

The first millennium AD in northern Europe is still a dark age in terms of our understanding of Late Roman and post-Roman societies, with few written sources and an archaeological record that has been traditionally lacking in evidence. This is particularly true of the Picts in Scotland. First mentioned in late Roman-period sources, the Picts inhabited north-eastern Scotland until the late 1st millennium AD. The weakening of the Roman Empire in southern Britain and final withdrawal between the late 4th and early 5th centuries AD had a profound impact on the whole of Britain leaving the Brittonic tribes more susceptible to international and national raids (more so in the south – however both north and south were impacted). It is during this period that the archaeological record appears to show a rise in the construction or reoccupation of fortified settlements in northern Britain. Rhynie in Aberdeenshire is a good example of this with two fortified enclosures that date to the late 4th century AD (the Craw Stane Complex and Cairn more). In this paper we focus on the Craw Stane complex, an elite centre which was occupied from the 4th-6th century AD. During five seasons of excavation, more than 1000 artefacts were recovered including symbol stones, Mediterranean pottery, glass, metalwork and evidence for non-ferrous metalwork production. Despite the wealth of archaeological data obtained from the Craw Stane complex we still know very little about the day-to-day life of the early medieval people in this valley and why the Craw Stane complex was abandoned in the 6th century AD. By combining paleoenvironmental analysis (pollen, non-pollen-palynomorphs, and X-ray diffraction) with available historical and archaeological archives we provide new insights into the economic, social and environmental impacts caused by the rise and subsequent abandonment of this elite node of power.

3 DIVERSIFYING NARRATIVES. AGRICULTURAL CHANGE AND RESILIENCE AMONG IRON AGE SOCIETIES IN THEIR INTEGRATION INTO THE ROMAN STATE

Abstract author(s): Teira-Brión, Andrés (Universidade de Vigo)

Abstract format: Oral

The assimilation of Iron Age communities of the Iberian Northwest into the Roman state is a controversial and still unresolved subject of debate. In order to observe the impact of Roman acculturation, agriculture and the exploitation of wild plant resources offer us the possibility to understand how their life-styles and the exploitation of the territory changed or resisted. For this purpose, an archaeobotanical approach was taken, integrating all published seed analyses through multivariate statistics. The results obtained provide crucial information for understanding the social and economic settings.

The formation of hillforts, as the predominant settlement model, led to a series of social and economic consequences, which reflected on the interaction between the communities of the Northwest of the Iberian Peninsula and the environment natural resources. The transformation of the agrarian systems during the 1st millennium BC meant a change of trend towards an economic system based on the accumulation of surpluses, mainly cereals, within the existing crop diversification. The irruption of Rome into this scenario meant, on the one hand, a reorganisation based on a new administrative system, a change in the socio-economic model and, on the other, the immersion of the Northwest in the trading of products and ideas between the Atlantic and the Mediterranean. Through these routes, new crops, agricultural practices and different rituals in the consumption of plants arrived. However, these changes were uneven and with different intensities between the new Roman settlements and the model inherited from the Iron Age.

4 LANDSCAPE-SCALE INDIRECT HYDROLOGICAL TRANSFORMATIONS DURING ROMAN TIMES

Abstract author(s): Silva-Sánchez, Noemí (Instituto de Ciencias del Patrimonio, Incipit-CSIC) - López-Merino, Lourdes (Universidad Complutense de Madrid, Facultad de Farmacia, Unidad de Botánica, ENVIROVEG, grupo UCM 910164) - Martínez Cortizas, Antonio (Universidade de Santiago de Compostela, Facultade de Biología, EcoPast - GI-1553)

Abstract format: Oral

It is well known that during the Roman expansion across Europe hydraulic engineering experienced a golden period. Examples of hydraulic architecture such as aqueducts for civic, domestic, farming and industrial purposes still remain in many cities (Segovia, Tarragona, Metz, Belgrado, Tivoli, etc.). Hydraulic mining systems are also very well known, such as 'ruina montium', which have left large-scale evidence of transformations of the landscape (e.g., Las Médulas). The work presented here focuses on less obvious hydric modifications, which were the indirect result of other anthropogenic activities. The combination of geochemical and palynological approaches in peat archives has provided evidence that, in many different places across Europe, environmental transformations associated with Roman mining, as well with other activities such as forest clearance, resulted in significant, landscape-scale, hydrological changes. These changes led to an increase in run-off and soil erosion in some areas, but also to the formation of peatlands due to a rise in the water table. At Cruz do Bocelo Mire (NW Iberia; Silva Sánchez et al., 2014), for example, the transition from the Iron Age to the Roman Period was a tipping point in the buffer capacity of the catchment in terms of water retention. As a result of a large deforestation event, which occurred between AD 210 and 240, and contrary to what had happened before, the mire hydrology started to respond more abruptly to changes occurring in its catchment. Similarly, in their study of La Molina mire, López-Merino

et al. (2011) concluded that between the AD 20 and 140 it would have been used as a 'piscinae', marking a no-return point in its hydrological conditions, which led to a change from a minerotropic to an ombrotropic status (responsible for its present declaration as protected habitat in Natura 2000 network).

5 DISCREPANCIES IN THE RECONSTRUCTION OF ROMAN RIVER LANDSCAPES : FISH, BOATS AND WHAT WE CAN DO WITH THE LEGAL TEXTS

Abstract author(s): Ronin, Marguerite (CNRS)

Abstract format: Oral

How do we integrate Roman legal texts (mainly contained in the Digest of Justinian) with more traditionally considered pieces of documentation (archaeology, inscriptions, literary texts...) and why does it matter anyway? While legal texts present major drawbacks for historians (i.e. debatable chronological and geographical context, ill-defined scope of application), I argue that they can improve our understanding of ancient landscapes because, dealing as they do with human activities, they can help us reconstruct economic and social uses of an environment not necessarily well documented from an archaeological/historical perspective. But first, we must address their defining features and establish a methodology for their integration.

Rivers and riverside activities are a good starting point to explore ways of integrating different pieces because they constitute a crossroad for competitive uses of water as a resource (irrigation, supplying of workshops, fountains and piscinae...) and of rivers as an environment (transport, water wheels, ports and embankment, dams, and of course fishing). As waterway transport was crucial to supplying urban centres and to exports, it is not surprising to find many legal texts referring to activities hampering the navigation and providing judicial tools to limit these. Amongst the many activities that can change the course of the river by making its bed narrower or its current faster, we may assume that legal texts refer to permanent or semi-permanent fishing installations. It is, however, hard to find them in archaeology and the literary sources hardly mention fishing activities in rivers. My aim is therefore to explore these discrepancies and to try to provide some methodological avenues for the cross-reading of different types of documentation.

6 ENVIRONMENTAL CHANGE IN MAURETANIA TINGITANA

Abstract author(s): López-Costas, Olalla (EcoPast - GI-1553, Archaeology Fac. de Xeografía e Historia, Universidade de Santiago de Compostela; Archaeological Research Laboratory, Stockholm University; Laboratorio de Antropología Física, Universidad de Granada) - Martínez Cortizas, Antonio (EcoPast - GI-1553, Facultade de Biología, Universidade de Santiago de Compostela) - Iriarte, Eneko (Laboratorio de Evolución Humana, Universidad de Burgos) - García-López, Zaira (EcoPast - GI-1553, Facultade de Biología, Universidade de Santiago de Compostela) - Peña Chorcarró, Leonor (Instituto de Historia, Centro de Ciencias Humanas y Sociales, CSIC) - López Merino, Lourdes (ENVIROVEG, grupo UCM 910164.Unidad de Botánica, Facultad de Farmacia, Universidad Complutense de Madrid)

Abstract format: Oral

The Rif (Northern Morocco) was settlement of numerous cultures due to its strategic position. Although Mauretania Tingitana was formally incorporated within Roman frontiers by AD 40s, the Roman presence in highlands such as Middle Atlas was apparently only nominal. In contrast, lowland settlements close to the sea (e.g., Tingis, Lixus) or inland (e.g., Volubilis) were highly populated and the drivers of Roman culture spread. On one hand, the Rif was close enough to them, and surrounded by Roman roads, so intense occupation may be expected. On the other hand, their mountainous nature could have prevented an intense romanization. Considering the history of human occupation and the known scale of Roman transformations of western Mediterranean landscapes, we wonder if the Rif Mountains were also significantly impacted in Roman times.

Under the framework of the AGRWESTMED ERC grant, we collected a sediment core at Bab el Karn, a wetland located on the northern slopes of Jbel Khesana (Western Rif). We performed colour, IR-spectroscopy and geochemical analyses, in order to understand the wetland environmental history in the last four millennia. We found four main environmental signals: fine mineral matter fluxes from the catchment, variations in organic matter accumulation, changes in diatoms' production and in the degree of oxygenation of the lake. By the onset of Roman times the wetland shifted abruptly from permanent to seasonal. This evolution is framed within the western Mediterranean aridity trend and the regional onset of deforestation in the Rif area. Surprisingly, the increase in diatoms during the Roman period can be interpreted as indicating a lower impact on the lake water quality. In sum, Roman times represented a tipping point in the wetland dynamics. This stresses the importance of including environmental information in the debate about differences in the occupation of lowlands and mountainous areas of Mauritania Tingitana.

7 BEYOND NEMAUSUS: THE EXTENSIVE ENVIRONMENTAL PRINT OF THE ROMAN CITY THROUGH THE INVESTIGATION OF A PALAEO-CHANNEL

Abstract author(s): Save, Sabrina (Amélie SARL) - Flaux, Clément - Scrinzi, Maxime (Mosaïques Archéologie)

Abstract format: Oral

Where and when do cities start and end? The Roman city of Nemausus (Nîmes, Southern France), capital city of the Volques Arécomiques established around the source of the river Le Vistre de la Fontaine, became Colonia Augusta Nemausus in 22 BC, following the annexation of Gallia Narbonensis in 118 BC. In 2019, preceding the artificial re-meandering of the river as a flood prevention measure, a developer-funded excavation took place in the plain of Le Vistre, 3km downstream of Nemausus. The excavation exposed a palaeo-channel, its southward migration along a 30m profile, and the remains of a Roman bridge, documenting in total over 2500

years of history, and providing an opportunity to see from a distance (both physical and temporal) not only when Nemausus started and ended, but how its environmental print extended beyond its physical boundaries. A multidisciplinary study of the palaeo-channel's alluvium was undertaken, combining geoarchaeology, bioarchaeology, geochemistry and magnetic susceptibility. The results present a global vision of the impact of the creation and development of Nemausus on its surrounding environment.

Faunal and plant remains recovered from the alluvium shed light on agricultural practices, diet and the environmental context. The ceramic assemblages, combined with radiocarbon dates of charred plant remains, provide a chronological framework of the alluvial sequence. PXRF measurements reveal significant levels of lead enrichment in the chronostratigraphy corresponding to the Roman period, followed by their decrease after the IIIrd c. AD. Excavation data from the urban center and historical sources show extensive use of lead in early water distribution systems, with its progressive abandonment during the IInd c. AD. Taken together the geoarchaeological, bioarchaeological, geochemical, chronostratigraphic and magnetic susceptibility data show how increasing development at Nemausus polluted the city as well as the wider landscape, thus forcing us to ask where Nemausus really ends.

8 THE TRANSFORMATION OF ROMAN COLONIAL LANDSCAPES (TARRACO, ILICI) FROM THE EARLY TO THE LATE EMPIRE: ARCHEOLOGICAL AND GEOARCHAEOLOGICAL DATA

Abstract author(s): Vila, Oriol (Universitat Autònoma de Barcelona)

Abstract format: Oral

From 2016 our team has developed several geoarchaeological works about the Roman landscape in two selected Roman colonial territories: the Ager Tarraconensis (Vilardida) and the Ager Illicitanus (Alcúdia-Elche). In both areas we have identified the presence of Roman agricultural soils (and rural structures, like vineyard pits), and their connection with the settlement patterns.

The paper is focused on two main objectives.

First, the characteristics of the Roman agricultural soils (Geochemistry patterns, chronology...). In the case of Ilici, the Roman soils identified are included in the centuriatio system (the regular land division typical of the Roman colonies), and for the first time in the Roman Empire we are able to connect the particular plots with the general rural structure. In the case of Tarraco, the fields documented are adapted to the general topography of the "Vilardida" sector, with clear indicators of human fertilization.

Second, the evolution of both territories through Antiquity, showing the deep changes suffered in these landscapes from the 3rd c. onwards. We have documented periods of abandonment, indications of Pb pollution, phenomena of colluvium... that could be linked with changes in the general settlement patterns (and also climate alterations) in both Roman colonies.

We will analyse finally this data in the framework of the so called crisis of the Roman urban system.

9 A GEOCHEMICAL APPROACH TO SOILS FROM POST-ROMAN BURIALS (A LANZADA, NW SPAIN)

Abstract author(s): García-López, Zaira - Martínez Cortizas, Antonio (EcoPast - GI-1553, Facultade de Biología, Universidade de Santiago de Compostela) - López-Costas, Olalla (EcoPast - GI-1553, Archaeology, Facultade de Xeografía e Historia, Universidade de Santiago de Compostela; Archaeological Research Laboratory, Stockholm University; Laboratorio de Antropología Física, Departamento de Medicina Legal, Toxicología y Antropología Física, Facultad de Medicina, Universidad de Granada)

Abstract format: Oral

Necropolises enable to approach ancient societies through the study of the human remains they contain and their funerary contexts. Most research has focused on skeletons, burial typology and grave goods, but the associated soils and sediments have been seldom considered. The interaction between human remains and sediments (i.e. diagenesis) starts after inhumation, leading to bidirectional physical and chemical changes. As a result, a new kind of soil, so-called Necrosol, develops. Morphologically described by Sobocka in 2004, the associated pedogenetic processes are only starting to be approached.

In this study we analysed 46 samples taken from longitudinal and transverse transects of two graves (one single and one double) from the post-Roman funerary area of A Lanzada (Sanxenxo, NW Spain), and 34 samples of a nearby pedo-sedimentary sequence. The dominant type of soil in the necropolis is Arenosol, developed from dune material. Samples were analysed for physical (grain size, colour) and chemical (pH; elemental composition: XRF, C and N) properties.

Principal components analysis resulted in four main components: Cp1 and Cp2 reflect pedogenic processes related with the balance between organic matter (OM) and biogenic carbonates; while Cp3 and Cp4 reflect changes in mineralogy. OM content is higher in the Necrosol (i.e., samples inside the burial), showing differences with the soils of the pedo-sedimentary sequence and also with sediments collected outside the burials. The Necrosol has a lower content of biogenetic carbonates, as a result of higher chemical alteration. In terms of mineralogy, the Necrosol shares a similar composition to that of samples from the same stratigraphic layer, i.e., same parent material. Despite most of the surrounding soils are acidic, the Necrosol is slightly to moderately alkaline (pH=8-9). The intensity and uniqueness of the Necrosol pedogenesis make this soil a valuable archive that provides complementary information for the study of skeletal remains.

THE HISPANIA PALEODIET: A REVIEW OF ISOTOPIC STUDIES ON HUMAN REMAINS FROM THE 1ST TO THE 8TH CENTURIES AD

Abstract author(s): García-Moreno, Carlos - Martínez-Cortizas, Antonio (EcoPast - GI-1553, Faculty of Biology, University of Santiago de Compostela) - López-Costas, Olalla (EcoPast - GI-1553, Archaeology, Faculty of Geography and History, University of Santiago de Compostela; Archaeological Research Laboratory, Stockholm University; Physical Anthropology Laboratory)

Abstract format: Oral

Food in antiquity is one of the booming topics in archaeology. Paleodiet can be approached through the study of stable isotopes in human remains from ancient populations. For Spain and Portugal, there are several isotopic studies dealing with diet of Roman and Post-Roman times; however, these data have yet not been explored in detail.

In this work, we review the isotopic composition ($\delta^{13}C$ and $\delta^{15}N$ in human bone collagen) of 16 necropolises (1st-8th AD) from Spain and Portugal. Apart from the comparison of human and animal raw data, we also calculated the isotopic enrichment in humans in order to consider the necropolis baseline. The enrichment was obtained by subtracting the mean isotopic value of herbivore data (caprine+cattle of each necropolis) to the individuals' isotopic values.

Our results show a similar diet in Spain and Portugal, characterized by C3 plants with some meat/dairy products from terrestrial herbivores, which were mainly fed with C3 plants. Most of the sites are rural and located close to the sea (<50km). Although diet is not homogeneous, especially when compared with that of earlier centuries, intra-site is greater than inter-site variability. A Lanzada (NW Spain) site is exceptional since it shows a greater human consumption of C4 (millet) and marine resources. Necropolises separate slightly better when enrichments are considered, increasing the inter-site variability. Atlantic sites seem more dependent on marine resources than inland or Mediterranean ones. The $\delta^{15}N$ values show a slight correlation to the distance to the sea, but this is less clear for $\delta^{13}C$ values. No urban/rural or Roman/post-Roman differences were found. Our review stresses the need to increase the data for urban inland sites. Necropolis such as Emerita Augusta, where we are working at the moment, may help to fill this gap and allow a closer view to life in Hispania.

WOMEN AND CHILDREN IN ROMAN THESSALONIKI: AN INVESTIGATION OF BREASTFEEDING AND WEANING THROUGH $\delta^{13}C$ AND $\delta^{15}N$ INCREMENTAL ANALYSIS

Abstract author(s): Ganiatsou, Elissavet - Vika, Efrossini - Georgiadou, Aggeliki (Laboratory of Physical Anthropology, Department of History and Ethnology, Democritus University of Thrace) - Protopsalti, Tania (Ephorate of Antiquities of Thessaloniki City, Ministry of Culture and Sports) - Papageorgopoulou, Christina (Laboratory of Physical Anthropology, Department of History and Ethnology, Democritus University of Thrace)

Abstract format: Oral

The ancient city of Thessaloniki was conquered by the Romans in 168 BC and quickly became the capital of the Provincia Macedonia. Having the great advantage of being located on the sea front and along the Via Egnatia, the monumental Roman road that connected the Adriatic to the Black Sea, Thessaloniki developed into one of the most prominent trade centres of the Roman Empire. At the same time, the flourishing local artisanality and cultural countenance created the unique regional character of the city: although it was the affluent capital of the province, Thessaloniki was declared a *Liberam Civitatem* with many privileges, attested through the city's exceptional architecture and influential artistic expression.

The recent excavations of the two main necropoleis provide an unprecedented opportunity to investigate the bioarchaeological expressions of the city's distinctive cultural character as part of the Empire.

In this study, we explore the role of women in the domestic sphere as mothers and care-givers in Roman Thessaloniki. For this purpose, we employed $\delta^{13}C$ and $\delta^{15}N$ stable isotope analysis from dental increments to study breastfeeding and weaning patterns, under the premise that breastfeeding is a complex interaction between biological necessity and cultural evolution and a concept critical to the understanding of parental investment and the liminality of childhood.

Our holistic approach aims to enhance the fruitful integration of historical and bioarchaeological research to better explain the cultural complexities during a time of social transformation in the south of the Roman Empire.

INSULA EXHAUSTA SILVARUM? HISTORICAL AND (GEO)ARCHAEOLOGICAL SOURCES ALLOW DOUBTING THE NARRATIVE OF THE DEFORESTATION OF ELBA ISLAND IN ROMAN TIMES

Abstract author(s): Becker, Fabian (Freie Universität Berlin / Physical Geography) - Eser, Raphael A. (Humboldt Universität zu Berlin / Classical Archaeology) - Schütt, Brigitta (Freie Universität Berlin / Physical Geography)

Abstract format: Oral

Iron production in the ancient metallurgical centre on Elba Island (Italy; 7th century BCE to 2nd century CE) was observed by various ancient writers. Diodorus (5.13.1) accounts for the smoking smelting furnaces on the island in the 1st century BCE—Strabo (5.2.6) some years later instead reports that all iron from Elba was transported to the mainland to be processed there. This contradiction (or shift) is at least since the 18th century habitually read as evidence for a “deforestation narrative”, i.e. the lack of fuelwood on the island in the 1st century BCE that resulted in the end of smelting activities. New archaeological and physio-geographical studies in the last years have challenged an “environmental” reading of Strabo's account, though.

Proceeding from Bayesian models and cumulative probability functions of radiocarbon ages and facies interpretations from sediment sequences, we attempt to challenge the narrative. At it, we contrast (and integrate) the ancient texts, archaeological chronologies, palaeoenvironmental reconstructions (sedimentological data and pollen analysis), cliometric findings (Monte-Carlo-simulation of the fuelwood requirements based on chronology and amount of archaeometallurgical remains), and the modern interpretations of the ancient environmental conditions (as found in travelogues and scientific literature).

Although the different approaches used to analyse the situation on Elba Island rely on different spatial, temporal, and measurement scales and specificities, they appear to be closely complementary.

From the findings of the methodical triangulation, we support the following hypotheses:

1. Iron smelting on Elba had a distinct environmental impact, causing i.a. increased flood dynamics and sedimentation.
2. A complete lack of fuelwood is—however—most likely not the cause for the end of smelting on Elba, but supra-regional economic changes must be employed.
3. The deforestation narrative mainly developed in the modern period when readers of Strabo's comment experienced contemporary deforestation and a fuel scarcity on the island.

POLLUTION'S BOOMERANG: THE IMPACT OF INCREASED ATMOSPHERIC MERCURY LEVELS IN PAST POPULATIONS

Abstract author(s): Álvarez Fernández, Noemi - Martínez Cortizas, Antonio (EcoPast (GI-1553), Faculdade de BioloXia, Universidade de Santiago de Compostela) - López-Costas, Olalla (EcoPast - GI-1553, ArqueoloXia, Faculdade de Xeografía e Historia, Universidade de Santiago de Compostela; Archaeological Research Laboratory, Stockholm University; Laboratorio de Antropología Física, Facultad de Medicina, Universidad de Granada)

Abstract format: Oral

Past human societies modified their environment in several ways; however, the extent of these modifications is, in many cases, poorly known. Under the Roman rule, extensive environmental changes took place, in the Western Empire in particular. During this historical period, atmospheric levels of several potentially toxic metals, such as mercury, increased substantially due to intense mining and metallurgy. These activities left behind their imprint in both the landscape and humans.

This research is focused on A Lanzada (NW Iberia) – a rural necropolis placed relatively far away from the neuralgic sources of mercury emissions during the Roman period. The aim was to find out variations in mercury levels in human remains. Human (cortical) bone was analysed from skeletons covering contrasting periods of atmospheric pollution (Roman, AD 1st-4th centuries, post-Roman, AD 5th -7th centuries). Samples from 3 types of bone (n=143; ribs, long bones, and crania) as well as soils/sediments associated with the burials (n=34) were analysed. Mercury concentrations in soils were below 5 ng g⁻¹, while the average in bone was 36±52 ng g⁻¹, making post-depositional incorporation unlikely. Concentrations were found to be significantly different between the two periods (Roman: 54 ± 60 ng g⁻¹, post-Romans: 21±23 ng g⁻¹), but for type of bone, sex, age, social status, or diet of the individuals they were not. Values from Roman times were moderately elevated when compared with other collections of individuals subjected to direct mercury exposition. These results agree well with the chronology of mercury pollution reconstructed from a local peatland, suggesting a predominant atmospheric source. Our study shows that, as it happens today, rural Roman populations were mostly affected by low dose chronic mercury exposure, whose levels varied with the intensity of the anthropogenic activities.

THE CHANGING LANDSCAPE OF AUGUSTAN ROME: SACRO-IDYLLIC PAINTINGS AND POLLEN EVIDENCE FROM THE GULF OF GAETA

Abstract author(s): Shriver-Rice, Meryl (University of Miami, Abess Center for Ecosystem Science & Policy) - Rosenthal, Crystal (University of Texas at Austin)

Abstract format: Oral

Sacro-idyllic fresco paintings from the homes of first century Roman elites appeared at a time of dramatic change to the topography of the Bay of Naples. Verdant woodlands and forests that once had defined Roman identity were sacrificed to expanding urban development. Roman authors praised the power of architecture over natural forces, on the one hand, while criticizing the destruction of trees, funerary gardens, and sacred groves, on the other. To date, scholarly inquiry about this distinctive genre within the history of Roman wall painting has sought to connect these paintings to Vergilian literary constructs, such as the *locus amoenus*, accounting for their sudden appearance in the archaeological record as a consequence of stylistic influence or elite whimsy. The aim of this paper is to examine these murals, which date from 60 BCE to the end of the first century CE, in light of recent scholarship on the regional ecology of the period, specifically palynological and climate reconstruction research from the Gulf of Gaeta. A survey of arboreal pollen data from the region indicates a rise in secondary forest species caused by human activity; while additional data regarding planktonic foraminifera and oxygen stable isotopes will help to disentangle the effects of human activity on vegetation from natural climate phenomena (Sadori et al. 2018, Sadori 2015, Di Rita et al. 2017). Sacro-idyllic imagery at such sites as Boscotrecase and Boscoreale work to resolve a crisis of Romanness faced by the Imperial elite who increasingly struggled to reconcile their urban political identities with the lost rustic virtues from which they had become estranged. In these images we witness a longing for the dignity of pastoral labor amidst a context of irreversible deforestation caused in part by Augustan agrarian reforms and the growing consumption of natural resources in a globalized world.

FUELLING ROMAN BARCINO (BARCELONA, SPAIN). THE CONTRIBUTION OF CHARCOAL ANALYSIS TO APPROACH THE CITY'S WOODLANDS EXPLOITATION FOR FIREWOOD PROCUREMENT

Abstract author(s): Bianco, Sabrina (Institut Català de Paleoecologia Humana i Evolució Social - IPHES-CERCA; University of Barcelona, Faculty of Geography and History) - Riera Mora, Santiago (University of Barcelona, Faculty of Geography and History) - Miró Alaix, Carme (Servei d'Arqueologia de Barcelona, Direcció de Memòria, Història i Patrimoni - ICUB)

Abstract format: Oral

Forested areas played an important role in past fuel supply of human settlements. In particular, in a Roman city there were many activities and facilities that demanded fuel according to a recurrent use of fire: from domestic heating and kitchens, to the wide-spread *thermae*, as well as several workshops (i.e. pottery, metallurgical and glass productions), bakeries or other food processing installations, to even funerary practices as cremations.

The colony of Barcino (Barcelona) was founded at around 10 BC in the northeast of Hispania Citerior region, in a plain providing diverse natural resources. Nonetheless, archaeological evidences in the urban area and the suburbs suggest that economical activities were mostly oriented to satisfy the daily needs of the inhabitants. In this sense, pollen analyses indicate that a limited and punctual transformation of the landscape occurred during Roman times nearby the city, evidencing a predominance of woodlands over crops.

Within such a context, the aim of this presentation is to study various sites of the Roman city (domestic, productive, ritual) to identify the wood taxa used as fuel. The analysis is based on wood charcoal fragments recovered during commercial/preventive archaeological excavations carried out throughout the last decade in Barcelona. Charcoal fragments are, in fact, very durable plant material that preserves in all kind of archaeological contexts, allowing for the observation of wood anatomical characters and the subsequent taxonomical identification.

Results of charcoal analysis focusing on urban contexts, which are up-to-date quite scarce, constitute a valuable proxy to shed a light on the woodland exploitation system and fuel needs of Barcino, and to assess preferences for forest products in relation to different activities documented. At the same time, this work offers new evidence to enrich the knowledge on the urban settlement impact on the environment and the landscape evolution in the surrounding area.

THE CELESTIAL ENVIRONMENT OF THE ROMAN CITIES OF THE WESTERN PART OF EMPIRE

Abstract author(s): González-García, Antonio César (Institute of Heritage Sciences, Incipit-CSIC) - Garcia Quintela, Marco (Universidade de Santiago de Compostela)

Abstract format: Oral

One of the most prominent and characteristic elements of the Roman expansion in the West is the construction of a large number of cities, many of them built or reformed at the time of Augustus.

According to Vitruvius, the new cities had to be built taking into account the location and the prevailing winds to secure the healthiness of the new town. The ideal city followed an orthogonal grid, with streets running north-south and those perpendicular running east-west. However, according to the 'agrimensores', one way to achieve such orientation would be following the course of the sun by directing the streets (*decumani*) towards a particular sunrise.

Such practice was deeply rooted in the legendary accounts for the foundation of Rome and the ritual practices associated to them, that allegedly had an influence in the orientation cities founded or restored at that time.

In the last decade, we have measured nearly 200 towns in the ancient provinces of Germania, Gallia, Hispania, Italia, Mauritania and Africa. The idea was testing if their orientations followed random directions or if they appeared grouped towards particular directions.

In the present talk, we will review the state of the art on this research question. We will show that one of the clearest concentrations appeared for the cities built or reformed at the time of Augustus.

In order to interpret these results, we will consider new data from the centre of Rome. We will provide a new reading for some of the foundation myths of Rome in the light of this new data. Further, we will present a review of the connections of Augustus with the Sun. Finally, such lines will provide support to some of the ideas proposed to explain the peculiar orientations of the cities built at the time of Augustus in the west.

ROME TRANSFORMED: AN INTERDISCIPLINARY ANALYSIS OF POLITICAL, MILITARY AND RELIGIOUS REGENERATIONS OF THE CITY'S FORGOTTEN QUARTER C1 - C8 CE

Abstract author(s): Bailey, Phyllida (Newcastle University) - Azzari, Margherita (Università degli Studi di Firenze) - Haynes, Ian (Newcastle University) - Liverani, Paolo (Università degli Studi di Firenze) - Rosa, Carlo (S.I.G.E.A. Lazio) - Shillito, Lisa-Marie (Newcastle University)

Abstract format: Poster

The environmental impact of political, military and religious changes in the Eastern Caelian

ROMETRANS, the first project of its kind, aims to further our understanding of the religious, military and political transformation of the Eastern Caelian Hill from the 1st to 8th centuries C.E. During this time the area went from being home to the extravagant qua-

si-rural horti, homes to elite families, through a period when it was dominated by imperial palaces and military bases, to becoming, with the building of the world's first cathedral and the palace of the Bishop of Rome, the centre of Catholic Christendom.

ROMETRANS integrates the study of 11 sub-surface excavated areas, the largest geo-radar and laser scanning surveys ever conducted in Rome, and an extensive programme of archival research to revolutionise our knowledge of this quarter. By incorporating archaeological, historical, topographical and geographical research, the project seeks to create a holistic 4D approach to the Eastern Caelian that goes beyond isolated studies of individual structures to understanding the evolving landscape as a whole.

Fundamental to this aim is consideration of how these changes manifested on the environment in terms of vegetation cover and land exploitation. This will be investigated through a combination of geophysical survey data, archival research, archaeobotanical and borehole analysis. Provisional archaeobotanical techniques include palynology and microcharcoal analysis with the likely addition of macro-remain identification and further micro-fossil analysis in the future depending on the nature of the deposits recovered.

This environmental investigation stands to not only significantly expand our knowledge of local and regional vegetation but will also synthesise existing data into an invaluable diachronic visualisation of the landscape in a key quarter of Imperial Rome during a time of unprecedented change that echoed throughout the Empire.

More information available at <https://research.ncl.ac.uk/rometrans/>

APPLIED ARCHAEOLOGY – NEW DIRECTIONS FOR THE DISCIPLINE IN A CHANGING WORLD

Theme: 2. Pandemics and climate change: responses to global challenges

Organisers: Horak, Jan (Czech University of Life Sciences in Prague, Faculty of Environmental Sciences) - Cembrzyński, Pawel (Christian-Albrechts-Universität zu Kiel, Cluster of Excellence ROOTS)

Format: Round table

Rapidly changing climate, growing inequalities, migration, and social changes pose a great challenge to social sciences and humanities. They are facing a question of their role and contribution in the modern world. Among them, archaeology and history seem to be especially entitled to provide insights into the modern-day problems because they study human development in long-term perspectives and the reasons behind social, economic, and environmental changes. Archaeology and history can evaluate past processes in their context and can overcome simplistic present-past analogies. They can provide such a context to other disciplines which use historical data, like environmental and life sciences, climatology, or sociology.

This session intends to create an opportunity for a meeting and discussion concentrated around a central Theme: has applied archaeology a viable potential for future? This central question leads us to a variety of important issues, like:

1. What does archaeology as a discipline need to be successfully applied?
2. Is there a viable network of specialists able to guide archaeology this way?
3. Archaeological data in other disciplines – ensuring their availability (and standardisation?), ensuring their correct interpretation.
4. Environmental and conservation issues – what people did in the past (human impact), how they dealt with the world (landscape / nature management).
5. How can archaeology contribute to present social issues like migration or racism?
6. How to correctly use historical parallels and how to deal with problems of ahistoricism (lack of correct context).

We invite to discuss and to be involved people from various fields of archaeology to share their view on applied archaeology. We believe it can create great potential for networking, sharing ideas and experiences, and looking for opportunities for future cooperation.

FROM CONTEMPORARY KNOWNS TO PAST UNKNOWNNS - UNLOCKING ANCIENT HUMAN-ENVIRONMENT INTERCONNECTIONS VIA MODERN ISOTOPIC RECORDS

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Winter-Schuh, Christine (Institut für Ur- und Frühgeschichte, University of Kiel) - Eckelmann, Rebekka (Department of Cultures, Archaeology; University of Helsinki)

Format: Regular session

Isotopic analyses of ancient human and faunal skeletal remains has flourished over the past decade, providing new insights into how people (and animals) moved across the landscape, exploited food resources, and interacted with new environments and changing climates. However, the interpretation of stable and radiogenic isotopic data gleaned from ancient remains relies on an established understanding of the mechanics that drive isotopic variation in water, soil, plant and animal communities demonstrated in diverse ecological settings, metabolic and physiological conditions, and sample materials. This session aims to bring together isotope practitioners that explore how isotopic data from modern contexts with known/controlled conditions can help to better understand mobility, dietary intake as well as animal and agricultural management practices in the past.

More specifically this could include the following topics, but is not limited to:

- nitrogen and carbon isotopic studies of modern plant and soil systems to better understand environmental and cultural variables such as manuring, tillage, cultivation, grazing, foddering, stocking rate;

- multi-isotopic studies of modern faunal materials with known history and their diet to better understand the effect of animal physiology and diet-tissue isotopic fractionation;
- multi-isotopic studies of modern environmental samples to create local and regional isoscapes to better understand the spatial distribution of isotopes and their relevance for humans and animals in the past.

ABSTRACTS:

1 USING MODERN MULTI-PROXY ENVIRONMENTAL SAMPLES TO CONSTRAIN BIOAVAILABLE SR ISOTOPE BASELINES FOR HUMAN MOBILITY STUDIES: A CASE STUDY FROM GREECE

Abstract author(s): Frank, Anja (National Museum of Denmark) - Kristiansen, Kristian (University of Gothenburg) - Frei, Karin (National Museum of Denmark)

Abstract format: Oral

The application of Sr isotopes as a tracer for past human mobility has provided us with unprecedented insights, but hinges on the availability of bioavailable $87\text{Sr}/86\text{Sr}$ reference baselines. To date, no consensus exists on how to establish these, which resulted in many studies using different proxies to characterise the bioavailable $87\text{Sr}/86\text{Sr}$ signature of an area of interest. Here, we present Sr concentrations and $87\text{Sr}/86\text{Sr}$ data for three modern environmental proxies (plants, soils and water) from the Peloponnese, Central and West Greece to constrain the differences in their respective $87\text{Sr}/86\text{Sr}$ values and to evaluate their suitability as a baseline proxy. The $87\text{Sr}/86\text{Sr}$ values of the different proxies appear to be dominated by geologically-sourced Sr. This is particularly true for the water samples, which record the widest isotopic range ($87\text{Sr}/86\text{Sr} = 0.7077 - 0.7237$). In areas characterised by Mesozoic and Cenozoic sediments the environmental proxies record very similar $87\text{Sr}/86\text{Sr}$ values with an average of 0.70852 ± 0.00174 ($\bar{x} \pm 2\sigma$) and 0.70845 ± 0.00085 ($\bar{x} \pm 2\sigma$), respectively. However, while the plants and soil leachate $87\text{Sr}/86\text{Sr}$ values from these sediments are strongly correlated, they show a lower correlation to the $87\text{Sr}/86\text{Sr}$ signatures measured for surface and spring waters. The surface and spring water samples from areas dominated by Mesozoic sediments are strongly correlated, while no correlation was observed between spring and surface waters within Cenozoic areas. Areas characterised by Palaeozoic bedrocks returned the widest range in environmental $87\text{Sr}/86\text{Sr}$ values with an average of 0.71427 ± 0.01065 ($\bar{x} \pm 2\sigma$). The few samples collected from these areas are strongly correlated in their $87\text{Sr}/86\text{Sr}$ signatures of all three proxies. The differences in proxy $87\text{Sr}/86\text{Sr}$ signatures and correlations observed in this study emphasises the complexity behind establishing suitable baselines and highlights the importance of comprehensive, multi-proxy sampling to best characterise bioavailable Sr isotope baselines.

2 ON THE CONSTRUCTION OF MULTI-PROXY, BIOAVAILABLE SR-ISOTOPE BASELINES IN DIFFERENT TERRANES

Abstract author(s): Ladegaard-Pedersen, Pernille (National Museum of Denmark) - Sabatini, Serena (University of Gothenburg) - Kaul, Flemming - Frank, Anja (National Museum of Denmark) - Kristiansen, Kristian (University of Gothenburg; Globe Institute, GeoGenetics Centre) - Frei, Karin (National Museum of Denmark)

Abstract format: Oral

The strontium isotope tracing technique is a powerful tool for expanding our understanding of individual mobility in prehistory. The technique relies on the comparison of analysed human samples to an environmental baseline, which defines the range of bioavailable $87\text{Sr}/86\text{Sr}$ ratios available through the food chain in the area of investigation. Thus, the constraining of the bioavailable strontium baselines influences the interpretation of who is local and who is not. These interpretations influence the archaeological narrative about prehistoric societies.

Understanding the relationship between the geological background of a specific area, the measured bioavailable strontium isotope ratios in the same area, and the strontium isotope ratios of the archaeological material under investigation is not a trivial task. As part of the "Towards a New European Prehistory" and "Tales of Bronze Age People" research projects, we are attempting to aggrandize our knowledge of this complex system by constructing Sr-isotopic baselines through a multi-proxy technique in which we collect soil, plants and water from the study areas. This talk discusses the continued challenges in the construction of bioavailable Sr-isotope baselines in different terranes by use of case studies drawn directly from ongoing research in different terranes in Scania (south Sweden), Cyprus and northern Italy.

3 STRONTIUM ISOTOPIC RATIOS ($87\text{SR}/86\text{SR}$) FROM TOOTH ENAMEL REFLECT SEASONAL MOBILITY OF MODERN HERDS. EXAMPLES FROM THE PYRENEES (PRESENT-DAY CATALONIA)

Abstract author(s): Nieto-Espinet, Ariadna (Archaeology of Social Dynamics IMF-CSIC) - Trentacoste, Angela (University of Oxford) - Cardona, Gerard (Casa Ricou livestock farmer - Catalan Pyrenees) - Bòria, Artur (Catalan Goat project livestock farmer - Catalan Pre-Pyrenees) - Guimarães, Silvia (Archaeology of Social Dynamics IMF-CSIC) - García-Solsona, Ester - Torner-Pérez, Judit - Pena, Leopoldo (GRC-Geociències Marines, Dept. de Dinàmica de la Terra i de l'Oceà, Facultat de Ciències de la Terra, University of Barcelona) - Carrocio, Mateo Maria (Catalan Goat project livestock farmer - Catalan Pre-Pyrenees) - Valenzuela-Lamas, Silvia (Archaeology of Social Dynamics IMF-CSIC)

Abstract format: Oral

The analysis of animal mobility is key to understanding pastoral strategies and animal husbandry regimes. In the frame of the ERC-StG project 'ZooMWest' we conducted ethnographic work with present-day herders with organic herds in the Pyrenees. This comprised several steps: making first contacts, choosing the most relevant sheep and goat herds, accompanying and recording their transhumant and local movements, attaining agreement that the animals that could be used for the project, requesting permission from the health authorities to access the slaughterhouse, preparing the modern jaws, and finally sequentially sampling and analysing the teeth. No animals were slaughtered specifically for the purpose for the project. We respected the rhythm of each herd, and kept a fluent relationship with the herders to ensure a two-way knowledge transfer.

This work allowed us to develop a relevant baseline for both strontium and oxygen isotopic ratios ($87\text{Sr}/86\text{Sr}$; $\delta 18\text{O}$), together with an understanding of the challenges and constraints linked to livestock mobility. Our isotopic results demonstrate that strontium isotopic ratios closely reflect mobility patterns and can be used to trace animal mobility in the past. The work also provides an opportunity for critical reflection on tooth sampling protocols and ethnographic work. Consequently, it provides highly relevant results that will help improve and refine isotopic reference for the study of mobility, and also reflects on what is involved in doing ethnographic work with modern livestock farmers beyond the scientific issues.

4 RESOLUTION AND LIMITS OF ISOTOPIC APPROACHES TO PUZZLE OUT SEASONAL HERD MOBILITY. A MODERN CASE STUDY FROM AZERBAIJAN

Abstract author(s): Berthon, Remi (Archéozoologie, Archéobotanique - Sociétés, Pratiques, Environnement - AASPE, MNHN-CNRS) - Giblin, Julia (Quinnipiac University, Department of Sociology, Criminal Justice and Anthropology) - Balasse, Marie - Mashkour, Marjan (Archéozoologie, Archéobotanique - Sociétés, Pratiques, Environnement - AASPE, MNHN-CNRS) - Thévenin, Michaël (Unité de recherches Migrations et société, Université de Paris-UCA-CNRS-IRD) - Fiorillo, Denis (Archéozoologie, Archéobotanique - Sociétés, Pratiques, Environnement - AASPE, MNHN-CNRS) - Ehleringer, James (University of Utah, School of Biological Sciences) - Amiri, Sarieh (Department of Archaeology, University of Tehran) - Sheikhi Sheno, Shiva (Independent scholar)

Abstract format: Oral

Herd mobility is a key parameter of many agro-pastoral strategies. Sequential variations of oxygen, carbon and strontium isotope ratios in ruminant teeth are commonly used for characterizing herd mobility along altitudinal gradients and across geological areas. To what extent is the variation and covariation of isotopic ratios along a tooth actually reflecting vertical and geological mobility? The interpretation of such data from archaeological material widely depends on our ability to answer to this question. Few modern baselines are available to assess covariation of oxygen and carbon isotope ratios along the tooth of modern sheep experiencing vertical mobilities. There are no such baselines for the covariation of strontium, oxygen and carbon isotope ratios. Our study aimed at analyzing the variation and covariation of isotope ratios of oxygen, carbon, and strontium in the teeth and guard hair of domestic ruminants experiencing different pastoral mobilities along altitudinal gradients and across geological areas. We sampled lower molars from one cow and 17 sheep, as well as the guard hair from five goats, all grazing in different mountainous areas of Azerbaijan (Nakhchivan, Ganja-Qazakh, and Lankaran regions) at least part of the year. Our results suggest that the covariation of the isotope ratios of oxygen and carbon allow to spot easily the specimens moving seasonally between the plains and the highlands and also between the subalpine zone and the highland meadows. To a lesser extent it is possible to sort two-staged annual mobility from four-staged annual mobility. The variations in strontium isotope ratios during the period of enamel formation also adequately reflect seasonal mobility but it deeply depends on the number of samples analyzed along the tooth crown. These results allow us to interpret isotope ratio variations in archaeological domestic ruminant teeth in order to analyze the role of herd mobilities in past agro-pastoral communities.

5 DETERMINING BIRTH SEASON USING OXYGEN ISOTOPES IN ENAMEL. A NEW MODERN REFERENCE SET FOR AUTUMN BIRTHS IN SHEEP

Abstract author(s): Balasse, Marie (AASPE Archéozoologie, archéobotanique : sociétés, pratiques, environnements, UMR 7209, CNRS MNHN) - Keller, Matthieu - Chemineau, Philippe (Physiologie de la Reproduction et des Comportements, UMR 7247, CNRS, INRAE, Univ Tours, IFCE) - Parisot, Sara (Unité Expérimentale de La Fage, UE0321, INRAE) - Fiorillo, Denis (AASPE Archéozoologie, archéobotanique : sociétés, pratiques, environnements, UMR 7209, CNRS MNHN)

Abstract format: Oral

The season of births in domestic herds determines the availability of animal production, the organization of agropastoral tasks and herds mobility on the annual scale. It can be manipulated by the herder to a certain extent and it may have been so early in

the history of domestication. Birth season can be investigated through the reconstruction of the seasonal cycle record in teeth, using sequential analysis of stable oxygen isotope ratios in enamel. The season of birth is then determined by comparison with modern references, i.e. oxygen isotope sequences measured in the teeth from animals of known birth season. Such works have been conducted in particular in sheep. For those, previous modern references have mostly included winter and early spring births, the season when most births occur under temperate latitudes in Europe. In order to complete the existing framework, we have built a new reference set focusing on autumn births, occurring currently in the western Mediterranean area. This new set is composed of 27 teeth (including second and third molars) from Lacaune and Merinos ewes raised in southern France. We will explain how the set was constituted, present the data for autumn births, connect it to previous data for winter and early spring births on different sheep breeds, and discuss intra- and inter-breeds variability.

6 SEQUENTIAL ANALYSES OF BOVINE TOOTH DENTINE AND THE RECONSTRUCTION OF WEANING PROCESSES

Abstract author(s): Eckelmann, Rebekka (University of Helsinki) - Makarewicz, Cheryl - Winter-Schuh, Christine (Kiel University)

Abstract format: Oral

Exploitation of livestock for their dairy had a significant impact on human subsistence, providing people with a readily renewable source of fats and protein. Human manipulation of livestock for their milk can be identified by tracing changes in animal age at weaning, an ontogenetic shift associated with a decrease in trophic level that is detectable in the nitrogen isotopes of sequentially sampled herbivore dentinal collagen. However, various challenges remain with this method, in particular a loss of temporal resolution caused during sampling by cross-cutting dentine layers with different formation times. In this contribution, we explore sequential sampling methods, their effect on measured dentinal collagen $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values, and how this impacts our interpretation of weaning patterns. We do so using cattle from northern Germany with known grazing histories, pasture stocking rates, and age at natural weaning in order to better detect human interference in calf weaning and other seasonally-related husbandry strategies.

7 MEASURING NITROGEN ISOTOPES IN TOOTH ENAMEL: A NOVEL METHOD FOR CHARACTERIZING TROPHIC POSITION IN MODERN AND ANCIENT FOOD WEBS

Abstract author(s): Leichliter, Jennifer (Institute of Geosciences, Johannes Gutenberg University; Max Planck Institute for Chemistry, Mainz) - Lüdecke, Tina (Max Planck Institute for Chemistry, Mainz; Senckenberg Biodiversity and Climate Research Centre, Frankfurt; Institute of Cognitive and Evolutionary Anthropology, University of Oxford) - Foreman, Alan - Duprey, Nicolas (Max Planck Institute for Chemistry, Mainz) - Winkler, Daniela (Department of Natural and Environmental Studies, University of Tokyo) - Clauss, Marcus (Clinic for Zoo Animals, Exotic Pets and Wildlife, Vetsuisse Faculty, University of Zurich) - Tütken, Thomas (Institute of Geosciences, Johannes Gutenberg University) - Martínez-García, Alfredo (Max Planck Institute for Chemistry, Mainz)

Abstract format: Oral

Nitrogen isotopes ($\delta^{15}\text{N}$) are a well-established tool for investigating the trophic position of animals and humans in modern and ancient food webs. In the archeological record, $\delta^{15}\text{N}$ is usually measured in collagen extracted from bone or dentin. However, these tissues are susceptible to diagenetic alteration over time and only relatively young (<100 ka), well-preserved material is typically analyzed. In contrast, tooth enamel is less susceptible to diagenesis, but $\delta^{15}\text{N}$ analysis of enamel has long been hindered by its low nitrogen content. Here, we present a novel oxidation-denitrification method for measuring $\delta^{15}\text{N}$ in tooth enamel, which requires ≤ 5 mg of enamel, a 100-fold improvement in sensitivity over existing techniques.

To demonstrate that tooth enamel reflects the N isotope composition of diet, we conducted a feeding experiment with rodents ($n=36$), which were fed a plant-, insect- or meat-based diet. We found significant differences in enamel $\delta^{15}\text{N}$ between all dietary groups; animals which received plant-based diets had the lowest enamel $\delta^{15}\text{N}$ values (6.0 ‰), followed by insect- (7.1 ‰), then meat-based diets (7.8 ‰).

Additionally, in order to evaluate whether enamel $\delta^{15}\text{N}$ records trophic level in a natural ecosystem, we analyzed the tooth enamel of modern African fauna (herbivores, omnivores, and carnivores; $n=60$) and compared these data to collagen $\delta^{15}\text{N}$ values from the same individuals. We found a positive correlation between enamel and collagen $\delta^{15}\text{N}$ ($R^2 = 0.75$; $n = 34$), and a trophic spacing of ~ 3 ‰ in enamel $\delta^{15}\text{N}$ between herbivores (6.3 ± 1.7 ‰) and carnivores (9.9 ± 2.0 ‰).

These initial datasets provide us with a framework for interpreting enamel $\delta^{15}\text{N}$ values from archeological records. The application of this novel method to diagenetically robust tooth enamel has the potential to open up new frontiers in paleodietary research by granting access to samples that were previously analytically out of reach.

8 USING MODERN MAMMAL TOOTH ENAMEL DATA TO UNDERSTAND NOVEL TROPHIC LEVEL RECONSTRUCTIONS OF EARLY PLEISTOCENE AUSTRALOPITHECUS (STERKFONTAIN, SOUTH AFRICA)

Abstract author(s): Lüdecke, Tina (Department of Climate Geochemistry, Max Planck Institute for Chemistry, Mainz; Institute of Cognitive and Evolutionary Anthropology, University of Oxford; Senckenberg Biodiversity and Climate Research Centre) - Leichliter, Jennifer (Department of Climate Geochemistry, Max Planck Institute for Chemistry, Mainz; Institute of Geosciences, Johannes Gutenberg University) - Duprey, Nicolas (Department of Climate Geochemistry, Max Planck Institute for Chemistry, Mainz) - Stratford, Dominic (School of Geography, Archaeology and Environmental Studies, University of the Witwatersrand) - Haug, Gerald (Department of Climate Geochemistry, Max Planck Institute for Chemistry) - Bamford, Marion (Evolutionary Studies Institute and School of Geosciences, University of the Witwatersrand) - Mathe, Jacinto - Bobe, René - Carvalho, Susana (Institute of Cognitive and Evolutionary Anthropology, University of Oxford; Gorongosa National Park) - Martínez-García, Alfredo (Department of Climate Geochemistry, Max Planck Institute for Chemistry, Mainz)

Abstract format: Oral

Direct evidence regarding when and to what degree our early ancestors incorporated animal resources into their diets is sparse. The strongest, but indirect, evidence for meat (and bone marrow) consumption so far are cut and percussion marks on fossil bone material. Yet, meat eating has major implications for the evolution of the hominin lineage, as it is a calorie-dense, high-quality food whose consumption has been linked to significant adaptations (e.g., brain expansion). Improving capacity to identify meat consumption is crucial step towards reconstructing the timing of changes in hominin dietary behavior and to evaluate their position in (paleo) food-webs.

Nitrogen isotopes ($\delta^{15}\text{N}$) reveal information about an individual's position in the food-web and are frequently used in conjunction with carbon isotopes ($\delta^{13}\text{C}$) to reconstruct diet. However, $\delta^{15}\text{N}$ has thus far only been measured in specimens younger than 120,000 years, because large quantities of relatively unaltered collagen are required for analysis. Here, we utilize a novel biogeochemical method that enables us to perform high precision $\delta^{15}\text{N}$ measurements of diagenetically resistant tooth enamel (Leichliter et al., 2021).

To gain a better understanding of $\delta^{15}\text{N}$ patterns in tooth enamel in a well-constrained, modern ecosystem, we analyzed enamel of modern mammals (herbivores, carnivores and omnivores, including primates) from Gorongosa National Park, Mozambique. Then, we measured isotope values of fossil tooth enamel from a Plio-Pleistocene assemblage from southern Africa (Sterkfontein Member 4), including Australopithecus ($n=7$). These data represent the first $\delta^{15}\text{N}$ values measured in any early hominin. Our results indicate a large variation in $\delta^{15}\text{N}$ values among Australopithecus individuals, exceeding that observed in all other analyzed primate taxa from Sterkfontein or Gorongosa. However, the hominin values do not overlap with carnivore $\delta^{15}\text{N}$ data, pointing to a plant- rather than meat-based diet for these early Pleistocene hominins, providing a first glimpse into the trophic level of Australopithecus.

9 UNSPOOLING ENVIRONMENTAL FROM ANTHROPOGENIC INPUTS RECORDED IN HAIR KERATIN CARBON AND NITROGEN ISOTOPES OF SEMI-ARID REGION CAPRINES

Abstract author(s): Flohr, Pascal - Makarewicz, Cheryl (ROOTS Excellence Cluster, Kiel University; Institute for Prehistoric and Protohistoric Archaeology, Kiel University)

Abstract format: Oral

Establishing the intensity of ancient pasturage systems through carbon and nitrogen isotopic analyses of herbivorous animal skeletal remains offers new perspectives into nascent animal management, agro-pastoralist production, pasture access rights associated with territorialization of landscapes, and the provisioning of cities. However, establishing if variation in herbivore isotopic composition is environmental or anthropogenic in origin is particularly challenging in environments such as the southern Levant, where there are sharp differences in rainfall levels and vegetation composition over short distances. In this region, the carbon and nitrogen isotope composition of floral growth (i.e. pasture) is heavily influenced by aridity, precipitation patterns, and localized water availability, but can be further modified by, among other things, anthropogenic intensification activities involved with food production. Here, we investigate the relationship between precipitation, other aridity and water availability indicators, soil type, stocking rates, and livestock $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values through isotopic analyses of hair keratin obtained from caprines grazed across the diverse landscapes of Jordan. In doing so, we seek to decouple pasturing intensity from environmental inputs in an effort to build better isotopic models for identifying pasturing dynamics in semi-arid environments.

WELL-WATERED VS. WATER-STRESSED: THE CONTRIBUTION OF MODERN C4 PLANT STABLE ISOTOPE ANALYSIS FOR RECONSTRUCTING PAST AGRICULTURAL PRACTICES IN DRYLANDS

Abstract author(s): Varalli, Alessandra - D'Agostini, Francesca (CaSEs Research Group, Department of Humanities, Universitat Pompeu Fabra) - Fiorentino, Girolamo (Laboratory of Archaeobotany and Palaeoecology, Department of Cultural Heritage, University of Salento) - De Benedetto, Giuseppe - Pennetta, Antonio (Laboratorio di Spettrometria di Massa Analitica ed Isotopica, Department of Cultural Heritage, University of Salento) - Madella, Marco (CaSEs Research Group, Department of Humanities, Universitat Pompeu Fabra; ICREA) - Vadez, Vincent (Institut de Recherche pour le Développement - IRD, Université de Montpellier – UMR DIADE, BP; International Crops Research Institute for Semi-Arid Tropics - ICRISAT) - Lancelotti, Carla (CaSEs Research Group, Department of Humanities, Universitat Pompeu Fabra; ICREA)

Abstract format: Oral

Charred seeds from archaeobotanical assemblages are routinely investigated to reconstruct past agricultural management. In arid environment, C4 plants like millets are widespread as their physiology makes them tolerant to drought. Because of this, it is generally assumed that C4 plants' isotopic values do not vary with different hydrological conditions. Nevertheless, recent research based on modern plants has found correlations between carbon and nitrogen values and watering conditions in some species of millets (e.g. *Setaria italica*). Our aim is to define the isotopic variability in selected species of C4 crops grown under different water treatments in order to deliver a reliable framework to reconstruct past water management based on experimental analyses.

Within the framework of RAINDROPS (ERC-Stg 759800), we conducted two different controlled experiments on two C4 species, *Pennisetum glaucum* and *Sorghum bicolor*. The plants were grown under different water treatments and all the physiological parameters (e.g. water transpired) were monitored. In the first experiment, the well-watered plants were irrigated weekly to maintain 80% of the soil field capacity while the water-stressed plants received water only until the flowering. In the second experiment, plants were irrigated following four water-stress treatments, stopping the irrigation at the second, fourth, sixth and eighth week from the sowing. We then compared $\delta^{13}C$ and $\delta^{15}N$ in all plant grains in order to estimate ranges of variability.

The preliminary results show that pearl millet and sorghum react differently to the diverse hydric conditions. Sorghum (NADP-ME) is more sensitive to irrigation than pearl millet (NAD-ME), likely because of the different physiology. In both experiment, $\delta^{13}C$ in sorghum is positively correlated with water availability, while $\delta^{15}N$ does not show any correlations. Concerning pearl millet, no correlations are evident any of the experiments. This allows for considering sorghum as an eventual good proxy for reconstructing agricultural strategies in the past.

STABLE ISOTOPE COMPOSITION OF WEED PLANT CARBONATE AS A PALEOENVIRONMENTAL INDICATOR FOR PAST AGROECOSYSTEMS

Abstract author(s): Pustovoytov, Konstantin (Institute for Archaeological Science and Senckenberg Center for Human Evolution and Palaeoenvironment, Tübingen University; Institute of Oil and Gas, Yugra State University) - Riehl, Simone (Institute for Archaeological Science and Senckenberg Center for Human Evolution and Palaeoenvironment, Tübingen University)

Abstract format: Oral

Human-ecosystem interactions in the past remain poorly understood because of the scarcity of accurate paleoenvironmental records on ancient agroecosystems. Here we report about the potential of plant carbonate in the weed taxon *Lithospermeae* (fam. Boraginaceae) as a local paleoenvironmental indicator of growing conditions on ancient arable fields.

The tribe *Lithospermeae* includes the genera *Lithospermum* and *Buglossoides*, which are typical representatives of weed flora with in a broad range of climates, but especially common in the Mediterranean regions. These plants accumulate biogenic carbonate in tissues of their fruits during one vegetative season. The ripe fruits represent small (2-5 mm in length) nutlets with calcareous pericarps. Under arid-semiarid conditions, they can remain well-preserved over millennia in cultural layers and sediments. Ancient nutlets of *Lithospermeae* widely occur in archaeobotanical spectra of Eurasia and both Americas. A comparison of 14C ages of fruit carbonate with numerical chronology shows that biogenic $CaCO_3$ of the taxon can be successfully dated with radiocarbon.

In this study, we use modern $\delta^{18}O$ and $\delta^{13}C$ values of plant carbonate sampled in herbaria and from experimentally grown plants to demonstrate sensitivity of the $CaCO_3$ fraction to ambient factors. Our data suggest that the oxygen isotope fractionation in fruit carbonate is relatively low ($1000\ln\alpha = 4.72$). Furthermore, its $\delta^{18}O$ is clearly sensitive to amount of atmospheric precipitation for the warm season (r_s and R^2 about -0.70 and 0.45 respectively), but shows a lower degree of correlation to air temperatures. The indicative role of $\delta^{13}C$ of fruit carbonate is less evident and may be linked to specific physiology of photosynthesis of *Lithospermeae*. The findings of this study thus demonstrate potential possibilities of fruit $CaCO_3$ as a specific paleoenvironmental indicator, primarily for problematic issues of moisture availability in the past.

EFFECTS OF MARINE BIOFERTILISATION ON CELTIC BEAN CARBON, NITROGEN AND SULPHUR ISOTOPES: IMPLICATIONS FOR RECONSTRUCTING PAST DIET AND FARMING PRACTICES

Abstract author(s): Gröcke, Darren - Church, Mike - Treasure, Edward - Gron, Kurt (University of Durham)

Abstract format: Oral

The application of fertilisers to crops can be monitored and assessed through stable isotope ratios. However, the effect of marine biofertilisers (e.g., fish, macroalgae/seaweed) on crop stable isotope ratios has been rarely studied, despite widespread archaeo-

logical and historical evidence for the use of marine resources as a soil amendment. A heritage variety of Celtic bean, similar in size and shape to archaeobotanical macrofossils of *Vicia faba* L., was grown in three 1x0.5m outdoor plots under three soil conditions: natural soil (control); natural soil mixed with macroalgae (seaweed); and 15cm of natural soil placed on a layer of fish carcasses (Atlantic cod). These experiments were performed over two growing seasons in the same plots. At the end of each growing season, the plants were sampled, measured and analysed for carbon, nitrogen and sulphur stable isotope ratios. The bean plants freely uptake the newly bioavailable nutrients (nitrogen and sulphur) and incorporate a marine isotopic ratio into all tissues. Bean nitrogen-isotope values average 0.9‰ in the control experiment compared with 2.5‰ in the macroalgae crop. The cod fish crop exhibited a range between 8‰ to 17‰. Sulphur isotope values averaged 6‰ in the control, compared with 15.5‰ in the macroalgae crop and 10.5‰ in the cod fish crop. The beans became more ^{13}C -depleted due to crop management practices. Humans and animals consuming plants grown with marine biofertilisers will incorporate a marine signature. Isotopic enrichment in nitrogen and sulphur using marine resources has significant implications when reconstructing diets and farming practices in archaeological populations. Additional archaeological bean isotope data from coastal and in-land sites will be presented as examples.

SEAWEED FERTILISATION AND CONSUMPTION: MODERN REFERENCE DATA OF FERTILISED BARLEY AND BONES AND TEETH OF SEAWEED-EATING SHEEP

Abstract author(s): Blanz, Magdalena (University of Vienna, Austria; University of the Highlands and Islands) - Mainland, Ingrid (University of the Highlands and Islands) - Ascough, Philippa (Scottish Universities Environmental Research Centre) - Taggart, Mark (University of the Highlands and Islands) - Richards, Michael (Simon Fraser University) - Wishart, John - Martin, Peter (University of the Highlands and Islands) - Raab, Andrea - Feldmann, Jörg (University of Graz)

Abstract format: Oral

Historical evidence indicates the use of seaweed as a fertiliser and as forage for domesticated animals to have been common in coastal areas. However, until recently it has been unknown how fertilisation of terrestrial crops with seaweed affects $\delta^{13}C$, $\delta^{15}N$ and $^{87}Sr/^{86}Sr$ values. Similarly, the effects of seaweed consumption on bone collagen $\delta^{13}C$ and $\delta^{15}N$ had not been studied.

To further study the effects of fertilisation, a field trial was undertaken where bere barley was fertilised with seaweed (25t/ha and 50t/ha). Analysis of the crop showed $\delta^{13}C$ values to be unaffected, but $\delta^{15}N$ were elevated by $0.6 \pm 0.5\text{‰}$ (average $\pm 1\sigma$ for five replicate plots) in grain, and $1.1 \pm 0.4\text{‰}$ in straw due to seaweed fertilisation. Sr concentrations were elevated by a factor of 1.3 in seaweed fertilised grain, but no significant difference was found for straw.

Additionally, bone collagen $\delta^{13}C$ and $\delta^{15}N$ of modern seaweed-eating and grass-eating sheep (C3 vegetation) as well as terrestrial vegetation and seaweed from the Orkney islands were analysed. For the seaweed-eating sheep $\delta^{13}C$ values were significantly elevated compared to grass-eating sheep, ranging from -25.1‰ in a terrestrially feeding sheep and up to -10.7‰ in a seaweed-eating sheep. Since collagen and tooth enamel bulk $\delta^{13}C$ values suffer from equifinality issues when C3, C4 and marine plants are present, an alternative method to identify seaweed consumption would be beneficial for areas where C4 plants grow. For this reason trace elemental analysis of modern sheep enamel was undertaken, which revealed significantly lower lg(Ba/Sr) values for seaweed-eating sheep than terrestrial feeding sheep. Trace elemental ratios may thus be useful to support studies of isotope ratios.

The results of this work show that the study of modern reference materials is necessary for the correct interpretation of isotope ratios from archaeological material and will aid the identification of seaweed consumption by herbivores globally.

MULTI-ISOTOPIC APPROACH OF MODERN ENVIRONMENTAL SAMPLES FROM THE BALTIC COAST REVEALS INSIGHTS INTO SEA SPRAY MECHANISMS

Abstract author(s): Göhring, Andrea (Ludwig Maximilian University, Faculty of Biology, Department of Biology I, Anthropology and Human Genomics) - Hölzl, Stefan (RiesKraterMuseum Nördlingen) - Mayr, Christoph (Friedrich Alexander University Erlangen-Nuremberg, Institute of Geography; Ludwig Maximilian University Munich, Faculty of Geosciences, Department of Earth and Environmental Studies) - Strauß, Harald (University of Münster, Institute of Geology and Palaeontology)

Abstract format: Oral

Isotopic analyses on skeletal remains from archaeological sites close to the sea are hampered by the so-called sea spray effect. This effect causes a marine signal in terrestrial environments in all trophic levels, including humans. This results in a misleading isotopic fingerprint, if the data were not corrected for the sea spray effect. However, so far, the impact of the sea spray effect can only be mathematically approximated. Moreover, we do not know how and in what magnitude the sea spray actually enters the food chain in the different isotopic systems.

Therefore, modern environmental samples (plant, soil, water) were collected along the Baltic coast three times a year. In addition, greenhouse samples treated with known mineral salt concentrations or seawater solutions were analyzed for comparison. A multi-isotope approach including $\delta^{13}C$ of cellulose (plant), $\delta^{18}O$ of cellulose (plant) and inorganic sulfate (plant, soil, water), $\delta^{34}S$ of total sulfur (plant), inorganic sulfate (plant, soil, water), and organic sulfur (plant), as well as $^{87}Sr/^{86}Sr$ of the inorganic components of plant, soil, and water was performed.

The influence of the sea spray can be clearly seen in the seven isotopic dimensions. The impact of the sea spray on the isotopic systems under study differs due to different biochemical pathways. The isotopic data also show remarkable seasonal variability between spring, summer, and autumn samples, partly due to temperature effects as well as prevailing wind directions. Moreover,

the sea spray differs between sites and distance from the coast. The influence of the sea spray on the different isotopic systems is evidenced using cluster analysis.

Modern environmental samples can help to solve the problem of the sea spray effect on stable isotopes of archaeological skeletal remains. If we know the impact of sea spray on the isotopic fingerprints of individuals, the data can be interpreted correctly.

15 PRESERVATION OF ⁸⁷Sr/⁸⁶Sr SIGNATURES IN EXPERIMENTALLY HEATED HARD CLAMS: IMPLICATIONS FOR SHELL MIDDEN RESEARCH

Abstract author(s): Höpker, Sebastian (Leibniz Centre for Tropical Marine Research - ZMT - GmbH, Bremen, Germany; Faculty of Geosciences, University of Bremen; Environmental Research Institute, School of Science, Faculty of Science and Engineering, University of Waikato) - Wu, Henry (Leibniz Centre for Tropical Marine Research - ZMT - GmbH) - Lucassen, Friedrich (Faculty of Geosciences and MARUM - Center for Marine Environmental Sciences, University of Bremen) - Merschel, Peter (Leibniz Centre for Tropical Marine Research - ZMT - GmbH, Bremen, Germany; BDG Berufsverband Deutscher Geowissenschaftler e.V.) - Kasemann, Simone (Faculty of Geosciences and MARUM - Center for Marine Environmental Sciences, University of Bremen) - Westphal, Hildegard (Leibniz Centre for Tropical Marine Research - ZMT - GmbH; Faculty of Geosciences, University of Bremen)

Abstract format: Oral

Archaeological shell middens present valuable archives of past human societies and the environment that they lived in. Much of the information gained from midden deposits relies on geochemical analyses of individual components, such as the skeletal remains of shellfish and fish. Sr isotope ratios (⁸⁷Sr/⁸⁶Sr) are of increasing interest to archaeological enquiries as a means of geochemical tracing of dietary habits and migration patterns, and measured in midden-derived biogenic carbonates can serve as a proxy of precipitation and runoff in the respective organisms' aquatic habitats. However, when using geochemical information from midden constituents, a potential alteration of the material's original chemical composition due to pre-depositional processing or cooking practices by historic communities needs to be considered. In this regard, the stability of Sr isotopic signatures with respect to such treatments has not been affirmed to date, which is required for any confident ⁸⁷Sr/⁸⁶Sr-based interpretations. In this study, we assessed the preservation potential of ⁸⁷Sr/⁸⁶Sr by re-analysing 23 cultured hard clams from the experimental study by Müller et al. (2017). Our findings suggest that none of the three simulated prehistoric cooking practices (boiling, roasting, burning) alter the original ⁸⁷Sr/⁸⁶Sr signature (0.70918 - 0.70920; p = 0.26, one-way ANOVA), despite significant mineralogical changes and previously reported implications for other geochemical properties. Based on our results, we suggest that carbonate ⁸⁷Sr/⁸⁶Sr measured in midden constituents can be expected to present the original isotopic composition, which in turn can be linked to past runoff patterns and hydroclimate, and foraging habits of human settlements.

References:

- Müller, P., Staudigel, P.T., Murray, S.T. et al. (2017). Prehistoric cooking versus accurate palaeotemperature records in shell midden constituents. *Sci Rep* 7 (3555).

16 STABLE OXYGEN ISOTOPE ANALYSIS ON PATELLA DEPRESSA REVEALS SEASONAL MARINE MOLLUSC EXPLOITATION PATTERNS IN N IBERIA BY MESOLITHIC FORAGERS

Abstract author(s): García-Escárcaga, Asier (Max Planck Institute for the Science of Human History; Universidad del País Vasco; Universidad de La Rioja) - Gutiérrez-Zugasti, Igor (Instituto Internacional de Investigaciones Prehistóricas de Cantabria, Universidad de Cantabria) - Cuenca-Solana, David (Instituto Internacional de Investigaciones Prehistóricas de Cantabria, Universidad de Cantabria; Centre de Recherche en Archéologie, Archéosciences, Histoire - CReAAH) - González-Morales, Manuel (Instituto Internacional de Investigaciones Prehistóricas de Cantabria, Universidad de Cantabria) - Ilgner, Jana (Max Planck Institute for the Science of Human History) - Lucas, Mary (Max Planck Institute for the Science of Human History) - Roberts, Patrick (Max Planck Institute for the Science of Human History; School of Social Sciences (University of Queensland))

Abstract format: Oral

Investigations conducted during last few decades in the Cantabrian region (N Iberia) have greatly increased our knowledge about littoral resource exploitation patterns during the Mesolithic period (ca. 10,500 - 6,700 cal BP). Stable oxygen isotope ratios ($\delta^{18}O$) can act as powerful recorders of the seasonal seawater temperature variations experienced by a mollusc in the past, enabling us to accurately establish the period of the year when it died/was collected by humans. Recent studies applying this methodology to mollusc shells have allowed us to properly determine seasonal exploitation patterns of the topshell *Phorcus lineatus* (da Costa, 1778) and the limpet *Patella vulgata* Linnaeus, 1758 in N Spain. Results obtained so far have reported differences in collection strategies depending on the species, with *P. lineatus* collection patterns being driven by a cost-benefit principle. However, while the limpet *Patella depressa* Pennant, 1777 is one of the most common mollusc species found in Holocene archaeological assemblages along the Atlantic façade of Europe, seasonal collection patterns in relation to this species have been under-studied. Here, we apply stable oxygen isotope analyses to *P. depressa* shells recovered from the shell midden site of El Mazo cave (Asturias, Spain) to determine if there are seasonal patterns in its exploitation by humans. We also undertake a modern experimental programme, collecting *P. depressa* individuals all year round from N Iberia, in order to establish whether observed seasonality (if any) is likely to have caused by cost-benefit principles or other cultural factors. The results obtained allow us to better understand patterns of littoral resource exploitation and overall subsistence of some of the last specialized hunter-fisher-gatherers in western Europe.

462 ASSESSING THE IMPACT OF MAJOR CLIMATIC AND/OR ENVIRONMENTAL EVENTS ON HUMAN CULTURE AND SUBSISTENCE

Theme: 2. Pandemics and climate change: responses to global challenges

Organisers: Glykou, Aikaterini - Lidén, Kerstin (Archaeological Research Laboratory, Stockholm University) - López-Costas, Olalla (EcoPast, Area of Archaeology, Dpto. History, Universidade de Santiago de Compostela) - Jordan, Peter (Department of Archaeology and Ancient History, Lund University) - Uchiyama, Junzo (Sainsbury Institute for the Study of Japanese Arts and Cultures, University of East Anglia and Center for Cultural Resource Studies, Kanazawa University)

Format: Regular session

This session will examine the extent to which archaeologists can reconstruct the impact of major climatic and/or environmental events on humans and their environment and the extent to which past societies were able to respond, culturally and economically, to such changes during the Late Pleistocene and the Holocene. Sudden climatic events and weather extremes probably had significant societal impact, as they directly influence the food resources, plants and animals, upon which human livelihood depend. Climatic shifts and environmental change have the potential to be major drivers of societal change but this is poorly understood in practice. Additionally, both short-term catastrophic environmental disasters and long-term protracted and deep-seated climatic change may provoke different responses from different human societies. Major global environmental events such as the Preboreal Oscillation at 11.3 ka, the 8.2 ka cold event, the 4.2 ka aridification event and the 536 AD dust-veil event have been associated with cultural shifts in different regions worldwide. It is highly likely that there was variability in the extent to which different societies in different times and places were able to respond. Expression of such responses could be high mobility, relocations, large-scale abandonments, or adaptation and resilience. Cultural adaptation, however, is the most challenging to establish in the archaeological record. This session aims to bring together researchers who are interested in discussing how we can provide evidence-based data on past human adaptive strategies to climate/environmental change. This session is open for papers presenting various methodological approaches that use a multi-proxy approach to reconstruct past environmental impacts and the human cultural responses, from archaeology, archaeobotany, bioarchaeology, zooarchaeology, geoarchaeology.

ABSTRACTS:

1 CONVERGENT CATASTROPHE? THE COMBINED HUMAN IMPACTS OF THE 8.2KA EVENT AND THE STOREGGA TSUNAMI ON MESOLITHIC FORAGERS IN WESTERN DENMARK

Abstract author(s): Andreassen, Kathrine - Riede, Felix (Department of Archaeology and Heritage Studies, Aarhus University)

Abstract format: Oral

The so-called '8.2ka event' arguably had a major impact on Northern Hemisphere climate. In Denmark, it appears to have had an influence on lakes and rivers, which were essential landscape features for contemporaneous foragers. Around the same time as the 8.2ka event, the Storegga tsunami affected the North Sea Basin. While there is considerable debate about the loss of lives and livelihoods associated with this event, we here explore whether it, in combination with broadly coincidental climate change, lead to changing land-use amongst contemporaneous Maglemosian foragers in western Denmark. Drawing on theoretical approaches from environmental anthropology, our focus is in particular on sites in the catchment area of the River Gudenå. We review their numerical and techno-typological dating as well as associated evidence for environmental changes around the 8.2ka event horizon, and explore the possibility of a major reorientation from inland to coastal, and from networks reaching westwards towards networks with a preferential eastern orientation.

2 COMPARING HUMAN RESPONSE TO THE ONSET OF THE HOLOCENE IN NORTHERN GERMANY AND DENMARK

Abstract author(s): Weber, Mara-Julia - Eriksen, Berit Valentin - Grimm, Sonja B. - Groß, Daniel (ZBSA - Centre for Baltic and Scandinavian Archaeology; CRC 1266 "Scales of Transformation") - Krüger, Sascha - Mortensen, Morten (National Museum of Denmark) - Wild, Markus (Cluster of Excellence "ROOTS"; CAU Kiel)

Abstract format: Oral

The Pleistocene-Holocene transition is well suited to study how major climatic shifts were reflected in the composition of floral and faunal communities and how prehistoric societies responded to these climatic and/or environmental changes due to its significant impact on the environment. After a long phase of colder climate in the Younger Dryas, the onset of the Holocene is marked by a rapid rise of temperature, which was in some areas only interrupted by the short-term climatic and environmental event of the Preboreal Oscillation.

We jointly investigate the interrelationship of changes in the technical, economic and social behaviour of the Ahrensburgian and early Maglemosian hunter-gatherer groups on the one hand and the climatic as well as environmental transformations from the Younger Dryas to the early Holocene on the other hand. For this purpose, archaeological studies of the material culture are interlinked with archaeozoological and palaeobotanical analyses. In addition, supposed Lateglacial and Early Holocene bone and antler artefacts from Denmark have recently been reviewed and radiocarbon dated.

In this paper, we compare the results of different projects in order to address the timing and nature of the changes in human behaviour that indicate the end of the Palaeolithic and the beginning of the Mesolithic in northern Germany and Denmark. In a second step, we discuss potential environmental factors that could be at the origin of different human responses to the onset of the Preboreal in both regions.

3 SURVIVING IN THE ASHES: A PRELIMINARY ASSESSMENT OF SOCIO-ECOLOGICAL RESPONSES TO A “SUPER-ERUPTION” IN FORAGING SOUTHWEST JAPAN (7.3KA CAL BP)

Abstract author(s): Uchiyama, Junzo (Sainsbury Institute for the Study of Japanese Arts and Cultures; Center for Cultural Resource Studies, Kanazawa University) - Jordan, Peter (Department of Archaeology and Ancient History, Lund University) - Isaksson, Sven (Archaeological Research Laboratory, Department of Archaeology and Classical Studies, Stockholm University) - Kuwahata, Mitsuhiro (Advanced Asian Archaeological Research Center, Kyushu University)

Abstract format: Oral

Major volcanic eruptions are one of the most devastating and unpredictable events for all societies past and present. Although major progress has been made by archaeologists in understanding volcanic impacts on past societies, almost all this work has focused on urban or settled agricultural societies. In contrast, there is a major gap in knowledge about how forager communities were able to respond and recover, though important work has been conducted in northern Europe. In this paper we aim to add to this emerging knowledge base, and present a case-study from the Pacific “Ring of Fire” – we aim to understand the extent to which Jōmon Hunter-Fisher-Gatherers were impacted by the Kikai-Akahoya (K-Ah) super-eruption of 7.3ka cal BP, by looking at devastation, resettlement and recovery with a long-term perspective.

The K-Ah eruption was equivalent to VEI 7 and one of the top 6 large eruptions in the Holocene, which occurred in the ocean off the coast of Southern Kyushu. It produced more than 100 km³ tephra which covered a 2 million km² area of Northeast Asia. Tanegashima Island, which is located only about 50 km to the east of the eruption centre, was exposed to the full force of the pyroclastic flow. Everything was destroyed and the entire landscape decked with metres of ash. But within a few centuries, people were back and recolonised the island. We use the data of site location, lithic tool, and food residue analysis as well as paleo-ecological information to explore how people adapted to the new environments and estimate the long-term influence of the eruption.

We are in the process of launching a larger interdisciplinary project that will investigate K-Ah impacts and socio-ecological responses across a transect of local and more distant sites and regions.

4 DEALING WITH THE IMPACT OF THREE MAJOR ENVIRONMENTAL EVENTS ON PREHISTORIC COASTAL SOCIETIES AND THEIR MAIN PREY SPECIES

Abstract author(s): Liden, Kerstin - Glykou, Aikaterini - Eriksson, Gunilla - Isaksson, Sven (Archaeological Research Laboratory)

Abstract format: Oral

How did humans use culture as a means to handle sudden environmental change, and can we detect common patterns of human behaviour in prehistoric coastal societies in the Baltic Sea area? Our project is focusing on three major global environmental events that are likely to have affected both humans and marine mammals, and consequently should be possible to trace in the archaeological record: the 8200 cal BP cold event in the Mesolithic (the 8.2 event), the 4200 cal BP aridification event in the Neolithic (the 4.2 event) and the 536 AD dust-veil event in the Migration Period. These events have been associated with cultural shifts in different regions worldwide, but not previously in the Baltic Sea Region. Although there are detailed records on both geological/environmental processes and the archaeological cultural contexts, respectively, in this area, the impact of climatic change on cultural shifts has not been previously taken entirely into consideration. By integrating studies on archaeology, bioarchaeology, marine mammal ecology and environment, the project will provide new data on how the prehistoric environment was entangled with both human culture and marine mammal ecology, affecting each other both ways.

The project will address the following questions:

1. How did humans deal culturally with environmental/climatic change?
2. Is it possible to identify temperature fluctuations caused by such events in skeletal remains of humans and seals?
3. Can we recognize dietary shifts and mobility triggered by environmental/climatic change?

5 SEALS ON THE ICE: THE IMPACT OF CLIMATIC CHANGE ON THE BALTIC SEA HARP SEALS AND ON HUMAN SUBSISTENCE

Abstract author(s): Glykou, Aikaterini (Archaeological Research Laboratory, Stockholm University) - Lõugas, Lembi (Archaeological Research Collection, Tallinn University) - Piličiauskienė, Giedrė (Department of Archaeology, Vilnius University) - Schmölcke, Ulrich (Centre for Baltic and Scandinavian Archaeology - ZBSA, Schleswig) - Eriksson, Gunilla - Lidén, Kerstin (Archaeological Research Laboratory, Stockholm University)

Abstract format: Oral

This paper will explore climatic/environmental and human impacts on a temperature sensitive species, the harp seal (*Pagophilus groenlandicus*), which occurred frequently in the Baltic Sea during the mid-Holocene and became extirpated during the late Holocene. Seal hunting was of great economic significance for the coastal societies of the Baltic Sea mainly during the mid-Holocene

and to a lower extent during the late Holocene. One of the most hunted seal species in this area was the harp seal, which is commonly found in archaeological assemblages. Harp seal is cold adapted and today, it has a subarctic distribution with breeding populations in the White Sea, the Jan Mayen Islands and around Newfoundland. Harp seals are considered to be a good paleoclimate indicator as they are highly dependent on pack ice and are highly sensitive to any changes in their habitat that affect breeding and foraging patterns. We combined radiocarbon dating of harp seal bones with zooarchaeological, palaeoenvironmental, stable isotope and strontium isotope data to reconstruct the presence of harp seals in the Baltic Sea during the Holocene. Our data show that the harp seal bred in the Baltic Sea already during the Holocene Thermal Maximum (HTM), the population declined or even went locally extinct around the 4.2 event, and final extirpation coincided with the onset of the Medieval Warm Period. Further, this paper will discuss how temperature sensitive species can be used as proxies to explore impacts of climatic/environmental change on human subsistence.

6 THE BALTIC GREY SEAL – A HISTORY OF PRESENCE AND ABSENCE

Abstract author(s): Bro-Jørgensen, Maiken (Archaeological Research Laboratory, Department of Archaeology and Classical Studies, Stockholm University; Section for Evolutionary Genomics, GLOBE Institute, University of Copenhagen) - Ahlgren, Hans - Glykou, Aikaterini (Archaeological Research Laboratory, Department of Archaeology and Classical Studies, Stockholm University) - Schmölcke, Ulrich (Schleswig-Holsteinische Landesmuseen) - Angerbjörn, Anders (Department of Zoology, Stockholm University) - Olsen, Morten (Section for Evolutionary Genomics, GLOBE Institute, University of Copenhagen) - Lidén, Kerstin (Archaeological Research Laboratory, Department of Archaeology and Classical Studies, Stockholm University)

Abstract format: Oral

The grey seal has been part of the Baltic fauna since at least 9000 BP and were together with other seal species an important resource for coastal hunter-gatherer societies. Large numbers of bone remains bear witness to the intensity of seal hunting and seal bones are plentiful at the Swedish site Stora Förvar (Gotland) and the German site Neustadt. We generated 69 mitochondrial control regions from ancient grey seals from Stora Förvar and Neustadt and applied radiocarbon dating on the same bone material in order to investigate genetic changes in the Baltic grey seal population through time and in response to known climatic events. Based on the radiocarbon dates, the disappearance of grey seals from Stora Förvar in the Mesolithic was not directly link-able to the 8.2 ka cold event, and might instead reflect intensive hunting prior to this climatic event. The genetic results show that a population replacement took place some time between the Early Neolithic and the Bronze Age. As this time range overlap with the 4.2 ka aridification event, it is possible that a prior population size reduction or even local extinction of grey seals in the Baltic Sea can be linked to this climatic event. The new genetic variation, which appeared in the Bronze Age, is similar to that of modern Baltic grey seals. The majority of the mitochondrial haplotypes from the Mesolithic and Neolithic are not found among modern and historical data, and are therefore to be considered extinct today.

7 A LONG TRANSITION: THE END OF LATEGLACIAL AND THE BEGINNING OF THE HOLOCENE AT COVES DE SANTA MAIRA (ALICANTE, SPAIN)

Abstract author(s): Vadillo Conesa, Margarita - Carrión Marco, Yolanda - Pérez Jordà, Guillem - Martínez Varea, Carmen M^ª - Morales Pérez, Juan V. - Balcázar Campos, Nicole - Miret Estruch, Carles - Aura Tortosa, J. Emili (Universitat de València)

Abstract format: Oral

The Lateglacial to early Holocene transition includes climatic events of high and medium magnitude, which ended up defining the current Mediterranean landscapes. Santa Maira sequence covers this period and analyses of different materials have allowed for the reconstruction of the landscape and human strategies for raw materials exploitation.

Wood charcoal analysis shows that the most exploited tree taxa are both deciduous and evergreen *Quercus* types (oak) together with *Juniperus* sp. (juniper) throughout the sequence. As far as the plant composition is concerned, there were no major changes. However, the frequencies of some taxa change noticeably, thus indicating a shift in the woodland structure and/or in the plant resources management strategies. Large numbers of macroremains of fruits (*Quercus* sp., *Sorbus* sp., *Olea* sp. and *Vitis* sp.) were also found, but a significant quantity of legumes together with a few grass seeds have also been identified.

Regarding the exploitation of mammals, no abrupt changes are identified throughout the sequence. However, a trend towards diversification is observed, with a greater presence of taxa which in turn represent a greater relative weight within the samples. This trend starts in the Lateglacial and can be linked to ecological changes, particularly to afforestation processes. The evolution of lithic assemblages during this period is also characterised by continuity (local and regional raw material procurement, production objectives), although some changes occur (exploitation modalities and retouched tools). However, this did not affect the essential purposes of lithic production: microlaminar tools intended for creating composite and household tools linked to maintenance and consumption.

It can be inferred that there was a long process of change in the management of forest resources and raw materials, which began ca. 14.5 ky cal BP and lasted until the appearance of the Mesolithic period ca. 10.5 ky cal BP.

- 8 **CLIMATIC IMPACT ON THE CULTURAL DEVELOPMENT IN THE VOLGA AND KAMA BASIN**
Abstract author(s): Vybournov, Alexander (Samara State University of Social Sciences and Education) - Kulkova, Marianna (Herzen University)
Abstract format: Oral
- The territory of the Volga and Kama basin is presented by different landscape zones: semi-desert of the Northern Cis-Caspian, steppe zone in the Low Volga basin, forest-steppe of the Middle Volga basin and forest zone in the Kama basin. Based on the investigations of last years, the climatic changes around 6,2 ka calBP and cultural transformations in this time should be considered as well. In the Povolzhye in this time the Khvalinian culture was developed. After the abrupt climatic event at 6,2 ka calBP, the sites of this culture disappeared from this territory. Some hiatus can be noticed between the Khvalinian culture and the early stage of Yamnaya culture. We can suggest that this connects with strong aridization at this time. In the forest area of Povolzhye at 6,2 ka, BP the sites of Krasnomostovskogo type were open. They are the results of the syncretism of two cultures and reflect the transition from Neolithic to Eneolithic. In the forest zone of the Upper Povolzhye, the protovolosoovsky type of sites demonstrates the same process. In the forest zone of the Kama basin, the sites of Novoilinskaya culture appeared at 6,2 ka calBP. The changes in technology and typology of the stone tools and ceramics are registered on the sites of these cultures. This culture was developed on the base of the Kamskaya culture and reflects the transition to the Eneolithic. So, the aridization around 6,2 ka cal BP influenced the cultural processes on the territory of the Volga and Kama basin, but there have features in these transformations in each landscape zone. The most mosaic process has occurred in the forest-steppe of Povolzhye. The cultural monotony characterizes the sites of Kama basin. But all these features predict the transition stage to the Eneolithic period.
- 9 **ENVIRONMENTAL CHANGE AND HUMAN RESPONSE IN A THESSALIAN BASIN LANDSCAPE SOUTH OF MT OLYMPUS: A DIACHRONIC STUDY (6500-3300 BC)**
Abstract author(s): Reingruber, Agathe (FU-Berlin) - Toufexis, Giorgos (Ephorate of Antiquities of Larissa)
Abstract format: Oral
- In a joint German-Greek project, intensive surveys were carried out between 2017 and 2020 in the basins of Sykourio and Elateia (north-eastern Thessaly), an area of about 15 x 5 km. In the process, we were able to re-locate already known prehistoric sites as well as discover new ones. The archaeological and geographical information collected was uploaded in a Geographical Information System (GIS) and evaluated diachronically. In addition, emphasis was placed on describing the surroundings of the various sites, be they tell sites (magoules), flat sites, hilltop settlements or limited assemblages of finds. Their proximity or distance to a water source (a lake or a river) or to various raw material sources was also recorded. Based on a detailed relative chronological system, we were able to establish that the oldest permanent sites were founded in the lowest areas of the basins in the Early Neolithic and the early part of the Middle Neolithic (ca. 6500-5700 BC). During the later MN, these areas were abandoned and new sites emerged at slightly higher altitudes, which were also preserved during the Late Neolithic and the first part of the Chalcolithic. After about 4000 BC, the magoules were abandoned and single-layer sites emerged in new locations in the basins, with new habitats on hilltops also being favoured.
- We interpret these relocations over 3000 years of prehistory not only as a cultural change, but also as a response to changing environmental conditions, in particular to fluctuating water levels of a currently desiccated lake as well as to flooding events originating from riverbeds that have also dried out today. This working hypothesis requires further evidence from drillings and geographical investigations.
- 10 **MAJOR CLIMATIC EVENTS DURING THE MEDITERRANEAN NEOLITHIC DISPERSAL FROM A SHORT-TERM AND LOCAL PERSPECTIVE**
Abstract author(s): Hausmann, Niklas (Römisch Germanisches Zentralmuseum - RGZM; University of York)
Abstract format: Oral
- This talk will outline how the impact of major climatic events on Neolithic dispersals could be identified and quantified by archaeological research using mollusc shell records.
- We aim to use limpet shells from Mesolithic/Neolithic transitional sites of the Mediterranean, to ascertain whether the spread of the Neolithic was accompanied or even constrained by climatic conditions at that time (i.e. 8.2 event, Rapid Climate Change (RCC) Events). Different to long-term climate archives, limpet shells are often found on site and record temperature changes on a seasonal scale, allowing us to measure weather extremes on a resolution that a) would have been noticeable to Neolithic Farmers and b) is essential to agricultural strategies.
- The fast maritime expansion of Neolithic farmers across the central and western Mediterranean occurred only after a continental-scale climatic amelioration around 8,000 cal BP (6,000 cal BC) and supposedly after the climate became more predictable. But whether an unpredictable and extreme climate prevented a similarly swift expansion before 8,000 cal BP is not certain, because the local and short-term expressions of this climate are unknown. We hope to provide a better environmental backdrop to this question and quantify extreme short-term events on site should they have occurred.

In addition, Neolithic farmers have been shown to be highly adaptive and often part of a network of sites, strengthening economic as well as social resilience. If major climatic events did cause unpredictable short-term extremes, would they have increased agricultural risks by so much that the spread of farming was constrained?

- 11 **USING MG/CA RATIOS FROM THE LIMPET PATELLA DEPRESSA PENNANT, 1777 MEASURED BY LASER INDUCED BREAKDOWN SPECTROSCOPY (LIBS) TO RECONSTRUCT PALAEOCLIMATE**
Abstract author(s): García-Escárcaga, Asier (Max Planck Institute for the Science of Human History; Universidad del País Vasco - UPV/EHU; Universidad de La Rioja) - Martínez-Mincheró, Marina (Grupo de Ingeniería Fotónica, Universidad de Cantabria; Instituto de Investigación Sanitaria Valdecilla - IDIVAL) - Cobo, Adolfo (Grupo de Ingeniería Fotónica, Universidad de Cantabria; Instituto de Investigación Sanitaria Valdecilla - IDIVAL; CIBER-BBN, Instituto de Salud Carlos III) - Gutiérrez-Zugasti, Igor (Instituto Internacional de Investigaciones Prehistóricas de Cantabria, Universidad de Cantabria) - Arrizabalaga, Alvaro (Universidad del País Vasco - UPV/EHU) - Roberts, Patrick (Max Planck Institute for the Science of Human History; School of Social Sciences, University of Queensland)
Abstract format: Oral
- Measurement of the elemental composition of shells is increasingly emerging as an avenue for obtaining high-resolution insights into palaeoclimate and past seasonality. Several studies have shown significant correlations between Mg/Ca ratios measured on shell carbonate and the sea surface temperature (SST) within which this carbonate was precipitated. However, other investigations have reported large variability in this relationship between species. Therefore, further studies including taxa previously not considered are still required in order to validate these new species as suitable climate proxies. Here, we measure Mg/Ca ratios for limpet *Patella depressa* Pennant, 1777 samples live-collected in northern Spain for the first time. The elemental ratio was measured using Laser Induced Breakdown Spectroscopy (LIBS), a technique that significantly decreases the time required for sample preparation and increases the number of shells that can be analysed. In this study, CF-LIBS methods were applied to estimate molar concentrations of chemical elements on biogenic calcium carbonate. The Mg/Ca ratio evolution along the shell growth axis was compared with stable oxygen isotope ($\delta^{18}O$) profiles obtained from these same limpets and the SST at the place where mollusc grew in order to determine if the sequences obtained correctly reflect environmental conditions during the life-span of the mollusc. The results showed a significant correlation between Mg/Ca ratio series and both $\delta^{18}O$ profiles and SST, highlighting the palaeoenvironmental and archaeological potential of LIBS analyses on this mollusc species that is frequently found in archaeological contexts in the western Europe.
- 12 **DEMOGRAPHIC FLUCTUATIONS IN THE SOUTHERN LEVANT IN RELATION TO THE 8.2 AND 4.2KA CLIMATE EVENTS**
Abstract author(s): Schmid, Magdalena (Kiel University)
Abstract format: Oral
- The southern Levant has had multiple cycles of cultural transition and human migration over the last 15.000 years. Causations of mobility are varied and center around opposing hypotheses including the role of rapid climate events and overexploitation of local resources. It has been argued that drought events either had limited impacts on southern Levant communities to they have led to societal collapse.
- In this study, a series of quantitative analyses was undertaken (Bayesian, frequency, outlier and aoristic) to correlate climate and archaeological datasets and to provide a robust temporal resolution of the intensity of human occupation on macro and micro scales. Using a new radiocarbon dataset compilation (> 3900 dates from > 580 archaeological sites), this study assess fluctuations in relative population numbers, archaeological sites and 14C-date frequencies. Coupled with aoristic approaches, it establishes for the first time the spatio-temporal distribution of human activities as narrow as 100-year intervals.
- This study demonstrates that 14C dates are uniformly distributed among archaeological sites and provide a robust narrative of human population trends. All models show a bottleneck at 8.1 and 4.3/4.0ka. Increased aridity has led to population decrease and the relocation of southern Levantine communities into mesic ecozones, where more stable and abundant resources are available. Increased humidity has led to population increase and relocation into marginal desert zones to allow for diversification of resources as a means of demographic pressure. These findings promise to contribute to the broader archaeological discussion regarding the relocation of human communities as a mitigation strategy for major climate fluctuations.
- 13 **CLIMATE CHANGE, ADAPTATION AND RESILIENCE IN THE INDUS CIVILIZATION: NEW ARCHAEOBOTANICAL DATA FROM BHANDO QUBO (SINDH, PAKISTAN)**
Abstract author(s): Jiménez Arteaga, Carolina - Madella, Marco - Lancelotti, Carla - Parque Pérez, Óscar (Universitat Pompeu Fabra) - Veesar, Ghualm - Abro, Tasleem - Chandio, Amin (Shah Abdul Latif University)
Abstract format: Oral
- The Indus Civilization was one of the great early complex societies (c.5.2–3.3 kyrs BP) and the earliest known urban culture of South Asia, spreading across modern Pakistan and India and reaching into Afghanistan during its peak. Archaeological evidence points to continuous adaptation by the Harappan people to climate changes, variable hydrologic regimes and regional ecological differences through diverse farming strategies and a mastery of water-supply management.

While it seems clear that the northwestern sites relied mainly on winter cyclonic rainfall originating in the eastern Mediterranean, southeastern rainfall was almost entirely sourced from the Indian Summer Monsoon. However, little is known about the Indus and Ghaggar-Hakra valleys, located in the transition zone, where both systems are most irregular. This area is of special interest as the western region of the Indo-Gangetic plain saw an unprecedented urban development during the Mature Harappan period (c.4.6–3.9 kys BP). Yet, no systematic studies of plant and animal remains have been done at Indus floodplain sites.

Preliminary archaeobotanical data from Bhandu Qubo, an archaeological site in the alluvial plain of the lower Indus Valley (Sindh, Pakistan), provides an interesting test case for exploring the role of climate in societal transformation. New multi-proxy evidence sheds light into local and regional adaptive strategies to environmental changes in the Indian subcontinent including (but not limited to) the 4.2 kyr aridification event. This new data is deepening our understanding of the rise and fall of Indus cultural traditions.

14 PRELIMINARY THOUGHTS ON SIGNS OF CHANGE IN BRONZE AGE SCOTLAND

Abstract author(s): Higginbottom, Gail (El Instituto de Ciencias del Patrimonio - Incipit, CSIC)

Abstract format: Oral

Exactly when and why prehistoric Standing stones first appeared remains an enigma (Scarre 2019: 216). Whilst they were culturally significant is already clear, as they came to be used across Europe in their tens of thousands for at least 5000 years (from c. 6000), no-one has discovered the actual reason for the start of these stone monuments in Europe, nor the reasons they stopped being built, nor again why in some areas the construction began anew (Higginbottom et al 2015). Key triggers for such relatively sudden appearances, changes and disappearances in cultures have been linked to a combination of competing cultural/people influxes (Whittle 2018; Olalde et al 2017) or climate change factors (Diers & Fritsch 2019). For Scotland, we know that StS first appeared as the great Circles c. 3000–2900 cal BC (Late Neolithic in Britain; Ashmore 2016; Ritchie 1976), with single StS in association with other monuments and some smaller-stoned circles dating between c. 2900-2600 BC (Bradley 1998; Burl 1993, 2000; Richards 2013b; Ashmore 2016; Ritchie 1976; Schulting et al. 2010; Gibson 2010; Ritchie 1974; Sheridan 2008; Noble and Brophy 2011, 2015). However, despite the fact that some StS monuments were still occasionally reused (Ashmore 2016, Bradley 2000, 2011; Gibson 2010), there are two possible eras of hiatus for their construction, the second one being c. 1800 BC - 1300 BC (Curtis and Wilkin 2012; Higginbottom et al 2015), after which a great number of simple StS monuments were erected across western Scotland (Higginbottom et al. 2015). The intention of this paper is to investigate known climate data and investigate the possible links between these and the start of this Middle Bronze Age megalithic phenomenon. It will also explain why it might be possible that these stones flag a change in the environment of the builders of these monument.

15 THE LITTLE ICE AGE (A.D. 1300-1850) AND ITS IMPACT ON HEALTH AND DIET IN NW SPAIN

Abstract author(s): López-Costas, Olalla (EcoPast - Gi-1553, Archaeology Fac. de Xeografía e Historia, Universidade de Santiago de Compostela; Archaeological Research Laboratory, Stockholm University; Laboratorio de Antropología Física, Universidad de Granada) - Mangas-Carrasco, Elvira (EcoPast - Gi-1553, Archaeology Fac. de Xeografía e Historia, Universidade de Santiago de Compostela) - Martínez Cortizas, Antonio (EcoPast - GI-1553, Facultade de Biología, Universidade de Santiago de Compostela)

Abstract format: Oral

North-western Spain offers a unique opportunity to explore changes in ancient lifestyles during The Little Ice Age (LIA, AD 1300-1850) due to the availability of detailed regional environmental reconstructions. Investigations based on peat records (pollen and geochemistry) revealed that the climate during the LIA was characterized by intense cooling (a decrease up to 5°C in comparison with maxima in the Medieval warm period), abrupt changes in rainfall, and higher frequency of storms. These changes are also common to other regions of the Iberian Peninsula, but our studies show that Galicia may have had a delay of 100-years in reaching the characteristic cool temperatures of the LIA. In order to understand the impact of these conditions on the human populations, we studied six skeletal collections for paleopathology and dietary changes (using stable isotope analyses in bone collagen). The three coastal collections displayed an increase on marine resources and C4 plants (millet and maize later), when compared with previous centuries. The change in diet fits well with the climate evolution and has been interpreted as a possible strategy to bioproductivity deterioration, as it was also observed in the Roman/post-Roman transition. We also detected elevated rates of porotic lesions such as cribra orbitalia (78%) and femoralis (70%) that could be linked to both diet change and climate deterioration. Infectious diseases such as tuberculosis, related to climate (i.e. fogs) and diet, were also present in the studied collections. Our investigation suggests that it is possible to detect the effects of abrupt climate changes on past human populations. Considering paleoenvironment in paleopathology is clearly an advantage, but we believe that future knowledge depends on including in the “formulae” also more detailed environmental reconstructions.

16 ANALYZING ADULT SURVIVORSHIP FROM CHILDHOOD STRESS DURING THE LITTLE ICE AGE IN THE NORTH AMERICAN GREAT PLAINS

Abstract author(s): MinskyRowland, Jocelyn (Smithsonian Institution; Howard Community College)

Abstract format: Oral

Extreme climatic events can affect human populations, culturally, and physiologically. The Little Ice Age (LIA) on the North American Great Plains caused temperature changes and droughts, influencing the availability of resources (1550-1850 CE). The Arikara Native Americans of South Dakota (1600-1832 CE) exhibit several childhood stress markers, including cribra orbitalia/porotic hyperosto-

sis, short stature and linear enamel hypoplasias (LEH). One-hundred and ninety-three adult individuals, with and without LEH, were analyzed for survivorship differences. Survivorship was estimated using Kaplan-Meier estimates with log-rank tests in SPSS version 27 and was analyzed in a two-step process. First survivorship of individuals with and without LEH was compared between the sites. These results were not statistically significant. However, the associated survivorship curves indicate that, among individuals with LEH, those at Moberg, died earlier in life compared to those at the other sites. Next, survivorship differences, within each site, between individuals with and without LEH, was estimated. These results were only statistically significant for the Moberg site. The individuals with LEH, at this site, died earlier in life compared to individuals without LEH at Moberg. Temporally, this is the earliest site, and is not known to have had contact with Euro-American explorers. While Euro-American contact has been shown to influence physiological stress in other contexts, this project reinforces the notion that multiple causes must be considered when evaluating stress in past populations and the variable effects of childhood stress markers on later adult health and survivorship. Furthermore, these results demonstrate the significance in evaluating survivorship within sites, as well as comparing survivorship over time between culturally related sites. Future research will consider survivorship, during the LIA, relative to cribra orbitalia/porotic hyperostosis and in the context of multiple stress markers.

463 WHAT REALLY WAS A CASTLE?: WIDENING THE HORIZONS OF INTERDISCIPLINARY INTERPRETATION

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Swallow, Rachel (University of Liverpool; University of Chester) - Rzepiela, Michał (Department of Medieval Latin of the Institute of Polish Language, the Polish Academy of Sciences, Kraków)

Format: Regular session

Past scholars have discussed the unresolved contemporary definition of ‘castle’, generally resorting to the ill-defined ‘private fortified residence of a lord’ for a variety of elite residences, fortified buildings and associated landscapes - including earthwork, timber and masonry fortifications, palaces, manor houses, crenellated church towers and hunting lodges.

Contemporary archaeological research across Europe, however, is now widening the research horizons of current academic disciplines, to include not only Archaeology, but also History; Medieval Literature; Linguistics; Landscape History and Archaeology; Architecture; Digital Humanities. This innovative research approach opens up new debate on what really was a castle? Through emerging research on medieval fortifications, new interpretations will be proposed for the contemporary meaning(s) of scribed words such as castrum, castellum, and domus defensibilis, all commonly translated by later international generations as simply ‘castle.’

Exploring the interplay between archaeological theory and the archaeological sciences, as well as examining the ebb and flow of various theoretical currents and analytical approaches, our session provides the opportunity to come to a better understanding of our shared human past. To revive debate and shed light on this particular problem, we welcome paper proposals of archaeological research aiming to widen the horizons of past castle interpretation in a new, multi-disciplinary and cross-period way.

ABSTRACTS:

1 THE TERMINOLOGY, DISTRIBUTION AND FORM OF FORTIFIED ELITE RESIDENCES IN MEDIEVAL IRELAND, MAN AND ATLANTIC SCOTLAND

Abstract author(s): Ó Ríagáin, Russell (Independent Scholar)

Abstract format: Oral

The presence of castles in Ireland before its incorporation into the Angevin Empire has been a matter of some debate due to the use of several Latin loanwords in Old and Middle Irish relating to enclosed settlements. This paper will apply a transdisciplinary approach, using philological, textual, toponymic, archaeological and architectural evidence together to make a contribution to this debate. The paper will open by treating the use of loanwords in Irish sources in their palaeographical, codicological, and political context. It will also explore the epistemological and ontological systems, and the general intellectual and intertextual context of these texts and their authors. This will shed important light on the motivations of the scribes using these words, seeing as no act of textual production is passive, helping to unpack and unpick their use of terminology. Rather than focus solely on twelfth-century Ireland, the paper will outline the sum evidence for castle-building in areas where Middle Irish/Gaelic was a spoken language, either as the principal language or spoken along with Old Norse, Middle Scots or Middle English, proposing several distinct forms of region-specific castle, which will then be used to explore the examples in Ireland, and how these forms may have influenced the emergence of more widespread castle use outside of core areas of the English colony in Ireland in the later medieval period. This will provide an important corrective to the standard narrative of transculturation in high and late medieval Ireland, by bringing a much wider set of potential interaction and cultural reference into the analysis, and its results will be applicable to encastellation in areas occupied by other speech communities.

2 CASTLES IN THE RURAL LANDSCAPE: A SEMANTIC PROBLEM IN EUROPEAN ARCHAEOLOGICAL RESEARCHES

Abstract author(s): Bernardi, Martina (Dipartimento di Studi Umanistici, Università degli Studi di Roma Tre)

Abstract format: Oral

The castle seems usually to indicate a building located in the rural landscape and dated back to the medieval ages. Indeed, the word *castrum* summarizes a multiplicity of meanings from the Roman period until today: a military encampment, a fortification located to control the borders the territory around (by sea and by land), a fortified village where peasants live inside, an aristocratic residence, up to the Bavarian medieval fake residence of Ludwig II, which is called castle but is not a castle.

Why Latin sources used just one or two words (*castrum* or *castellum*) to define several (and different) settlement realities? This represents a real problem, a semantic trouble in which the researchers have to take into account in their studies.

The purpose of this paper is to concentrate the attention on the different typologies of castles born in the European context, especially in Italy, where the phenomenon of *castra* can be generally described as a concentration of the rural population inside fortified high-altitude fenced sites, starting between X-XI century AD; but also in this context not all that castles are the same for the different chronology, function, and history.

3 CLASSICAL WITH A TWIST?: RE-EXAMINING THE ANGLO-NORMAN USE OF THE WORDS CASTRUM AND CASTELLUM FOR 'CASTLE' IN ENGLAND

Abstract author(s): Swallow, Rachel (University of Liverpool; University of Chester)

Abstract format: Oral

Taking a multi-disciplinary approach to research, this paper (re-)interprets the Anglo-Normans' documentary use of the words *castrum* and *castellum*, both of which are generally—and, it is argued here, over-simply—translated today as 'castle'. This fresh examination of the originally intended nuance(s) of both terms (re-)considers the language, architecture, archaeology, history—and particularly the multi-period landscapes and their monuments—of a number of English castles and their documentary mentions from the end of the eleventh century. Early conclusions point to a new interpretation, that the late-eleventh-century Anglo-Normans deliberately used either and/or both terms for 'castle' in their documents, because different meanings were in fact intended: *castellum* was communicated to signify the site of a new-build Anglo-Norman castle, and the Anglo-Norman use of *castrum*—notably a Classical Latin/Roman word originally—intentionally referred to the likely extant walls/delineation of a pre-existing Roman fort as the foundations and wider enclosed area as the basis for a new Anglo-Norman fortification.

4 JUST AROUND THE RIVERBEND. THE MEDIEVAL FORTRESSES OF THE RIVER SEGRE (11TH CENTURY)

Abstract author(s): Closa Ribera, Ariadna (Universitat Autònoma de Barcelona)

Abstract format: Oral

Traditional historiography has considered the castles situated along the river Segre, in its middle section (northeast of the Iberian Peninsula), as "husun", fortresses from Al-Andalus, built in the context of a castle building programme promoted either by the State or by the muladi family of Banū Qasī, former Christians, throughout the 9th and 10th centuries. These castles were assumed to be part of the defence system of Al-Andalus set in front of the territories of the Christian counties. Nonetheless, the concept of "frontier" has been revised as a moving and dynamic space, where the Catalan counties and the Caliphate of Cordova were able to impose their authority, although in an unstable way. So, these castles were occupied and transformed after the feudal conquest of this area by the counts of Barcelona and Urgell. In the feudal written records, they appear as "castrī" and some of them were linked to settlements and means of production, such as mills or irrigated systems, that evolved to permanent settlements. Most of them have endured until the present day.

Without setting aside the military role they played in the frontier, these fortifications developed into a network of castles with no jurisdictional gaps between them created by feudal lords. Castles served as centres of management and control of the population, which transformed the rural landscape. Through the archaeological and historical study of these buildings and their construction materials, as well as the study of their landscapes and their productive spaces, we aim to define their chronology, military function in the frontier, and their role in the colonisation process and control of the land's population after the feudal conquest.

5 KEEPING UP APPEARANCES. THE USE OF ARCHAIC ARCHITECTURAL FEATURES IN CASTLES IN THE LOW COUNTRIES (15TH AND 16TH CENTURY)

Abstract author(s): Eekelen, Bart (Utrecht University; Museum Het Markiezenhof)

Abstract format: Oral

Over the course of the fifteenth and sixteenth century, the vast majority of nobility's castles in the Low Countries was not practically defensible anymore against the increased power of artillery. Qualities of defence were often interchanged for a higher degree of comfort and a more representative appearance. Still, these rural dwellings often kept their archaic castellated appearance. Why keeping up appearances?

I will argue that the concept of a castle was inextricably bound to the concept of the past as a justification of the present. The castellated appearance was a visible and tangible reference to the descentance and legitimate rulership of the local lord. So the castle was used to legitimize rulership.

Which architectural features made these castles? For this presentation, I will focus on castles and rural houses of the high nobility in the Low Countries, roughly between 1450 and 1550. By identifying architectural modernizations, we will start recognizing the archaic elements. I will show how some castles/rural dwellings were turned into more representative, modern courts that lost their defensive qualities and at the same time kept characteristic elements of a 'castle'. I will also relate them to the 1536 definition of the 'ridderhofstede' (knight's house) issued by emperor Charles V. Thereby I will briefly consider contemporary terminology.

6 THE FORTIFIED LANDSCAPE OF EARLY MEDIEVAL CENTRAL PORTUGAL: CASTLES ON THE HORIZON?

Abstract author(s): Vilarinho, Gil (The University of Edinburgh)

Abstract format: Oral

Castles are one of the most conspicuous features of the medieval landscape. The origins of these fortifications have been the subject of ample debate and though some basic features are common across Europe, other aspects are prone to different levels of regionalisms. The administrative and military organization undertaken by Alfonso III of Asturias (r. 866-910) is often considered the first step towards the *incastellamento* that occurred across the NW Iberian peninsula in the tenth century. The territory was organized in *civitates*, military and administrative regions with a network of defensive structures spread across the landscape. Though these structures are mentioned in the literary sources with different nomenclature, such as *civitate*, *castrum*, *castello*, *penna* and others, up until recently the studies of the *incastellamento* have considered all these fortified structures as castles. But what exactly was a castle in this period? Drawing on evidence from literary sources, archaeological record, aerial surveys and LiDAR data, this study seeks to offer a perspective from central-north Portugal and discuss the architecture, topography and function of the medieval fortifications in the 10th and 11th centuries, using the frontier coastal region between the cities of Coimbra and Porto as a particular case study area. The results presented here allow to widen our horizons on early medieval fortifications and help to build a better understanding of this particular military landscape.

7 REWRITING THE HISTORY OF THE CASTLES IN THE SOUTH OF THE NORTHERN BORDER OF THE IBERIAN PENINSULA. RIOJAN FORT-TOWERS

Abstract author(s): Espinosa, Isaac (Universidad Autónoma de Madrid & Instituto de Estudios Riojanos)

Abstract format: Oral

For hundreds of years, the wars between the Christians and Muslims first, and between the Christian kingdoms later, encouraged the construction of defensive architectures in the valley of the Ebro River and its tributaries, which was known as the Northern Frontier. For this reason, the current Autonomous Community of La Rioja has the highest number of castles per inhabitant in the country, although, unfortunately, many of them are in a dilapidated state.

The objective of this proposal is to analyze the different types of castles that exist in the area, their current state and the restorations that have been carried out in some of them, paying special attention to the Fort-Towers, the most common type in La Rioja, but very unusual in the rest of the country. The actions that have been carried out and the new materials and techniques with which they have been counted will be discussed in order to better understand the history of these castles, demystify and analyse the idiosyncrasy of their construction, value the efforts to rehabilitate them and disseminate to the entire population the new story they offer us. The Fort-Towers represented a change in the mental paradigm of people from the 14th to the 16th centuries, going from a purely defensive mentality for defensive architectures, to a structure that seeks social, economic, administrative, judicial, military, and legislative control and mental of the people that the Lord controls. As there are no monographic studies in this regard in La Rioja and the existing general studies being outdated, an in-depth study and a new point of view in regional castellological studies is necessary.

8 TRYPOL ON DNEEPER: CASTLE, PALACE, FORTIFIED PALACE, FORTRESS, TOWN: AND WHAT IT REALLY WAS

Abstract author(s): Videiko, Mariia - Videiko, Mykhailo (Kyiv Borys Grinchenko University)

Abstract format: Oral

Known from as a city from XIth century, from 1501 this place with area around became property of Fedor Detkovich. For more than a hundred years, Trypol and the castle in it became the residence of family. In 1551 this family became so rich that they built a real masonry castle in the city. The foundations of the castle, erected on the top of the hill, were built of stone, and the upper part of the brick. The castle had towers, one of them was crowned with a dome. Masonry fortification was complemented by an earthen rampart and ditch. The castle was armed with artillery. In documents and narratives described Trepol-Trypilla were used different terms for this fortified place: castle, fortress, palace, fortified palace, town. Using of terms depended on situation and time. In the 16th and 17th centuries, the words "castle" and "town" was used in military relations. In the descriptions travelers used terms a "palace" or a "fortified palace". The ruins were later perceived as a "fortress". Archaeological research allows us to combine these quite diverse concepts that actually apply to the same object. Together with the documents, they demonstrate the variety of functions he performed depending on the circumstances and context. Archaeological finds from the central part of the city testify to the wealth of its inhabitants. Trypol-Trypilla was combination of two structures: the medieval castle and the medieval city, both with one owner.

The defense functions were of special importance due to their location in the border areas. This is also an interesting example of the existence of a typical European model of a castle so far in the East.

9 RELATIONSHIP BETWEEN CASTLE AND TOWN IN MEDIEVAL POLAND IN THE LIGHT OF LINGUISTIC EXAMINATION

Abstract author(s): Rzepiela, Michal (The Institute of Polish Language, The Polish Academy of Sciences)

Abstract format: Oral

A generally adopted perspective when examining the relationship between castle and town in the Middle Ages, is that of the modern expert, who tends to provide a balanced and interdisciplinary interpretation, as far as possible. However, it is only through linguistic examination, and particularly one based on the electronic corpus of Medieval Latin data available, that truly reveals the viewpoint of contemporaries writing about the relationship between their castles and towns. This paper examines such testimonies, focusing on the utterances concerning interaction between town and castle as they are encountered in the corpus of Polish Medieval Latin eFontes. A special attention is given to the distribution and collocational force of the term castrum as well as its more or less synonymic equivalents, such as castellum, arx and fortalitium. The research points to fresh interpretations for the definitions and delimitations of the functions of both castle and town in the medieval social sphere.

10 “CASTLES” OF THE CENTRAL SICILY

Abstract author(s): Patti, Daniela (University of Enna)

Abstract format: Oral

The landscape of central Sicily is marked by the presence of several fortified elite residences, but also hilltop fortifications defined generically “castles”.

However, in the publications, with some exceptions, have not been investigated by means of the multidisciplinary research including Landscape History and Archaeology, Archaeology of Architecture, Linguistics, Anthropology.

The same word “castle” is used continuously to indicate generically the castles in Medieval age without regards to the different architectonic features, functions, roles, and social cultural processes in the Byzantine, Norman Age and later.

The castles in this area often built or powered in the Norman age, today often appears in establishing assumed by the Swabian age; even if, they are involved in restorations, or damaged, or almost completely destroyed, still characterize the rural and urban landscape of the Island, often in closely topographic proximity with fortified cathedral churches.

The research documents a variety of “castles”, despite the several issues in common, often linked to the rock settlement, characterized by use long time with different functions suggesting that it is a cross-cultural phenomenon.

Only interdisciplinary approach will be allowed to have a detailed and complete analysis of the different phases of the fortified architecture in the central Sicily, also in order to understand the dynamic settlement over the long term and the connected cross-cultural behavioral processes.

A interdisciplinary research, including by means of digital humanities (also important for exploitation and dissemination) it's necessary for examining large-scale archeological and anthropological questions regarding the “castlescapes” and the unexplored issues about cross-cultural developments of central Sicily within the Mediterranean area.

11 „...IN CIVITATEM, QUE BUDEC...” WHAT REALLY WAS THE EARLY MEDIEVAL STRONGHOLD OF BUDEČ?

Abstract author(s): Tomanova, Pavla (Institute of Archaeology of the Czech Academy of Sciences, Prague)

Abstract format: Oral

The Budeč Stronghold is an abandoned early medieval fortified settlement located in central Bohemia (Czech Republic). It represents a site that would be traditionally labelled as an early medieval “castle”. In the contemporary written evidence of 10th century, Budeč was described with the term „civitas”. Past intensive and systematic archaeological research put together an image of the Budeč Stronghold as one of the most significant regional centres in Bohemia, and an administrative support point of the royal Přemyslid family in the times of emergence of the early medieval Czech state. In this traditional approach, the administrative and political aspects were usually accented.

The proposed paper however aims to offer a different approach to the investigation of the Budeč Stronghold. Recently, a study has been conducted that has focused primarily on the testimony of church architecture and on spatial analyses of the site. The study has combined methods of traditional and digital archaeology, together with history of architecture. Results of the study have put together an image of Budeč as not only an administrative-political centre, but primarily as a missionary centre and support point for Christianisation of the early medieval Přemyslid Bohemia. Moreover, some finds and features at Budeč indicate the everyday reality of the Christianisation process, including cultural syncretism and even violence. To sum up, the proposed paper turns the perspective from a general image of early medieval “castle” to the more specific image of Budeč as a significant (not only) political, but also (and especially) ecclesiastical centre of early medieval Bohemia.

12 CONCEALED DRAWBRIDGE IN THE FORBIDDEN CASTLE OF VIRTUSU. SNEAKING AROUND THE LACKING LICENCE TO CRENELLATE?

Abstract author(s): Kadakas, Villu (Tallinn University)

Abstract format: Oral

The fieldwork of 2018 in the ruins of the gatehouse of Virtsu castle (Estonia) revealed a puzzling built element. It appeared that in its final building stage its drawbridge was not located in front of the gatehouse, above the moat, but inside the gatehouse, above a trap pit. This very rare solution among the castles of Europe could be ignored as a random caprice of the owner. However, the written history offers events, which enable to interpret it as a calculated choice. According to written sources, during the Feud of Saare-Lääne (1532–1536), the owner of the castle was on the losing side. Eventually, the winning landlord returned him the land estate with the castle site, but only after it had been demolished, ‘razed to the ground’, and a ban was imposed to build it up again.

There was no legal act to regulate the licence to fortify in medieval Livonia, but the respective chapters of Sachsenspiegel were probably known. The expression ‘razed to the ground’ was obviously an exaggeration as the ruin still stands 1½ storeys high. Combining the material and written evidence, it can be assumed, that Virtsu castle was only stripped of its obvious defensive elements. However, the owner did not overtly cross the ban, but probably tried to compensate the effect by circumventing it in a formal way, by concealing one of the defensive capacities inside the building.

Deception and concealment play an important part in warfare. In case of castles, there has been a lot of discussion of apparently defensive elements with limited or even decorative capacities. This rare case offers an opportunity to discuss the possibilities to identify and interpret the evidence about the opposite – concealment of functional defensive capacities, not so much to deceive the attacking army but rather to fool the landlord.

13 SEARCHING FOR THE DUTCH CASTLE LANDSCAPE

Abstract author(s): Jong-Lambregts, Nancy (Tilburg University; municipal archaeologist gemeente Alkmaar) - van den Oever, Ferry (Geophysicist Saricon BV)

Abstract format: Oral

Castles are part of an extensive infrastructure consisting of outer wards, artisanal buildings, defensive structures, roads, ports and farmsteads: The Castle Landscape. In England it is a common research practice to involve the landscape during castle research, but in the Netherlands the focus used to be on the main castle and not its landscape.

To understand the castles position a holistic, interdisciplinary approach should be used using historical sources, archaeology, remote sensing and using a combination of different geophysical techniques. In the Netherlands this is a new innovative way of doing castle research and is now part of a PhD study.

The research area is the province of North-Holland (Netherlands) and is an important part of the 13th century county ship of Holland. During that era a lot of castles were built as part of a defensive ring of fortresses to suppress the West-Frisians.

The presented case is the spin-off a PhD research and includes a 13th century castle, the Middelburg (Alkmaar), the smallest fortress within the defensive structure. This archaeological cold case from 1942 is reinvestigated using multiple geophysical techniques, renewed extensive historical-archaeological research (including WW2-aerial photography) on a larger scale and the interdisciplinary interpretation of the data. Results showed that the castle was at least three times bigger and had a different function. It wasn't just a fortress, it was a medieval distribution center, complete with harbor and other functions and not just a military stronghold.

This PhD researches other similar 13th castles in this area using the same interdisciplinary large scale approach to prove that the meaning of these castles needs to be redefined. Applying this approach on Dutch castle research in general will lead to better understanding of the medieval castle and will make it possible to compare with similar castles in international context.

465 SOIL AND SEDIMENT MICROMORPHOLOGY IN ARCHAEOLOGY

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Devos, Yannick (Maritime Cultures Research Institute - MARI, Vrije Universiteit Brussel) - Krupski, Mateusz (Archeolodzy.org Foundation; Institute of Soil Science and Environmental Protection, Wrocław University of Environmental and Life Sciences) - Nicosia, Cristiano (Dipartimento dei beni Culturali, Università di Padova)

Format: Discussion session

Over the last decades soil and sediment micromorphology has become an important technique to study diverse archaeological problems. Whereas it initially mostly dealt with stratigraphical issues and palaeoenvironmental reconstructions, the scope has definitely widened. This resulted in a steady growth of publications (see for instance Stoops, 2014). Together with this growth we also witness a discipline that reaches its maturity with a series of important reference works.

Although these developments are encouraging, Goldberg and Aldeias (2016) rightly point out that the technique is still underutilized in archaeological research. One of the main points they make is that many archaeologists are still unfamiliar with the discipline and its potential and limitations.

The aim of our session is therefore to present some clear (recent) examples of how soil and sediment micromorphology can be utilised in the archaeological framework. We welcome contributions that highlight the potential of soil and sediment micromorphology to address specific archaeological questions from the interpretation of archaeological structures and stratigraphy to the reconstruction of past environments and the human-environment relations.

Bibliography

- Stoops, G., 2014. The fabric of soil micromorphological research in the twentieth century – a bibliometric analysis. *Geoderma*, 213, 193-202.
- Goldberg, P. & Aldeias, V., 2016. Why does (archaeological) micromorphology have such little traction in (geo)archaeology? *Archaeological and Anthropological Sciences*, 10, 269-278.

ABSTRACTS:

1 MICROMORPHOLOGICAL WAYS

Abstract author(s): Goldberg, Paul (University of Tübingen)

Abstract format: Oral

A long, long time ago my archaeology professor at the University of Michigan, Henry T. Wright, commented to me, wouldn't it be marvellous to be able to examine in cross section living floors and surfaces such as those at the Upper Palaeolithic site of Pincevent in France? I was a doctoral student in geology so didn't immediately get it. At the time, however, I was a teaching assistant for the sedimentology course and straightaway thought of using thin sections/petrography to tackle this query. I immediately asked the sedimentology professor if there were such a book on the petrography of unconsolidated sediments and soils. He suggested, Brewer's Fabric and Mineral Analysis of Soils. I checked it out of the library and tried to read it over the weekend. I got lost in the terminology and gave up, but I was convinced that there was something of value in studying archaeological deposits (sensu lato) with thin sections. That was over 50 years ago, and the study of archaeological deposits in thin section (whether by 'petrography' or by 'micromorphology') has come a long way in investigating floors and other features, as well as soils and sediments from prehistoric periods to modern ones. In this presentation I will attempt to sketch the development of micromorphology since those days and talk about its future evolution using a few examples of natural soils and sediments from prehistoric and archaeological sites.

2 THE LARGEST SWISS CITY ON A SMALL SCALE: A DECADE OF MICROMORPHOLOGICAL INVESTIGATIONS IN THE OLD TOWN OF ZURICH

Abstract author(s): Brönnimann, David (Integrative Prehistory and Archeological Science - IPAS, University of Basel) - Ohnsorg, Petra (ProSpect GmbH; Archaeological Department of the City of Zurich) - Rumo, Andrea - Wyss, Stephan (Archaeological Department of the City of Zurich)

Abstract format: Oral

Over the past 12 years, micromorphological analyses have been performed on more than 100 block samples from several archaeological excavations. This large dataset has provided unique insights into the eventful history of Zurich:

1. Reconstruction of the landscape history and lake level changes of Lake Zurich from the Iron Age to the Middle Ages on the basis of fluvial and limnic deposits.
2. Identification of Neolithic, Bronze Age and Iron Age agricultural soils and thus new insights into the use and development of the (cultural) landscape in prehistoric times.
3. Fine-stratigraphic investigations of various archaeological structures such as a Roman water channel, an early medieval glass workshop or laminated medieval house floors.
4. Reconstruction of natural and anthropogenic layer formation processes and, based on this, of different phases.

These multi-faceted results were only possible thanks to the close and continuous cooperation between the Archaeological Department of the City of Zurich and the Geoarchaeology Research Group at IPAS (Integrative Prehistory and Archaeological Science) at the University of Basel. In retrospect, it is apparent that the following points were crucial for this successful collaboration:

1. Fieldwork: the micromorphological research starts on the archaeological excavation. Geoarchaeological fieldwork helps to develop the right research questions and a stringent sampling strategy from the beginning.
2. Trust: honest evaluation of the potential and informative value of micromorphological samples creates a relationship of trust.
3. Rapid results: long time span between sampling and first micromorphological results can be a problem in some situations. Compromise and pragmatism may be required in these instances.
4. Staff continuity: especially in urban areas, where numerous but mostly small excavations take place.

3 BUILDING AND CRAFTING DURING EARLY MIDDLE AGES: MICROMORPHOLOGICAL INVESTIGATIONS INTO OVEN, KILN, AND FURNACE (FRANCE, 6TH – 11TH C.)

Abstract author(s): Borderie, Quentin (CNRS UMR 7041 ArScAn) - Bourdelle, Anthony (Univ. Orléans) - Sordoillet, Dominique (Inrap - CNRS UMR6249 Chrono-environnement Besançon)

Abstract format: Oral

In France, early medieval fire-related buildings often include excavated pits and fire chambers, such as in oven, kiln, and furnace. If the most of the building is scarcely preserved due to the erosion, the excavated parts are very regularly found in archaeological sites. The fillings of those pits are complex, both in the fire chamber as in the working area. In the latter, the stratification is made of a large number of thin or thick layers which can be hardly excavated one by one with a trowel due to their small size. They contain ashes, phytoliths, charcoals, and other very diversified fragments of artefact depending on the type of the building. In cooking oven, burnt bread or seeds and graminæ phytoliths can be encountered, while in metal working ones burnt iron oxydes and slaggs are numerous. In every type of working pits, strata can contain a large amount of burnt aggregates of silty clay, soils, and thin floor preparation layers. Into the fire chamber, layers can be produced by the building and the re-building of the hearth, the roof, or the flue which can have collapsed into the chamber. They also can contain ashy layers with charcoals. The micromorphological investigation of several buildings allows to better understand the processes of accumulation of the thin layers into the working area, where trampled floors can be built in relation with the refurbishing of the fire chamber. In few cases, the probable use of excrements as fuel can be assumed. Micromorphology gives clue data about the manufacturing of earth based building materials but also concerning the processes of heating, cleaning and rebuilding the fire chamber. Finally, it's the crafting activities, the social perception of waste, and the management of space that are highlighted.

4 UNDERSTANDING COMPLEX URBAN STRATIGRAPHIES IN NORTHWESTERN EUROPE THROUGH SOIL AND SEDIMENT MICROMORPHOLOGY

Abstract author(s): Wouters, Barbora (Vrije Universiteit Brussel)

Abstract format: Oral

Micromorphology, the microscopic study of soils and sediments, is a highly suited method for the identification of natural as well as anthropogenic processes on archaeological sites. It is ideal for the detailed study of human activities, the environmental context and site taphonomy, and especially so in the framework of complex stratigraphies, such as those typically encountered in urban contexts. Two specific phenomena, dark earths on the one hand, and microlaminated deposits on the other, that often occur in urban excavations, can arguably be understood solely through the application of high-definition methods such as micromorphology.

This contribution explores the ways in which soil and sediment micromorphology has contributed to our understanding of several urban sites in Northwestern Europe from Late Antiquity to the High Middle Ages. The focus will lie on a number of common research questions concerning the character and development of towns based on their stratigraphical information, such as their foundations and earliest development, the character of dark earths and thinly stratified floor deposits, the evolution of activities through time, as well as on questions about indoor versus open spaces such as (street) markets, and finally, marked depositional events and post-depositional alterations. This contribution will zoom in on the types and extent of archaeological interpretations that can be procured using this method. It will also mention where it is complementary with other techniques in order to attain the best possible resolution of interpretations.

Case studies from the Low Countries and Scandinavia illustrate how this approach has the potential to bypass a generalising discourse of (early) medieval towns and lead to sometimes unexpected results. Sites such as Ribe (Denmark), Ieper and Lier (Belgium) and others will be presented in order to demonstrate how the above-mentioned questions can be answered for urban contexts in a temperate climate.

5 MICROMORPHOLOGY OF PREHISTORIC DITCH INFILLS. TOWARDS THE IDENTIFICATION OF FORMATION PROCESSES AND LAND-USE AT ARCHAEOLOGICAL SITES

Abstract author(s): Krupski, Mateusz (Archeolodzy.org Foundation; Institute of Soil Science and Environmental Protection, Wrocław University of Environmental and Life Sciences)

Abstract format: Oral

Features cut into the soil, such as pits and ditches constitute a major part of the archaeological heritage worldwide. In the absence of occupational layers and free-standing structures (embankments, mounds), often poorly preserved in areas with a history of intensive, modern-era agriculture, the infills of these features represent the only stratigraphic sequences available for study. Micromorphology plays a prominent role in the identification of formation processes of this record.

Enclosures are spectacular relicts of past societies. Their significance in prehistoric cultural landscapes is a long-debated subject – they have been described as fortified settlements, places of social/ritual and economic importance (e.g. animal pens). The use of enclosures might have changed in time, nevertheless, the conducted activities are presumably recorded in the stratigraphy of archaeological features.

This issue was explored in detail during research at two double- and triple-ditched enclosures, with different layouts and initial interpretations – Mikulin (Neolithic) and Pietrowice Wielkie (early Bronze Age), both located in the loess-zone in S Poland. The macro-

scopically identified layers of the ditch infills were sampled and studied also in thin sections. This allowed to recognize certain sets of soil features (microfacies) and link them to depositional processes (natural and anthropogenic) and postdepositional alterations.

The infills consist largely of colluvium translocated from the prehistoric surface, ditch walls and ramparts and bearing diverse signs of anthropogenic enrichment. Direct human action is evidenced by intentional backfilling and single episodes of waste-dumping and fire management. In some cases, postdepositional processes have led to substantial modifications of physico-chemical properties of the layers (e.g. formation of humus horizons).

In sum, different use-patterns of individual ditches were observed. Placed in a relative and absolute chronological timeframe, this showed variations in human activity in certain zones of the enclosures.

6 GEOARCHAEOLOGICAL PERSPECTIVES ON EARLY IRON AGE BURIAL MOUND BUILDING IN SLOVENIA

Abstract author(s): Prijatelj, Agni (Durham University, Department of Archaeology; University of Ljubljana, Faculty of Arts, Department of Archaeology) - Gruškovnjak, Luka (University of Ljubljana, Faculty of Arts, Department of Archaeology) - Turniški, Rok - Grčman, Helena (University of Ljubljana, The Biotechnical Faculty, Department of Agronomy) - Črešnar, Matija (University of Ljubljana, Faculty of Arts, Department of Archaeology) - Grahek, Lucija (Research Centre of the Slovenian Academy of Sciences and Arts, Institute of Archaeology) - Brezigar, Barbara (Avgusta d.o.o.) - Drakslar, Matej (Skupina STIK)

Abstract format: Oral

As conspicuous and (occasionally) monumental grave-markers, burial mounds are one of the most recognizable elements of past and present landscapes. Soil/sediment micromorphology and select complementary analyses allow us to examine them as an independent archaeological source with the potential to reveal information on materials, distinct construction techniques and, ultimately, symbolic and ritual meanings embedded within their distinct materiality.

In this paper, we present the preliminary results of geoarchaeological research into four Early Iron Age burial mounds in Slovenia: at Poštela (NE Slovenia), Vače and Trata near Škofja Loka (Central Slovenia), and Podzemelj (SE Slovenia). Here, we address two research questions. First, were all the examined mounds man-made, or did people, in some instances at least, pragmatically take advantage of the local, undulating terrain? Second, what distinct materials, construction techniques and symbolic and ritual meanings can be recognised and/or inferred from the study of their stratigraphy?

The paper is structured into two sections. In the first, we present the four mounds on a macro-scale by comparing and contrasting their diverse geomorphological settings ranging from the Pleistocene alluvial terraces to complex slope systems. We also examine the strengths of micromorphological and other supporting analyses that may help to discern between natural and man-made mounds. In the second part of the paper, we present the preliminary results of micromorphological and bulk analyses of soils from the Poštela mound and highlight a complex interplay of anthropogenic, geogenic and pedogenic processes involved in the formation of the mound's intricate stratigraphy. To transcend the persisting misconception of burial mounds as a mere mass of dumped earth, we demonstrate their significant potential for revealing information that cannot be garnered through the study of graves, tombs or grave goods assemblages they contain.

7 PALEOCLIMATIC RECONSTRUCTIONS BASED ON THE STUDY OF BIG KURGANS OF THE BRONZE AGE IN THE STEPPE AREA OF RUSSIA

Abstract author(s): Khokhlova, Olga - Sverchkova, Alena (Institute of Physicochemical and Biological Problems of Soil Science, Russian Academy of Sciences)

Abstract format: Oral

Kurgans of considerable sizes often have several structures made one after the other. It allows studying a horizontal chronosequence of paleosols buried under those structures from a center to a periphery of a kurgan. Geoarchaeological studies were conducted in two key areas: in Krasnodar (kurgan Beisuzhek 9) and Stavropol (kurgan Essentuksky 1) regions in the steppe area of Russia.

Kurgan Essentuksky 1 was built in the second quarter of the 4th millennium BC (early stage of the Maykop culture) according to a single plan in a short time (several decades). The kurgan with a height of 5.5-6.0 m and a diameter of over 60 m consisted of four earthen structures. These structures consisted of alternating layers of dark and light materials that were taken from buried soils. This is confirmed by similar changes in the physicochemical properties of paleosols and overlying kurgan structures.

In the Beisuzhek 9 kurgan, three earthen structures of different ages were identified: the first and the second was built at the middle of the 2nd millennium BC (Novotitorovo culture), the third construction – at the beginning of the 2nd millennium BC (Catacomb culture). The height of the kurgan was more than 4 m, the diameter - about 100 m. The material of structures was a soil mass from the middle horizons of the buried soils.

As the material for the different constructions of the kurgans was mainly obtained from local soils, therefore, changes in soil properties affected the properties of the earthen material of the kurgan structures. According to the analysis of the physicochemical properties of both paleosols and the material of structures of two kurgans, an increase in climatic aridization is reconstructed during the time interval of their building. The technical and technological approaches of the kurgans' construction were also examined using a micromorphological approach.

8 A FUMIER DEPOSIT IN A VOLCANIC ISLAND: MICROSTRATIGRAPHY AND MINERALOGICAL DIAGENETIC PATHWAYS AT BELMACO CAVE

Abstract author(s): Fernández-Palacios, Enrique (Archaeological Micromorphology and Biomarkers - AMBI - Research Lab, Instituto Universitario de Bio-Orgánica Antonio González, Universidad de La Laguna; Dept. de Geografía e Historia, Facultad de Humanidades, Universidad de La Laguna; Institute for Archaeological Sciences, Eberhard Karls Universität Tübingen) - Mentzer, Susan (Institute for Archaeological Sciences, Eberhard Karls Universität Tübingen) - Mallol, Carolina (Archaeological Micromorphology and Biomarkers - AMBI - Research Lab, Instituto Universitario de Bio-Orgánica Antonio González, Universidad de La Laguna; Dept. de Geografía e Historia, Facultad de Humanidades, Universidad de La Laguna)

Abstract format: Oral

Prehistoric burnt animal stabling accumulations in caves and rock-shelters, also known as fumiers, have been widely documented across the Mediterranean region dating from the Neolithic to the Iron Age. The sedimentary features of these stabling deposits reflect regular substrate maintenance through burning. They are characterized by complex, and often thick stratified sequences comprise of alternating thin sedimentary layers of burnt and unburnt animal dung and plant fodder capped with wood ash or dung ash layers. Here, we present results from a high-resolution geoarchaeological study conducted on sediment samples from an approximately 700-to-1100-year old fumier deposit at the aboriginal site of Belmaco Cave (La Palma, Canary Islands). We combined soil micromorphology, Fourier-transform infrared spectroscopy (FTIR), micro-X-ray fluorescence (μ -XRF), and X-ray diffraction (XRD) to understand the site formation processes involved in the Belmaco Cave fumier. We documented recurrent goat/sheep habitation and maintenance activity throughout the sequence represented by interstratified layers of unburned dung, charcoal-rich sediment, and dung ash. Radiocarbon dates available for the sequence allowed us to estimate a minimum of 10 stabling episodes across a period of 200 to 400 years. Our results also revealed a suite of authigenic minerals, some of which have been previously documented in fumier (e.g. sylvite) and others that are not commonly reported (e.g. aragonite). Some of these were possibly formed through diagenetic interaction between the dung-derived components and the geogenic ones (volcanogenic rocks and clay). Our study contributes an example of a relatively recent fumier deposit in a volcanic island setting, corroborating the presence of the characteristic sedimentary features of these kinds of deposits and revealing previously undocumented fumier-related diagenetic alteration.

9 SAMPLING FOR MULTIPROXY MICROSTRATIGRAPHIC ANALYSIS IN DOMESTIC ARCHAEOLOGICAL CONTEXTS: THE CASES OF CERRO DE SAN VICENTE AND CUEVA PINTADA

Abstract author(s): Tomé, Laura (Archaeological Micromorphology and Biomarker Research Lab, Instituto Universitario de Bio-Orgánica Antonio González, Universidad de La Laguna; Dept. de Geografía e Historia, Facultad de Humanidades, Universidad de La Laguna) - Herrera-Herrera, Antonio (Archaeological Micromorphology and Biomarker Research Lab, Instituto Universitario de Bio-Orgánica Antonio González, Universidad de La Laguna) - Blanco-González, Antonio (Dept. de Prehistoria, Facultad de Geografía e Historia, Universidad de Salamanca) - Onrubia Pintado, Jorge (Dept. de Historia, Facultad de Letras, Universidad de Castilla-La Mancha) - Rodríguez Santana, Carmen Gloria - Sáenz, Iñaki (Museo y Parque Arqueológico Cueva Pintada – Cabildo de Gran Canaria) - Mallol, Carolina (Archaeological Micromorphology and Biomarker Research Lab, Instituto Universitario de Bio-Orgánica Antonio González, Universidad de La Laguna; Dept. de Geografía e Historia, Facultad de Humanidades, Universidad de La Laguna; ICAREHB - Interdisciplinary Center for Archaeology and the Evolution of Human Behaviour, Universidade do Algarve)

Abstract format: Oral

Multi-technique microcontextual approaches have been proven to be efficient in archaeological science. For example, joint archaeological soil micromorphology and lipid biomarker analysis have played an important role in reconstructing site formation processes, obtaining paleoenvironmental data and identifying relevant human behavioral patterns. However, currently there is uncertainty in the degree of microstratigraphic correlation between micromorphological and lipid biomarker data due to the sampling method, which consists in collecting an undisturbed block and loose sediment next to it. Here, we present the first tests towards more accurate sampling. We collected two adjacent undisturbed blocks: one for micromorphology and the other to be subsampled for subsequent lipid biomarker analysis. We applied this sampling method at two different archaeological domestic contexts from the sites of Cerro de San Vicente (Early Iron Age) and Cueva Pintada (Canarian Prehistory). The blocks from Cerro de San Vicente were sufficiently compact for handling and transport to the lab, where they were successfully excavated and subsampled. Those from Cueva Pintada were loose, and subsampling for lipid biomarkers was meticulously carried out in situ. In both cases, lipid biomarker subsampling from undisturbed blocks provided the opportunity to identify different visible microfacies while sampling. Future analysis of all the samples will tell if the new sampling method is likely to result in more accurate, microcontextualized data.

IN WHAT WAYS CAN ANT ACTIVITY AID IN CLARIFYING, OR DISGUISED OF ARCHAEOLOGICAL SEDIMENT FORMATION PROCESSES?

Abstract author(s): Lisá, Lenka (Institute of Geology CAS, Prague) - Mohammadi, Sahar (Department of Applied Geoinformatics and Spatial Planning, University of Life Science) - Bajer, Aleš (Department of Geology and Pedology, Faculty of Forestry and Wood Technology, Mendel University in Brno) - Rohovec, Jan (Institute of Geology CAS, Prague) - Hajnalová, Marie - Goláňová, Petra (Masaryk University, Faculty of Philosophy, Department of Archaeology and Museology, Brno) - Fránková, Markéta (Department of Paleocology, Institute of Botany, The Czech Academy of Sciences, Brno)

Abstract format: Oral

The implementation of the modern methods brought the possibility to detect human influence on the soil via chemistry or via soil microstructure. On the other hand humans are not the only triggers of the soil properties. One of the very active part of the soil microfauna is represented by ants. What is their role in mechanical and chemical impact on archaeological sediments?

The effect of possible ant bioturbation on archaeological soils was studied at the Celtic oppidum Bibracte located in the SE France. Sedimentary archives containing visible ant hills those with only imprints of former hills those with no visible traces of human or ant influence as well as those influenced by human presence were compared. The sections were compared using the multiproxy approach. The methods of ICP from Mehlich III and XRF, TOC, TN, magnetic susceptibility, grain size distribution combined with micromorphological observations were the main methodological approaches.

Ants are able to influence the soil into a depth through vertical and lateral galleries which are macroscopically difficult to recognize. They produce special type of granular microstructure. Ants pick up soil grains, bite off fragments of soil aggregates and relocate soil particles from deeper soil horizons to the top surface and the soil organic matter together with the microcharcoal is buried deeper increasing the water holding capacity of deep soil. Among the chemical properties an increase in soil organic matter (organic carbon), P, N, K, Na, Ca and Mg which may be miss leaded with the human activity has been reported. Ant-impacted soils are generally lower in clay, higher in sand and silt. Generally, ant action doesn't have strong impact on artefact relocation but may be disguising when interpreting the archaeological signal only via chemistry or archaeobotanical studies.

ROMAN MITHRAS CULT UNDER THE MICROSCOPE: NEW INSIGHTS INTO RITUALS THROUGH MICROMORPHOLOGY, HISTOTAPHONOMY AND ZOOARCHAEOLOGY

Abstract author(s): Lo Russo, Sarah (MARI, Vrije Universiteit Brussel; IPAS - Integrative Prehistory and Archaeological Science, University of Basel) - David, Brönnimann - Deschler-Erb, Sabine (IPAS - Integrative Prehistory and Archaeological Science, University of Basel) - Ebnöther, Christa (University of Bern) - Rentzel, Philippe (IPAS - Integrative Prehistory and Archaeological Science, University of Basel)

Abstract format: Oral

Roman Mithraism was a mystery cult known in the whole Roman empire. Mithras was worshiped in small communities and the cult actions to be kept (mostly) secret to outsiders.

Our contribution shows the potential soil micromorphology has to study Roman Mithraism, especially combined with zooarchaeology and histotaphonomy. This study highlights that multiple floor constructions as well as the related deposits and (micro-) artefacts of cultic indoor features are important sources of information - mostly unused in the otherwise broad and interdisciplinary research field.

Thanks to the recent micromorphological investigations in two mithraea (Biesheim F, Kempraten CH) and one cult cave (Zillis CH), it was possible to demonstrate that repeatedly spreading combustion residues and renewing the floor was an important part of the cult practices of Mithraism in the studied areas. The combination of micromorphological, histotaphonomical and zooarchaeological approaches enabled a systematic evaluation of thermal alteration and bioerosion (in particular bacterial attack) on animal bone fragments. This allows an identification and differentiation of various (cult) practices involving animals so far unknown to Roman Mithraism.

Our results suggest that a cult practice consisting of several stages was carried out on all three sites under study – a ritual so far unknown.

MICROMORPHOLOGY- AND XRF-BASED TYPOLOGY OF CERAMICS IN EARLY MEDIEVAL TOWN OF DZHANKENT (KAZAKHSTAN)

Abstract author(s): Karpova, Julia - Bronnikova, Maria (Institute of Geography Russian Academy of Sciences) - Amirgalina, Gulmira (Kyzylorda University named after Korkyt Ata, Scientific Center "Archeology and Ethnography"; Tübingen University) - Arzhantseva, Irina (Institute of Ethnology and Anthropology Russian Academy of Science; Institute for Oriental and Classical Studies, Higher School of Economics) - Haerke, Heinrich (Tübingen University; Institute for Oriental and Classical Studies, Higher School of Economics)

Abstract format: Oral

Micromorphology and XRF-analysis provide valuable information about ceramic craft technologies, sources of raw materials, their processing, and in some cases allow to suggest local production or possible importation of ceramics.

This paper presents the results of study of ceramic fragments from early medieval settlement Dzhan Kent using micromorphology and XRF-analysis. The site is located in the ancient delta of Syrdarya River in the south-west of Kazakhstan. The objectives of the study included characterization of the composition and morphology of ceramic fragments and local raw clays: bulk chemical composition, thin-section studies of key micromorphological features such as particle size distribution, colour, porosity, homogeneity/heterogeneity, features indicative of artificially added non-plastic leaning admixtures into the dough, reconstruction of technology and firing conditions.

In total, 4 samples of local raw clays and 15 samples of ceramic fragments were examined assigned to packing, dining, kitchen and household items. Based on their bulk chemical composition and morphological features a morpho-substantive typology was developed. The studied fragments were clearly subdivided by chemical and microelements composition into two groups. Group I includes high-calcium samples supposedly in-site manufactures. These samples were made from high-carbonate «fat» highly plastic clay with a low proportion of coarse silicate fractions. The dough of ceramic fragments is dense, fine-pored, colour is from grey-olive to dark-brown. Some samples contain different types of artificially introduced leaner. Sintering traces of the clay mass indicate high firing temperatures (800-1000 C). Group II incorporates all imported ceramic fragments. Samples of this group are low-calcium, made of low-carbonate meagre clay. The dough of ceramic fragments unevenly coloured, porous with the addition of different types of leaner. Low amorphization degree of clay mass, indicate low firing temperatures (500-900 C). Every group was further subdivided on the basis of firing conditions, colour, the presence of an artificially introduced leaner and its composition.

A. MICROPEPPER: AN AFFORDABLE 3D PRINTED PORTABLE PETROGRAPHIC MICROSCOPE FOR SCIENCE AND EDUCATION

Abstract author(s): Barbieri, Alvise - Aldeias, Vera (Universidade do Algarve)

Abstract format: Poster

The infrastructures required for the visualisation of micromorphological samples as well as the microscopes used for teaching and thin section analysis are costly for most institutes and companies working in archaeology, especially in developing countries. Consequently, despite the increase number of case studies and applications, micromorphology remains poorly known and/or understood outside the close network of its specialists (Goldberg and Aldeias 2018 [1]).

To make micromorphology more accessible, we have developed an affordable 3D PrintEd Portable PEtRographic Microscope (MicroPEPPER). MicroPEPPER combines the low magnification of a stereoscope with the specifications of a petrographic microscope (rotating stage and analyser) and it is designed for high education, on-site analyses, museum exhibits, and scientific workshops/meetings. With MicroPEPPER it is possible to easily connect a smartphone to a x20 objective, allowing for an on-screen magnification of ca. x8 to x32 (depending on the smartphone model). The integration of a smartphone in the design allows for three main advantages. (1) Two users can comfortably look together at the same thin section, making this microscope the perfect tool to be used for teaching, outreach, and workshops. (2) Thanks to the compact and light design (<0.4 Kg), MicroPEPPER can be easily carried to the field to perform real time analyses (Goren 2014 [2]). Lastly, (3) no licensed software is required to take photomicrographs.

The raw materials used in a MicroPEPPER (0.07 L of 1.75 mm PLA filament, x20 objective, light source, cooling fan for smartphone, polarizing filters) cost less than 30 €, making it an affordable solution for institutes and businesses working on a limited budget. In the future we plan to further develop MicroPEPPER, adding more features such as a condenser, custom objectives, and a tailored software to add labels and perform measurements on real-time images.

References

- 1 Archaeol Anthropol Sci 10, 269-278.
- 2 NYMS Newsletter 2014, 1-17.

NEW PERSPECTIVE ON NEOLITHIC RECTANGULAR FEATURES USING SOIL MICROMORPHOLOGY AND ETHNOARCHAEOLOGY. A CASE STUDY FROM STŘELICE U BRNA, CZECH REPUBLIC

Abstract author(s): Lisá, Lenka (Institute of Geology CAS, Prague) - Trampota, František (Institute of Archaeology and museology, Masaryk university) - Parma, David (Archaeological Heritage Institute Brno) - Hrnčíř, Václav (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Přichystal, Antonín (Department of Geological Sciences, Faculty of Science, Masaryk University) - Nývltová Fišáková, Miriam (Department of Physiology, Faculty of Medicine, Masaryk University) - Dreslerová, Gabriela (Masaryk Museum in Hodonín)

Abstract format: Poster

The function of sunken rectangular features in the Late Neolithic has been a subject of interest in Central Europe for many years. This type of pit is not found very often. One of the latest examples is a square Lengyel feature in the village of Střelice near Brno. A study of the microstratigraphy of fill has made it possible to qualitatively move the debate to a new level. The qualitative assessment of bone micro-fragments is also innovative for the method of micromorphology in the archaeological context. The study also includes an analysis of artefacts in the actual fill of feature 562, especially the deposits of fragments of "other lithic industry", pottery and parts of an animal's body. The discovered situation is then interpreted in the context of other known contemporary features of this type. The presence of excrement with digested bone micro-fragments in the lower layer and the absence of a floor treatment, tread horizon or bedding can be interpreted in the context of ethnoarchaeological knowledge in the broader context of

the activities of archaic societies, e.g., as the short-term use of a faecal pit for an omnivorous or carnivorous species (bear) with a subsequent ritual ending.

467 THE FUTURE IS NOW: SUSTAINABLE APPROACHES TO POST-PANDEMIC UNDERSTANDING AND MANAGEMENT OF CULTURAL HERITAGE

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Hadji, Athena (DIKEMES - College Year in Athens; Independent Social Research Foundation; Hellenic Ministry of Culture) - Serin, Ufuk (Middle East Technical University)

Format: Regular session

As we approach the end of the annus horribilis 2020, it is imperative that we widen our horizons both as human beings and scholars. Tangible cultural heritage has been hit extremely hard by the pandemic and its consequences, with most museums and sites around the globe closed intermittently or permanently. Moreover, intangible heritage, in the sense of values, ideas and principles that give coherence to the social and cultural fabric of contemporary societies, has been shaken de profundis. One thing that emerges clearly from the pandemic is that our existing cultural policies and cultural attitudes do not correspond to the 21st century and its realities.

A call for sustainability in heritage and heritage-related practices, made urgent by the visible, tangible and measurable environmental impact on heritage sites has been underway for quite some time. Along these lines, measures were taken in certain circumstances, sometimes of ambivalent purpose (i.e. MOSES project in flood-befallen Venice). Still, a common approach based on a consensus of urgency for all matters pertaining to heritage and its management is still lacking.

The lack of visitors during the pandemic was beneficial for many sites, catastrophic for most major museums and cultural institutions, indicative of a problem that cannot wait any longer to be addressed: whose heritage is it? Whom do we invite to partake in heritage as stakeholders and practitioners thereof? How do we plan to assume responsibility for an Anthropocene-induced trauma that undoubtedly will haunt humanity for years to come?

We invite contributions that relate to heritage, its understanding and management amidst and in the aftermath of the pandemic, as an endeavor to establish impact and evaluate lessons learnt.

ABSTRACTS:

1 (RE)DEFINING HERITAGE: PEOPLE-CENTERED STRATEGIES FOR A MORE SUSTAINABLE HERITAGE FUTURE

Abstract author(s): Arauz, Emily (Independent Scholar)

Abstract format: Oral

Following the global pandemic of 2020, we are facing new critical issues in 2021 that are unprecedented for our generation and within the field of heritage studies. The research presented in this paper was originally developed and conducted in the wake of the 2015 European "Migration Crisis" to address the concept of migratory heritage. At the heart of this research was the belief that heritage could be defined on a personal level. Responses to the question "What is your heritage?" asked during interviews conducted with persons on the move in 2017 in Berlin and Amsterdam, illustrated that heritage moves, changes, and adapts as people move between cities, across borders, and over seas. These insights ultimately revealed an alternative approach to the top-down heritage processes that focus on heritage defined by national governments, proffering instead a bottom-up approach that conveys transnational, personal, and conceptual forms of heritage.

Applying this methodology to a post-pandemic field of heritage studies, these results can provide a more sustainable model for defining heritage via individuals and their personal experiences. Informed by the people-centered and rights-based approaches put forth by ICCROM and ICOMOS, respectively, and based on an in-depth analysis of participatory structures, this paper proposes a collaborative approach to heritage that acknowledges the role of individuals in heritage processes. Suggesting a way forward, this paper will share plans for a crowdsourced digital archive intended as a dynamic platform of heritage makers that can transgress national borders and establish a collaborative initiative towards defining forms of personal heritage. While the post-pandemic social landscape and implications for the heritage field may not yet be fully apparent in 2021, this research endeavors to provide a sustainable framework for rethinking which, how, and by whom heritage is defined.

2 A BILATERAL ASSEMBLAGE IN HERITAGE PRACTICES AMIDST THE PANDEMIC: PROMOTION OF MUSEUMS THROUGH ARCHAEOLOGICAL HERITAGE SITE MANAGEMENT

Abstract author(s): Kalfa-Atakli, Basak (Cankaya University; Middle East Technical University)

Abstract format: Oral

Covid-19 has had repercussions on multiple fields in various and unexpected ways. Undoubtedly, heritage studies, especially museums, have had their share of damage. According to UNESCO, 90% percent of the museums had to temporarily close their doors, and 10% of them are expected to remain closed for good. Though the pandemic may be the first significant global test for humanity in the 21st century, museums transcended the 20th century, the period of wars and pandemics. Owing to their resilience, muse-

ums survived these 'shifts in paradigm' adapting themselves and their environments to contemporary realities. In the turmoil of outbreaks, some museums were assigned to inform the public on the ongoing disasters, and some were converted into hospitals. Thanks to the developments in technology and in the construction industry, it would be irrational to expect the previous transformations to happen today. In this study, a 'site-driven survival plan' is to be offered for the museums displaying archaeological materials, considering archaeological sites and the affiliated museums as 'assemblages'. Coined by Gilles Deleuze and Félix Guattari in 1980 as an ontological framework, assemblage theory claims that the components of a body are not fixed, and their role and scale in the assemblage are dynamic. As museums have functioned as hospitals in the past, given their spatial opportunities amid pandemics, today archaeological sites should come forward in heritage practices on account of their open-air and intrinsically 'social-distanced' qualities. Therefore, by advancing or introducing appropriate interpretation and presentation methods in archaeological sites to attract and inform the visitors and sponsors, the affiliated museums and sites themselves could be promoted. This paper, thus, aims to establish the role of archaeological sites to nourish museums during and after pandemics within the broader perspective of the assemblage theory to develop a management plan concerning the archaeological site-museum relationship.

3 READY-TO-WEAR: ART MUSEUMS AND COMMERCIAL COLLABORATIONS DURING THE PANDEMIC

Abstract author(s): Hadji, Athena (DIKEMES - College Year in Athens; Independent Social Research Foundation)

Abstract format: Oral

The production of commodities licenced after art is not a novelty in 2020-2021. Museums, especially art museums, have profited from issuing and/ or licensing products inspired by their collections for a long time: Mona Lisa has been printed on anything from neckties to toilet paper rolls!

However, two commercial collaborations, both appearing in 2020, are of special interest: TATE MODERN with global brand Pulland-Bear (Inditex company) and MOMA with streetwear brand Vans, both targeting a group of young customers, not the usual "museum crowd". A side case is the collaboration between banana producer and exporter, Chiquita, and major museums for their "art stickers" collection.

Through a visual exploration of styles as well as a discussion of the economics behind the aforementioned deals, the contribution explores issues of (sustainable?) survival in times of global crisis for major art organizations. Is commercialization a sellout or perhaps the only way out from now on?

4 STUDY ABROAD FROM HOME: DIGITAL TECHNOLOGY, CULTURAL HERITAGE, AND THE COLLEGE CURRICULUM

Abstract author(s): Kontes, Zoe (Kenyon College)

Abstract format: Oral

In a liberal arts college setting in the United States, the loss of study abroad opportunities for our students during the pandemic has been a devastating blow. To not be able to see, hear, feel, and experience in person the cultural heritage and archaeological history of another country is a true detriment to students' education, but also to our mutual human understanding. However, the adoption and adaptation of digital technologies allowing for virtual travel and learning about cultural heritage—for instance via on-site lectures given by faculty at study abroad programs or foreign archaeological schools, remote workshops on preservation and conservation, virtual museum tours, podcasts on endangered cultural heritage, and publicly available online panels on repatriation—has greatly expanded our curricula. These measures have also made learning across borders more accessible for everyone. Continued development of such measures is not only beneficial but essential; the survival of both archaeological sites and museums depends on education to demonstrate the importance of cultural heritage, and the necessity of the institutions that protect it.

468 BIOSOCIAL ARCHAEOLOGY: WHEN ANCIENT DNA OPENS THE DISCUSSION TO SOCIAL STRUCTURES

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Rivollat, Maïté (PACEA, University of Bordeaux; MPI-SHH, Jena) - Szécsényi-Nagy, Anna (Institute of Archaeology Research Centre for the Humanities, Eötvös Loránd Research Network, Hungarian Academy of Sciences Centre of Excellence) - Hofmann, Daniela (Department of Archaeology, History, Cultural Studies and Religion, University of Bergen) - Cassidy, Lara (Molecular Population Genetics Lab, Trinity College Dublin) - Koncz, István (Institute of Archaeological Sciences, ELTE - Eötvös Loránd University, Budapest)

Format: Regular session

Over the last years, methodological advancements in ancient DNA allowed more specific studies, either at individual levels with high-covered genomes, or at group levels with extensive sampling. The evolution of the field makes now possible finer analysis at local scales, exploring in particular kinship and site organization. This increasing power of resolution offers new elements of analysis for the investigation of social structures, such as marital rules, female/male mobility, population size, consanguinity, networks at local or regional scales... As one can always object that biological kinship or affinities do not necessarily demonstrate that the individuals either recognized this connection or bonded based on it, these elements open the discussion about the relationship between biological and social kinship. Developments of new analysis tools to explore these biological structures are actively in progress and will contribute to deeply improve our knowledge in this regard.

In parallel, the discussion now must include insights from social anthropology as well as archaeology to critically assess these new results in the light of human behavior. It also highlights our biases as modern societies and which we must question when coming to interpret social systems in ancient societies.

Many different perspectives can be brought together in this session to discuss this growing and exciting panel of ancient DNA data, with the aim to help building a critical and integrative research.

We welcome all researchers involved in genetics, archaeology, anthropology and social anthropology who want to contribute to an interdisciplinary discussion about biosocial archaeology. Contributions can address the following questions and research topics, for any time period:

- Case studies including analyses of social structures, kinship and site studies;
- New tools to explore genetic, archaeological or anthropological data in a social perspective;
- Theoretical discussions related to biosocial archaeology about interpretative choices, vocabulary, historical records and ethnoarchaeology.

ABSTRACTS:

1 MAKING KIN: THE ARCHAEOLOGY AND GENETICS OF HUMAN RELATIONSHIPS

Abstract author(s): Frieman, Catherine (Australian National University) - Bruck, Joanna (University College Dublin)

Abstract format: Oral

Kin-making is a key part of how humans structure their relations with each other, with their wider community and with the non-human world. Kin relations are constituted by shared values, shared experience, as well as by shared cultural or biological lineage. In recent years, archaeogenetics has offered us a startling level of clarity into biological relationships between individuals and groups of past people. At this crucial moment for our discipline, when archaeogenetic studies are being heralded as offering extraordinary insights into the social and political organisation of past communities, it is imperative that archaeologists retain a critical stance on the assumptions that so often underpin interpretations of archaeogenetic data.

In this paper, we argue that blood and biology are key elements of kin-making only in so far as they are contextualised and made sense of through social relations. The naturalisation of biological relatedness as the basis of kinship has its origins in the legacies of colonialism, which employed a particularly restrictive definition of kinship as a means of legitimating access to land and controlling the bodies of women and indigenous groups. Instead, taking as our inspiration the work of Indigenous scholars, we argue that the kinship produced through social relations and the kinship produced by genetic studies are not identical but can be complementary.

Archaeology, with its focus on the material remains of the past, provides particular opportunities to examine how other forms of material and technological intervention (including ritual, exchange, and the sharing of food) facilitated the creation of kinship links not solely rooted in the human body. Here, we consider the extent to which the social salience of biological relationships identified through aDNA analysis can be addressed without imposing contemporary forms of familial structure and gender ideology onto the past.

2 INVESTIGATING NEOLITHIC SOCIAL STRUCTURES ON THE BASIS OF UNPRECEDENTEDLY LARGE FAMILY TREES FROM THE SITE GURGY “LES NOISATS” IN FRANCE

Abstract author(s): Rivollat, Maïté (University of Bordeaux, PACEA; Max Planck Institute for the Science of Human History, Department of Archaeogenetics, Jena) - Ringbauer, Harald (Max Planck Institute for the Science of Human History, Department of Archaeogenetics, Leipzig) - Childebayeva, Ainash (Max Planck Institute for the Science of Human History, Department of Archaeogenetics, Jena) - Le Roy, Mélie (Queen's University Belfast, School of Natural and Built Environment, ArcPal) - Rey, Léonie (University of Bordeaux, PACEA) - Goude, Gwenaëlle (Aix Marseille University, CNRS, Ministry of Culture, LAMPEA) - Balter, Vincent (Ecole Normale Supérieure, Laboratoire de Géologie de Lyon) - Rottier, Stéphane - Deguilloux, Marie-France (University of Bordeaux, PACEA) - Haak, Wolfgang (Max Planck Institute for the Science of Human History, Department of Archaeogenetics, Jena)

Abstract format: Oral

The elucidation of kinship structure in past societies has been at the center of intra-group studies in archaeology and anthropology. However, the reconstruction of genetic relatedness in archaeological contexts has rarely been feasible. With the development of ancient DNA methods, it is now possible to obtain genome-wide data for multiple individuals from a single group, even in the presence of poor DNA preservation.

Here, we present new data from the Middle Neolithic French site of Gurgy “les Noisats”. Thanks to an extensive sampling and use of the 1240K capture array, we obtained genomic data for 94 out of 128 individuals. We reconstructed two large pedigrees, one of them spanning seven generations and connecting 62 individuals. These unprecedentedly large genealogies allowed us to look beyond the immediate genetic relatedness, and to explore the potential social structure of the group, its size, and its funerary and mobility practices.

We observed a strong patrilineal and patrilineal system with a single male lineage for the main family. The group practiced female exogamy, as no adult daughters were buried at the site (except for three females), and all mothers in the pedigree (except one) came from genetically-unrelated external groups, suggesting a wide regional network. Accompanying Strontium analyses confirm

the non-local origin of adult females, but also reveal a non-local signature of the first-generation founders of the site. Biological relatedness reveals a spatial organization of the graveyard, showing chronological and nuclear family groupings that were not visible through archaeological elements. The seven-generations pedigree also allowed us to constrain the chronological range of the site use and led us to propose a narrower occupation phase.

In the case of Gurgy, biological relatedness opens a previously inaccessible window into the Neolithic and provides numerous insights into the social structure of this group.

3 ANCESTRY CHANGE AND KINSHIP ORGANISATION IN CHALCOLITHIC-EARLY BRONZE AGE BRITAIN: A CRITICAL ASSESSMENT OF MALE-DOMINATED MODELS

Abstract author(s): Bruck, Joanna (School of Archaeology, University College Dublin) - Booth, Tom (Francis Crick Institute)

Abstract format: Oral

Large-scale archaeogenetic studies of people from prehistoric Europe tend to be broad in scope and difficult to resolve with local archaeologies. Drawing together a critical anthropological perspective with the details of the archaeological record, we show how information provided in the supplementary information of Olalde et al. (2018) can provide new insights into patterns of ancestry change and genetic relatedness in the past. Olalde et al. identified a >90% shift in ancestry of people who lived in Britain during the Chalcolithic and Early Bronze Age. We assess suggestions that such changes were the result of swift and large-scale migration of ‘war bands’ of young men from continental Europe who practised exogamous marriage with women from local groups and introduced patriarchal forms of social organisation. While ancestry change was certainly influenced by movements of communities carrying novel ancestries into Britain, this was unlikely to have been a simple, rapid process, potentially taking up to 17 generations, during which time there is evidence for the synchronous persistence of groups largely descended from the Neolithic populations. Insofar as genetic relationships can be assumed to have had social meaning, identification of genetic relatives in cemeteries suggests paternal relationships were important, but there is substantial variability in how genetic ties were referenced and little evidence for strict patrilocality or female exogamy. It is evident, too, that relations with maternal kin were significant and that kinship was not solely predicated on genetic relatedness.

4 SALVAGING ADNA KINSHIP RESEARCH: A NECESSARY WAKE UP CALL AND REORIENTATION

Abstract author(s): Ensor, Bradley (Eastern Michigan University)

Abstract format: Oral

Archaeology, bioarchaeology, and genomics are challenging the dominance of ethnological approaches to prehistoric kinship. Unlike today's kin term evolutionism, they have data that actually date to prehistory and can avoid dubious normative cultural models interpreted through discredited 19th century phylogenetics or 1960s neoevolutionism. Though largely ignored or misunderstood in Europe, archaeological kinship analysis is the most developed and can detect intra- and inter-community variation and change. Bio-archaeological kinship analysis - using strontium isotope ratios or phenotypic traits - needs more informed interpretive models. From a social anthropological perspective, European genomic research has the most impoverished understanding of kinship, is ethnocentrically obsessed with uninformative nuclear family relations, and some is alarmingly mired in pre-WWII essentialism - particularly disturbing in an era of reemerging racist nationalism. At stake is whether genomics will become relevant to kinship research or serve as a precautionary tale as it is currently headed. Because kinship is always a social construction, aDNA researchers need models for interpreting how different kinds of corporate kin groups socially distribute biological relatedness within and across settlements and cemeteries. This paper illustrates how common kinship practices manipulate intra- and intergroup/cemetery biological compositions and re-analyzes published aDNA, strontium, and archaeological data from Central European Neolithic sites (patrilocality is not supported). Far from the sensationalist image of aDNA providing a definitive source, different kinship practices produce difficult to distinguish aDNA distribution patterns - a problem compounded by inappropriate cemetery sampling. However, aDNA results can be clarified when combined with strontium isotope ratios for individual life histories. In turn, archaeological kinship analyses can further clarify those results. Ancient DNA can potentially contribute productively to prehistoric kinship research but only if scholars familiarize themselves with the subject, adopt informed interpretive models and appropriate sampling, and combine their data with other sources.

5 EARLY BRONZE AGE FAMILIES IN THE NORTHWESTERN CARPATHIAN BASIN

Abstract author(s): Szecsenyi-Nagy, Anna (Institute of Archaeogenomics, Research Centre for the Humanities, Eötvös Loránd Research Network) - Šefčáková, Alena (Department of Anthropology, Slovak National Museum-Natural History Museum) - Olalde, Inigo (Department of Genetics, University Pompeu Fabra) - Ringbauer, Harald (Department of Archaeogenetics, MPI EVA, Leipzig) - Bartík, Juraj - Farkaš, Zdeněk - Jelínek, Pavol (Slovak National Museum-Archaeological Museum) - Daňová, Kláudia (Archaeological Institute of the Slovak Academy of Sciences) - Pinhasi, Ron (Department of Evolutionary Anthropology, University of Vienna) - Reich, David (Department of Genetics, Harvard Medical School; Department of Human Evolutionary Biology, Harvard University)

Abstract format: Oral

Fine-scale ancient DNA analyses provide not only insights to prehistoric demographic processes, but also a deeper understanding of the studied communities' structure and organization. Here we present intensively sampled Early Bronze Age graveyards (assigned to the Nitra and Únětice cultures) from the north-west part of the Carpathian Basin, and compare the new genomic data with an-

thropological and archaeological records and theories. Several families are reconstructed based on the genome-wide capture data, and attempts on reconstructing distant relatedness is also presented. A comprehensive analyses of the paternal and maternal lineages, together with the autosomal DNA results enable to reformulate the current knowledge about the social system of the Nitra (Nitrianska) culture's population, that culture was disseminated in present-day southwest Slovakia and southern Moravia. The Nitra culture followed epi-Corded Ware traditions in many ways, and most of the burials showed emphasis on highlighting the gender and social status of the buried individuals. The homogeneity of the male lineages of the Nitra culture's population, the detected distinct ancestry components and the comparison of the male and female admixture signals all contribute to a new way of understanding of the social changes at the dawn of the Bronze Age in East-Central Europe.

6 HOME IS WHERE THE HEARTH IS: EXPLORING SEX BIAS IN GENETICALLY-ATTESTED MIGRATIONS IN PREHISTORIC EUROPE

Abstract author(s): Büster, Lindsey - Armit, Ian (University of York)

Abstract format: Oral

Recent large-scale ancient DNA studies have transformed our understandings of past population dynamics and, coupled with multi-proxy approaches such as stable isotope analysis, provide us with new insights into movement and mobility at a number of scales. Particularly striking has been the significance of population movement as a vector of cultural change. For many, this realisation carries uncomfortable echoes of early twentieth century archaeology, when migration, often implicitly presented as violent colonisation by a dominant group, was too easily invoked as the primary driver of change. Migration, however, as we can see from the world today, takes many forms, and can be a long-term process rather than a single event. Movement can be voluntary or forced, and is often undertaken by desperate or marginalised individuals and groups. Migratory pressures are also typically bound up with issues of age, class and gender. Indeed, recent aDNA analyses have demonstrated the major role of female mobility in Neolithic and Bronze Age societies. Traditional interpretations of prehistoric mobility have tended to focus on long-distance, male-dominated networks, but—drawing on the results of recent work on the Middle–Late Bronze Age in southern Britain—this paper argues that female mobility was crucial in instigating significant changes in language and culture. While the large-scale movement of women does not necessarily negate the presence of male-dominated power structures, it forces us to consider the lived realities of these migrants and the ways in which their own agency transformed their host communities from the inside out.

7 SOCIAL BELONGING BETWEEN GENES AND PRACTICES

Abstract author(s): Stockhammer, Philipp (LMU Munich; MPI Jena)

Abstract format: Oral

Recent breakthroughs in archaeogenetics have not only produced ground-breaking new insights into the deep past, but also raised the risk of reinforcing biological determinism in the constitution of social structure. Whereas New Kinship Studies have demonstrated the usual complexity of “feeling related”, the challenge of tracing such “feelings” in the archaeological record has instigated us to emphasize the notion of “biologically related”. However, we need to take into account that past human world views were shaped by completely different assumptions about being human in the world and that present-day world views shaped by current scientific knowledge present only one way of understanding belonging. In my paper, I will first present my approach to linking scientific and archaeological datasets in order to understand the dynamics of social belonging out of the dialogue of genes and social practices like gender, age, mobility, nutrition and status. Subsequently, I will discuss case studies from Central Europe and the Eastern Mediterranean, where bioarchaeological datasets have recently enabled fascinating new insights into past social structures. Finally, I aim to show how we might use these datasets to take a further step towards the understanding of past social belonging and consequently past world views.

8 GENETIC INSIGHTS INTO KINSHIP AND SOCIAL STRUCTURE OF AN IRON AGE COMMUNITY FROM TUVA, SOUTHERN SIBERIA

Abstract author(s): Keller, Marcel (Institute of Genomics, University of Tartu) - Caspari, Gino (Department of Archaeology, University of Sydney; Institute of Archaeological Sciences, University of Bern) - Milella, Marco (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Sadykov, Timur (Institute for the History of Material Culture, Russian Academy of Sciences, St. Petersburg) - Blochin, Jegor (Institute for the History of Material Culture, Russian Academy of Sciences, St. Petersburg) - Szidat, Sönke (Department of Chemistry and Biochemistry, University of Bern; Oeschger Centre for Climate Change Research - OCCR, University of Bern) - Saag, Lehti (Institute of Genomics, University of Tartu) - Kivisild, Toomas (Department of Human Genetics, KU Leuven; Institute of Genomics, University of Tartu) - Lössch, Sandra (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Scheib, Christiana (Institute of Genomics, University of Tartu; St John's College, University of Cambridge)

Abstract format: Oral

The site of Tunnug1 (Republic of Tuva, Southern Siberia) is prominent for its 'Scythian' kurgan (9th c. BCE) but includes also significantly younger features such as a funerary complex of the Kokel culture (2nd–5th c. CE). The skeletal material of this cemetery is remarkable for the high incidence rate of perimortem trauma due to interpersonal violence interpreted as signs of warfare, execu-

tions or rituals. However, the single and multiple graves including grave goods indicate a careful funerary treatment, and radiocarbon dating suggests usage of this cemetery over several centuries.

In this case study, we aim to explore the social structure and kinship of this population through ancient DNA analyses on more than 50 individuals. Genome-wide sequencing data revealed a heterogeneous genetic background of these individuals forming a cline with different proportions of Western hunter-gatherer and Han-like ancestry, reflecting the high mobility of this nomadic steppe culture. However, first- and second-degree relationships among the individuals support the interpretation as one or multiple social communities.

Dating to the period following the fall of the Xiongnu Empire, this site offers valuable insights into the social organization of a 'Hunno-Sarmatian' population in the face of political instability.

9 GENETIC METHODS IN ARCHAEOLOGICAL RESEARCH (FUNDED BY GOVERNMENT GRANT NO. 075-15-2019-1879)

Abstract author(s): Ochir-Goryaeva, Maria (Kalmyk Research Center Russian Academy of Sciences)

Abstract format: Oral

The introduction of genetic methods in archaeological research, has brought the studies of blood relations and social hierarchies of archeological societies to a new level. The results obtained by these methods have often the force of irrefutable facts. However, it may be quite useful to remember that cultural and historical interpretations are impossible without detailed analyses and examinations of archaeological sites, the only sources of information about prehistoric individuals and entire ethno-cultural communities.

To illustrate, the genetic analysis of twenty individuals from five burial mounds of the Scythian era located in the Sayan Highlands indicated that thirteen of them were first-degree relatives [Mary, et al., 2020]. In another work the examination of a Hunnic necropolis in Mongolia has allowed to establish that it comprised the representatives of five generations of two family clans buried in the same necropolis [Keyser et al., 2020]. Unfortunately, these and a number of similar articles discuss only the results of the work of geneticists. They shed no light on the planigraphy of the kurgan groups under study or on the analysis of their burial structures; there is no data concerning the chronology of the burials. When archaeology with its rich experience in the field is left neglected, the results of geneticists may appear less convincing or even doubtful. Archaeology has a whole arsenal of reliable methods and approaches, which can be illustrated by excellent examples in the studies of Scythian royal mounds [Aleksseev 1991; Mozolevsky, Polin 2005]. Of relevance is also the method of spatial analysis developed by the present author; this has proved to be quite effective in establishing social hierarchies, when the depth of graves and their location, with respect to each other and the space organization inside the mounds, are taken into special consideration [Ochir-Goryaeva, 2018].

10 KIN AND POWER IN EARLY CELTIC COMMUNITIES OF SOUTHWESTERN GERMANY

Abstract author(s): Gretzinger, Joscha - Mötsch, Angela (Max Planck Institute for the Science of Human History) - Schmitt, Felicitas - Francken, Michael (State Office for Cultural Heritage Baden-Wuerttemberg) - Rathmann, Hannes (Institute for Archaeological Sciences, Eberhard Karls University, Tübingen; Senckenberg Centre for Human Evolution and Palaeoenvironment, Tübingen) - Wieland, Günther (State Office for Cultural Heritage Baden-Wuerttemberg) - Harvati, Katerina (Institute for Archaeological Sciences, Eberhard Karls University, Tübingen; Senckenberg Centre for Human Evolution and Palaeoenvironment, Tübingen; DFG Centre for Advanced Studies 'Words, Bones, Genes, Tools: Tracking Linguistic, Cultural and Biological Trajectories of the Human Past', Tübingen) - Schier, Wolfram (Institute for Prehistoric Archaeology, Free University Berlin) - Krause, Dirk (State Office for Cultural Heritage Baden-Wuerttemberg; Institute of Prehistory, Early History and Medieval Archaeology, Eberhard Karls University, Tübingen) - Krause, Johannes - Schiffels, Stephan (Max Planck Institute for the Science of Human History; Max Planck Institute for Evolutionary Anthropology)

Abstract format: Oral

The European Iron Age is characterised by the two key archaeological cultures Hallstatt and La Tène in a large region to the north of the Alps, which are broadly associated with 'Celts'. While this term does not serve as an accurate description or grouping of a homogenous people or ethnic group, it highlights the close connection between a specific archaeological horizon, hypothesised linguistic affiliations (Celtic languages), and historical sources. The pan-European patterns and linguistic evidence for cultural connections during this time are complex and encompass a huge region from the Iberian Peninsula throughout Central Europe and as far east as Anatolia (during the 3rd century BC). However, during the earlier phase of the Iron Age (800 – 450 BC, Hallstatt C and D), a core region in Southwestern Germany and Eastern France, the 'West-Hallstattkreis', stands out in its archaeological importance, as highlighted by the emergence of rich and unprecedented 'princely burials', typically associated with the early Celts. Up to the present-day, the identity of these buried elites and the political power they represented remain controversial, with suggestions including chieftains, spiritual leaders, or even kings. Here, we describe and analyse the first genome-wide data from Southwest Germany dating to the late Hallstatt period. By reconstructing the genetic profiles of more than 20 individuals from this early Celtic population in Germany, we gain insights into familial relationships, transregional connections, system of rule, and the substantial population movements postdating the Iron Age in the region.

ANCIENT GENOMES REVEAL SOCIAL AND GEOGRAPHIC STRUCTURING OF THE POPULATION IN CARPATHIAN BASIN AT THE TIME OF THE AVAR EMPIRE

Abstract author(s): Gneccchi Ruscone, Guido Alberto (Department of Archaeogenetics, Max Planck Institute for Evolutionary Anthropology, Leipzig) - Szécsényi-Nagy, Anna (Institute of Archaeology, Research Centre for the Humanities, Eötvös Loránd Research Network) - Koncz, István (Institute of Archaeological Sciences, Eötvös Loránd University) - Csiky, Gergely (Institute of Archaeology, Research Centre for the Humanities, Eötvös Loránd Research Network) - Rácz, Zsófia (Institute of Archaeological Sciences, Eötvös Loránd University) - Reich, David (Department of Genetics, Harvard Medical School; Department of Human Evolutionary Biology, Cambridge; Broad Institute of Harvard and MIT; Howard Hughes Medical Institute, Harvard Medical School) - Vida, Tivadar (Institute of Archaeology, Research Centre for the Humanities, Eötvös Loránd Research Network; Institute of Archaeological Sciences, Eötvös Loránd University) - Hofmanová, Zuzana (Department of Archaeogenetics, Max Planck Institute for Evolutionary Anthropology, Leipzig; Department of Archaeology and Museology, Faculty of Arts, Masaryk University) - Jeong, Choongwon (School of Biological Sciences, Seoul National University) - Krause, Johannes (Department of Archaeogenetics, Max Planck Institute for Evolutionary Anthropology, Leipzig)

Abstract format: Oral

According to historical records, the Avars settled the Carpathian Basin in 568 CE, where they established the Avar “Qaganate” that lasted over 250 years, exerting a major influence in shaping the history Early Medieval Europe. Archaeological records of their material culture testify Inner or Central Asian origin of certain elements, but intensive contacts with the Byzantine Empire and the Eastern European steppe are also detected. Despite the rich archeological record and various historical sources, the genesis of the Avars and the social and political composition of their nomadic empire is still highly controversial and debated among scholars. The Qaganate unified people of different origin, and incorporated them to the empire on various levels. Local elites emerged that kept distinct traditions, but autochthon people probably also admixed with the newcomers.

Here we analyze new genome-wide data of 66 Early Medieval period individuals from present-day Hungary. Part of them were uncovered from Avar period elite burials located in the Danube-Tisza region, the primary power center of the Avar empire. The remaining were retrieved from different archeological contexts in the immediate surrounding areas from the IV-VIII. centuries. Our results reveal striking patterns of genetic structuring, mirroring geography and social stratification of the both culturally and genetically heterogeneous population of the Avar empire.

MATERNAL LINEAGES FROM 10-11TH CENTURY COMMONER CEMETERIES OF THE CARPATHIAN BASIN

Abstract author(s): Maár, Kitti (Department of Genetics; University of Szeged) - Varga, Gergely - Kovács, Bence (Department of Archaeogenetics; Institute of Hungarian Research) - Schütz, Oszkár (Department of Genetics; University of Szeged) - Tihanyi, Balázs (Department of Archaeogenetics; Institute of Hungarian Research; Department of Biological Anthropology; University of Szeged) - Maróti, Zoltán (Department of Pediatrics and Pediatric Health Center; University of Szeged; Department of Archaeogenetics; Institute of Hungarian Research) - Nagy, István (SeqOmics Biotechnology Ltd.; Institute of Biochemistry; Biological Research Centre, Szeged) - Raskó, István (Institute of Genetics; Biological Research Centre, Szeged) - Neparáczki, Endre (Department of Archaeogenetics; Institute of Hungarian Research; Department of Genetics; University of Szeged) - Török, Tibor (Department of Genetics; University of Szeged; Department of Archaeogenetics; Institute of Hungarian Research)

Abstract format: Oral

The conquer of the Carpathian Basin by the Hungarian tribes in the 9th century played a fundamental role in the history of Hungary, but the origin of the 10-11th century Hungarian people is still poorly understood. Based on the burial characteristics an elite social stratum can be discriminated from the major, commoner layer of the Conquer Period, but nothing is known about the genealogical relationship of these two groups. Genetic studies so far mostly concentrated on the investigation of the elite, therefore we set out to examine the genetic structure of the commoners, in order to be able to compare the two groups. We determined the complete mitochondrial genome sequences of 202 remains, most of them belonged to the plebeian people of the 10-11th century Carpathian Basin. We detected considerable (12%) Asian phylogeographic ancestry among the investigated individuals, which was considerably smaller than that in the elite (30%). Population genetic analyses revealed significant differences between the two groups, and mapped the commoners to ancient European populations, while the elite was mapped much closer to Asian groups. However shared sub-haplogroups between the elite and commoner layers indicated admixture between them, which happened in both directions, but by the 11th century this was not yet enough for genetic equalization.

THE LATE-ANTIQUITY FUNERARY COMPLEX OF ITTENHEIM (ALSACE, BAS-RHIN). RE-READING OF ARCHAEO-ANTHROPOLOGICAL DATA AT THE DAWN OF GENOMICS

Abstract author(s): Pruvost, Melanie - Mendisco, Fanny (Université de Bordeaux, CNRS, UMR5199 PACEA) - Barrand-Emam, Hélène (ANTEA-Archéologie, UMR 7044) - Chenal, Fanny (Inrap Grand Est, UMR 7044)

Abstract format: Oral

The Ittenheim site “Lotissement du stade” (Bas-Rhin, France) delivered a small Late Antiquity community burial complex consisting of 23 burials, occupied over a short period of time from AD 350 to 430-450. Confined within a small space of 225 m², the funerary ensemble seems to be organised in small groups of tombs separated by empty areas and a few loosely arranged graves. A study of

the age and sex composition of the population showed that the mortality profile was compatible with that of natural mortality, with the exception of the total absence of individuals under one year of age.

The way in which burials are laid out in small groups of graves raises questions about the type of recruitment with possible kinship ties (biological or social) between these different individuals.

In order to verify these working hypotheses, a palaeogenomic study was carried out over the entire necropolis. Thanks to the excellent preservation of DNA on this site, it was possible to obtain the complete genome of more than 90% of the individuals. These results enabled us to find family links between individuals within the different groups and partially confirm the hypotheses of family regroupings established by the archaeological studies. However, these analyses also raised new questions, particularly about the origin of these individuals.

The relatively small number of burials on the Ittenheim site and the favourable taphonomic conditions have enabled an almost exhaustive palaeogenetic analysis of this site, making it an exemplary site for comparing genomic and archaeological data at different levels : management of the burial space, geographical origin of the individuals and also the variability of funeral practices within the same family group, chronology of the site...

INVESTIGATING KINSHIP PRACTICES THROUGH DENSE SPATIAL AND TEMPORAL SAMPLING OF 5-6TH CENTURY CEMETERIES IN PANNONIA

Abstract author(s): Koncz, István (Eötvös Loránd University, Institute of Archaeological Sciences) - Vyas, Deven (Department of Ecology and Evolution, Stony Brook University) - Vida, Tivadar (Institute of Archaeological Sciences, Eötvös Loránd University; Institute of Archaeology, Research Centre for the Humanities, Eötvös Loránd Research Network) - Mende, Balázs (Institute of Archaeology, Research Centre for the Humanities, Eötvös Loránd Research Network) - Krause, Johannes (Department of Archaeogenetics, Max Planck Institute for the Science of Human History; Institute for Archaeological Sciences Archaeo- and Palaeogenetics, University of Tübingen) - Kay, Janet (Department of Art & Archaeology, Princeton University) - Pohl, Walter (Institute for Medieval Research, Austrian Academy of Sciences) - Veeramah, Krishna (Department of Ecology and Evolution, Stony Brook University) - Geary, Patrick (School of Historical Studies, Institute for Advanced Study, Princeton)

Abstract format: Oral

When used in conjunction with archaeology, paleogenomics can be a powerful tool to better understand human history, demography and with the sampling of whole sites it could also provide insights to the processes involved in the formation of communities and social structures. This is especially interesting in the Middle Danube Region as very few parts of Europe witnessed so many population shifts in a few centuries as this area during the early Medieval period. After the decline of the Roman rule in Pannonia (433 AD) came a time of political instability. From the last decades of the 4th century onward until the arrival of the Avars in the late 6th century, population groups arrived continuously into the Carpathian Basin. This political instability led to the emergence of a mosaic-like cultural landscape with small burial sites consisting of around 20-50 graves. In our study, we analyze three cemeteries near the southern shore of Lake Balaton (in present-day Hungary) from the 5th and 6th centuries. We present new findings from two nearby late-5th-century cemeteries named Hács and Balatonszemes and compare them to the mid-6th-century cemetery of Szólád published by Amorim et al. (2018). We use principal component analyses and genetic clustering analyses to characterize the genetic ancestry of the 25 individuals and estimate levels of kinship between them. We analyze these results alongside the archaeological record of the sites to investigate how differences in ancestry and kinship are reflected within the layouts of the cemeteries and whether these are similar from cemetery to cemetery. Furthermore, we also use analyses of identity-by-descent (IBD) tracts in the genomes to test whether there is population continuity between the late fifth century Hács and Balatonszemes with sixth century Szólád or whether there is evidence of the continuous immigration attested by the written sources.

INVESTIGATING KINDREDS AND WAVES OF MIGRATION IN 6-8TH CENTURY NORTHERN ITALY THROUGH ARCHAEOLOGICAL AND PALEOGENOMIC ANALYSES

Abstract author(s): Koncz, István (Institute of Archaeological Sciences, Eötvös Loránd University) - Tian, Yijie (Department of Ecology and Evolution, Stony Brook University) - Modi, Alessandra (Dipartimento di Biologia, Università degli Studi di Firenze) - Giostra, Caterina (Dipartimento di Storia, Archeologia e Storia dell'Arte, Università cattolica del Sacro Cuore) - Kay, Janet (Department of Art & Archaeology, Princeton University) - Bedini, Elena (Dipartimento di Storia, Archeologia e Storia dell'Arte, Università cattolica del Sacro Cuore) - Pohl, Walter (Institute for Medieval Research, Austrian Academy of Sciences) - Caramelli, David (Dipartimento di Biologia, Università degli Studi di Firenze) - Krause, Johannes (Department of Archaeogenetics, Max Planck Institute for the Science of Human History; Institute for Archaeological Sciences Archaeo- and Palaeogenetics, University of Tübingen) - Geary, Patrick (School of Historical Studies, Institute for Advanced Study)

Abstract format: Oral

The Langobard conquest of Italy is one of the most well documented migrations in early medieval Europe. Collegno, near Turin – founded around the turn of the 6th-7th centuries and remained in use till the 8th century – is among the most important burials sites dated to the beginning of the Langobard occupation. Previous study from the Veeramah Lab showed that the community was organized around biological kinship with multiple kindreds. The former study focused on the first phase of the site, but additional sampling from its later phases allows us a more comprehensive study of this cemetery. While a large part of the earliest period individuals had more ancestry associated with contemporary northern Europeans, the later period is marked by the arrival of a new

genetic ancestry. This pattern suggested that there might have been multiple different groups of people that arrived and settled in this region gradually within a period of time. We were able to find new kindreds and complement the old ones with individuals from the later phases. Integrating paleogenomic results with archaeological data we found correlation between burial customs and kindred groups and we identified patterns that suggest the community was indeed organised around biological relatedness, but rather than around the wider kinship, the focus was on the core families.

16

USING ADNA AS PART OF A MULTI-PROXY APPROACH TO UNDERSTAND BIOLOGICAL AND SOCIAL KINSHIP OF UNUSUAL BURIALS FROM PORTMAHOMACK (SCOTLAND)

Abstract author(s): Fischer, Claire-Elise (Department of Archaeology, University of York) - Olalde, Iñigo (Institute of Evolutionary Biology, CSIC - Universitat Pompeu Fabra; Department of Genetics, Harvard Medical School) - Reich, David (Department of Human Evolutionary 46 Biology, Harvard University; Broad Institute of MIT and Harvard; Department of Genetics, Harvard Medical School, Boston; Howard Hughes Medical Institute, Boston) - Armit, Ian - Carver, Martin (Department of Archaeology, University of York) - Spall, Cecily (FAS HERITAGE)

Abstract format: Oral

The Tarbat Discovery Programme is best known for the excavation of an 8th-century Pictish monastic settlement which lay around and beneath the Church of St Colman, Portmahomack, Easter Ross, Scotland. The results of the 20-year research programme also identified exceptional archaeology belong to a later medieval settlement of the 13th to 16th centuries. Evidence for housing and craft-working was excavated, as well as over 80 medieval burials from the nave (Carver et al. 2016)

This paper presents the results of a recent scientific enquiry into a group of highly unusual burials, including a grave that contained six skulls. It was located in the central part of the nave of the church to accommodate an oak coffin containing the body of an adult male, bearing signs of perimortem sharp force injuries. This individual was buried with a group of four skulls around his head. Some time later, the grave was reopened for the burial of a second man, an event accompanied by the rearrangement of the skull of the grave's earlier occupant. These highly unusual burials have been the subject of a multi-proxy approach, combining detailed osteological study, radiocarbon dating including Bayesian analysis, multi-isotope analysis, facial reconstruction and ancient DNA analysis. For the aDNA, nine samples were targeted from which eight yielded genome-wide data.

Results highlight that seven of the individuals are males, with only one female was identified. They also show a high diversity of mitochondrial DNA and a relatively low diversity of the Y chromosome. Kinship analysis performed on these samples indicates a family composed of five individuals, including a woman.

Altogether, the data allows different scenarios for this family to be constructed and provides insight into Scottish clan organisation.

A.

SURVIVAL OF ADNA IN TOOTH AND BONE SAMPLES FROM IRON AGE (7TH – 12TH CENTURIES AD) BURIALS IN LATVIA

Abstract author(s): Ranka, Renate - Ķīmsis, Jānis - Pokšāne, Alise (Latvian Biomedical Research and Study Centre) - Pētersone-Gordina, Elīna - Vilcāne, Antonija (Institute of Latvian History, University of Latvia) - Kazarina, Alisa (Latvian Biomedical Research and Study Centre) - Gerhards, Guntis (Institute of Latvian History, University of Latvia)

Abstract format: Poster

Ancient DNA (aDNA) studies offer new possibilities for the in-depth investigation of ancient social structures at local and regional scales. Human aDNA studies have helped to decode the human history on the Eurasian continent. Present-day Latvia is situated in north-eastern Europe with a coastline along the Baltic Sea. During the Iron Age the local inhabitants began to form distinct ethnic and regional identities. The productive farms continued to develop, and crafts and trade became increasingly important. Studies of historical genomes and metagenomes may help to explore many different perspectives, in particular kinship, female/male mobility, funeral ritual practice, and life experiences. However, endogenous DNA preservation in human skeletons is crucial for aDNA studies.

Here, we examined DNA preservation within tooth and bone samples from two Iron Age cemeteries in Latvia: Lejasbiteni (Vidzeme region), and Cunkani-Drengeri (Zemgale region) (7th – 11th centuries AD). The DNA extraction was performed according to a modified version of the protocol of Keyser-Tracqui and Ludes, 2005. Metagenomics shotgun libraries were sequenced using Illumina technologies. Raw-read sequencing data were processed using the EAGER pipeline for aDNA sequencing data. For microbial DNA analysis, read files were analyzed using MALT 0.5.0. The results indicated that human DNA proportion in bone samples was less than 10%. Higher proportion of human DNA was recovered from the petrous pyramid and well-preserved tooth samples, while mitochondrial DNA yields varied greatly between individual specimens. The presence of oral microbiome signature was detected in archaeological tooth samples indicating the preservation of ancient microbial DNA. Overall, we were able to access the endogenous aDNA in archaeological tooth and bone samples. The availability of aDNA data will be highly useful for investigation of the demographic history and social structures in Iron Age Latvia.

Acknowledgements. This study was supported by the Latvian Council of Science project No Izp-2018/1-0395.

469

COAST LAND CONTACTS – THE SOUTHERN BALTIC AREA IN EARLY HISTORICAL TIMES (1 – 600 AD)

Theme: 7. From global to local: Baltic-Pontic studies

Organisers: Voss, Hans-Ulrich (Römisch-Germanische Kommission, Frankfurt am Main) - Schuster, Jan (Instytut Archeologii Uniwersytetu Łódzkiego) - Schmidt, Jens-Peter (Landesamt für Kultur und Denkmalpflege Mecklenburg-Vorpommern, Landesarchäologie, Schwerin)

Format: Regular session

The southern Baltic Sea coastal area is a supra-regional contact zone in all epochs, including the Roman Iron Age and the Late Antiquity. A special feature is the fact that the communications lead on the one hand by sea to Scandinavia, on the other hand by land to Western and Central Europe as well as the Eastern Baltic States. They connected the drainage basins of important European rivers - the Elbe, the Oder, the Vistula up to the Düna (Daugava) and the Neva. During the period under consideration here, the archaeological characteristics of these greater areas are very different. At present, countless metal detector finds enrich our knowledge of the contacts between North and South and East and West that can be made with components of costume and jewelry, but also with personal equipment and armament. The session will discuss how research reacts to the associated challenges. What new findings does the current flood of base and precious metal finds provide on questions of the availability of the raw material non-ferrous metal, the development of style and costume provinces, as well as the analysis and interpretation of regional and supra-regional contacts? Are there any research opinions that are confirmed by new discoveries? Does this have any consequences for the description, e.g. the archaeological phenomena known as the "Elbgermanen", Wielbark and Dollkheim-Kovrovo cultures, and if so, which ones?

ABSTRACTS:

1

ARCHAEOLOGICAL DATA ON CULTURAL CONTACTS IN THE SOUTHERN BALTIC COASTAL AREA FROM A PERSPECTIVE OF RESEARCH

Abstract author(s): Voss, Hans-Ulrich (RGK - Romano-Germanic Commission DAI)

Abstract format: Oral

It is one of the generalities of our discipline that coasts and seas are natural spaces of transport. Maritime trading places, harbours and landing sites, which have recently been of particular interest to research, are just as eloquent a testimony to this as the remains of boats and ships. Due to the so-called "night jumping method", crossing the Baltic Sea in prehistoric and early historic times was possible even without a permanent view of coasts or navigational aids such as the compass. In this lecture, however, the focus is not on the north-south/south-north connection to and from Scandinavia, but on the land connection along the southern Baltic Sea coast. Based on Hans Jürgen Egger's studies on Roman "import" from the first half of the 20th century, the find spectra of Roman material goods are compared with those of non-Roman origin. Against this background, the archaeological evidence for connections between population groups of different cultural character will be discussed in a diachronic comparison, and the interpretations attached to them - the mobility of persons or groups of persons, marriage relations and networks of social groups, trade - questioned against the background of the recent increase in source material, especially metal finds.

One example are the different distribution patterns of Roman bronze vessels in that part of the study area in the northern Elbe and Oder-Vistula regions, which contrast with the occurrence of indigenous products such as pottery, and brooches.

A good example of the picture, which has changed considerably in recent years due to new finds, is the "Thuringian" influence from Central Germany, which can now be identified west of the lower river Oder in the second half of the 5th century and traces of which reach as far as the areas east of the lower river Vistula.

2

"PIZZA CONNECTION" – MOBILITY OF MEN AND OBJECTS BETWEEN SICILY AND THE NORTH

Abstract author(s): Rasbach, Gabriele (RGK - Romano-Germanic Commission DAI)

Abstract format: Oral

The period between the 1st century BC and the 1st century AD is an age of constant warfare in the western Mediterranean between Carthage and Rome, socially motivated struggles, wars for supremacy in Rome and the imperial expansion of Rome to the north. The lecture shows the mobility of people and metal objects (brooches and coins) in this period.

Starting point is the Hellenistic-Roman settlement on Monte Iato in the hinterland of Sicily, which has been studied for over 40 years by archaeologists from the University of Zurich. Unlike in Central Europe, the chronology of the Mediterranean region is based on ceramics. Metal finds, with exception of coins, have so far played a subordinate role in the chronological classification of layers and the cultural-historical classification of a site. The finds that are focused here are fibulae and military equipment. Approaching individuals on the basis of material culture is not an easy undertaking. Nevertheless, an attempt will be made to use this material to approach the actors and groups who fought for supremacy in the western Mediterranean during the centuries BC.

The metal finds include brooches that are also relevant to the north, such as 25 Jezerine brooches, 20 pieces of the Alesia type and a Gorica brooch. The fibulae spectrum of the centuries around the birth of Christ is completed by various forms of Aucissa fibulae; the youngest fibula - an Early Imperial Lunula fibula - is a unique piece.

The distribution of these fibula types and the quantity of pieces in Sicily, especially at the sites of Monte Iato and Morgantina, raises questions about the historical events, the groups involved in them and their mobility, and offers the possibility of taking a comparative look at the chronologies south and north of the Alps.

3 “BARBARIAN” FIBULAE (ALMGREN GROUP V) AND THE FORMATION OF A REGIONAL MODEL OF FEMALE DRESS IN THE SOUTHEAST BALTIC

Abstract author(s): Khomiakova, Olga (Institute of Archaeology of RAS, Moscow)

Abstract format: Oral

Fibulae as details of dress appeared in the Southeast Baltic with the beginning of the formation of archaeological cultures of the Roman period and the activation of the Amber Route in the 1st century AD. Already from the earliest phase (B1/B2) in the dress of the Sambian-Natangian culture (SNC), associated with the Aestians of Tacitus, both Provincial-Roman and “barbarian” “comb” fibulae (Kopfkammfibeln) appeared.

The report presents a possible reconstruction of the process of the formation of a regional model of female dress in the Southeast Baltic in the first centuries AD. The study is based on a review of the SNC complexes of the 1st – 2nd centuries with “barbarian” elements, the leading role among which is occupied by fibulae of group V of O. Almgren. The traditions of production of Northern-European “barbarian” fibulas influenced the emergence in the Baltic cultures of their own fibula set, jewelry style and dress in general.

The dress model of the “Middle Danube look”, fully accepted by the SNC population at the boundary of the B1/B2 phases, was quickly (during the life of one or two generations) eroded under the influence from the territories of neighboring cultures. At the end of the 1st - the beginning of the 2nd century the dress was only supplemented by individual ornaments, the origin of which was not associated with the Provincial-Roman style. Then by the middle of the 2nd century it was completely formed by a set of elements of the “barbarian” tradition. Appeared in the middle of the 2nd century on the Kaliningrad Peninsula (Sambia), in a contact zone with East Germanic cultures, the model of female dress influenced the dressing of the rest of the Baltic and more eastern territories of the western part of the forest zone of Eastern Europe.

4 ABOUT BALTIC CONNECTIONS OF THE LATE ROMAN SHIELD BOSS FROM HERPÁLY (H)

Abstract author(s): Heinrich-Tamaska, Orsolya Mariann (-) - Masek, Zsófia (-) - Becker, Matthias (-) - Voß, Hans-Ulrich (-)

Abstract format: Oral

The origin of the Late Roman shield boss with horizontal grip from Herpály has been the subject of several studies, which have largely concentrated on stylistic and formal criteria. The shield was discovered in the mid-nineteenth century in a barrow cemetery from the Sarmatian Period in Hungary. The analysis of its decoration elements reveals that the shield’s design combines both Roman and Nordic-Germanic elements and constitutes an individual stylistic departure in the 3rd century AD in the eastern Carpathian Basin.

This contribution also presents the results of recent light microscopic and XRF analyses of the artefact. The study was intended to reconstruct the shield’s manufacturing process, its workmanship and gilding of the individual mounts made of pressed sheet metal, and to identify the composition of its alloy as well as repairs and unusual technical solutions. Its results are then discussed within the context of other finds of shield bosses with sheet metal mounts of the 3rd to early 5th century AD (e.g. from Gommern, Vermand and Illerup) to obtain new information concerning the different workshop traditions related to the Herpály shield boss.

5 BOOTY OR PAY? FINDS OF ROMAN PROVINCIAL COINS ON THE SAMBIAN TERRITORY

Abstract author(s): Myzgin, Kyrilo (Faculty of Archaeology, University of Warsaw) - Konstantin, Skvorcov (Institute of Archaeology, Russian Academy of Science)

Abstract format: Oral

Finds of Roman provincial coins are one of the crucial sources to use in the studies of the Roman-Barbarian relations. Baltic zone looks rather unremarkable if we look on the distribution of the Roman provincial coin finds in Barbaricum. A “blank spot” is to be seen foremost in Sambian Peninsula, from where until the beginning of the 21st c. only one such coin was known. During the last two decades at least ten new finds of Roman provincial coins, originating from three cemeteries and four settlements, have been discovered. These pieces were minted in the Balkan provinces (Viminacium, Marcianopolis, Deultum), as well as in the cities of Asia Minor (Nicaea, Prusa, Attuda) and in Alexandria of Egypt, from the reign of Septimius Severus until Gallienus. The chronological spectrum and the mints, in general, reflect the picture known from other parts of Central and Eastern Barbaricum. Their inflow to this territory is commonly associated with the involvement of Barbarians in Gothic Wars in the Balkans and in Asia Minor during the 3rd c. But can the finds of Roman provincial coins in Sambia – the domain of Balt’s settlement, be explained by the activity of Goths in the South? On the one hand, it can’t be ruled out, taking into account the written sources saying about a coalition of tribes fighting at the Goth’s side. But on the other hand, the presence of these coins in the Baltic region could result from the redistribution of Roman imports or the bronze coins circulation already inside Barbaricum. Since this topic hasn’t been thoroughly studied, the attention draws first of all the presence of these coins in the grave inventories dated to the Younger Roman Period in West Balt’s culture circle – the custom which remains unknown in other neighbouring parts of Barbaricum.

6 ENEMY HITHERTO UNSEEN? A RADIOCARBON-BASED RECONSIDERATION OF TRILOBATE ARROWHEADS FROM PLINKAIGALIS CEMETERY, CENTRAL LITHUANIA

Abstract author(s): Kurila, Laurynas (Lithuanian Institute of History)

Abstract format: Oral

Trilobate arrowheads had been in use for centuries by peoples along the Eurasian steppe, from the Sarmatians to the Xiongnu. This was not, however, a typical arrowhead form in Europe. It was never adopted here on a massive scale, but was repeatedly brought with major nomad invasions, or through military contacts, e.g. through recruitment of archers from the East into the Roman armies. The Huns who broke into Europe ca 370 AD are considered to be responsible for the spread of trilobate arrowheads in the Migration period Barbaricum. This deadly weapon, together with reflex bow and horseback archery, raised an unprecedented horror. During the battles and through joint military campaigns the European Barbarians could become acquainted with the new arrowhead form and could have added it to own arsenal, too.

Although the current territory of Lithuania was a remote periphery of the Barbarian world, finds of trilobate arrowheads bear witness to turbulent times. About 70 arrowheads have been found in hillforts or adjacent settlements, some of them in destruction layers. These finds encouraged Lithuanian archaeologists to create a narrative about severe incursion of the Huns. However, the debates do not cover the exact circumstances of this event. Whether it happened at the time of coming of the Huns to Europe, during the Attila’s conquests or after the fall of the Hunnic Empire, remains beyond the discussion. The main obstacle faced here is the lack of precise chronology.

Extremely rare finds come from Plinkaigalis cemetery, Central Lithuania. Two trilobate arrowheads were found embedded in human bones. Both individuals had other lethal injuries, and both were interred in group burials together with other presumed victims of brutal attack. Based on new radiocarbon dates, the report will offer new insights into the narrative of the Huns’ attack and historical background of the event.

7 UNIQUE IMPORTS FROM VEGERIAI, NORTHERN LITHUANIA: RECONSIDERING MIGRATION PERIOD CULTURAL CONTACTS IN THE EASTERN BALTIC

Abstract author(s): Petrauskas, Gediminas (National Museum of Lithuania; Klaipėda University, Institute of Baltic Region History and Archaeology) - Bliujienė, Audronė (Klaipėda University, Institute of Baltic Region History and Archaeology)

Abstract format: Oral

Northern Lithuania and Southern Latvia were long portrayed as a sparsely populated region in the Early Migration Period. This image was determined by the limited attention of researchers to the peripheral areas further away from the well-known archaeological sites and their clusters, the lack of research and data on the archaeological findings of the Late Roman and Migration Periods. Recent investigations have revealed that the Mūša-Lielupe River basin, located between present-day Lithuania and Latvia, underwent significant social, economic, and cultural changes in the late 5th and 6th centuries. At the time, population growth was accompanied by the development of community contacts and exchanges of various kinds, and the emergence of new political and economic centres. However, the Vadakstis/Vadakste microregion, located west of the Mūša-Lielupe River basin, has not received wider attention of researchers due to the reasons mentioned above.

In 2020, a few Migration Period artefacts were found by metal detectorists in Vegeriai, Northern Lithuania. Archaeological research at the site revealed that a previously unknown Semigallian cemetery has been discovered. Although the cemetery was used intermittently from the 5th through the 17th century, it contained unique Early and Late Migration Period gilded and silver-inlaid imports with only a few analogies from the Eastern Baltic region. They evidence about the contacts of the Vadakstis/Vadakste microregion with the Merovingians and the Olsztyn Group, while other analogies are known from the graves of the military elite in the South-Eastern Baltic. The paper attempts to answer how did unique Migration Period objects come to the Vadakstis/Vadakste microregion, which has been considered “empty” until now. The development of cultural contacts and people holding high social status, and the emergence of centres of power and authority in the Eastern Baltic in the Migration Period are being discussed in the paper.

8 THE NORTH IN THE SOUTH, THE WEST IN THE EAST. TRACES OF SCANDINAVIANS AND OTHERS IN POMERANIA AROUND 500 AD

Abstract author(s): Schuster, Jan (University of Łódź)

Abstract format: Oral

In the beginning of the migration period a destabilization of the settlement system between Oder and Vistula rivers took place. The traditional cultural structures in this area began to vanish, slowly. On the other hand, more and more finds of Scandinavian and Merovingian origin are noticed, inter alia made of precious metal and of high symbolic value dating back to the time around 500. Some have been discovered during regular excavations, others have been found with the help of the metal detector. This finds can be connected with Scandinavian groups that penetrated the southern Baltic coast region. Some of them may even have been founders of centers of wealth and power and / or trade there, others (from the north and from the west) could had been attracted by those centers. In the northernmost part of Pomerania we even have evidence for small groups of Scandinavians that have tried to settle down and buried their deceased at very small cemeteries.

9 NORTH MEETS SOUTH - EAST MEETS WEST: "INTERSECTION" AT THE RIVER CROSSING ON THE WARNOW NEAR WERLE IN MECKLENBURG

Abstract author(s): Schmidt, Jens-Peter (Landesamt für Kultur und Denkmalpflege Mecklenburg-Vorpommern)

Abstract format: Oral

When the river Warnow were dredged and straightened at the end of the 1920s, in the surrounding of Schwaan, Rostock district, numerous archaeological finds from different ages came to light. A weapon ensemble from the Migration Period is particularly important: the so called "Schwaaner Waffenfund".

The exact location of the weapons has not been reported, but since the late 1990s there have been increasing indications that they came from a Warnow section near Werle, Rostock district. Since 1997, numerous weapons and personal equipment, but also items of jewelry and costume as well as raw materials and tools have been recovered there. Some finds reveal supra regional cultural contacts to the Eastern Baltic region, to Western and Central Europe or to Scandinavia. Also, the investigations yielded a large number of human skeletal remains, many of them with injuries.

The present material mostly points to the 1st half and the middle of the 5th century AD. This corresponds to the dendro data of a wooden structure, which was determined in the area of the greatest density of finds and build in the 5th century.

Today we can assume, that the Werle site is to be placed in the cultic context like of the Scandinavian war booty deposits, which also occur in the southern Baltic region. But the sacrifices in Werle do not only include military and personal equipment, but also people. This makes this sacrificial site extraordinary.

10 CHANGING CONTACTS: THE EVIDENCE OF NEW COIN FINDS FROM MECKLENBURG-VORPOMMERN

Abstract author(s): Wigg-Wolf, David (Römisch-Germanische Kommission des Deutschen Archäologischen Instituts - RGK)

Abstract format: Oral

The activities of metal detectorists working in cooperation with the archaeological authorities in Mecklenburg-Vorpommern has led to a dramatic increase in the numbers of Roman coins found. More than 3 times as many coins have been recorded in the last 10 years alone than had been recorded before 1997 when the last inventory of coins from Mecklenburg-Vorpommern was published. This has led to significant changes in the overall picture of the presence and distribution of Roman coins in the region, as well as to new insights into the mechanisms and processes by which the coins arrived there.

This paper will focus on three particular axes and phenomena:

- The influx of Roman silver from the Empire as reflected in an increase in the proportion of denarii in the finds, including a number of hoards;
- imitations of Roman denarii as evidence for links within the Germanic world to the south-east;
- and two recently discovered hoards of 5th-century solidi containing coins otherwise unknown in northern Germany as possible evidence for contacts with Scandinavia.

A. AUTOCHTHONOUS OR MIGRANTS? ROMAN PERIOD BURIALS WITH WEAPONS IN ROMANOV-PUGACHEV POND I.E. AN UNDERGROUND BURIAL GROUND IN NORTHERN SAMBIA

Abstract author(s): Dobrovolskaya, Maria - Mastykova, Anna (Institute of Archaeology Russian Academy of Sciences)

Abstract format: Poster

There has long been considered the question of presence and role of an allochthonous, first and foremost Germanic, element in the composition of the population that left behind artefacts belonging in the Sambian-Natangian (Dollkheim-Kovrovo) archaeological culture. This Western Balts (the Aests) culture existed in the Southeast Baltic region in Roman times. The point at issue is the migration to Sambia and Natangia of the carriers of the Wielbark and Przeworsk cultures, as well as descendants from Scandinavia. The present study focuses on the burials of the Roman period, investigated in the necropolis of the Romanov-Pugachev pond in Northern Sambia. These burials represent the cremated remains of two men, and contain weapons, such as a spear, an ax, a boss. Burial 1.2016 dates to the years 160/180 - 250/270 (phase C1 according to the chronology of the European Barbaricum), burial 2.2016 - to the years 300/320 - 400/410 (phase C3 - D1). Among the weapons there are spears of Scandinavian origin, as well as weapons spoiled (bent) during the rituals, which corresponds more to Germanic rather than Western Balt rites. Therefore, one may wonder whether the people, buried here, were migrants. The cremated remains from burial 1.2016 were subjected to isotopic analysis. The ratio of strontium isotopes (Sr 87 / Sr 86) in bone tissue samples from burial 1.2016 is about 0.713 ‰. This indicates that the last years of life seemed to pertain to landscapes with alluvial sandy deposits. In general, such values are typical of several territories in the Eastern and Southern Baltic states, and not typical of Denmark, Finland, and Central Sweden. To conclude, it is still impossible to unambiguously answer whether the owners of the "military" burials of the Romanov-Pugachev pond burial ground were autochthonous people or migrants.

470 RECENT CHRONOLOGY: CHALLENGING COPPER AGE HISTORICAL NARRATIVES IN CENTRAL, SOUTH-EASTERN AND EASTERN EUROPE

Theme: 7. From global to local: Baltic-Pontic studies

Organisers: Hofmann, Robert (Kiel University, Institute of Pre- and Protohistoric Archaeology) - Kadrow, Sławomir (Rzeszów University, Institute of Archaeology) - Lazar, Catalin (University of Bucharest, Research Institute of the University of Bucharest - ICUB) - Shatilo, Liudmyla - Terna, Stanislav⁺ (Kiel University, Institute of Pre- and Protohistoric Archaeology)

Format: Regular session

Our session will address new insights concerning the chronology of Copper Age sites between the Black Sea and Central Europe. This vast region is characterised by various environments and historical landscapes, which led to an equally large variety of lifestyles and historical archives. The diversity of archives and different research traditions resulted in different ways of constructing chronology such as stratigraphic sequences of the lower Danube tell sites, ornamental styles and local groups of the flat Cucuteni-Tripolye settlements, or grave types in the North-Western Pontic. These different research approaches have built the basis for the establishment of various historical narratives, which often became fixed points of view. For example, current spatio-temporal understanding of 'Tripolye' was built up mainly on data obtained before late 1980s and the resulting models are partly used to date. Intensive research and dating have changed the 'local' situation dramatically in recent years. But often results of this work are confronted with established 'global' narratives that reflect 'regional research traditions'.

The aim of the session is to explore how these new data increasingly allow us to rethink the typology-focused chronological constructions and historical reconstructions based on them. In particular, we would like to have a closer look on transformations that took place in this region, e.g.:

- Establishment, transformation and disintegration of flourishing agricultural settlement systems in the Lower Danube (BPK V, KGK VI)) and the North-Eastern Carpathian region (Cucuteni-Tripolye),
- Expansion of human groups into the forest-steppe zone between Prut and Dnieper,
- Cucuteni-Tripolye population agglomerations with giant settlements,
- The development of mobile pastoralism with dispersed settlement pattern in the steppe and forest steppe north-west of the Black Sea
- Intensive interlinking of the Pontic-Baltic region through communication and exchange networks (Baden, Funnel beaker, Globular Amphora, Malice).

ABSTRACTS:

1 POPULATION DYNAMICS INFERRED FROM SUMMED PROBABILITY DISTRIBUTIONS OF RADIOCARBON DATES DURING THE 5TH MILLENNIUM BCE IN THE LOWER DANUBE REGION

Abstract author(s): Popescu, Gabriel - Covătaru, Cristina - Oпри, Ionela - Frujină, Ovidiu (Research Institute of the University of Bucharest) - Sava, Tiberiu (Horia Hulubei National Institute of Physics and Nuclear Engineering - IFIN-HH) - Lazăr, Cătălin (Research Institute of the University of Bucharest)

Abstract format: Oral

Past population dynamics play a key role in integrated models of understanding socio-ecological change over time. However, despite the importance of deciphering population change through time, little analysis on this issue has been carried out for the prehistoric societies in the Lower Danube area. Here, we use summed probability distributions of radiocarbon dates (SPDs hereafter) to investigate potential regional and local variation population dynamics.

Our study adopts a formal model-testing approach to the fifth millennium BCE archaeological radiocarbon (14C) record, performing a region-wide, as well as a comparative analysis of the demographic trajectories of the area astride Danube river. We follow the current backdrop of theoretical models of population growth and controlling for taphonomic loss, sampling biases and errors, and perform global and regional significance and spatial permutation tests on the data.

Specifically, we investigate whether populations astride the Danube follow a logistic pattern of steady growth or an exponential growth followed by a major decline over time. Finally, our analysis of local-scale growth will investigate whether considerable heterogeneity or homogeneity within the region may be observed over the timespan considered here. The results will help us understand how similar or different the population trends were across the area.

Our findings will be displayed in relation to the cultural characteristics that the Middle Holocene societies in the region experienced within the timeframe under scrutiny, and some future research directions will be also suggested.

2 TAKE THE WHOLE VALLEY! NON-INVASIVE SETTLEMENT ARCHAEOLOGY OF THE CUCUTENI CIVILIZATION IN THE NEAMȚ DEPRESSION OF THE MOLDAVIAN SUBCARPATHIANS (ROMANIA)

Abstract author(s): Preoteasa, Constantin (Neamț National Museum Complex) - Mischka, Doris - Mischka, Carsten („Friedrich-Alexander” University of Erlangen-Nuremberg)

Abstract format: Oral

The Neamț River’s valley forms a natural path from the Carpathian Mountains to the Moldavian Plateau, part of the great eastern European plain. Where it leaves the mountains, it crosses the hilly Subcarpathian area, where also the Precucuteni and Cucuteni communities had to adopt to the less confined topographical settings. No longer restricted to small hillsides, they had the potential to evolve bigger sites and concentrate larger communities. But did they do this?

Since 2017, a joint project of the Neamț National Museum Complex (Romania) and the Institute of Pre- and Protohistory of the FAU Erlangen-Nuremberg (Germany) aims for the complete survey of all Precucuteni and Cucuteni settlements in the Neamț Depression. The main objective is to get reliable data on the organization of the settlements’ plans and based on the number of houses, the settlement intensity, and further data to participate on the discussions of demographic estimations regarding the temporal sequence.

Long-term extensive field walking, which finally covers the whole area, located the sites, and lead the path to the gradiometer-survey. Nearly done for all sites, these surveys revealed the settlements’ sizes, numbers of houses, fortification systems and the remains’ current state of preservation. In addition, more complex structures than expected showed off, like overlapping ditch systems even on sites assumed to be only one-phased, based on the surface finds. To sharpen our understanding of the spatial-chronological processes of all these sites, a second project phase, based on intensive surface collections just started.

3 INTERACTIONS BETWEEN TRYPILLIAN FARMERS AND SREDNIJ STOG PASTORALISTS IN THE DNEIPER AREA AT THE END OF THE 5TH MILLENNIUM BCE

Abstract author(s): Nikitin, Alexey (Grand Valley State University) - Videiko, Mykhailo (Kyiv Borys Grinchenko University)

Abstract format: Oral

Migration of Cucuteni-Trypillia farmers from the Carpathian region eastwards in the second half of the 5th millennium BCE subdivided the Trypillian complex into a number of relatively isolated local groups. At the same time, some of these groups came into contact with nomadic pastoralists of the Srednij Stog complex from the northern part of the Pontic steppe. At the Trypillian site of Kolomyitsiv Yar Tract in the middle Dnieper area, evidence of Srednij Stog influence on Trypillian kitchenware pottery (Cucuteni C) has been identified. Human remains uncovered at the site allowed to directly date the Kolomyitsiv Yar Tract settlement to the end of the 5th- beginning of the 4th millennium calBCE. The analysis of diet isotopes of the Kolomyitsiv Yar’s remains suggests that the individual’s subsistence was that of a pastoralist, such as a member of the Srednij Stog community. This finding further supports close relationships between Trypillia and Srednij Stog during the BI-II stage of Trypillia culture chronology.

4 THE CHRONOLOGY OF THE TRYPILLIA CULTURE AND THE BAYESIAN APPROACH

Abstract author(s): Chub, Nataliia (RGK - Romano-Germanic Commission DAI)

Abstract format: Oral

The relative chronology of the Cucuteni-Trypillia culture was established first of all on the basis of pottery found in the settlements, taking into account both the shapes of the vessels as well as their ornamentation. Besides the main chronological phases, the sites with similar materials, usually clustered spatially, are grouped into so called local groups.

The absolute chronology of Trypillia culture is still controversial despite the rather large amount of radiocarbon dates available. There are two main reasons for this problem. The first one is the quality of the available radiocarbon data, many of which were considered unreliable. Only in recent years the old pool has been supplemented by new sets of radiocarbon data. The second problem is the fact that there are almost no stratified settlements of the Cucuteni-Trypillia culture which would allow a more precise absolute chronology.

While the absolute chronology of the South-Eastern European tell settlements could be refined using the Bayesian approach, this method is not appropriate for the single-layered settlements of the Cucuteni-Trypillia culture. However, some research groups are working on the refinement of the chronology of particular settlements of the Trypillia culture applying the Bayesian modelling.

In my research I have followed a supra-regional chronological perspective of the Trypillia culture using Bayesian approach. The applicability of Bayesian modelling in the context of Trypillia culture was tested, based on relative chronology as prior information. In this paper I will show, that applying the Bayesian modelling on the radiocarbon dates of Trypillia culture has both possibilities and limits. But by and large this method can be used despite the absence of stratigraphic sequences in case of a well-established relative chronology.

5 TRIPOLYE MOBILITY PATTERNS, HOUSE DURATION AND DEMOGRAPHY: THE EVIDENCE OF RADIOCARBON DATING

Abstract author(s): Mueller, Johannes - Robert, Hofmann - Ohlrau, Rene (Institute of Prehistoric and Protohistoric Archaeology Kiel) - Rassmann, Knut (Römisch-Germanische-Kommission DAI Frankfurt) - Shatilo, Mila - Terna, Andreea (Institute of Prehistoric and Protohistoric Archaeology Kiel) - Rud, Vitalii (Institute of Archaeology, National Academy of Sciences of Ukraine, Kyiv) - dal Corso, Marta - Kirleis, Wiebke (Institute of Prehistoric and Protohistoric Archaeology Kiel) - Videiko, Mykhailo (Laboratory of Archaeology, Borys Grinchenko Kyiv University)

Abstract format: Oral

Numerous new 14C data from different Tripolye settlements enable settlement-related analyses on house, village and town biographies as well as information on the relationship of different Tripolye regions to each other. The results are correlated with archaeological data, primarily stratigraphy and typology of pottery, and the presence of imports. A reassessment of e.g. the data from Maidanestke, Nebelivka and Talianky informs about demographic and cultural processes.

We observe different processes. The emergence of megasites is linked to the depopulation of other regions and the concentration of population in a previously sparsely populated area. In the process, previously separate communities are obviously drawn together. There is also a strong demographic interaction between megasites, through which moments of fluid societies can be identified. In particular, the relocation of large settlements through gradual demographic exchange is discernible. Radiocarbon data can also be used to better assess different phenomena. Some mega-settlements, e.g. Nebelivka, were never settled and abandoned early, while others, e.g. Maidanetske, represent a typical populous mega-settlement. This explains some misinterpretations of the megasite phenomenon of the past.

6 TRANSFORMATION OF SETTLEMENT SYSTEMS AT DNEEPER REGION: FROM MEGA-SITES TO SMALL SITES AT TRYPILLIA CULTURE

Abstract author(s): Videiko, Mykhailo (Kyiv Borys Grinchenko University) - Burdo, Nataliia (Institute of Archaeology)

Abstract format: Oral

The “Age of mega-sites” in Trypillia Culture started at BI-II stage at the end of Vth Millenium BC. At this moment appeared first agglomerations at different areas: from Dniestr-Southern Bug interfluve to Dneeper. At Dneeper area at the beginning settling system included one large site (Trypillia, near 60-70 hectares) and few small (2-4 hectares). For the next phase (the end of BI-II stage) we know two middle size sites (16-25 hectares) – Veremya and Kolomiitsiv Yar and few small. From the beginning of BII stage up to the end of CI at this area were only small size sites. On the one hand, we see the process of disintegration of the settling system, the central element of which was mega-site and a returning to the previous system, which included only small sites. The similar transformation of the settlement system we can see at the end of the CI-befinining of CII stages in the interfluve of the Southern Bug and the Dnieper (Kosenivka local group). On the other hand, the return to the ancient system of settling on the Dnieper occurred at a time, when in other areas the “Age of mega-sites” became widespread and lasted for next several centuries. Different versions of the explanation of this phenomenon are possible. A return to the previous resettlement system could occur if the population of the mega-site could disperse over a large area. This model seems plausible given the gradual reduction in the size of central settlements. Another version involves military intervention by neighbors, which resulted in the destruction of the local mega-site as the center of power and the establishment of control by other chiefdoms. Further research in the region will allow us to study in more detail the history of the transformation of the settlement system and its probable causes.

7 CHALLENGING POTTERY BASED CHRONOLOGIES AND NARRATIVES ON TRIPOLYE SOCIETIES

Abstract author(s): Hofmann, Robert (Kiel University) - Shatilo, Mila (Kiel University; Institute of Archaeology NASU Ukraine)

Abstract format: Oral

Already since the end of the 19th century, the ceramics found in Tripolye settlements have attracted great interest among researchers both aesthetically and as a valuable source of information because of their elaborate ornamentation and shapes. Due to the almost complete absence of stratified settlements, style and techniques of ceramics became one of the most important material for chronological constructions, and even more, settlements with similar vessels started to be used for reconstruction of tribes. Thus, ceramics had ceased to be just dishes, but were equated with people. Thanks to the work of many generations of scientists, the archaeological remains in the enormous Tripolye distribution area was divided both temporarily and spatially into a number of accurate periods and ‘local groups’. Unfortunately, there has long been a lack of independent sources to test the chronological relevance of the observed typological variability of pottery and interpretations based on it. In recent years, this situation has changed considerably insofar as different projects have systematically obtained a larger number of new 14c dates that can be used to review existing constructions based on pottery like chronological and others. In our paper we would like to discuss the question to what extent we need to revise and rethink existing narratives and in how far this opens up starting points for new approaches for the interpretation.

8 FALL OF NEOLITHIC SOCIETIES IN CENTRAL EUROPE AND EXPANSION OF STEPPE POPULATIONS AT THE END OF THE 4TH MILLENNIUM BC

Abstract author(s): Kadrow, Sławomir (Institute of Archaeology, Rzeszów University)

Abstract format: Oral

The contribution presents the materials as well as the chronology and taxonomic position of the heterogeneous Wyciąże group from western Lesser Poland, dated to the 2nd part of the 4th millennium BC, which was the result of mixing of elements of Polgár and Baden cultures. The analysis of the presence of other heterogeneous cultural units in other regions of Central Europe (Mittelelbe-Saale-Gebiet and Kuyavia) showed that their existence was accompanied by crisis processes (Fall of Neolithic societies).

The source of a series of local crises in Central Europe at that time, resulting in a decreasing population and cultural hybridization (e.g. the case of Bronocic IV-V), seems to be local conflicts of a socio-cultural nature. They contributed to a serious weakening of the hitherto dominance of the FBC groups or the late Danube cultures. In the cultural sense, the element co-forming the heterogenization processes at that time was mainly the early Boleraz influence.

In periods of disappearance of hierarchical ties typical of the world system (Wallerstein), or the relationship between the center and the periphery (Braudel), horizontal network structures begin to dominate. The phenomena of poly(multi-)culturalism, heterogenization and multi-ethnicity appear (Maffesoli). Late antiquity (the spread of early Christianity) and modern times (Untergang des Abendlandes by Oswald Spengler or Le temps des tribus by Michel Maffesoli) are an excellent illustration of the flourishing of hybrid cultures in the conditions of a deepening socio-cultural crisis.

The end result of the long-term crisis of Neolithic communities was creation of space for new processes of cultural integration encompassing the entire continent in the form of the formation of the Corded Ware and Bell Beakers as well as the Yamna culture in the east.

9 UNDERSTANDING CHANGES IN HOUSE CONSTRUCTION IN THE SECOND HALF OF THE 4TH MILLENNIUM BC IN THE EASTERN CARPATHIAN AREA

Abstract author(s): Król, Dariusz (Rzeszów University) - Sîrbu, Ghenadie (Academy of Sciences of Moldova) - Rybicka, Małgorzata (Rzeszów University) - Sîrbu, Livia (National Museum of History of Moldova) - Burlacu, Vitalie (Academy of Sciences of Moldova)

Abstract format: Oral

Among most obvious research activities, the investigation into construction of dwellings, their spatial arrangements, and the nearest surroundings are particularly relevant in studies of functioning of archaeological phenomena. During the field campaigns undertaken so far at the Late Eneolithic fortified settlement in Gordinești II-Stînca goală (NCN Opus 15 project no. 2018/29/B/H3/01166), we revealed and fully documented the relics of two dwellings and their directly adjacent economic zones. These dwellings together with their surroundings may be considered as basic units of production referred to as household clusters (Grygiel 1986; por. Flannery 1976; Kent 1984; Jongmsma, Greenfield 2003). At the outset of our research some fundamental questions have been formulated: a) What type of dwellings were used by the occupants of this settlement?, b) How their interiors and the adjacent economic zones were arranged?, c) What was the function of the various parts of the household cluster units? In this talk, we would like to focus closer on these issues. Our goal is to present not only the key attributes of the dwellings, but also to show the results of the spatio-functional analysis of features and artifacts found in the context of the whole household clusters. We are convinced that detailed analysis of these units could be crucial from the perspective of general significance of this site in the broader context of the Eastern Carpathian area in the second half of the 4th Millennium BC.

471 WHAT'S SO CULTURAL ABOUT APPROPRIATION? ARCHAEOLOGICAL PERSPECTIVES ON CULTURAL ANNEXATIONS

Theme: 4. Globalisation and archaeology

Organisers: Casimiro, Tania (NOVA University of Lisbon) - Simões, Sara (Cambridge Archaeological Unit)

Format: Regular session

A simple definition of cultural appropriation can be "the adoption or co-opting, usually without acknowledgment, of cultural identity markers associated with or originating in other communities". The process is far more complex and even the definition of cultural appropriation, its archaeological use, and if it can be applicable to all the moments of the human past should be debated. The (in)appropriately appropriation of cultural characteristics, either pacifically or violently, has always been observed in the European past from pre-history to the contemporary world, and archaeology has a key role in the study, discussion and understanding of the impact of those appropriations in European societies.

The purpose of this session is to engage archaeologists from all periods and geographies in debating the social and political impact, and power relations, of the appropriation of cultural elements by European societies either by contacts within Europe or with societies across the globe, and how they help us to reconstruct the emergence of modern unequal or equal human social and political organizations. Although archaeology is the base of this session interdisciplinary approaches are welcome.

ABSTRACTS:

1 INTRODUCTION: HOW SHOULD ARCHAEOLOGY APPROACH CULTURAL APPROPRIATION?

Abstract author(s): Simões, Sara (UNIARQ - Center for Archaeology, University of Lisbon) - Casimiro, Tânia (HTC/IAP Nova University of Lisbon)

Abstract format: Oral

In the abstract of this session we used the definition of cultural appropriation as "the adoption or co-opting, usually without acknowledgment, of cultural identity markers associated with or originating in other communities". Cultural appropriation has been shaping historical relationships, mostly through structural expropriation processes and mechanisms of oppression. In this sense, the purpose of this introduction is to reflect on possible ways how archaeology studies and analyses those processes of expropriation of identity markers and cultural elements. Whether they are technical, symbolic, religious, ideological or social made by societies in contact, they always underline unbalanced power relations. We aim to theoretically think how these annexations can be studied in wider relations of power and question if these processes can be equality analysed as appropriation, either they were shaped pacifically or violently. Appropriations of cultural elements, as demonstrated by the presentations made in this session, can be recognized along human history whenever different societies interact, from pre-history to the contemporary world. What have been the social, political, economic, cultural or mental implications of the appropriation of different elements by different cultures? Should all annexations be considered appropriations? What defines appropriation in different human groups? In fact, what defines an annexation as appropriation in different historical moments? How have they been conforming the development of unequal or equal human social organizations? Bearing in mind the complexity of all these concepts, we do not hope to find consensus or a unique definition. Instead, we intend to promote discussion, reflecting on how archaeologists can engage with such discussion.

2 WHO'S APPROPRIATING WHO? „IMITATIONS" OF ROMAN COINS FROM OUTSIDE THE EMPIRE

Abstract author(s): Wigg-Wolf, David (Römisch-Germanische Kommission des Deutschen Archäologischen Instituts - RGK) - Bursche, Aleksander - Myzgin, Kyrylo (University of Warsaw, Institute of Archaeology)

Abstract format: Oral

Today coins are among the most frequently encountered material remnants of the Roman Empire, and they played a central role in the rise of classical scholarship during the Renaissance. This paper considers coins and coin-like objects that were produced by Germanic groupings outside the Roman Empire in Central Europe, and which in some way imitate or reference Roman coins. Numismatists and archaeologists have generally classified these objects as mere "imitations", but the question arises at to what extent they fit this somewhat simplistic interpretation. While they may simulate Roman coins in their appearance, they do not always do so in function. Many were worn as personal ornaments and were not primarily intended to be used as money. In particular they were often pierced or mounted so that when worn the head of the emperor on the obverse of the coin was correctly oriented and visible.

What does this inform about the social and political impact of Rome on societies outside the Empire, and the relationship between Rome and the Germanic groupings with which it was engaged in a terminal power struggle in Late Antiquity? What was it exactly that was being appropriated, and what role did this play in the power relationships and social structures of the Germanic societies of Central Europe?

3 HOW TO DRESS AND WORSHIP LOCAL GODDESSES – THE ROMAN “MAKING” OF THE SO-CALLED RHINELAND MATRONAE

Abstract author(s): Schmölzer, Astrid (Otto-Friedrich-Universität Bamberg, Institut für Archäologische Wissenschaften, Denkmalwissenschaften und Kunstgeschichte)

Abstract format: Oral

The history of Roman provinces varies like the regions and cultures they embrace. The Romans were looking to connect to a certain region, by introducing the Roman traditional culture of worship and blending it in with local religious elements. This also happened at the Roman province Germania Inferior. Here, inscriptions from goddesses called matres or matronae are known from votive altars, showing also a depiction of them in the altar niche. Research on these female deities was very long biased within epigraphy and linguistics, whereas their iconography was very often skipped over general statements.

The matronae are always shown in a triad setting. Next to their bynames of Germanic or Celtic origin their clothing is the obvious local element. We take the form of worship as a starting point to trace back their responsibility – all over the Roman Empire we can observe the custom of setting stone altars with votive inscriptions for various deities. For the matronae/matres of Germania Inferior, we can work with a basis of 440 altars and their fragments, mostly located in the southeastern part of the province.

While their clothing and bynames are the markers of their geographical responsibility, their other attributes are gathered from the visual imagery of classical mediterranean deities. The main attributes are baskets with fruits, followed by bunches of flowers or corn ears, little boxes, as well as cornucopiae and the caduceus. Therefore, we can trace the "making of a Roman provincial deity" (inside the overall discussion on how "Romanisation" works) and illustrate the different parts of their syncretistic creation.

This process went on for 3 to 4 generations after the Roman conquest and ended up with an established depiction of female deities. In addition to this, the worshipping community comprises all social groups, locals as well as officials.

4 IMITATION AND CULTURAL APPROPRIATION. CHINESE INFLUENCES IN PORTUGUESE TIN GLAZE WARE

Abstract author(s): Casimiro, Tania (HTC NOVA University of Lisbon)

Abstract format: Oral

Blue on white tin-glazed earthenware was made in Portugal since the mid 15th century. The early modern production passes by different styles, however, somewhere around mid 16th century the decoration of Portuguese tin-glazed earthenware started to resemble, if not clearly imitate, Chinese porcelain. Potters were widely aware of this attempt to imitate Chinese porcelain considering that most of these objects are mentioned in documents as porcelain. Archaeological and documentary evidence shows that this type of blue on white earthenware started as a luxury product, sometimes reaching the same prices as porcelain, and found in wealthy contexts. However, in the first half of the 17th century the production of this type of earthenware increased to a point that everyone was able to own such objects and thousands of them are found daily in archaeological contexts from around the globe. The purpose of this paper is to discuss the appropriation of forms and decorations of Chinese porcelain in the development of the Portuguese tin-glazed earthenware industry and its international importance from an social, economic, cultural, and symbolic perspective.

5 CULTURAL APPROPRIATION AND IRON METALLURGY: THE 16-17TH CENTURIES SLAG FROM PARANÁ, SOUTHERN BRAZIL

Abstract author(s): Giardino, Claudio (University of Salento - Lecce) - Bottaini, Carlo (Hercules Laboratory, University of Evora) - Chmyz, Igor (Federal University of Parana - Curitiba) - Zappatore, Tiziana (University of Salento - Lecce)

Abstract format: Oral

Archaeological excavations in Paraná recovered slag associated with iron metallurgy. The slag, coming from different contexts, could be dated between the 16th and 17th centuries. The items belong to the Jesuit reduction of Santo Inácio Mini (1610-1631) and to a village of Indios Tupiguarani (PR-FL29 site: 1476-1636 cal AD) located a few kilometers from the Spanish village of Vila Rica do Espírito Santo (1589-1632).

Iron objects were produced in the Spanish villages of Ciudad Real do Guaira (1557-1632) and Vila Rica do Espírito Santo, both in Paraná.

Iron smelting was not a technology used by the Tupiguarani before the Spanish arrival. Paraná has iron ore deposits that have been exploited since the 16th century, shortly after the arrival of the conquistadores.

The excavation carried out at the Santo Inácio reduction demonstrates that iron objects were produced by the Jesuits with the help of the Tupiguarani. The Jesuits were prohibited from smelting iron by the Spanish Crown, to which the reductions were subordinate. It was feared that the reductions would become armed nuclei. Research shows that the Jesuits made iron illegally. In Santo Inácio traces of weapons were not found, only domestic utensils.

The presence of slag at the PR-FL29 site indicates contact between the Tupiguarani, who lived there, and the Spaniards from Vila Rica. The Indios, as well as other sites that existed in the space controlled by the military of Vila Rica, were involved in the maintenance of the Spaniards in a regime of slavery.

The slags show that the natives used metallurgical methods of direct European derivation, just a few decades after the Iberian colonization. They explain the impact of the new technologies on the native society. Even the pottery produced by the Indians at the PR-FL29 site is an indicator of influences from European models.

6 SOCIAL NUANCES DURING THE OLD REGIME PERIOD ON BRAZILIAN PORTUGUESE OVERSEAS POSSESSIONS, ACCORDING TO THE PRESENCE OF PORTUGUESE FAIENCE

Abstract author(s): Bandeira, Beatriz Brito De (Universidade Federal de Sergipe)

Abstract format: Oral

From the 17th century onwards, to supply large orders from the Far East, or stimulated to produce something similar and an equal quality to the Eastern Porcelain, the Europeans unleashed a series of technological developments in the production of Faience, a ceramic that was able to compete with herself and the porcelain. In the middle of the 18th century, the English culminated in the progressive improvement of a thinner and more resistant faience, which value would vary according to the complexity of the decorative techniques applied on this ceramic. Recent discoveries of English earthenware in Brazilian slave quarters, on 19th century contexts, it has allowed to analyze the artifact as a symbol of social negotiation, in the sense of building and maintaining social differences and boundaries, especially when it found in non-manorial contexts. However, in Portuguese-Brazilian colonial contexts from 18th Century, located in Sergipe, Northeast Brazil, when it faced with a substantial amount of Portuguese earthenware among ceramics with African decorative patterns and indigenous lytic artifacts, an area of free indigenous and afro descendants, who might be free or not, it is possible to question about the use of the faience as a practice of social negotiation, with regard to the policy of social expansion for the maintenance of Portuguese possessions overseas, under the Pombaline Reforms (1750-1777). On this way, the interpretation of this social dialogue from the European faience in non-manorial contexts, these findings have been allowing to give visibility to the people that Historical Archeology has explored recently or of which very little is known.

A. APPROPRIATION AND ATTRIBUTION AS SIGNS OF CULTURAL IGNORANCE?

Abstract author(s): Adlung-Schönheit, Lilian (Hamburg University)

Abstract format: Poster

The proposed poster shall present visual and textual narratives of appropriation and rejection in Imperial Rome. Depictions and descriptions of India and Indians in Imperial Roman Art serve as illustrative examples of an interplay between ignorance, appropriation and attributing. Not only is a whole subcontinent with varying political and cultural systems reduced in the single term "India", it is also presented as a subordinate trading partner, not much distinguished to controlled provinces. While a cultural appropriation is attributed to northern Indians by Alexander biographers through the myth of Dionysus in India and the recalled Indian appropriation of western vegetation cults, visual attribution is made by Roman artist who take on attributes and characteristics from depictions of Ethiopians for Indians. Hereby, they reveal underlying subjective parallelization.

The posters aim is to evoke questions and self-reflections on roots of west-east-stereotypes, European desire to simplify and marginalize non-Europeans and western perception of trading relationships.

472 EAA COMMUNITY CLIMATE CHANGE AND HERITAGE' (CCH) ROUNDTABLE

Theme: 2. Pandemics and climate change: responses to global challenges

Organisers: Biehl, Peter F (University at Buffalo, SUNY) - Dalen, Elin (Directorate of Cultural Heritage) - Martens Vandrup, Vibeke (Norwegian Institute for Cultural Heritage Research - NIKU)

Format: Round table

Archaeology and cultural heritage are central to both human understanding and management of crises such as pandemics or climate change. Interdisciplinary research on responses of previous societies to similar crises can help us to develop resilience, mitigation and adaptation strategies to tackle these global big challenges at the beginning of 21st century.

This fifth roundtable organized by the EAA Community Climate Change and Heritage (CCH) builds on the success of the previous ones and hopes to focus further on: (1) Internationalization, (2) Prioritization, (3) Strategies, and (4) Policies.

We will also invite representatives of key archaeology associations such as the AAA (Elizabeth Chilton), AIA (Ben Thomas), SAA (Anne Jensen) and WAC (Koji Mizoguchi) as well as specialists in climate change and heritage research as a sounding board for the CCH activities as well as opinion leaders in methods and practice of climate change and heritage research. In addition, the roundtable session will provide an update on the work done in and by the community since the previous meeting and discuss next steps for the Community to grow and extend its network and activities in a COVID-19 environment.

473 CROSS-CHANNEL CONNECTIONS: COMPLEMENTARY NEW PERSPECTIVES ON LATER MEDIEVAL ARCHAEOLOGY IN FRANCE, BELGIUM, NETHERLANDS, AND THE BRITISH ISLES

Theme: 4. Globalisation and archaeology

Organisers: Lorans, Elisabeth (University of Tours) - Lewis, Carena (University of Lincoln) - Guillot, Bénédicte (Institut national de recherches archéologiques préventives - Inrap; University of Caen-Normandie) - McClain, Aleksandra (University of York) - Tys, Dries (Vrije Universiteit Brussel)

Format: Regular session

This session aims to bring together archaeologists working in France, Belgium, Netherlands, and the British Isles to share late medieval discoveries and ideas exploring the character and development of areas connected by the narrowest stretch of water between the British Isles and north-western Europe. Throughout the later medieval period, the territories either side of the Channel were closely connected politically, culturally and economically, but too often their archaeologies remain separated by national and natural divides. This session aims to share new projects, discoveries, methodologies and data from both sides of the Channel so that interpretations, ideas, narratives and even future research directions will be better through being informed by their nearest cross-Channel neighbours. Its overarching aim is to move from discovery and datasets to new narratives.

We welcome papers on recent archaeological excavation, fieldwork, analysis or other research focussing on any part of the first half of the second millennium AD (c. AD 1000-1500) (recognising that the chronological range of some papers may need to begin or end outside this core period). We will be particularly interested in papers which explore key themes of (a) environment and sustainability; (b) identity and belief; (c) health and the life-course (d) mobility and change; (e) power and place (f) production, trade and consumption; but will welcome papers on any aspect of later medieval archaeology which can be shown to have resonance both sides of the Channel and the North Sea.

This session is organized jointly by members of the Society for Medieval Archaeology (SMA), the French Society for Medieval, Modern and Contemporary Archaeology (SAMMC), and MERC.

- 1** **CROSS-CHANNEL MEDIEVAL ARCHAEOLOGIES PAST AND FUTURE – RETROSPECT AND PROSPECT**
Abstract author(s): Lorans, Elisabeth (Université de Tours) - Lewis, Carezza (University of Lincoln) - Tys, Dries (Vrije Universiteit Brussel) - McClain, Aleksandra (University of York) - Guillot, Bénédicte (Inrap/University of Caen-Normandie)
Abstract format: Oral
- This paper introduces this session by contextualising its aims in bringing together archaeologists and archaeologies working in France, Belgium, the Netherlands and the British Isles on the period between AD 1000 and 1500. Throughout this period, these areas were intimately connected politically, culturally and economically but in today's era their archaeologies have been too often separated by language, administrative boundaries, professional practice and intellectual habit. One of the most important aspects of the annual EAA general meeting is the way in which it brings together archaeologists working on different material in different places, and this is particularly valuable when closer collaboration across borders would be beneficial to the advancement of knowledge and understanding. The inspiration for this session originated in an EAA meeting through MERC which brought together the Société d'Archéologie Médiévale, Moderne et Contemporaine based in France and the Society for Medieval Archaeology based in the British Isles and Ireland. We hope the session will be the precursor to a large conference on cross-channel later medieval archaeologies, jointly hosted by the two societies, which will drive a step-change in collaborative archaeological practice. Accordingly, this paper will firstly review some of the projects and discoveries associated with these societies which have to date advanced knowledge, across borders, of themes vital to understanding our shared later medieval histories, such as environment, sustainability, identity, belief, health, the life-course, mobility, change, power, place, production, trade and consumption. It will finish by considering how much further this understanding might be advanced through greater cross-channel collaboration and sharing of knowledge, ideas, methods and data, and how this might help us write new narratives of the past in the future.
- 2** **NEW APPROACHES TO AN ENVIRONMENTAL HISTORY OF THE NORMAN MARITIME INVASION IN 1066**
Abstract author(s): Tyson, Rebecca (University of Bristol)
Abstract format: Oral
- To date the extensive scholarship of the Norman Conquest has focussed on the activities of the Normans once they landed in England, often passing over the Channel crossing as a necessary means to progress the narrative on to the Battle of Hastings.
- This paper outlines how the application of methodologies from environmental history, as part of an interdisciplinary suite of evidence and techniques, can contribute a new perspective to studies of the Norman invasion and start to redress the balance in scholarship to acknowledge the significance of the maritime operation and Channel crossing.
- By considering a range of environmental factors influencing the Norman invasion fleet, such as the resources required for construction and the potential impacts of tides and weather, it is possible to illuminate the decision-making process in the early months of 1066 and provide an environmental context within which the textual narratives of the Norman invasion can be properly situated and explored. By placing these narratives within the wider context of eleventh-century shipbuilding and seamanship traditions, as identified through archaeological investigation and reconstruction, diverse textual and material evidence can be brought to bear on questions of the practicalities of a cross-Channel invasion in the autumn of 1066.
- 3** **IMPROVING CONNECTIVITY – A FRESH LOOK ON MEN-MADE NAVIGABLE CANALS ON BOTH SIDES OF THE CHANNEL (11TH /12TH CENT. AD)**
Abstract author(s): Werther, Lukas (Tuebingen University)
Abstract format: Oral
- Navigable canals and artificial waterways were key elements of Later Medieval waterborne infrastructure on both sides of the Channel. Nevertheless, there is a lack of comparative in-depth analysis. The paper is based on a newly developed database of navigable canals in Central Europe from Antiquity to the 13th century AD, documented by means of archaeological and geoarchaeological fieldwork as well as written sources and surface remains. On a European scale, construction schemes of the 11th and 12th centuries AD are particularly well represented on both sides of the Channel and in this period England, Northern France and the Low Countries have clearly been hotspots of artificial landscape modification at transition zones of navigational networks. Embedded in a wider chronological and geographical analytical narrative, the paper will discuss the specific materiality of canals (e.g. hydrological connection, construction, usability, maintenance), the causes and specific historical circumstances of their construction (e.g. trade, military campaigns, symbols of power), their agency (especially the increasing role of civic agents) and traces of knowledge transfer in canal construction via the Channel before and after the Norman Conquest. Therefore, the paper aims to enlighten direct infrastructural proof for intentional improvements of cross-Channel connectivity as well as the agents and motivations behind it in a period of transition.

4 **THEREIN LIES THE POINT: A STUDY OF KNIFE SHEATH CHAPES FROM CROSS-CHANNEL EUROPE**

Abstract author(s): Webley, Robert (University of York)

Abstract format: Oral

Study of the protective metal terminals of knife sheaths – called 'chapes' – has recently started to expand from its initial, German, historiography, exemplified by a presentation of Danish material by Claus Feveile at the Maastricht meeting (2017). Finally, we are now in a position to appraise relevant material from England, France, the Netherlands and Belgium, not least due to the work of recording schemes for metal-detected discoveries (PAS, PAN, Medea). After decades of their misidentification in the literature, knife sheath chapes from this zone may be placed firmly into the widespread European distribution of such embellishments.

The majority of the knife sheath chapes discussed can mostly be dated to a 'long-12th-century' period, based on a combination of contextual dating and more subtle correspondences between different forms based on tool trace evidence. As such, they offer an insight into patterns of trade in a period before documentary evidence attains its full strength. These patterns will be picked out, with some types of chapes suggested to be entirely insular, while others have a cross-channel currency. Interestingly, the types circulating across the English Channel/North Sea appear to be largely distinct from those that are common further east and northeast. Furthermore, within the zone internal distinctions may be drawn out. The social dimensions of these distinctions will also be explored and compared with assessments made in the German literature regarding these objects' status.

5 **CROSS-CHANNEL INFLUENCES IN MEDIEVAL COMMEMORATIVE MONUMENTS**

Abstract author(s): McClain, Aleksandra (University of York)

Abstract format: Oral

This paper will explore the varying influence of continental and native forms, styles, craftworking, and commemorative practices on medieval grave monuments in England after the Norman Conquest. It will draw primarily on examples from the 11th and 12th centuries, when England was in the midst of negotiating the sociocultural transition brought on by the establishment of Norman political rule. By 1066, England already had a strong tradition of stone monumental commemoration, and in the new Anglo-Norman cultural milieu, patrons may well have been making judgements on the relative benefits of preserving past practices versus embracing novel forms and stylistic motifs introduced by the new regime. In some regions of the country, monumental sculpture had proliferated for over 200 years, while in others the pre-existing body of stone monuments was much more sparse. As such, patrons' choices in post-Conquest memorialisation may have been particularly contingent on localised factors, such as the availability of raw materials, the established presence of workshops and sculptors, and the differential value attached to both established and new forms and styles. Through an examination of commemorative practice, the paper will comment on how cross-channel connections, communications, and influence interacted with pre-existing modes of expression in a period of intense change.

6 **DETERMINING THE EVOLUTION OF CULINARY PRACTICES THROUGH THE STUDY OF COOKING TRACES: AN EXPERIMENTAL AND MULTIDISCIPLINARY APPROACH**

Abstract author(s): Chantran, Aurélie (Université Paris1 Panthéon-Sorbonne; UMR 7041 - ArScAn)

Abstract format: Oral

Around the 12th and 13th centuries A.D., in northern France, we note changes in the types of utensils and cooking hearths used, but also see the introduction of new animal and plant varieties along with recipes used by people in the upper echelons of society being put in writing. These novelties could be the result of changing tastes and manners of preparing food. The study of archaeological materials could help to determine the cooking methods that may have been used. The range of archaeological sites from which material cooking remains are recovered should moreover allow us to compare context and time periods to point out evolutions and regional specificities. Nevertheless, what actually remains from Medieval period cooking? Traces on ceramics are regularly seen on vessels, while residues trapped inside the ceramic pastes can sometime be analyzed, and some faunal and botanical remains can also be found. However, studies have yet to show how these remains could reveal the way food was cooked. Therefore, experiments were designed and carried out to determine the traces left behind by different cooking methods. The results obtained made it possible to create a reference collection consisting of ceramics as well as animal and plant remains. The study of cooking traces allowed to establish criteria that can be used in use-wear analysis. Preliminary results were obtained from comparing the experimental reference collection with archaeological material recovered from different contexts and regions in France. These data reveal regional and chronological specificities that can be related to cooking recipes written at the same periods. The use-wear analysis, realized on ceramics from Orville Castle (Île-de-France), was complemented by microbotanical and chemical analyses. Combining these data indicates that the analysis of traces is reliable as supports the importance of multidisciplinary approaches in this field.

This innovating methodology can be used on several type of ceramics and could be applied to other European contexts, to understand how, when and where changes in cooking practices appeared and have spread out.

- 7 **THE TRADE OF COAL BETWEEN ENGLAND AND FLANDERS DURING LATE MIDDLE AGES**
Abstract author(s): Jagou, Benjamin (INRAP; UMR 5060 IRAMAT - LMC; UMR 7041 ArScan TranSphères)
Abstract format: Oral
- For some time now, many operations of preventive archaeology have been conducted in the former territory of the County of Flanders. These have often allowed to discover traces of metalworking. Studies related to these late Middle Ages metallurgical spaces showed that these crafts used coal. Afterwards, the first researches could determine that this early use was caused by a lack of wood in this territory. This period of time is known for its extensive economic and demographic growth. Indeed, this expansion led to open the landscape widely in order to gain some new farming and housing areas. Then, this brought about a shortage of forest resources and a price inflation, which forced craftsmen to choose another fuel. At this time, the English territory took a leading role in the spread of coal in Flanders. In fact, the English people had been confronted with a lack of wood earlier, so they had to use coal soon, considering that this fuel was abundant in their territory. Moreover, this transition was facilitated by numerous exchanges between Flemish and English cities, particularly related to wool trade.
- This presentation intends to unveil a multidisciplinary research (archaeological discoveries, study of written sources and archeometric analysis) which highlights a supply network from English to Flemish cities.

- 8 **STONE MORTARS: RECENT DATA ON THE CONTINENT FOR LATE MEDIEVAL PRODUCTIONS TRADED FROM THE CHANNEL UP TO THE BALTIC**
Abstract author(s): Verbrugghe, Geert (INRAP - National Institute for Preventive Archaeological Research; Centre Michel de Boüard - CRAHAM, University of Caen)
Abstract format: Oral
- Since the 2000s, discoveries of medieval stone mortars have multiplied in France and Belgium, and some of them have benefited from studies that go beyond summary description. With a recent survey of the available data for the Lower Countries and Denmark, they provide clues for productions concerned by the long-distance trade of this utensil, such as those studies from the sixties on, and synthesized by G.C. Dunning in the King's Lynn excavations monograph (1977) of the Society of Medieval Archaeology.
- Two recent preventive excavations in Normandy provide information mainly on the production in Caen stone while expanding its repertory. They revealed also mortars in lutetian limestone whose morphological characteristics refer not only to a production documented in the Paris region, but also confirmed their trade up to the danish harbour city of Ribe, where a fragmented mortar in micaceous sandstone was also uncovered. It is today well documented in the Meuse valley, where it seems to be a Ardennes production. An Estonian excavation attest its use in the kitchen area of a cog wreck in the eastern part of the Baltic Sea.
- Another decorated mortar type uncovered in northern France has been identified as carved in Marquise stone, extracted north of Boulogne-sur-Mer. Building stones and baptismal fonts in this stone type are already attested in England, such as is also the case of blue limestone from Tournai, that probably produced also stone mortars, as illustrated mainly by findings in the Netherlands and Denmark.
- The use of the English mortars in Purbeck Marble (Dorset) is further documented by Belgian rescue excavations, and now attested also south of the french frontier, nearby Dunkirk.
- These recent mortar findings reflect a complex long-distance Late-Medieval trade, whose study requires petrographical examination of the raw material, also relevant to the uses of this culinary utensil.

- 9 **CONTINENTAL CONNECTIONS - THE CHANGING ORIGINS OF SCOTTISH WINDOW GLASS DURING THE 13TH - 16TH CENTURIES**
Abstract author(s): Spencer, Helen (Society of Antiquaries of Scotland; Heriot-Watt University)
Abstract format: Oral
- There is no evidence of window glass being manufactured from its raw materials in Scotland until the early 17th Century. Therefore, window glass was imported to Scotland to furnish the numerous Medieval Cathedrals and Abbeys that were built during the 12th - 15th centuries and latterly domestic properties built until the end of the 16th century. Sadly, unlike elsewhere across Europe, almost no window glass from these buildings survives in situ and the only glass remaining is from the archaeological record. In addition, window glass is rarely mentioned in historical documents. In order to determine the potential place of manufacture, window glass discovered during archaeological excavations from 18 late medieval sites from across Scotland was analysed scientifically by SEM-EDS, p-XRF and LA-ICP-MS. The results of the analysis were used to chemically characterize the glass composition and this was compared to previous analytical work on window glass and glass waste from across Europe during this period. The results show that during the 12-13th centuries the majority of window glass imported into Scotland was likely made in north-western France/Normandy, with a specialized deep blue glass coming from elsewhere. By the 15th century, the majority of plain clear glass was likely to have been made in Belgium/Flanders region. A small number of specialized colours of glass were still being sourced from north-western France and modern day Germany. This paper will compare the results of the analysis with known trade routes and connections between Scotland and the continent.

- 10 **RISE AND FALL: TEST PIT EXCAVATION AND THE RECONSTRUCTION OF HALF A MILLENNIUM OF CHANGE IN RURAL SETTLEMENTS AD 1000-1500**
Abstract author(s): Lewis, Carezza (University of Lincoln)
Abstract format: Oral
- This paper will consider what the excavation of small (one metre square) test pits within today's villages, small towns and hamlets can reveal about the development of rural settlements between 1000 and 1500 AD, drawing on data from more than 2,000 test pits excavated between 2005 and 2018 in 75 different rural settlements in south-eastern England. Mapping the spatial distribution of pottery of different types and dates from the test pits has been able to show which areas were in use at different times and enabled the origins and long-term spatial development of settlements to be reconstructed.
- Key trends to be explored in this paper relating to the period 1000-1500AD across this large region of England include a three-fold growth in the number, size and density of settlements between c.1100 and c.1300 as the population rose in Norman and Angevin England, and an even more dramatic decline in settlement number and size after the population plummeted in the fourteenth century due to climate change and pandemics which impacted across Europe and beyond. As the population rose, changes observable from the test pit data in southern England include the appearance of new communities along the edges of lanes and commons and the addition of planned settlement extensions, some associated with newly constructed castles. As the population fell, we can see the abandonment of more remote communities and the collapse of formerly large sprawling villages into small nuclei tightly clustered around churches, as well as the growth of a few resilient communities. The paper will end by considering the potential for a similar approach south of the channel to add to our understanding of change in settlement, demography and economy at wider, trans-regional scale.

- 11 **APPLICATION OF THE SOCIAL ARCHAEOLOGY'S PRINCIPLES TO THE STUDY OF SOCIAL IDENTITY WITHIN ENGLISH AND FRENCH VILLAGES**
Abstract author(s): Rego, Diane (CRAHAM)
Abstract format: Oral
- In 2004 in their A companion to Social Archaeology, L. Meskell and R. Preucel define the Social Archaeology as the study of the social being through "the ways in which we express ourselves through the things we make and use, collect and discard, value". The Social Archaeology combines three essential concepts: temporality (the way people experienced their environment on a daily basis), spatiality (the way space and distance could be used to express and maintain social relations) and materiality (the material dimension of the excavated artefacts bears social messages) to formulate social interpretations of archaeological remains.
- I applied those principles to my PhD investigations about small élites living in late medieval English and French villages. My research focused on the ways people could express their superior social status using their day-to-day environment: their living space. Thus, I studied the topography, the morphology and the material culture of seventy-two archaeological sites: aristocratic sites such as castles or manor houses as well as villages and hamlets, occupied from the 11th to the 15th century. Furthermore, I drew comparisons within each site and between sites on both sides of the English Channel. Finally, I managed to identify thirty-two archaeological indicators of social distinction and seven houses or plots that may be associated with rural élites.
- During my presentation, I would also develop two case studies: Trainecourt (Calvados, France) and Caldecote (Hertfordshire, United Kingdom).

- 12 **VUYDANGES ET SALUBRITAS. THE MANAGEMENT OF WASTE IN ROUEN (FRANCE) THROUGH THE EXCAVATION OF THREE PUBLIC GARBAGE DUMPS (15TH-16TH CENTURIES)**
Abstract author(s): Guillot, Bénédicte (INRAP - National Institute for Preventive Archaeological Research; Centre de recherches archéologiques et historiques anciennes et médiévales - CRAHAM)
Abstract format: Oral
- This presentation will present the results of three preventive archaeology excavations led by Inrap to Rouen in 2012, 2015 and 2019. Two of them have taken place in the same district, in the northwest of the fortified city, outside the fortification but around the medieval castle and near one of the main accesses in the city, la Porte Bouvreuil. The third is located west of Rouen, near another access, la Porte Cauchoise, and inside the city, along the ramparts.
- They allowed to study three big public garbage dumps of the second half of the 16th century, named "heurts" in texts of the time (from old French hord, hillock). The archaeological data illustrate the reality of the management policy of the waste of the city of Rouen, with the arrangement of a real public system of waste management between the 15th and the 16th century.
- Having described the evolution of the sector concerned by the excavations before the 16th century, we will be dealing of the arrangement of the hurts in Rouen, the organization and the dating of garbage dumps and what we found (lands, crafts waste, human and animal bones, ceramics and domestic objects).
- This paper will also present the particular excavation technique, considering the fine stratification of the deposit, the dipping of the levels and the abundant furnishings (more than 100,000 remains), all in the time allowed by preventive archaeology.

Finally, this paper will compare the waste management in Rouen with similar studies in the British Isles and with the New Lödöse Project in Sweden.

13

THE SAINT-MACLOU ASTER (ROUEN, FRANCE): EVOLUTION OF AN URBAN CEMETERY FROM THE BLACK PLAGUE TO THE MODERN PERIOD

Abstract author(s): Coupeur, Camille (EPHE - Université Paris Sciences et Lettres; Centre archéologique Inrap de Grand Quevilly; PACEA UMR 5199 Université de Bordeaux) - Thomann, Aminte (Centre archéologique Inrap de Grand Quevilly; CRAHAM UMR 6273 CNRS - Université de Caen Normandie) - Chapelain de Sézeville-Niel, Cécile (CRAHAM UMR 6273 CNRS - Université de Caen Normandie) - Dutour, Olivier (EPHE - Université Paris Sciences et Lettres; PACEA UMR 5199 Université de Bordeaux)

Abstract format: Oral

The Saint-Maclou Aster, located in the city of Rouen (Normandy, France), is one of the last three remaining asters in France. He was built, according to several historical archives, to bury people who died of the Black Plague that impacted the area in 1348. However, others historical texts indicate that the first plots of land acquisition for this cemetery did not take place before 1355. This question concerning the origin of this exceptionally well-preserved cemetery has led to the setting up of several archaeological digs (preventives and programmed), carried out between 2016 and 2019. These digs allowed for the excavation of approximately 550 skeletons (circa less than 10% of the people buried in the cemetery) and for the identification of two use phases of the cemetery. The first phase (14th-15th centuries), revealed collective burials containing 2 to 6 individuals, indicating episodes of high mortality. In addition, preliminary paleomicrobiological investigation on one of the 15th century individuals detected the molecular signature of *Yersinia pestis* DNA.

During the second phase (16th-18th centuries), the buried area seems managed as a parish cemetery. Paleopathological and paleoepidemiological studies are in progress concerning the second phase's osteological sample in the framework of a PhD degree. The first results show a population affected by numerous infections (tuberculosis, syphilis) and deficiencies (rickets, scurvy).

In this communication, we will describe in a first step the history of this cemetery in the light of these new archaeological discoveries. Then, we will develop the results of the ongoing PhD research on the skeletal sample from the modern period. Finally, we will discuss the new data from the late Medieval period, particularly those from the mass graves, comparing them to others plague's cemeteries from the North of Europe, particularly in England (East Smithfield Cemetery, Thornton Abbey, etc...).

475

HUMAN BONE AND TOOTH ARTEFACTS IN HUNTER-GATHERER CONTEXTS – CASE STUDIES, ANALYSES, INTERPRETATIONS AND THEORIES

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Mannermaa, Kristiina (University of Helsinki; University of Tartu) - Gray Jones, Amy (University of Chester) - Malyutina, Anna (Institute for the history of material culture, St Petersburg)

Format: Discussion session

Excavations at prehistoric sites in Europe and elsewhere have revealed a rare but interesting phenomenon where human bones or teeth have been modified into artefacts and used as pendants, tools or weapons. In this session we focus on these practices, with the aim to investigate their distribution, variety and significance. The scope will be prehistoric and historic hunter-gatherer, pastoral and early farming groups from anywhere in the world and any chronological periods. We call for papers focusing on case studies with contextual and analytical descriptions of the finds, including manufacture and functional analyses and reconstructing object biographies. We would also wish to hear theoretical papers discussing the significance of such practices, for example, how these artefacts may reflect human-environment relationships (for example, similar type of artefacts made of human and other mammal bones), or, how they potentially reflect attitudes towards human remains and the dead. In order to approach these topics thoroughly we warmly welcome colleagues from all disciplines, for example archaeology, anthropology, ethnography, and natural history.

ABSTRACTS:

1

MELODIES FLOWING FROM HUMAN BONES. MUSICAL INSTRUMENTS FROM PRE-COLUMBIAN PERIOD

Abstract author(s): Bak, Judyta (Doctoral School in the Humanities, Jagiellonian University) - Zdeb, Katarzyna (Institute of Archaeology, Cardinal Stefan Wyszyński, University in Warsaw)

Abstract format: Oral

Throughout history, societies have dealt with the bodies of the dead in different ways. We can find decoration and engraving of human skulls, mandibles and long bones. Also, various types of tools were made from animal and even human bones, including tattooing devices and drinking vessels.

It is important to notice that music has accompanied humanity almost from its very beginning. As with other items, musical instruments were made of different materials, including animal and human bones. There are flutes made of long bones and drums membranes covered with human skin used in shamanism. Such cultural practices are known in the pre-Columbian civilizations of South America.

2

FROM NEAR AND FAR. TOOTH BEADS FROM LATE MESOLITHIC CEMETERIES IN SKATEHOLM, SOUTHERNMOST SWEDEN

Abstract author(s): Larsson, Lars (Department of Archaeology and Ancient History) - Boethius, Adam (-) - Ahlström, Torbjörn (-) - Kjällquist, Mathilda (-)

Abstract format: Oral

Decoration in the form of tooth beads appears in some of the burials at the two Late Mesolithic cemeteries Skateholm I and Skateholm II located in southernmost Sweden. Most of the examples have been produced from the teeth of red deer, fewer from wild boar and a smaller number from elk, aurochs, bear and wolf. Tooth beads occur in burials with both men and women but with different locations in relation to the body. In order to trace the origin of these tooth beads, a number have been subjected to laser ablation with the intention of measuring the strontium content and thereby determining the origin of the animals as well as any change of movement pattern in their adolescence. In parallel, the tooth beads have been examined to identify use wear around the perforation drilled in the tooth root in order to establish how and for how long the tooth beads were used.

Through the combination of measurement of box values and laser ablation, it appears that the humans grew up in the region where they were buried. The limited variation of strontium exhibited by the humans has been compared with the values for the tooth beads. It appears that the majority of tooth beads were made from animals that, like humans, have lived in the vicinity of the settlement. In addition, there are some tooth beads with values that differ to a greater or lesser extent from those of the region. Among these there are not only animals that are well represented in the waste material at the settlements but also some that are poorly attested in the find material. The movement patterns of different animals may have been of some importance in this context.

3

HUMAN BONE PENDANTS FROM LATE MESOLITHIC NORTHEAST EUROPE

Abstract author(s): Mannermaa, Kristiina (Department of Cultures, Archaeology, University of Helsinki) - Malyutina, Anya (Laboratory of the Experimental Traceology, Institute for the history of material culture Russian Academy of Sciences, Saint-Petersburg) - Gerasimov, Dmitriy (Russian Academy of Sciences, Peter the Great Museum of Anthropology and Ethnography, Saint-Petersburg)

Abstract format: Oral

In this paper we introduce a previously undocumented practice in Northeast Europe. Human bone was used as raw material for making pendants, in a similar way as animal bone. Our material derive from Yuzhniy Oleniy Ostrov (Karelia, Northwest Russia), the largest Late Mesolithic cemetery in Northern Europe. Most of these graves contain human skeletal remains and rich burial inventory of bone and stone artefacts. The grave inventory reveals a variety of goods deposited in the burials. They mainly consist of artefacts of bone, teeth and antler (for example harpoons, points and pendants), and flint and quartz utensils, mostly finished arrowheads. However, by far the most common bone artefacts are pendants made of Eurasian Elk (*Alces alces*), Eurasian Beaver (*Castor fiber*), and Brown Bear (*Ursus arctos*) teeth. In addition to tooth pendants, two other types of osseous pendants are present. One type is pendants made of Cervid or Bovid hyoid bone, and the other type is pendants made of mammalian long bone splinters. All three types of pendants were manufactured by making one or several grooves on the narrowest part of the specimen. Grooved bone pendants made of bone splinters were found in 22 of the 177 registered inhumations. Zooarchaeology by Mass Spectrometry (ZooM) method revealed that the raw material used for twelve of these is human bone. In this paper we present the morphological and microtrace analysis of these human bone pendants and describe their contexts. We also discuss their potential meanings and functions in the context of Mesolithic burial archaeology.

4

THE AGENCY OF THE DEAD IN MESOLITHIC EUROPE

Abstract author(s): Gray Jones, Amy (University of Chester)

Abstract format: Oral

Evidence for the treatment of the dead in Mesolithic north-west Europe reveals an ever more complex and varied set of mortuary practices taking place. These include inhumation, cremation, secondary burial, manual disarticulation and dismemberment and, potentially, anthropophagy. Recent finds indicate that this also included the modification of human bone into artefacts such as tools/weapons. Such practices clearly involved affective engagements with death and the dead body. What is more, ethnographic studies show that bones and other bodily substances could hold significance beyond the funerary context, being utilised for their affective, magical or powerful qualities. Examples include the potential agency of the dead to enhance hunting success through the use of amulets or charms made from human remains, or spiritual assistance obtained through the consultation of curated dead bodies or the application of their bodily substances to the bodies of hunters and their weapons. This paper will explore the significance of the ways in which human remains (bones and other bodily substances) were engaged with in Mesolithic Europe.

476 UNDERSTANDING AND EXPANDING CAPACITY IN ARCHAEOLOGICAL DATA MANAGEMENT BEYOND WESTERN EUROPE

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Wright, Holly - Richards, Julian (University of York) - Niccolucci, Franco (PIN - University of Florence)

Format: Regular session

The COVID-19 pandemic has exacerbated or made more visible many known inequalities across borders and societies. This includes access to archaeological resources, both physical and digital. As both the creators and users of archaeological data adapted to working from their homes, cut off from artefact collections and research data siloed within organisations and institutions, the importance of making data freely and openly available internationally became even more pronounced. The ARIADNE infrastructure (ariadne-infrastructure.eu) for archaeological data, and the SEADDA COST Action (seadda.eu) are working to secure the sustainable future of archaeological data across Europe and beyond, in ways that are Findable, Accessible, Interoperable and Re-usable (FAIR). Experience within the ARIADNE partnership during the pandemic was largely positive, with many partners able to carry on as usual with accessing their digital resources, emphasising what is possible, while also emphasising what is not achievable across archaeology, due to lack of capacity. ARIADNE and SEADDA invite papers discussing the challenges, opportunities and lessons learned across all aspects of archaeological data management during the pandemic, and how it may change and inform our best practice going forward. We particularly invite papers from outside of Western Europe on how the COVID-19 pandemic created barriers or opportunities for accessing archaeological resources, so that we may better understand capacity building during a post-COVID era.

ABSTRACTS:

1 FROM THE 2ARCHIS ARCHAEOLOGICAL INFORMATION SYSTEM TO DATAREPOSITÓRIUM: CASE STUDY OF THE ARCHAEOLOGICAL COINS OF CASA DA BICA

Abstract author(s): Botica, Natalia - Machado, Diego - Magalhães, Fernanda - Martins, Maria (Unidade de Arqueologia; Lab2PT; Universidade do Minho)

Abstract format: Oral

To promote open science and data reuse, it is necessary to have data available in open repositories that guarantee their accessibility and permanence, while facilitating their reuse.

Data classified as FAIR (Findable, Accessible, Interoperable and Reusable) must follow guidelines that ensure the use of an appropriate metadata scheme, persistent identifiers, well-defined vocabularies, procedures to standardize and improve data quality and sustainable file formats. We will present the methodology used for recording the coin findings from an archaeological excavation carried out by the Archaeology Unit of the University of Minho (UAUM) in the intervention of Casa da Bica, starting with the recording of data in the UAUM's 2ArchIS information system and ending with its availability in the scientific repository "DataRepositóriUM".

We will also present some works of visualization and research as examples of the reuse of these data sets, which can be wider when they are integrated in structures of greater visibility like ARIADNE.

2 WAYS AND CAPACITY IN ARCHAEOLOGICAL DATA MANAGEMENT IN SERBIA

Abstract author(s): Tapavicki-Ilic, Milica (Institute of Archaeology) - Šegan-Radonjić, Marija (Mathematical Institute)

Abstract format: Oral

Over the past year and due to the COVID-19 pandemic, the entire world has witnessed inequalities across borders and societies. They also include access to archaeological resources, both physical and digital. Both archaeological data creators and users spent a lot of time working from their homes, away from artefact collections and research data. However, this was the perfect moment to understand the importance of making data freely and openly available, both nationally and internationally.

This is why the authors of this paper chose to make a selection of data bases from various institutions responsible for preservation and protection of cultural heritage, in order to understand their policies regarding accessibility and usage of the data they keep. This will be done by simple visits to various web-sites or data bases. They intend to check on the volume and content, but also importance of the offered archaeological heritage. In addition, the authors will estimate whether the heritage has adequately been classified and described and also check whether data is available in foreign languages.

It needs to be seen whether it is possible to access digital objects (documents and the accompanying metadata), whether access is opened for all users or it requires a certain hierarchy access, what is the policy of usage, reuse and distribution etc. It remains to be seen whether there are public API or whether it is possible to collect data through API. In case that there is a public API, one needs to check whether datasets are interoperable or messy, requiring data cleaning.

After having visited a certain number of web-sites, the authors expect to collect enough data to make a satisfactory conclusion about accessibility and usage of Serbian archaeological data web bases.

3 PRESERVING HISTORIC BUILDING DOCUMENTATION FOR REUSE AT THE NATIONAL COLLEGE OF ARTS, PAKISTAN

Abstract author(s): Khan, Doa (National College of Arts, Lahore)

Abstract format: Oral

Like many countries around the world, Pakistan was forced to go into a COVID-19 national lockdown in March 2020. While this confined most people to their homes, it also had the unintended consequence of catapulting many institutions into embracing going digital. At the National College of Arts (NCA), Pakistan's oldest art school, this meant embracing online tools and digital resources that had previously been resisted or underutilized in the teaching of art, design, and architecture. The experiences of lockdown have highlighted inadequacies and inequities within our systems, and as Pakistan returns to normal there is a renewed will to maintain the momentum gained during the pandemic, and an increased realization of the need for developing and sustaining digital infrastructures. The National College of Arts Archives collect and preserve the records, manuscripts, and other artefacts of historical and archaeological significance at the National College of Arts. From March 2021, the NCA Archives are initiating a project to collect, preserve, and digitize historic building documentation created at the NCA over the past 145 years. This paper will follow this process and document the NCA Archive's attempt at creating a Findable, Accessible, Interoperable, and Reusable (FAIR) database of historic building documentation in Pakistan. It will summarize the experiences of the six-month pilot project, including opportunities that have arisen in the aftermath of the Covid-19 pandemic, and in light of the Government of Pakistan's ongoing Digital Pakistan initiative. The paper will also document and analyze the difficulties and hurdles that might emerge during the course of the project as the NCA Archive's digital infrastructure is built from the ground up in a post-colonial setting and a post-COVID world.

4 INJECTED BY INFORMATION: A SILENT (R)EVOLUTION IN CZECH DIGITAL ARCHAEOLOGY

Abstract author(s): Novak, David (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Pajdla, Petr (Institute of Archaeology of the Czech Academy of Sciences, Brno)

Abstract format: Oral

Every crisis period puts pressure on the individual components of traditionally functioning systems. This effect is well known from archaeological contexts, where external influences are often viewed as factors motivating the development. Currently, archaeology has an opportunity to view this situation from the opposite perspective, itself facing new challenges linked to the reduction of social contacts, forcing us to maximise the search for innovative solutions. We believe that crisis situations may indeed be the motivation for development. However, often it is imaginary fire-fighting that leads only to unsustainable solutions. We verified this case well after the catastrophic flood of Prague in 2002 and in other unforeseeable events in the past. The event forced us to make anticipated but only partially prepared changes that significantly moved the field forward. Yet, as a result of rapid decisions taken under pressure, we are still dealing with some unintended consequences. COVID-19 found us in a different situation. It has demonstrated the importance of conceptually building robust information systems, which are a welcome aid at any time, but are now becoming a necessity. Due to long-term systematic work, the new situation did not result in any fatal disruptions or problems and in turn helped the full establishment of the large research infrastructure Archaeological Information System of the Czech Republic (AIS CR). The paper analyses the situation in which the current crisis has caught Czech archaeology and how much it motivates changes in the disciplinary routine, or whether the causes of the development can be found in other aspects of archaeological data management practice. We conclude that Czech archaeology was mostly well prepared, and the main change is noticeable in the higher demand for accessible digital archaeological information by the general public.

5 ARCHAEOLOGICAL MAP OF BULGARIA IN ARIADNEPLUS – AN OPPORTUNITY FOR BETTER POST-COVID TIMES

Abstract author(s): Kecheva, Nadezhda - Nekhrizov, Georgi (National Archaeological Institute with Museum, Bulgarian Academy of Sciences)

Abstract format: Oral

On one hand, COVID-19 world pandemic showed the people vulnerability and inability of face-to-face communication and ideas sharing. Through this point of view digital data that is Findable, Accessible, Interoperable and Re-usable (FAIR) showed its added value in even higher extent. On other hand, online communication became a daily routine enabling easier access of all interested parties regardless of their location. The latter helped focusing on particular tasks difficult to accomplish otherwise. The situation in Bulgaria concerning improving state-of-the-art of site and monument dataset "Archaeological Map of Bulgaria" is still in a work process based on online communication with interested participants. Scientists from the National Archaeological Institute with Museum at Bulgarian Academy of Sciences are responsible for all that. Legacy data available beyond local repositories using FAIR principles is a main focus in the development and up-to-date improvement. Sharing the most informative fields metadata and available digital data in ARIADNEplus portal enabled cleaning other issues in the information system.

6 NORWEGIAN UNIMUS, NORDIC COLLECTIONS, AND ARIADNEPLUS. ENCOURAGING USE AND RE-USE OF COLLECTIONS, EXCAVATION DOCUMENTATION, AND MUSEUM EXHIBITS

Abstract author(s): Uleberg, Espen - Matsumoto, Mieko - Kille-Vesik, Jakob (Museum of Cultural History, University of Oslo) - Ore, Cristian-Emil (Department of Linguistics and Scandinavian Studies, University of Oslo) - Dell'Unto, Nicolás - Bonelli, Letizia - Kimball, Justin - Kristensen, Steinar - Samdal, Magne - Tesfamariam, Ermias (Museum of Cultural History, University of Oslo)

Abstract format: Oral

This contribution will present digital assets and initiatives at the Museum of Cultural History (MCH), University of Oslo (UiO) and aims at sharing data.

The COVID-19 restrictions have elevated the importance of digital assets. At the beginning of this period, metadata for the archaeological collections were, to a large degree, already digitized and accessible online. This is the result of a national collaboration beginning in the 1990s and continue today in UniMus:Kultur. MCH had also published a map-based overview of all excavations in Eastern/Southern Norway, and begun to release excavation reports through UiO's science archive. Recently, focus has shifted towards 3D-documentation of exhibits and publication of existing 3D-models on 3DHOP—available through humgis.uiocloud.no

MCH now concentrates on digitizing artefacts at the Viking Ship Museum. The 3D-models from here will be included in the BitFROST project, which will address the active role of 3D-models in research and education. BitFROST will work on FAIRification of 3D-models and promote dialogue with researchers. The 3DHOP platform enables the creation of interactive user-interfaces for researchers and a public audience. Collaboration with DarkLab in Lund, Sweden will create common user-interfaces for Swedish and Norwegian collections. The project will also utilize AR and VR in the presentation of data.

In addition, the infrastructure project ADED (Archaeological Digital Excavation Documentation) provides open-access to excavations in Norway. The five Norwegian university museums and the Directorate of Cultural Heritage take part in the project. ADED's map-based webpages will integrate excavation documentation and the museums' artefact/photograph databases, making it possible to have an overview and detailed information of excavations and finds. As part of migrating the data to a common repository, mapping it to CIDOC-CRM archeo facilitates further mapping to ADRIADNEplus and/or other datasets.

7 INTEGRATING ARCHAEOLOGICAL DATA FROM DIGITAL REPOSITORIES AND WEB-BASED SPATIAL DATABASES. IDACORDIG AND SUQUIA IN PANDEMIC TIMES

Abstract author(s): Izeta, Andres - Cattáneo, Roxana (CONICET; Universidad Nacional de Córdoba)

Abstract format: Oral

The COVID-19 pandemic unleashed during 2020 implied a change in the way of doing archaeology on a global scale. In Argentina, in particular, activities had to move to the domestic sphere and, most times, the possibility of carrying out fieldwork, material analysis and collection management in the usual workplaces was lost. This practice showed the need for repositories, libraries and online databases that would allow access to archaeological information. Suquia, the institutional repository of IDACOR, has been compiling and disseminating archaeological information since 2016, although it had not yet developed its capacity to include databases that would allow meta-analysis of the information hosted. So, the needs raised by the lockdown led to implementing an action aimed at incorporating data from 1938 archaeological sites in the Province of Córdoba (Argentina) together with IDACORDIG (an implementation of the Arches software) which links this set to a spatial database, creating a gazetteer of archaeological sites for the region. This integration is the first of its kind in Argentina, and fosters an increase in primary information and grey literature visibility, together with publications preprints and prints that allow continuity in the study of archaeology on a regional scale. In this presentation we will characterize this process and its technical aspects to aware on the potential of this type of platform for its integration into digital infrastructures of global impact.

8 IMPACT OF THE COVID-19 PANDEMIC ON ARCHAEOLOGICAL DATA MANAGEMENT IN FRANCE, THE INRAP EXAMPLE

Abstract author(s): Marx, Amala - Bryas, Emmanuelle - Salas Rossenbach, Kai (INRAP - National Institute for Preventive Archaeological Research)

Abstract format: Oral

As in many countries, the COVID-19 pandemic took the French public authorities by surprise, forcing them to close the country almost completely in less than 72 hours. The French National Institute for Preventive Archaeological Research, like other public institutions, was not prepared for full teleworking and total shut-down of its activity, its excavation activity having been entirely suspended for two months. After a period of astonishment and reorganisation, many initiatives were taken in terms of management, organisation and even accessibility of data produced by the Institute.

The strict lockdown, that took place in France during the months of March, April and May 2020, has given Inrap's archaeologists time to develop or implement data management practices, experiments and procedures already initiated internally or induced by the Institute's participation in European programmes and networks such as ARIADNEplus or COST SEADDA. However, this situation has also brought to light blockages and malfunctions that existed previously but for which workarounds had been put in place (non-materialised administrative procedures; scientific documentation scattered; difficulties of communication; non-accessibility of archaeological collections; etc.).

The aim of this paper will be to show how Inrap archaeologists and scientific staff were able to take advantage of this special moment, how this situation was an opportunity for the management and opening up of Inrap's data, while underlining the difficulties of implementing collective projects at a time of entirely digital communication. We will also look at the lessons to be learnt from the lockdown but also from the period of reinforced teleworking that we continued to experience afterwards. What is the impact of this period of isolation on our practices, research subjects and projects as researcher or research manager despite more accessible data?

479

FROM CLIMATE CHANGE TO ACTIVISM: HOW CAN EUROPEAN HUNTER-GATHERER ARCHAEOLOGY CONTRIBUTE TOWARDS BROADER CONTEMPORARY DEBATES? (PAMI)

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Elliott, Benjamin (Newcastle University) - Nyland, Astrid (Universitetet i Stavanger) - Warren, Graeme (University College Dublin) - Piezonka, Henny (Christian-Albrechts-Universität zu Kiel)

Format: Regular session

Hunter-gatherer archaeology in Europe covers a wide temporal frame stretching from the initial arrival of Homo Sapiens sapiens until the transition to farming. It explores deep Stone Age histories based on elaborate analytical tool kits and interpretative frameworks. However, within the broader, interdisciplinary field of hunter-gatherer studies, European hunter-gatherer archaeology is distinct to that of other continents, in that it has remained a „consumer“ of anthropological theory and ethnographic analogies – despite its great potential to contribute original and highly relevant perspectives to contemporary concerns. When integrated with anthropological approaches and broader global concerns such as rising social inequality, decolonization processes, climate change and other socio-environmental hazards, it becomes clear that European hunter-gatherer archaeology has a lot to offer in order to approach current problems through its longue durée perspective and its expertise on alternative life worlds.

This session aims to discuss how European hunter-gatherer archaeology contributes to these wider popular debates and contemporary concerns, and seeks to situate this contribution in relation to that of other continents. We will consider the impact on diverse fields such as postcolonial debates, indigenous archaeologies, empowerment and multivocality, the growing interest in multi-species systems, and sociologies of adaptive potential from vulnerability to resilience.

We welcome contributions which discuss achievements and identify future imperatives across this spectrum, addressing e.g. the following questions: How does hunter-gatherer archaeology contribute to wider anthropological debates? What role does hunter-gatherer archaeology play in promoting alternative social structures to counter-act growing social inequalities? How do our findings inform political activism, e.g. concerning indigenous rights and empowerment, or anarchist movements? On the global scale, what role have archaeologists played in advocating the concerns of contemporary hunter-gatherer communities? In a world where anthropogenic climate change rapidly increases natural hazards, what does hunter-gatherer archaeology contribute to understand vulnerability and strengthen contemporary resilience?

ABSTRACTS:

1 A EUROPEAN APPROACH TO HUNTER-GATHERER ARCHAEOLOGY?

Abstract author(s): Warren, Graeme (University College Dublin)

Abstract format: Oral

This paper compares the character of hunter-gatherer archaeology in Europe to hunter-gatherer archaeology as practised in different parts of the globe. I will argue that there are important features of European hunter-gatherer archaeology that make it distinctive in this comparative context and that this requires careful consideration. This difference arises from how archaeological practice is influenced by the main sources of data available for ancient and recent hunter-gatherer populations: material culture, linguistic evidence, oral tradition, ethnographies, historical sources and genetics. The combination of these sources in different regions is distinctive and has important implications for the development of archaeological practice, not least through the development of indigenous archaeologies. Although these characteristics are, to large extent, self-evident, the implications of them for how we practice hunter-gatherer archaeology in Europe are not widely considered. These implications are outlined in this contribution, including the need to start to decolonise our conceptual frameworks and forms of practice.

2 UNDERLYING NARRATIVES IN MESOLITHIC AND NEOLITHIC SOCIETIES “...TO THE DETRIMENT OF THE [...] HUNTER GATHERERS”?

Abstract author(s): Nyland, Astrid (Museum of Archaeology, University of Stavanger)

Abstract format: Oral

Although it can seem almost comical how Stone Age Hunter-gatherers in popular culture are portrayed as either aggressive and violent, or simple-minded and primitive, this persisting representation is not created in a vacuum exempt from research. Marek Zvelebil argued 30 years ago that “These perceptions arose from the social evolutionary notions of the eighteenth and nineteenth century and resulted in the privileged treatment of the evidence for the early farming, ‘Neolithic’ societies to the detriment of the earlier

hunter-gatherers.” Unfortunately, although there are many examples to the contrary in current archaeological research, the popular or mainstream preconceptions of the primitive Mesolithic hunter-gatherer societies as opposed to civilized Neolithic farming societies still persist. Why is this narrative so hard to change? In the Neolithic, hunter-gatherers are often interpreted as marginalised while their farming neighbours drive change. What are the responsibilities of archaeologists if this bias or prejudice is transferred to contemporary hunter-gatherer groups? In this paper I will discuss the suggested power imbalance and the possible negative effects of the abiding Mesolithic narrative, i.e. of the wild, simple and uncultivated. This is a contribution to the ongoing debate of decolonising the Mesolithic, and through case studies, I will also consider how archaeology can contribute to the empowerment of hunter-gatherer societies, across time and space.

3 URBAN FORAGERS: LINKS BETWEEN PAST PRACTICES AND A SUSTAINABLE FUTURE?

Abstract author(s): Damm, Charlotte (Arctic University of Norway)

Abstract format: Oral

Hunter-gatherers are by many associated with the deep past, and in popular imagery they are frequently perceived as barely scraping a living. As archaeologists and anthropologists are aware, hunting, fishing and gathering are practices that continued long after domestication and farming were introduced. These ways of acquiring food are active in many communities even today, and here it will be argued that foraging for food is now experiencing a renaissance also amongst the modern urban population.

In Norway “matauk”, meaning complementing the main food supplies with small scale hunting, fishing and gathering has long been important for the Norwegian identity, and has not diminished despite recent urban centralization. While this is generally a small scale supplement, it is part of a general re-orientation towards local products and an awareness of the need for a more sustainable production and consumption regime.

The archaeology, history and anthropology of hunter-fisher-gatherers has the potential to contribute to this trend, with past and recent hunter-gatherers serving as role models. Rather than employ recent analogies to understand past foragers, we can explore insights from hunter-gatherer archaeology to suggest practices that, albeit in a small way, counteract the negative anthropogenic effects of long distance transport of food products.

4 PARADIGM SHIFT IN THE STUDY OF THE EASTERN EUROPEAN UPPER PALAEOLITHIC IN THE EDUCATIONAL PERSPECTIVE

Abstract author(s): Shydlovskiy, Pavlo - Chymyrys, Marharyta (Taras Shevchenko National University of Kyiv; Center for Paleoethnological Research) - Tsvirkun, Ostap (National Museum of the History of Ukraine; Center for Paleoethnological Research) - Dudnyk, Diana (Institute of Archaeology of the NAS of Ukraine; Center for Paleoethnological Research)

Abstract format: Oral

General works and textbooks on the prehistoric archaeology of Europe often provide a view of the gradual replacement of one cultural phenomenon by another more developed one. This approach in teaching creates the impression of the culture stability, the idea of constant growth of human achievements, the expansion of the resource base and the successful use of natural resources by prehistoric groups. The presentation of such schemes leads to a misconception about correctness and internal logic of historical development, a false sense of the possibility of infinite growth.

Recent research in the field of prehistoric archaeology in Eastern Europe, together with the rapid development of natural sciences and radiocarbon dating, is radically changing our perception about the development of prehistoric cultures as a slow, steady and gradual process. When studying the Upper Palaeolithic sites in the Dnieper basin, it became obvious that there was a chronological gap in several millennia (24-19 ka cal BP), which occurred after the LGM in northern Ukraine, which calls into question the evolutionary connection between the late Gravettian vestiges and the Middle Dnieper Epigravettian. After the flourishing of the Epigravettian mammoth hunters culture (19-14 ka cal BP), during the transition to the final Pleistocene the absence of technological successors of Epigravettian industry in these areas in the following millennia is possible to observe. Current data allow us to state that as a result of global changes there has been depopulation in large areas, the disappearance of large groups of people in times of crisis, complex migration processes.

This knowledge allows us to draw conclusions about the vulnerability of human networks to abrupt climate change and the need to objectively analysing the current situation. One of the necessary activities should be the explanation the importance of global climate change in teaching and communicating with local communities.

5 TWO STEPS BACK, THREE STEPS FORWARD: HOW TO MAKE PALAEOLITHIC/MESOLITHIC ARCHAEOLOGY RELEVANT FOR CONTEMPORARY CONCERNS?

Abstract author(s): Porr, Martin (University of Western Australia)

Abstract format: Oral

This paper will argue that “European hunter-gatherer archaeology” can only contribute to “broader global concerns such as rising social inequality, decolonization processes, climate change and other socio-environmental hazards” if it deeply engages with relevant critical strands in anthropological research and debates. This process has hardly started within the fields of Palaeolithic/Mesolithic archaeology and palaeoanthropology. This situation is unsatisfactory, because (1) the latter fields continue to produce highly influ-

ential and publicly recognised understandings of human evolution and origins, and (2) key terms within these fields of archaeological research have been critiqued extensively in other social sciences. For example, within the postcolonial movement, the Western idea of humanity has received an extensive amount of critical attention. Similarly, notions of time and history have been identified as part of deeply Western frameworks that have fostered a universalising and exclusive narrative of the deep history of humanity. Finally, even though human interactions with the natural environment are at the core of methodological and theoretical the notion of ‘nature’ itself rarely receives critical attention, even though it is a highly contested term within the social sciences. These are only three examples of key notions that are at the heart of European Palaeolithic/Mesolithic archaeology and which are rarely critically assessed. However, such an engagement is key to the field’s ability to allow European Palaeolithic/Mesolithic archaeology to critically contribute to current debates as outlined above. This paper will make some suggestions in this direction with reference to the necessity to develop a theoretically informed critical research history and a critique of current theories and practices as well as the representation of research results in exhibitions/museums and publications.

6 THE ARCHAEOLOGY OF PERSISTENT HUNTER-GATHERER PLACES: CRITICALLY CONSIDERING THE IMPACT OF KNOWLEDGE GENERATED AT HIGH PROFILE EUROPEAN SITES

Abstract author(s): Elliott, Benjamin (-)

Abstract format: Oral

2018 witnessed the landmark publication of an extensive program of C14 dating and Bayesian modelling of the Final Pleistocene and Early Holocene deposits at Star Carr (Milner, Conneller & Taylor 2018). This provides a c.800 year-long chronological structure to the complex sequence of hunter-gatherer activities carried out at the at this iconic Early Mesolithic site.

This paper will explore the impact of this model in relation to historic and ongoing land rights disputes involving hunter-gatherer groups around the world. These frequently hinge on the assumption that hunter-gatherer settlement and occupation is short-lived and ephemeral when compared to the perceived permanence of agriculturalist sites (eg Hagen & Minter 2020). A consideration of the new evidence from Star Carr in relation to other examples of long-lived hunter-gatherer occupations within Europe will be broadened to encompass the concept of “persistent places”, and the potential for the actualization of these ideas within indigenous land rites disputes discussed.

- Barton, R.N.E., Berridge, P.J., Walker, M.J. and Bevins, R.E., 1995. Persistent places in the Mesolithic landscape: an example from the Black Mountain uplands of South Wales. *Proceedings of the Prehistoric Society*, 61, pp. 81-116.
- Hagen, R.V. and Minter, T., 2020. Displacement in the Name of Development. *How Indigenous Rights Legislation Fails to Protect Philippine Hunter-Gatherers. Society & Natural Resources*, 33(1), pp. 65-82.
- Milner, N., Taylor, B. and Conneller, C., 2018. *Star Carr Volume 1: A persistent place in a changing world*. White Rose University Press.

7 FROM PERCEPTION TO PEDAGOGY: TEACHING THE RELEVANCE OF PREHISTORIC HUNTER-GATHERER RESPONSES TO CLIMATE CHANGE

Abstract author(s): Piper, Stephanie - Bates, Jessica - Bell, Taryn (University of York)

Abstract format: Oral

This paper seeks to address the theme of widening horizons from a dual perspective on human-environment interconnections: the first is the significance of studying prehistoric hunter-gatherer archaeology in relation to climate change; the second is in the human-learning environment, namely Higher Education. Specifically, we wish to explore student perceptions of the relevance of past hunter-gatherer responses to climate change in relation to addressing this issue in the present.

The authors of this paper reflect on their experiences of teaching UK University students about prehistoric hunter-gatherer societies, and with a particular focus on the Final Upper Palaeolithic and Mesolithic. These discussions have highlighted a diverse range of student opinions, not only about hunter-gatherers in the past, but also on the value of prehistoric hunter-gatherer studies to challenges faced in the present day, and vice-versa. Furthermore, these perceptions appear to be connected to students’ motivation for studying hunter-gatherer archaeology, and how the subject is communicated to the public. This has implications that span issues such as sustainability of degree programmes, influencing climate change policy, widening participation, and decolonisation and diversification of the discipline.

From this, we consider the ways in which the study of Late Glacial and early Holocene communities and their direct relevance to current debates on climate change can be better incorporated into archaeological pedagogy, to continue to address one of the Grand Challenges of archaeology.

8 OVERCOMING AGRICENTRISM: HOW HUNTER-GATHERER STUDIES CAN CONTRIBUTE TO DE-EVOLUTIONIZING THE NEOLITHIC

Abstract author(s): Piezonka, Henny (Christian Albrechts University Kiel)

Abstract format: Oral

Many current global concerns such as increasing social inequality and socio-environmental hazards are connected to an essentially extractionist, growth-orientated ontology dominating the globalized world. An underlying dualist concept distinguishes between an

inanimate nature, and human societies at who's disposal nature is to exploit. With most researchers in European archaeology biographically based in "Global North" life words, such an extractionist, dualist, agr-centric mind set is often uncritically assumed also for prehistoric actors from the Neolithic onwards. Reflecting this ontology, the transition to farming is perceived as a major evolutionary step, often named the "Neolithic" or "agricultural revolution". The farming economy is regarded foundational to everything complex across the socio-political, economic and ideological spheres, from sedentary life ways to hierarchical society structure to hereditary leadership.

In the talk, alternative views on socio-economic dynamism from a hunter-gatherer perspective will be discussed. Concerning "Neolithisation", hunter-gatherers in a way have remained "people without history", although it was actually hunter-gatherers who were the "great innovators", as Peter Jordan et al. (2014) phrased it; it was them who were the driving force behind the transformations now largely regarded as "Neolithic" traits. Discussing evidence of technological innovation, economic intensification and socio-political complexity in hunter-gatherer societies from diverse prehistoric, ethnohistoric and contemporary contexts, it will be argued that rather than evolutionist, agr-centric notions of "Neolithisation" as a global horizon, an alternative mindset is necessary to grasp the diversity of the historical spectrum as well as underlying more universal patterns. This encompasses e.g. bottom-up models on the diverse local and regional trajectories of socio-economic developments, the assessment of "platforms of societal dynamics" (Arnold et al., 2015), and the incorporation of alternative ontologies into archaeological inquiry, leading to a critique of agr-centric models and a fresh view on the role and agency of hunter-gatherer societies in past and present.

9 RETHINKING CHILD DEVELOPMENT FROM THE PERSPECTIVE OF ARCHAEOLOGICAL RESEARCH ON HUNTER-GATHERERS

Abstract author(s): Milks, Annemieke (UCL, Institute of Archaeology) - Lew-Levy, Sheina (Simon Fraser University, Department of Psychology, Canada; Aarhus University, Department of Archaeology and Heritage Studies) - Lavi, Noa (UCL, Department of Anthropology) - Friesem, David (University of Haifa, The Recanati Institute of Marine Studies; University of Haifa, The Haifa Center for Mediterranean History) - Reckin, Rachel (University of Cambridge, St John's College)

Abstract format: Oral

Research on child development is biased towards samples from Western, Educated, Industrialized, Rich, and Democratic—or WEIRD—societies, thus overlooking the considerable diversity in childhoods in the present and past. Archaeological research elucidating our shared human past has often overlooked children as actors in, and modifiers of, their social and ecological environments. And yet, combining developmental and archaeological perspectives can shed light on children's agency in the past, and by extension, their contributions to culture change in the present. Here, we present representative cases from a systematic survey of the archaeological literature on hunter-gatherer children. The survey includes archaeological evidence of material culture relating to hunter-gatherer childhood including children's playthings and tools, learning to flintknapping, and their involvement in the making of marks, art and footprints. Much of this evidence points to children's agency and autonomy in the deep past. We discuss the implications of these findings in relation to children's contributions to the archaeological record within and outside of hunter-gatherer societies, child development more broadly, and to understanding children's agency as transformers of social and ecological spaces. This longue durée view is central to supporting youth wellbeing, activism, and global resiliency.

10 CLIMATE VICTIMS? CLIMATE EXPERTS! - NEW NARRATIVES FOR OUR PAST AND FUTURE EXISTENCE

Abstract author(s): Bradtmöller, Marcel (Rostock University - Heinrich Schliemann- Institute for Ancient Studies) - Grimm, Sonja (Zentrum für Baltische und Skandinavische Archäologie | ZBSA; CRC 1266: "Scales of Transformation - Human-Environmental Interaction in Prehistoric and Archaic Societies")

Abstract format: Oral

Today anthropological and archaeological data from hunter-gatherer communities starts slowly to affect societal or economic frameworks such as the incorporation of Dunbar's number for stable social relationships into business culture (see Gladwell, 2000). We can expect this development to have a significant effect on our society in the future (cf. Boivin and Crowther, 2021) and it will also support our ability to deal with the current climate change ahead. However, this process is still at the beginning.

In the meantime, new storylines for the climate crisis need to be formed because the actual "doom and gloom narrative" seems to be counterproductive for mobilising people (cf. Hinkel et al. 2018). Here European hunter-gatherers can enter the stage. Ice age cycles, seasonality, or volcanic eruptions had a significant impact on the habitat of human communities. In fact, it seems that human adaptation, reorganisation, and survival were rather the rule than the exception in the general human history. Furthermore, Heinrich stadials and Bond events also initiated regularly extensive biosphere changes in the North-Atlantic region. Hence, European Palaeolithic and Mesolithic societies provide a robust source of stories about successful adaptation to climate change and a possible antidote for the current narratives. By using case studies of Late Pleistocene hunter-gatherers, we will explore the general benefit of focusing more on these climate experts and the practical application of the given scenario in the fields of teacher training and science communication.

Literature:

- Boivin, N., & Crowther, A. (2021). Mobilizing the past to shape a better Anthropocene. *Nature Ecology & Evolution*, <https://doi.org/10.1038/s41559-020-01361-4>.
- Gladwell, M. (2000). *The tipping point: How little things can make a big difference*. Little, Brown.

- Hinkel, J., Mangalagu, D., Bisaro, A., & Tabara, J. D. (2020). Transformative narratives for climate action. *Climatic Change* 160, 495-506.

480 HOW MUCH SHAPE MATTERS? APPROACHES IN POTTERY STUDIES

Theme: 6. Material culture studies and societies

Organisers: Gomez Bach, Anna - Molist, Miquel (Autonomous University of Barcelona) - Taranto, Sergio (Sapienza University) - Ozbal, Rana (Kos University)

Format: Regular session

Some pottery forms have a typology that allows them to be inferred in specific functionalities. Evidently, these first approaches, widely studied by researchers, have been complemented with petrographic and organic residues studies to validate their possible uses and functions. In this session, however, it is proposed to start from the variable shape to limit, as far as possible, these uses, validating and expanding these typologies. Topics such as individualized morphology, profile, typology, and quantitative and qualitative data would be discussed. In this sense, those vessels with singular shapes beyond the anthropomorphic or zoomorphic type will be analyzed.

To understand the role that this variable (shape) plays in the archaeological record, the inclusion of other materials (lithic, bones, wood) and types of support is considered where the form has also been the basic element of study.

Chronologically this research aims to address the early Neolithic and Bronze Age in Europe and the Near East assemblages.

ABSTRACTS:

1 THE BEADED RIM

Abstract author(s): Nilhamn, Bonnie (Helsinki University)

Abstract format: Oral

In this paper we are zooming in on one detail that first may seem trivial, but when studying the shape and the typology of Near Eastern Neolithic plaster vessels becomes quite extraordinary – the beaded rim.

The beaded rim is a commonly applied feature found on plaster ware, so called white ware, that dates to the Early pottery Neolithic phase, ca. 6700-6200 cal. BC. The plaster material studied comes from the excavation of Tell Sabi Abyad Syria in the River Balikh valley. This site was inhabited from the later PPNB into the Halaf period.

I would like to argue why this specific commonly applied feature on white ware is of importance, what it may say about the manner the vessel was produced and also something about the usage of the vessel. I also want to discuss the "beaded rim" in a broader context by comparing the plaster with other contemporary materials like ceramic, stone, and basketry.

2 INVESTIGATING POTTERY FUNCTION THROUGHOUT EXPERIMENTAL ARCHAEOLOGY

Abstract author(s): Taranto, Sergio (Sapienza University of Rome) - Gomez Bach, Anna - Molist, Miquel (Universitat Autònoma de Barcelona)

Abstract format: Oral

Since their invention, ceramic artifacts, thanks to their resistance and diffusion, have been the protagonists of archaeological contexts.

Archaeological studies have focused on these artifacts to investigate different aspects of ancient societies: relative chronology, cultural identity, contacts, production skills and techniques, transmission of knowledge, influences.

In recent years, ceramics have been studied from the point of view of its function: residues and use-wear analysis.

In fact, the study of the function of ceramics allows us to investigate the dietary behaviors of societies. These can provide information on the anthropological and sociological aspects of ancient human communities.

In this communication, examples of how a pottery forms can be studied through experimental archeology will be presented. In particular, the importance of reproducing and using ceramic replicas to understand the functional values and characteristics of ceramic artefacts will be emphasized. In fact, only dedicated experimental replicas and focused trials can improve our knowledge about specific pottery forms from the past.

3 ORGANIC RESIDUES AND VESSEL SHAPES. THE CASE STUDY OF CARRER REINA AMÀLIA

Abstract author(s): Breu, Adrià - Gómez-Bach, Anna - Molist, Miquel (Autonomous University of Barcelona)

Abstract format: Oral

New recent data from the mid Vth millennium neolithic societies in the north-eastern coast of the Iberian Peninsula has shown that, almost a millennium after the arrival of the first agro-pastoral communities, new economic strategies were consolidated and human groups were developing new and unique ways to interact with the environment and themselves. The social developments guiding the

transition between the epicardial and postcardial Neolithic certainly implied changes in the way pottery types were produced and used. The goal of this communication is to present the analysis of 51 pottery vessels and their organic residues from the two oldest occupation phases in the site of Carrer Reina Amàlia and assess whether the range of vessel shapes present in this assemblage can explain variations in their contents. These will provide useful data to better understand how much did shape mattered these particular human groups when choosing the best vessel to contain and/or transform organic products.

4 MONTBOLÓ: SINGULAR HANDLES FOR SPECIFIC PURPOSES?

Abstract author(s): Gomez Bach, Anna - Faro, Santi - Molist, Miquel (Universitat Autònoma de Barcelona)

Abstract format: Oral

This presentation will review main pottery collections from different Early Neolithic sites from NE Iberian Peninsula and South of France. Aspects such as typology, the morphology of handles in relation to a volumetric and experimental approach will be done with the aim of studying the typology known in the references as “Montboló type” or “Montboló style”. This specific pottery production is characterized by thin walls, polished surfaces, and singular apprehension or suspension system.

Those technological and functional analyses have never been revised with attention since its identification in Balme de Montboló at Pyrénées-Orientales (Guilaine et al. 1971-1972, Guilaine 1974). The possibility to set up an exhaustive experimental program will help us to define and understand these tubular handles, in a vertical position and grouping in 2 to 6 along the vessel surfaces. Moreover, these elements let infer in storage and mechanical properties that go beyond its decorative aspect across the Early to Middle Neolithic sequences.

5 RAW MATERIAL AND POTTERY SHAPES IN BARCELONA THROUGH CLAY STUDIES DURING MIDDLE NEOLITHIC

Abstract author(s): Pera, Cristina (Autonomous University of Barcelona)

Abstract format: Oral

This contribution aims to identify, characterize and understand the raw material strategies developed by prehistoric societies in Barcelona’s plain (northeast of the Iberian Peninsula). To achieve this goal, the petrographic study performed on main middle Neolithic sets recovered in Carrer Espalter site (Filmoteca de Catalunya) and their archaeometric results will be presented. It is a well-known open-air settlement for being located in the area with the highest concentration of Neolithic sites (Raval area) and for presenting a chronology of the IV BC with later occupation during Early Bronze Age.

Shapes and pottery typology analyses, macroscopic manufacture techniques and archaeometric studies (thin section and petrographic groups) have been carried out with the aim to identify and characterize the acquisition strategies from raw material to technological transfers.

This study addresses this issue at a specific prehistoric cultural phase, such as the Middle Neolithic, a well known period for its richness in pottery production throughout Western Europe.

6 TALKING POTS: INVESTIGATING CONSUMPTION STRUCTURES OF THE LATE COPPER AGE

Abstract author(s): Fábíán, Szilvia - Berente, Zoltán (Hungarian National Museum) - Marton, Tibor (Research Centre for the Humanities, Institute of Archaeology, Eötvös Loránd Research Network - ELKH) - Rajna, András (Ferenczy Museum Center)

Abstract format: Oral

This research is based on the premise that the archaeological identification of households and activity areas is possible since the basic activities of everyday and symbolic life were carried out in a delimited area and within a delimited timeframe. Our Funded (NRDI Fund K_129332) research aims to delineate household units, the smallest social unit at the settlements, through the combination of various approaches with statistical and GIS modeling of the settlement remains from the 4th millennia BC in Hungary.

During this investigation, we assume that the assessment of the vessel sets may shed light on the size, complexity, and wealth of a given household and the community. But to determinate these assemblages, we have to reconstruct the functions of the different vessel types which are not necessary derived from the nomenclature of the traditional typology.

We attempt to infer the function of the vessels from their shape, size and technology through statistical analyses rather than from archaeometric analysis bearing in mind the formation of archaeological contexts and wider theoretical and methodological tools, like behavioral and ethnoarchaeology. Three-dimensional modeling was used to get more new data about the ceramics. Based on our statistical evaluations on this new metric data, the ceramic typology developed for the site was verified and we were able to collect data regarding the functionality of the vessel types.

With this method, we also tried to classify the pottery fragments into larger groups to define their functions. Through this, it can be possible to see trends among the ceramic forms and other archaeological finds and features and to delineate activity areas of the given settlement.

7 DIVERSITY IN POTTERY DURING EARLY BRONZE AGE: NORTHEAST OF IBERIAN PENINSULA AS A CASE

Abstract author(s): Vicens-Saiz, Laura - Bach Gómez, Anna - Molist Montaña, Miquel (Autonomous University of Barcelona)

Abstract format: Oral

During the transition III-II millennium cal BC, and throughout this, the ceramic productions consumed by the human groups of farmers and herders of Europe increase and diversify so much in shapes as in decorations. These have been partially sequenced and grouped by decorative techniques (printing, engraving, and plastic application) and shapes (introduction of carinated vessels, and large containers). Early Bronze Age to Middle Bronze Age assemblages from northeast of the Iberian Peninsula let to deal with this diversity.

In this presentation, we have worked from the pottery materials of three areas: Baix Ebre, Baix Camp and Pla de Barcelona, all placed in the North East of the Iberian Peninsula to look for recurrences and pattern evidence of production and consumption. Mainly we will work with the combination of plastic application motif (outer surface of the vessel and handles) and shapes, to identify how the formal and decorative aspect infers functionality.

8 DISTINCTIVE CERAMIC FORMS IN SOUTHERN ITALY DURING EBA-MBA: FORMAL TAXONOMY AND FUNCTIONAL HYPOTHESES

Abstract author(s): Marino, Sara (-)

Abstract format: Oral

In Southern Italy, during the EBA-MBA, the presence of some characteristic and singular ceramic forms is quite evident: vases with different types of internal support and with internal dividers; the so-called “hourglass” vases and the Aeolian “fruit bowls” are the main ones, although not the only ones. These forms can be found mainly, but not exclusively, in residential contexts. In some cases, in association with these forms, there are also distinctive non-vascular elements or objects in stone and animal hard materials as well as the widespread presence of miniature vases from even ritual and necropolis contexts. The strong distinctiveness of these ceramic objects has, in some cases, discouraged a more restricted typological classification based on formal differences, while it has more easily proposed generic but not definitive functional hypotheses. The diffusion of these forms in other contemporary Mediterranean contexts inspires a more careful and detailed reflection. In this paper we will try to tackle the problem with a harsher taxonomic approach on formal differences, by associating the materials not only with the reference contexts but also with the other non-ceramic elements and with the (few) analyses carried out.

9 INTERDISCIPLINARY APPROACHES TO THE SHAPE AND FUNCTION OF MIDDLE BRONZE AGE MINIATURE VESSELS FROM EASTERN ROMANIA

Abstract author(s): Drob, Ana (“Alexandru Ioan Cuza” University, Interdisciplinary Research Institute, Science Department, Arheoinvest Research Center, Iași) - Bolohan, Neculai (“Alexandru Ioan Cuza” University, Faculty of History, Iași) - Vasilache, Viorica (“Alexandru Ioan Cuza” University, Interdisciplinary Research Institute, Science Department, Arheoinvest Research Center, Iași)

Abstract format: Oral

The typology of some special pottery forms has always been a point of interest for the archaeologists. For the middle bronze age period in the eastern Carpathian basin, the ceramic typologies included a series of miniature vessels attributed to the Costișa and Monteoru pottery cultures. Although the role of these forms is not fully known, being classified as ritual or special purposes, in this research we conducted a case study for this type of vessel. The analyzed pot comes out from the settlement from Piatra Neamț-Bâta Doamnei (Neamț County) and has on the inner surface consistent traces of red pigment. This find led to a series of questions related to its use, being known that in this period the painting of ceramics was no longer practiced. In order to obtain more information about these residues were performed detailed analyzes, such as those of optical microscopy (details of texture and surfaces), SEM-EDX (elemental composition) and micro-FT-IR (chemical compounds). Following these investigations, a series of data were obtained on the nature of the pigment, the preparation method, as well as some information related to the source of raw material. Therefore, the use of miniature vessels for the preparation of pigments contributes to the knowledge of certain functions that can be attributed to this typological category.

10 TOO MANY POTS, TOO FEW FUNCTIONS. WHAT IS GOING ON WITH THE URNFIELD POTTERY?

Abstract author(s): Łaciak, Dagmara - Baron, Justyna (University of Wrocław) - Łucejko, Jeannette (University of Pisa) - Stolarczyk, Tomasz (Museum of Copper in Legnica)

Abstract format: Oral

Studies on prehistoric pottery usually entail its typological and formal classification suggesting the use of each of the vessel forms (cups, jars, pots etc.). This is followed by the dating and attributing the assemblages to certain “archaeological cultures”. Any further research starts from this point.

The Urnfield (ca. 1300-550 BC in Central Europe) pottery collections consist mostly of vessels suitable for storage, cooking and serving food, such as pots, amphorae, cups, vases, and bowls. Similar vessel shapes and ornamentation occur in funerary and settlement contexts. Rattles, figurines (mostly birds) and other small objects of clay constitute only a small part of the ceramic assemblages.

Most of the vessels found at the cemeteries were suitable for use as containers. It does not mean they were necessarily utilised in household activities: as the prehistoric iconography shows, pottery played a crucial role in funerary practices. For the functional analysis of the vessels, we selected data from three large cemeteries in SW Poland: Domasław, Czernikowice and Wicina.

We started the study by examining the vessel shapes which might also suggest their function. The kernos from Domasław is a compelling example. Kernoi are extremely rare in this part of Europe but in the Mediterranean world, they are connected to making ritual offerings. Finding such an object in a grave so far away to the north may (but does not have to) indicate a matching function. The pottery (both common and more exotic specimens) from the other two cemeteries was sampled for the GC-MS analysis. The obtained data, along with the traditional typology, anthropological information and spatial analysis, gave a new, exciting picture of the ceramic use patterns.

This study is a part of projects of the Polish National Centre for Science (NCN 2014/12/S/HS3/00082, 2016/23/B/HS3/00450) and The National Heritage Board of Poland (no 3686/2019).

11 QUANTITATIVE SHAPE-BASED APPROACHES TO FUNCTIONAL TYPOLOGIES IN LATE BRONZE AGE AND IRON AGE POTTERY FROM SOUTHWEST ANATOLIA

Abstract author(s): Daems, Dries (Middle East Technical University) - Kafetzaki, Danai (KU Leuven)

Abstract format: Oral

Pottery studies have been part and parcel of archaeology since its origins as a scientific discipline. This long research history has resulted in standardized approaches to pottery analysis focused on sets of parameters, as for example in the Peacock classification system of modes of production (Peacock, 1977, Pottery and Early Commerce). An important part of this research has been dedicated to the establishment of pottery typologies. Three main categories of typology building have been identified: intuitive typologies, the type-variant system, and quantitative typologies (Sinopoli, 1991, Approaches to Archaeological Ceramics). Recent research in particular has started to increasingly move from the first two to the latter.

In this paper, we will present our work on using shape-based quantitative methods for typology building, applied to Late Bronze Age and Iron Age pottery collected from the area of Sagalassos (southwest Anatolia). First, we vectorize pottery drawings using the full vessel profile, the profile outline as well as a set of individual scale and shape measurements (e.g. wall thickness, diameter, rim position, roundness, protuberance, etc.) with potential functional relevance. Next, for each of the quantified elements, we compute distance matrices which are used to pick the most suitable mapping and propose coherent material groupings. These groupings are consecutively validated or rejected qualitatively by the material specialist through comparisons with existing type-variant typologies of Late Bronze Age and Iron Age pottery in the area. The feedback is then incorporated in a subsequent iteration of algorithmic grouping. Our work shows how morphological quantitative analysis can be integrated as an additional analytical tool in the toolbox for typological classification and generate new insights for the functional underpinnings of pottery typologies.

482 MOULDING THE WORLD. CRAFTSMEN AND CRAFTSMANSHIP BETWEEN THE BALTIC AND THE CARPATHIANS IN THE LIGHT OF ARCHAEOLOGICAL RESEARCH (2600-500 BC)

Theme: 6. Material culture studies and societies

Organisers: Strózyk, Mateusz (Archaeological Museum in Poznań) - Kiss, Viktória (Hungarian Academy of Sciences) - Nørgaard, Heide (Moesgaard Museum) - Garbacz-Klempka, Aldona (AGH University of Science and Technology) - Czebreszuk, Janusz (Adam Mickiewicz University in Poznań)

Format: Regular session

The mastery of metalworking skills occupies a special and significant place in the history of our culture. Particularly copper and its alloys, due to their physical properties (ductility, colour, strength, and remouldability) found a wide range of applications both on the functional/usability and symbolic/prestigious level. Bronze in the form of raw material or ready-made items crossed the borders between various social, ideological, and economic systems and manufacturing traditions, inspiring societal changes in many regions.

The versatility of this metal resulted in the supra-regional spread of some types of objects and manufacturing techniques in Central Europe, thus triggering the development of many local bronzeworking traditions. The rise of large metalworking centres indicates not only a high demand for bronze products but also the importance of trade contacts, often between distant communities.

The key issues in the interpretation of changes taking place during the Bronze Age (within general frameworks, 2600-500 BC) focus on an attempt to answer the questions of the processes behind the transmission of technical knowledge and metal objects and the dynamics of change. The most satisfying answers are provided by archaeometallurgical investigations, combining scientific experiments and multidisciplinary analysis by the cooperation between archaeologists and scientists.

The proposed session, in the widest sense, will be focused on an attempt to define the origins of traditions and networks of exchange of metalworking-related ideas, the dynamics of changes and technology transfer as well as the durability and innovativeness of metalworking solutions in the area stretching from the broadly defined Baltic region to the Carpathian Basin. This session welcomes papers that discuss:

- development of metalworking in the context of the product quality, with emphasis on the analysis of metal composition and production techniques,
- possibility of reconstructing bronze-working practices and techniques using the potential of interdisciplinary research.

ABSTRACTS:

1 LOCAL OR INTERNATIONAL ARTEFACTS? THE ARCHAEOLOGICAL DIFFERENCE BETWEEN ORNAMENTS AND SWORDS IN THE NBA AND ITS IMPACT ON CRAFT ORGANISATION

Abstract author(s): Noergaard, Heide (Moesgaard Museum, Department of Archaeology) - Vandkilde, Helle (Aarhus University, School of Culture and Society)

Abstract format: Oral

We often talk of mobile people and mobile artefacts in the European Bronze Age and consider artefact mobility as proof of people's mobility. In the last years, our knowledge concerning prehistoric mobility has been put to a new level, mostly due to strontium isotope investigations. Regarding the Nordic Bronze Age, a cultural unit spread in northern Europe roughly from 2000-900BC, natural scientific analysis proved a far larger mobility rate than previously assumed and natural scientific investigation of metal artefacts showed shifting networks in the metal trade. This paper aims to examine the possible connection between the shifting trading networks and the increase of mobility. Further, it is to be examined if ornaments and swords might reveal different kinds of information concerning this question and what such difference might reveal regarding the organisation of metalcraft.

The study is based on a large scale archaeometric investigation of 550 artefacts from the first 800 years of metallurgical establishment in the Nordic Bronze Age, focusing on the time when the metal trade opened up for the southern European ore sources around 1600 BC and onwards. The metal used to craft ornaments and swords is examined regarding possible differences in their material origin. Lead isotope studies will clarify if ornaments can be considered evidence for local manufacture and might be directly connected to mobile people. It is asked if swords, on the other hand, reveal a much more international picture and should perhaps be seen as traded objects rather than the personal ornament of mobile people. A compared investigation of these two most widespread artefacts groups in the Nordic Bronze Age would allow understanding the local metal workshops' repertoire and their influence on the metal trade. It would also highlight the importance of skilled craftsmanship within the established trading systems of the European Bronze Age.

2 DYNAMICS OF RAW MATERIAL SUPPLY IN THE CENTRAL AREA OF THE CARPATHIAN BASIN DURING THE EARLY AND MIDDLE BRONZE AGE

Abstract author(s): Kiss, Viktória (Institute of Archaeology, HAS) - Pernicka, Ernst (University of Heidelberg; Curt-Engelhorn-Zentrum Archäometrie gGmbH, Mannheim)

Abstract format: Oral

The presentation focuses on 40 Bronze Age metal objects from various Hungarian sites, including burial and hoard finds. We will investigate the period between 2800 BC and 1500 BC, from the transitional period to the Bronze Age until the end of the Middle Bronze Age according to Hungarian terminology. Compositional analysis of Bronze Age finds from Hungary are known from the 1960s, however, only a very small number of Middle Bronze Age lead isotope data were available. Elemental compositions and lead isotope ratios of artifacts were analysed in order to determine the provenance of copper. The geochemical signatures were compared with ores from central and southeastern European copper deposits, exploited during Prehistoric times. The results reveal insights into the raw material supply and management of the Early and Middle Bronze Age communities living in the central area of the Carpathian Basin.

Investigations were supported by the Momentum Programme of the Hungarian Academy of Sciences (Project Nr. LP 2015-3).

3 PRODUCTION, FUNCTION AND REPRESENTATION – NEW ASPECTS ON THE BRONZE AGE METALLURGY IN THE BALKANS

Abstract author(s): Gavranovic, Mario (Austrian Archaeological Institute, Austrian Academy Of Sciences) - Mehofer, Mathias (Vienna Institute for Archaeological Science, University of Vienna)

Abstract format: Oral

Within the frame of ongoing research project "Bronze Age metal producing societies in western and central Balkans" (FWF-Austrian Science Fund, project no. P32095) 562 Bronze Age artefacts from the area of today's countries of Bosnia-Herzegovina, Croatia, Serbia and North Macedonia have been investigated by means of chemical (ED-XRF) and lead isotope analyses (MC-ICP-MS). Bearing in mind the position of the study area between the Carpathian Basin, the Alps and the Mediterranean, one of the important goals of the project is to examine if and to what extent the development of the local metallurgy was connected with neighboring regions in a diachronic perspective.

The paper will discuss selected results with a special focus on the production of Bronze Age metal types with limited regional distribution as they most likely represent objects made in some of the domestic workshops. Especially for the time between 11th and 9th century BC, the archeological record suggests a significant increase of the local bronze working with a considerable number of sites being engaged in casting of artefacts. However, the technological background of the rising metallurgical activities in the Balkans was for a long time unexplored due to the lack of the analytic approach. Our investigations revealed the existence of chronologically and regionally different alloys as well as specific mixtures for certain object groups. The prestigious objects such as swords or oversized jewelry items deserve special attention since they show often inconsistent composition, traces of subsequent processing

and repair. The analytic results also point to the presence of seemingly finished and processed objects whose composition do not meet the criteria for full use in functional sense.

4 OLD FINDS IN A NEW LIGHT. ON THE BEGINNINGS OF ENEOLITHIC METALLURGY IN THE MIDDLE WARTA BASIN

Abstract author(s): Zurkiewicz, Danuta - Szmyt, Marzena (Adam Mickiewicz University in Poznań; Archaeological Museum in Poznań) - Garbacz-Klempka, Aldona (AGH University of Science and Technology in Cracow) - Silska, Patrycja - Stróżyk, Mateusz (Archaeological Museum in Poznań)

Abstract format: Oral

In the second half of the 20th century, a lively discussion was taking place on cultural and chronological classification of the artefacts discovered at Bytyń and Rudki in Greater Poland (Wielkopolska). Spiral bracelets, Bytyń-type axes, silver items, and, above all, unique oxen figurines became the symbols of this debate. The latest findings show that these stylistically and technologically advanced metal artefacts should be linked with a relatively early chronological horizon, in the Polish Lowlands associated mainly with the Funnel Beaker culture.

The presented project aims to provide better insight into the issues of raw material and technology of these rare finds and to place them in a local context including both the evidence of the use of metal objects and indications suggesting the knowledge of metallurgy among the Lowland communities in the 4th millennium BC.

The application of modern analytical methods to the study of metal artefacts and other objects associated with early copper and bronze metallurgy, retrieved from well-recognized settlement contexts, will contribute significantly to the considerations outlined above.

5 METAL ARTEFACTS AND THEIR USERS IN THE EARLY BRONZE AGE ON THE POLISH LOWLAND. NEW DATA FROM ŁĘKI MAŁE

Abstract author(s): Szmyt, Marzena (Adam Mickiewicz University in Poznań; Archaeological Museum in Poznań) - Garbacz-Klempka, Aldona (AGH University of Science and Technology in Kraków) - Czebreszuk, Janusz (Adam Mickiewicz University in Poznań) - Müller, Johannes (Christian-Albrechts-Universität zu Kiel)

Abstract format: Oral

The barrow cemetery in Łęki Małe originally consisted of a dozen or so earth mounds, which covered tombs of stone structures. Five of them were explored by archaeologists in the 1930s, 1950s and in 1970. During the excavations, it was discovered that some of the tombs were completely or partially robbed and destroyed, and only a part remained intact. Nevertheless, a series of bronze and gold artefacts were found in the tombs. Among them there are signs of power (halberds), weapons (daggers), tools and ornaments. The Łęki Małe cemetery is seen as a part of the north-eastern enclave of the Unětice culture. Currently, all artefacts from Łęki Małe are subject to detailed interdisciplinary research undertaken as part of two scientific projects developed jointly by the Archaeological Museum in Poznań, the Adam Mickiewicz University in Poznań and the Christian-Albrechts-Universität zu Kiel. Three scientific agencies - the National Science Centre, Poland, Deutsche Forschungsgemeinschaft, Germany, and National Programme for Development Humanities, Poland, provided funds for the development of the projects.

All organic materials (including human and animal bones, and plant remains), clay vessels, flint, stone and metal artefacts have been analyzed. Among others, a long series of isotopic data including radiocarbon datings and some archaeogenetic data have been obtained. Also the new archaeometallurgical observations have been collected. It is possible now to present preliminary results of the completed research, which reveal a new context for both metal artefacts and their users in the last centuries of the third mill. BC and first centuries of the second mill. BC in the Polish Lowland.

6 NEW DATA FROM NON-DESTRUCTIVE INVESTIGATIONS ON PREHISTORIC GOLD ADORNMENTS OF THE SARASĂU HOARD (ROMANIA)

Abstract author(s): Bors, Corina Ioana (National History Museum of Romania - MNIR) - Radvan, Roxana - Ghervase, Luminita (National Institute for Optoelectronics - INOE 2000)

Abstract format: Oral

The paper presents the results of non-destructive investigations carried out for 11 prehistoric gold adornments, which were part of the Sarasău hoard, a Bronze Age find nowadays partially preserved in the collections of the National History Museum of Romania (NHMR). The other part of this assemblage, found in the mid-19th c., is kept in the collections of the National Hungarian Museum. Several bronze artefacts from this assemblage are lost. For the objects acquired five years ago for the collections of the NHMR, at first a series of preliminary XRF investigations were conducted at the Investigation Department of the NHMR, followed by more complex ones carried out at the National Institute for Research and Development in Optoelectronics – INOE 2000. The analysed artefacts included seven discoidal appliques (a very rare type of prehistoric adornments), three notched rings, and five small beads from the batch of 239 beads. The investigators from INOE used the most advanced methods for the examination of the material and manufacturing technology of these gold artefacts in order to provide additional data to the historic and archaeological study concerning these very rare objects of this LBA hoard. The investigations have yielded a relevant set of information for curators, restor-

ers and conservators. The X-rays allowing to identify the potential hidden degradations or to reveal all the technological aspects also generated high-resolution digital images, which were then processed and combined with other information about the nature of the material. The investigations involved also the elemental analyses obtained by XRF (a new set of data both in addition and comparison to the preliminary ones obtained at NHMR); these are refined and completed by electronic microscopy associated with V ray dispersive spectroscopy (EDS). The physical and chemical analyses of this kind were made in the CERTO and RECAST laboratories of INOE.

7 TRAVELLING IDEAS AND METALWORKING TECHNIQUES – THE CASE OF BRONZE SICKLES

Abstract author(s): Fejer, Eszter (Eötvös Loránd University FH IAS, Budapest)

Abstract format: Oral

Bronze sickles are one of the most common types of metal artifacts in the Bronze Age Carpathian Basin. Based on the assumption that sickles are fairly uniform objects and that they do not show significant variability in time and space, questions about whether and how they reflect transcultural interactions, the transfer of technological innovations have rarely arisen.

Bronze sickles first appeared in the Carpathian Basin at the end of the Middle Bronze Age (ReBA-BB), they were deposited in enormous quantities in the Late Bronze Age (mostly ReBD-HaA1, but also HaA2-HaB) and seemed to be produced until the Early Iron Age (HaB-HaC). From a nearly thousand-year-long period more than 10.000 objects have come to light in the area.

Despite its presumed homogeneity, this large amount of material offers a wide range of possibilities to detect the spread of techniques, ideas or the movement of single objects between different regions. In addition to typo-chronological data, the analysis of production and use-wear marks can also provide us some evidences that technological knowledge had been successfully transferred or lost in translation and only partially forwarded (e.g. the morphological elements of the sickles had been transferred; however, their accompanying hafting techniques got lost). This paper focuses on some tanged sickle types of the Carpathian Basin and, by involving various investigation methods, it aims to reveal the supra-regional and regional connections behind the observed technological changes.

The presentation is supported by the Higher Educational Thematic Excellence Program of the Eötvös Loránd University.

8 FROM BONE TO BRONZE. METALWORKING IN THE LIGHT OF DATA FROM THE EBA CEMETERY AT NIŽNÁ MYŠĽA (SLOVAKIA)

Abstract author(s): Jaeger, Mateusz (Adam Mickiewicz University in Poznań) - Stróżyk, Mateusz (Poznań Archaeological Museum) - Olexa, Ladislav (Slovak Academy Sciences)

Abstract format: Oral

The proposed paper presents the results of statistical analyses of sources from an extensive cemetery in Nižná Myšľa, Slovakia. A long-term study of the site revealed nearly 800 well-preserved burials dating to the first half of the 2nd millennium BC and associated with the Otomani-Füzesabony cultural circle.

The vast collection of sources of various categories was subjected to a multifaceted statistical analysis in order to establish the chronological and spatial development of the cemetery and to establish possible relations between the material culture and the sex and age of the buried.

The analysis made it possible to capture the stage of appearance of metal in the local community and the dynamics of development of autochthonous metallurgical production, partly based on local tradition and partly modified under the influence of external factors and influences. Moreover, in the course of the research, the elements of equipment of the deceased were identified, which can potentially be connected with the production of bronze objects (graves of metallurgists).

9 NEW DATA ON THE METALLURGISTS' BURIALS IN THE EARLY AND MIDDLE BRONZE AGE OF THE CARPATHIAN BASIN

Abstract author(s): Melis, Eszter (Institute of Archaeology, Research Centre for the Humanities, ELKH; Castle Headquarters Integrated Regional Development Centre Ltd.)

Abstract format: Oral

The innovation of copper smelting and alloying represents a turning point in the organisation of production. However, the metallurgists' burials are considered as exceptional finds; they are one of the main sources of identification of specialised handicraft. The new technologies in metalworking (e.g. two-piece moulds) and the display of craftsmanship, in the burials as well, were included in the 'Yamnaya Package' expanded from the Pontic region to Central Europe before the Bell Beaker Period, around 2500 BC. While in the time of Corded Ware and Bell Beaker Complexes (2500–2200 BC) the metallurgists' tools (stone hammer and anvil) were found almost exclusively in the warrior elite's graves, the metallurgists' burials of the Middle Bronze Age (2000–1500 BC) from the territory of Hungary are good examples for non-elite burials with foundry equipment. From this point of view it is problematic, if the deceased was a real craftsman or controlled the handicraft. The emergence of the specialised craftsmen from the less specialised subsistence craft and the organisation of metallurgy during the Early and Middle Bronze Age (2500–1500 BC) will be discussed in my presentation based on the metallurgists' burials in the Carpathian Basin.

TRACING THE CRAFTSPEOPLE. LATE BRONZE AGE GRAVES AND HOARDS OF METALLURGISTS FROM GREATER POLAND

Abstract author(s): Strózyk, Mateusz (Poznań Archaeological Museum) - Garbacz-Klempka, Aldona (AGH University of Science and Technology) - Sińska, Patrycja (Poznań Archaeological Museum) - Kozana, Janusz - Piękoś, Marcin - Żak, Paweł - Fijołek, Andrzej - Wardas-Lasoń, Marta - Perek-Nowak, Małgorzata (AGH University of Science and Technology)

Abstract format: Oral

One of the chief roles in the development and spread of bronze metallurgy was served by metalworkers. Today we can deduce the level of their skills and technical knowledge almost exclusively on the basis of the ready-made items, tools and metallurgical debris. The most important among these sources are deposits attributed to metalworkers and graves equipped with casting implements. The analysis of these finds permits an attempt at the reconstruction of bronzeworking practices and the workshop of craftspeople, the principles/rules they followed, and the organisation of their work. The application of methods derived both from humanities and science makes it possible to obtain new information regarding, among others, chronology, the context of finds, and the social status of people buried in the so-called graves of metallurgists.

The paper discusses the results of the study on the Late Bronze Age graves and hoards of metalworkers from Greater Poland. The data obtained will provide a good starting point for a more general discussion on the development of the Late Bronze Age metallurgy in Central Europe.

ABOUT TRAVELLING CRAFTSMEN IN THE BRONZE AGE: NEW RESULTS ON METALLURGY IN THE EASTERN BALTIC SEA REGION

Abstract author(s): Civilyte, Agne (Lithuanian Institute of History) - Duberow, Elka (Curt Engelhorn Centre Archäometry) - Skvortsov, Konstantin (Institute of Archaeology of the Russian Academy of Science)

Abstract format: Oral

Many unique materials on the eastern coast of the Baltic sea demonstrate the intense metallurgical activity at the local Bronze Age sites. Namely, hillforts with a plethora of casting moulds. However, this evidence contradicts the real quantity of Bronze artifacts. From a typological point of view, a very limited ensamblage of objects were produced and the Scandinavian forms have proven dominant. Bronze casting seems to have taken place only momentarily during the Late Bronze Age. This makes the situation much more intriguing because it raises questions about the value and use of metal in the society. In this paper we present new results based on archaeometallurgical analysis of Bronze artifacts from the Eastern Baltic sea region. Our aim is to show the potential provenance of this metal and to investigate how it came in to this region. We will focus on the newly discovered hoard from Büsterwalde (formerly East Prussia) with clearly indications for travelling person. We will not only interpret the chemical composition of objects in a wider context but also look at the technological aspects of production. Finally, metal as imported material and the spread know-how will be connected with moving people, economic, and symbolic motivation.

HUNTER-FISHER SOCIAL ECOLOGY IN FORESTED ENVIRONMENTS: APPROACHING BOREAL NATURECULTURES

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Schreiber, Tanja - Piezonka, Henny (Institute of Prehistoric and Protohistoric Archaeology, Kiel University) - Nordqvist, Kerkko (Department of Archaeology, University of Helsinki) - Chairkina, Natalya (Institute of History and Archeology of the Ural Branch of the Russian Academy of Sciences) - Taylor, Barry (Department of History & Archaeology, University of Chester)

Format: Regular session

The boreal forests of the northern hemisphere, also referred to as taiga, stretch almost continuously across the high latitudes of Europe, Asia and North America, forming the world's largest biome. The economic and ecological aspects of subarctic forests have been important for generations of people and their significance prevails, especially in view of today's pressing challenges of global warming and the rising demand for resources.

The cold climatic conditions and the short growing season of northern boreal forests, unsuitable for agriculture, have favored hunter-fisher subsistence for thousands of years, from the beginning of the Holocene until today. As has been seen in modern indigenous forager communities, an interwoven relationship between humans and the boreal forest characterizes lifeways and cosmologies. This entanglement is expressed through several adaptive strategies based on multi-species systems. Strong human-animal ties are reflected in nomadic lifeways based on animal seasonal movements and associated seasonal shifts of hunting and fishing grounds, reindeer husbandry, and the use of dogs for hunting. Of special importance can be mass harvesting strategies of (seasonally) abundant resources such as salmon or shellfish, potentially leading to surplus economies and the rise to territoriality and sedentism, social stratification, the display of wealth and power through terraforming or specific classes of material culture and thus to possible beginnings of social inequalities and conflicts.

We welcome contributions that take into view trajectories of social complexity in hunter-fisher communities of the northern hemisphere and papers that investigate the role forest environments play in shaping lifeways of past and modern forager groups. We

want to discuss these naturecultures in terms of resource exploitation, housing, transportation, belief systems and subsistence strategies, including mobility, storage and seasonality.

ABSTRACTS:

1

THE SECRET LIFE OF TREES DURING THE NORTH EUROPEAN MESOLITHIC

Abstract author(s): Taylor, Barry (Department of History and Archaeology, University of Chester)

Abstract format: Oral

The forest environments of Northern Europe provided a wealth of economic resources for the human communities inhabiting these regions during the Mesolithic. Species of shrubs and trees were particularly important, providing a suite of different materials that were utilised in an incredible range of material culture. However, we know surprisingly little about the ways in which trees were understood by the human communities that exploited them.

This paper seeks to explore this issue, by using the concept of object biography to study the relationships between trees and humans during the North European Mesolithic. Like objects, trees can have long and complex life histories, comprising of numerous interactions with humans, animals, and other aspects of the environment. These interactions constitute relationships between the tree and its world, relationships in which the tree (as a living entity) played an active part. Though the trees themselves rarely survive archaeologically, evidence of these interactions persist in the remains of artefacts made from them, the waste produced through their manufacture, and the remains of plant foods. By studying these forms of evidence, this paper seeks to explore the way different species of tree may have been understood by human communities. It will look specifically at the way humans harvested, used, and disposed of material deriving from different species, and how the trees themselves would have responded to these interactions. In doing so it will highlight the active, but different roles that trees played in the lives of humans, and how humans may have perceived particular species.

2

INTO THE WOODS ... APPROACHING COAST-HINTERLAND RELATIONS IN THE LATE MESOLITHIC OF SOUTHEAST NORWAY

Abstract author(s): Schülke, Almut (Museum of Cultural History University of Oslo)

Abstract format: Oral

This paper explores how human engagement with the wooded hinterland in the Late Mesolithic of Southeast Norway can be approached archaeologically. Hunter-gatherer engagement with the environment is, especially in Scandinavia, often discussed from a maritime perspective, as many archaeological sites are placed at the coast. They are today either submerged or located on uplifted land. In Southeast Norway constant landuplift since Late Glacial times has resulted in the preservation of hundreds of Mesolithic coastal sites on dry land. Their placement in areas which today are exposed to infrastructure development has not only led to a high number of excavated former coastal sites, but has also enhanced the idea that the coast and marine resources played a major role for Mesolithic hunter-gatherers. A generally accepted model on a semi-sedentary way of life prevails, where larger shorebased locations are interpreted as base-camps. But how and to what extent the people who lived in these coastal areas used and were attached to the coastal hinterlands and its extensive woodlands is still little discussed, even though there are growing indications of such use. These include the evidence of visits of hinterland locations, the human manipulation of forested areas as attested by pollenanalysis, bones of terrestrial animals and depictions of such on rock art, which can indicate (seasonal?) movement and mobility patterns into and across the woods. This contribution aims to set indications of hinterland and woodland use on the agenda, and asks which possibilities these open for a thicker understanding of human-nature encounter at the time – in social, economic, and cosmological terms.

3

THE ECOLOGY OF WAR – HUMAN-ENVIRONMENT RELATIONSHIPS IN WARFARE AMONGST CIRCUMPOLAR HUNTER-GATHERERS IN PAST AND PRESENT

Abstract author(s): Schreiber, Tanja (Institut fuer Ur- und Fruehgeschichte Kiel)

Abstract format: Oral

The relationship between human warfare and the natural environment has rarely been studied outside military histories and environmental contexts, particularly prior to the 20th century. Research into the connection between ecology and conflict has largely focused on the damaging environmental effects of war and how this can dictate modern combat tactics. However, the way environment shapes human behaviour in war and vice versa has not been sufficiently investigated, archaeologically or anthropologically. Is this relationship reciprocal? How does it influence people's perceptions of their socio-environmental world? In what way was the natural environment used amidst conflict by past societies? Considering the Western dichotomist narratives regarding nature and culture, we can no longer separate war from its environmental context. There is a demonstrated need to consider the symbiotic processes of conflict, especially within non-western, non-agricultural societies.

To address this issue, I present a detailed study on the intersection of ecology and war amongst circumpolar hunter-gatherer groups, using ethnographic, ethnohistoric, and archaeological materials on a comprehensive, multiregional scale. The results reveal a "longue durée" in the ecology of war and reciprocal relationships between humans, non-humans, and built and natural environments in times

of war. The influence of warfare on nature is visible through the modification of landscapes for the construction of defensive monuments, earthen mounds, escape tunnels and other terraforming activities related to warfare. Conversely, the natural environment shapes human behaviour in war through seasonality, geography, access to natural resources, and functions as an influencing rather than determining factor. In the sphere of hunter-gatherer groups, the environment thus acts as a major tool for the conduction of warfare.

4 BEAVER NATURECULTURES IN THE EARLY HOLOCENE OF NORTHWESTERN EURASIA

Abstract author(s): Hussain, Shumon - Laustsen Lomborg, Kamilla (Aarhus University) - Brusgaard, Nathalie (Groningen University)

Abstract format: Oral

Castorid and human lifeways have intersected in Eurasia for many thousands of years – both in glacial and interglacial ecosystems – yet the beaver has left a notable mark especially in material and aesthetic productions of human societies in the archaeological record of the developing Mesolithic of northern latitudes. This paper explores the entanglement of the Eurasian beaver (*Castor fiber*) with these early Holocene societies in the emerging sub-boreal, boreal, and riverine landscapes at the edge of former glaciers. We argue that the archaeological record testifies to the potent ecocultural role of the beaver across a large geographical area spanning at least Northern Germany, the Netherlands, Southern Scandinavia, the Baltic region, and the Trans-Ural area.

We combine evidence from different fields of material culture, faunal remains and different climatic and environmental archives to show that the highly transformative and “textured” landscapes of early Holocene Northwestern Eurasia provided unique conditions for human-beaver interactions, and that the beaver’s consequential environmental agency not only played an important role in anchoring human activities but also greatly encouraged materially-mediated negotiations of the human-beaver interface. Re-casting the respective societies in Northwestern Eurasia in terms of their “beaver-ness” helps to qualify their naturecultures and elucidates their constitutive multispecies fabric.

5 CANNOT SEE THE FOREST FOR THE TREES: THE IMPACTS OF BOREAL ECOLOGY ON REINDEER HUSBANDRY AND FORAGER SUBSISTENCE

Abstract author(s): Windle, Morgan - Piezonka, Henny (Institut fuer Ur- und Fruehgeschichte Kiel)

Abstract format: Oral

Ethnographic and ethnohistorical research into North Eurasian reindeer herding communities has largely been focused on tundra-dwelling and Inner and East Asian mountainous regions groups. Communities inhabiting the West Siberian taiga have remained on the periphery despite small-scale reindeer herding being practiced by some into the present day. In the tundra, reindeer are a primary subsistence resource in a specialized pastoral economy, whereas reindeer in boreal contexts represent both a resource as wild game and as domesticates predominantly kept for transportation and decoy hunting.

The role of reindeer in the taiga is deeply entwined with other aspects of nomadic multi-species lifeways. The way in which belief systems, exploitation of wild resources, such as bird and fish, and the intricacies of reindeer management articulate within a closed forest landscape versus the vast openness of the tundra is largely undefined. How does the forest impact human-animal interactions? How do herded reindeer influence forest dwelling? How do the role of other species dictate human relationships to reindeer and the forest? The enduring practices of the modern hunter-fisher-herder groups can provide analogous insights into these questions and help inform on the formation processes of boreal archaeological records.

In this paper, we will discuss the intersection of boreal ecology and human-animal interactions in subarctic North Eurasia, comparing ethnographic and ethnoarchaeological evidence from tundra and taiga contexts. From abundant resources and natural storage to herd management architectures and transhumance, we seek to demonstrate how the seasonality and biodiversity of boreal ecosystems reciprocally shape hunter-fisher cultures and lead to specific niche construction strategies. In assessing the mechanisms of forest environments, we can identify the visibility and invisibility of these impacts in the archaeological record, improving our ability to study hunter-fisher-herder societies.

6 ECONOMY IN CHANGING CULTURES AND ENVIRONMENT IN UPPER AND MIDDLE VOLGA AREA

Abstract author(s): Lavento, Mika (Valeri S. Patrushev)

Abstract format: Oral

The Middle and Upper Volga belong to the area where the environment has slightly changed during the whole Holocene. The livelihood in northwestern Russia was the hunting and gathering where copper was known after the 5th millennium BC. The hunting of elk and wild reindeer had a central role in economy but decreased when the population grew. This took place together with the changing climate. Fishing retained an important role, too and this comes visible in the bone material preserved at the dwelling sites of the large rivers. Human groups living by River Volga were gathering and utilizing plants, but the macrofossile material has not been much analyzed at the dwelling sites. We still know that the economy in this area was changing when the Bronze Age began at the beginning of II millennium BC.

When the Early Metal Age approached, the cultivation began with wheat, barley and lastly rye. The first traces are visible very early, the remains can be dated in the Middle Volga to the IV millennium BC. Dogs were together with humans already during the Mesolithic

Age. Sheep, cows and pigs indicate the meaning of domesticated animals, which get people to stay in their areas more than hunting. Despite this, hunting and fishing together with gathering still played a role in the economy, as it was especially possible for small groups. These groups represented the population still growing in the II millennium B.C. The archaeological data was studied at the dwelling sites and cemeteries. This large material is located in the Upper and Middle Volga in the area, where habited shores and excavated sites are located on the sandy ridges or shallow deltas.

7 A STONE AGE INNOVATION HORIZON IN THE SIBERIAN TAIGA: EXPLORING THE ENVIRONMENTAL BACKGROUND

Abstract author(s): Piezonka, Henny (Christian Albrechts University Kiel) - Chairkina, Natalya (Institute of History and Archaeology, Ural Branch, Russian Academy of Sciences)

Abstract format: Oral

The emergence of complex enclosed and fortified sites among Stone Age hunter-gatherers in the Western Siberian taiga in the 7th-6th millennium BCE is an outstanding and unique phenomenon in world prehistory. The early complex settlements coincided with a range of other innovations that bear witness to an overall horizon of substantial social, cultural and economic changes, among them the appearance of pottery vessels, the foundation of sacrificial mounds, and a decrease in residential mobility reflected by the rise of pit houses. It is unclear, however, what led to such complex hunter-gatherer life worlds with new enclosed settlement types. Based also on archaeological and ethno-historical evidence from other parts of the world, one hypothesis regards mass harvesting strategies of seasonally abundant resources (e.g., migratory fish) as possibly connected to the phenomenon.

In the talk, new data from pilot studies at selected key sites in the Middle and Lower Ob’ regions will be presented. Drillings in peat stratigraphies adjacent to the sites provide first insights into the local landscape development concerning the dynamics of water bodies and peat growth. Based on this data and also drawing on palaeoenvironmental evidence from the wider region between the forest steppe to the south and the Transuralian foothills to the West, we will discuss the current state of knowledge on climatic fluctuations and landscape dynamics and outline future avenues of research.

8 RED BUTTONS AND GREEN AXES: SPECIALISED CRAFT PRODUCTION AND LONG-DISTANCE TRANSPORTATION OF ARTEFACTS IN THE BOREAL REGION, FOURTH MILLENNIUM BC

Abstract author(s): Macane, Aija (Department of Historical Studies, University of Gothenburg) - Nordqvist, Kerkko (Faculty of Arts, University of Helsinki) - Tarasov, Alexey (Karelian Research Centre, Russian Academy of Sciences)

Abstract format: Oral

The fourth millennium BCE was a dynamic period in prehistory in the boreal region east of the Baltic Sea. Dominated by fisher-hunter-gatherer societies and varyingly linked with increasing sedentariness and settlement units and possible surpluses based on aquatic resources, this period also shows changing attitudes to materiality and worldview. Among the intriguing new features are evidence of craft specialisation – mass production – appearing in archaeological record. Particular workshops produced objects that were circulated in hundreds and thousands in the boreal region and even beyond. This talk is focused on amber items from the Baltic States and Russian Karelian metal artefacts from Lake Onega, the production and exchange of which reached their peaks during the fourth millennium BCE, especially in its second half. Artefacts produced in bulk from particular raw materials in specialised craft centres, and the long-spanning networks distributing them, are often associated with hierarchically ranked farming communities. In the present forager context they can also be seen as indicators of rising of social and economic inequality. At the same time, the distribution of amber and metal artefacts shows how the waterways have woven communities together and allowed the creation of new kinds of social and material links, reflecting new attitudes not only to the social, but also to the material world.

9 BOREAL FISHER-HUNTER-GATHERERS UNDER EXTERNAL PRESSURE: INTERACTIONS WITH ADVANCING PASTORALISTS AND FARMERS

Abstract author(s): Nordqvist, Kerkko (University of Helsinki, Faculty of Arts) - Heyd, Volker (University of Helsinki, Department of Cultures)

Abstract format: Oral

In the early third millennium BC, major population and cultural turnovers across much of continental Europe led to the emergence of the expansionist Corded Ware Complex. In the regions of the eastern Baltic Sea and beyond, it encountered a new kind of environment – boreal forests inhabited by numerous fisher-hunter-gatherer communities. The new cultural phenomenon took root especially in the Baltic area, but also in the large river valleys in the central part of European Russia. Recent aDNA studies have confirmed that the appearance of Corded Ware in these regions does indeed involve newcomers with a different genetic make-up but they have, so far, not been able to fully clarify the vexed question of the role of fisher-hunter-gatherers in these events. We therefore do not know which contacts prevailed between the arriving and local populations, and how much the interaction involved violence, substitution, cultural adaptation and hybridization. Moreover, it is even less known how forager populations outside the immediate Corded Ware distribution reacted and adapted to the new situation, and how these groups contributed to what we think may be the final centuries of fisher-hunter-gatherers in much of the boreal region.

A NETWORK FOR AGENT-BASED MODELLING OF SOCIO-ECOLOGICAL SYSTEMS IN ARCHAEOLOGY (NASA)

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Verhagen, Philip (Vrije Universiteit Amsterdam) - Daems, Dries (KU Leuven) - Romanowska, Iza (Aarhus University)

Format: Session with keynote presentation and discussion

Agent-based modelling (ABM) has developed into an important methodological tool in archaeological research. ABM allows us to simulate the dynamics of complex systems, hypothesize individual and collective action, and investigate socio-ecological processes at various scales. It represents a veritable paradigm shift, not just for the study of the human past but also for the social sciences in general.

Formal modelling tools such as ABM have several advantages over more informal approaches to study complex dynamics in past human and environmental systems. They 1) enforce conceptual clarity, 2) define mechanisms of change, 3) help infer dynamics in the past from the static archaeological record, and 4) allow for rigorous hypothesis testing.

Applications in archaeology have been growing in number in recent years, but ABM is yet to fully mature as a conceptual and methodological tool for studying the past. To make this maturation possible, we need to encourage wider dissemination among researchers and the establishment of standardized practices. An important step forward was the recent foundation of the Network for Agent-based modelling of Socio-ecological systems in Archaeology (NASA). The main targets of this network are: 1) compile a curated model library for ABM in archaeology; 2) collect and develop best practices and modelling guidelines; 3) develop tools for interoperability following the FAIR principles; 4) create a network for international collaboration.

We invite researchers working on archaeological ABM to present their work and contribute to the goals of the network. Contributions can consist of, but may not be limited to:

- individual case studies highlighting a specific issue, method or solution;
- proposals including demos of ABM modules that can form part of the modelling library;
- examples of integration of ABM with other (archaeological) methods;
- standards and best practices in ABM, as well as directions for the current and future development.

ABSTRACTS:

1 REASSESSING THE ROLE OF CLIMATE CHANGE IN THE EXPANSION OF AMAZONIAN FARMERS DURING THE LATE HOLOCENE

Abstract author(s): Gregorio de Souza, Jonas - Madella, Marco (Universitat Pompeu Fabra)

Abstract format: Oral

During the late Holocene, the archaeological record of lowland South America shows the emergence and dispersal of ceramic traditions associated with polyculture agroforestry (forest farming). Such expansions coincide with the distribution of the largest language families in the continent. At the same time, starting ca. 4-3 ka, wetter conditions drove the advance of forests in regions affected by the South American summer monsoon. The coincidence between precipitation increase, forest expansion and population dispersal has long suggested that the establishment of modern climate conditions favoured the expansion of tropical forest farmers and their languages. Here, we employ a computational approach to test the role of climate change in determining the rhythm of advance and the routes taken by populations expanding from the Amazon to other parts of South America. We simulate demographic-diffusion processes in an agent-based model informed by the dynamics of growth, fission and movement of Amazonian villages interacting with a dynamic environment that reproduces shifts in landcover based on interpolated fossil pollen data.

2 AN ABM APPROACH TO THE NEOLITHIC SPREAD IN EUROPE AND AN ANCIENT GENETIC CLINE

Abstract author(s): Fort, Joaquim - Pérez-Losada, Joaquim (Universitat de Girona)

Abstract format: Oral

We report an agent-based modelling (ABM) approach of Neolithic spread and compare it to archaeological and genetic data. This ABM approach uses integer numbers for the population sizes, so it is more realistic than a previous approach (Isern, Fort and de Rioja, Sci. Rep. 2017). However, implementing this feature is not straightforward and we will explain the difficulties and solutions that we have applied. Our new ABM approach correctly reproduces the arrival times of the Neolithic at several regions of the Near East and Europe, as well as the cline of mitochondrial haplogroup K that has been detected using ancient DNA data. We discuss the implications of our ABM model on the dispersal and interbreeding behaviour of farmers and hunter-gatherers. We also discuss differences along the two main routes of Neolithic spread, namely an inland route along the Balkans and central Europe and a coastal route along the Northern Mediterranean coast.

3 EXPLORING ENVIRONMENTAL DETERMINISM WITH AGENT-BASED MODEL OF SETTLEMENT CHOICE

Abstract author(s): Sikk, Kaarel (University of Luxembourg)

Abstract format: Oral

Archaeology and the related fields of geography and anthropology have a long history of debate of environmental determinism going beyond discussing methodological issues. The environment's influence on social processes has always been an important component of archaeological interpretations. Several research tools are completely dependent on the concept, for example it is essential for archaeological site locational modelling both in case of deductive and inductive models.

Studies using empirical inductive models have proven the significance of environmental effects of various spatial processes observed in archaeological material. Those works have resulted in models with varying predictive power, therefore a lot of emphasis has been put on advancing algorithms and model training. It has also been discussed that systemic properties of past human-environment relations like economic intensification, social complexity and spatial configuration of the environment influence the environmental determinism of settlement choice. So far possible influences of those systemic properties have not been quantitatively researched.

In this study possible spatial and systemic effects to environmental influence to settlement choice are explored using Agent-Based Model (ABM). A stylised ABM simulation model of settlement pattern formation is created based on general settlement theories from geography (ekistics) and archaeology. The model includes the generation of synthetic environments and is used to simulate settlement patterns formation as a process of consecutive settlement choice events.

The model is used for testing different systemic properties of human-environmental interactions and their effect on the environmental determinism of settlement choice. It is explored for the sensitivity to various mechanisms of human-environment interactions, population properties and spatial configuration of the environment. It is argued that environmental determinism is valuable information in itself and can be used as an indication of systemic properties of the past. Possibilities for quantifying the environmental determinism of the settlement choice process are explored.

4 MODELING THE LANDSCAPE EVOLUTION AND LAND-USE IN EARLY BRONZE AGE AT HACILAR, IN SW ANATOLIA

Abstract author(s): Arikan, Bulent - Özdoğru, İnci (Istanbul Technical University)

Abstract format: Oral

The mound of Hacilar (Burdur-Turkey) in SW Anatolia was a major settlement during the Early Bronze Age-I (ca. 3100 – 2900 BC). Systematic archaeological research has been going on for the last decade. Excavations at the site revealed a detailed settlement plan. Based on the site's layout, it is possible to calculate the approximate population of the settlement. Combined with paleoenvironmental and paleo-climate research conducted at the site, we now have a comprehensive dataset about its immediate region. This paper will deliver the results of agent-based modeling experiments at Hacilar. Using this diverse set of data for human behavior and past environmental conditions, agent-based modeling has been applied to simulate how dry farming and ovicaprid-based, site-tethered pastoralism affected the immediate landscape around the site. The use of agent-based modeling at this single-period settlement also informs us about the patterns of socio-economic and demographic changes in the long-term. The results of the modeling experiments allow us to understand the processes of socio-political and environmental processes in greater detail.

5 MODELLING GAIA: TOWARDS AN ACTOR-NETWORK MODELLING FRAMEWORK IN ARCHAEOLOGY

Abstract author(s): Ertsen, Maurits (Delft University of Technology)

Abstract format: Oral

Agent-based models have become powerful instruments to explore archaeological questions. Yet, one of the main challenges remains to avoid too much pre-structuring of agent activities in such models. Many modelling approaches are less capable to acknowledge change in activities, as they tend to model patterns of activities (defined as behavior). This hampers our understanding of emergence of change in the settings we are interested in. Discussing examples on Mesopotamia and Jordan, this paper explores how the Gaia approach as provided by the French scholar Latour allows an elegant, robust and theoretically convincing modelling framework. A major decision appears to be how to assign agency to non-humans as well, next to human model agents. The contribution will discuss why and how for cases with different spatial and temporal scales like Mesopotamia (landscape change over thousands of years) and Jordan (irrigation systems within days and/or decades), it does make sense to keep the modelling scales (parameters and time step) similar.

6 SIMULATING ROMAN ECONOMIES

Abstract author(s): Brughmans, Tom (Classical Archaeology and Centre for Urban Network Evolutions - UrbNet, Aarhus University)

Abstract format: Oral

The use of formal modelling and computational simulation (especially agent-based modelling (ABM)) in studies of the Roman economy has become more common over the last decade. This paper will explore why Roman Studies should add these approaches as

tools of the trade. In doing so, the paper aims to reflect on the potential and challenges ahead as ABM becomes integrated in archaeological subdisciplines. The paper will explore seven arguments, and will illustrate these with examples from studies of the Roman economy and personal experiences of a romanist modeller:

1. Formal modelling and computational simulation are necessary techniques for explicitly representing our complicated theories (or aspects of them), and for testing them against historical and archaeological evidence.
2. Complex systems simulation is the only suitable approach for identifying emergent properties in complex systems.
3. The Roman economy was a highly complex system. Theories describing this system are necessarily extremely complicated.
4. Building complicated models is a step-by-step cumulative process, where simplification is key.
5. Simulation should be integrated as one of our tools of the trade. This is an addition to and enrichment of current practice; it is not in conflict with current practice.
6. There are many different and competing views on the nature of the Roman economy. Simulation studies will enhance constructive multivocality of these theoretical debates.
7. Good simulation studies of the Roman economy necessarily rely on collaboration across specialisms (where simulation is a specialism in the same way as ceramology or osteology). Encouraging this means integrating the basics of simulation approaches into education in classical studies.

7 REPLICATION OF VILLAGE, AN AGENT-BASED MODEL OF SOCIO-ECOLOGICAL DYNAMICS IN THE NORTH AMERICAN SOUTHWEST

Abstract author(s): Allison, James (Brigham Young University)

Abstract format: Oral

Recently, archaeologists have developed increasingly realistic agent-based models to explore the dynamics of human socioecological systems. One of the best-known of these is Village, developed as part of the Village Ecodynamics Project. Village models maize and wild resource productivity for a portion of the North American Southwest, and it populates the landscape with agents conceived as Ancestral Pueblo households, who farm, hunt, gather wood, and interact on the virtual landscape. Recent versions of the model examine warfare, the formation of territorial groups, and the development of complex socio-political systems among those groups.

The fine-grained, spatially explicit modeling is a great strength of Village, but the complexity of the model and the number of agents means that it runs slowly and creates voluminous output that is challenging to analyze. This limits the number of parameter combinations and/or the number of iterations of each parameter combination that are practical. Crabtree et al. (2017), for instance, report results for 36 combinations of parameters, but only 15 runs for each combination. The results are interesting and provocative, and there is no reason to doubt them, but some questions remain. Specifically, 1) is 15 runs really enough to characterize the variability in output from a given parameter combination?; and 2) what effect would expanding the range of tested parameters have?

In this paper, I partially replicate and expand on the analyses presented in Crabtree et al. (2017), using 100 iterations for each parameter combination. This enables reflection on the strengths and weaknesses of the model, as well as those of similarly complex models of the socio-ecological dynamics of past societies.

Reference:

- Crabtree, Stefani A., R. Kyle Bocinsky, Paul L. Hooper, Susan C. Ryan, and Timothy A. Kohler. 2017. How to Make A Polity (in the Central Mesa Verde Region). *American Antiquity* 82(1):71-95.

8 SIMULATING SUBSISTENCE AND RESOURCE EXPLOITATION STRATEGIES IN IRON AGE TO HELLENISTIC COMMUNITIES IN SOUTHWEST ANATOLIA

Abstract author(s): Boogers, Stef (Sagalassos Archaeological Research Project; KU Leuven) - Daems, Dries (Sagalassos Archaeological Research Project; KU Leuven; Middle East Technical University)

Abstract format: Oral

All human societies need energy and resources in order to sustain themselves. As a result, people have a profound impact on their environment when exploiting these resources. In this paper, we will explore human-environment interactions in the area of Sagalassos (southwest Turkey) from Iron Age to early Hellenistic times (900-200 BCE). We will use an agent-based model to simulate subsistence and resource exploitation strategies and their impact on the natural environment. Specifically, we will test the hypothesis that Iron Age hilltop sites in the area of Sagalassos can be considered the main drivers of environmental change during this period.

In our model, we use a semi-realistic GIS environment, plotting known sites in a simplified landscape with properties such as altitude, forest yield potential, crop fertility and feedstock availability. We simulate three general types of resources across the landscape: agricultural products (subsistence: renewable), clay (production: non-renewable), and wood (fuel for subsistence and production: renewable). We simulate different resource exploitation strategies by varying parameters related to agent behaviour and requirements, after which we investigate the energetic returns on investment for these scenarios. In order to validate our model, we will compare simulated patterns of exploitation and human impact with those apparent in environmental data from the Gravgaz valley.

9 LAND USE MODELLING IN THE DUTCH LIMES: A COMPARISON OF APPROACHES

Abstract author(s): Verhagen, Philip (Vrije Universiteit Amsterdam) - de Kleijn, Maurice (SpInLab, Vrije Universiteit Amsterdam)

Abstract format: Oral

In this paper, we will compare two approaches to model the impact of settlement on land use in the Roman period in the Dutch river area, on the northern frontier (limes) of the Empire. After the arrival of the Romans around 15 BC, the area witnessed a strong increase in population, putting more demands on the available land to produce food and wood, not only for the local population, but also for the soldiers stationed on the frontier and the citizens of the newly founded towns.

Estimating the spatial effects of this increased agricultural demand through time can be approached through simulations of food production, taking into account the available workforce and the productivity and availability of suitable land. The paper will provide a comparison of ROMFARMS, an agent-based model (ABM) of agricultural production in the region by Joyce (2019), and a simulation model using the Past Land Use Scanner (PLUS; De Kleijn et al. 2018). The ABM is fine-grained, simulating agricultural production at the household level and aiming to explore different the factors and dependencies involved in agricultural production. The PLUS model is more generalized, aiming to provide accurate predictions of land use over larger regions for specific hypothetical scenarios.

How should we evaluate these outcomes within the general context of the debate on land use and agricultural production in the region? What are the advantages and limitations of each? We will discuss issues of scale, temporal resolution and model inputs, together with questions of technical implementation and validation of the model outcomes.

10 THE AGENCY OF CONNECTIONS. AT THE CROSSROAD BETWEEN ABM AND NETWORK MODELLING

Abstract author(s): Fulminante, Francesca (Bristol University; University Roma Tre) - Prignano, Luce (University of Barcellona) - Cozzo, Emanuele (Open University of Catalonia)

Abstract format: Oral

The idea of network models as a means for explaining features of real networked systems in terms of the processes and mechanisms that generated them dates back to the late 1990s and is the main motivation for the onset of network science. Such mechanisms are implemented as algorithms that work in different fashions: in some cases, they take as a starting point a regular or random network and proceed to modify it by rewiring or adding connections; in some other cases, nodes are also added at each step. Nevertheless, networks are more often included in the framework of Agent Based Modelling (ABM), one of the most extensively adopted modelling approaches in archaeological research, as interaction topology. Thus, agents interact on an underlying structure that determines who is able to interact with whom, introducing non-trivial heterogeneities whose effects can be measured and tested against data.

However, the output of such interactions can be also regarded as a network sometimes. For instance, the roads built by the communities living in a territory, the web of trade agreements signed by public authorities, or the similarity network of assemblages of artifacts, are all suitable to be studied as the results of the interactions that shaped them. Whenever there is evidence that allows us to build an empirical network, it is possible -in principle- to model the process that created it. The modelling techniques may vary from pure abstract network modelling to more explicit ABM approaches where the nodes can be either the agents themselves (e.g., individuals, polities), or the objects manipulated by them (e.g., artifacts, goods). The common trait is the possibility to implement network science methods for hypothesis testing. We will discuss the potential and limitations of such combined approaches, considering few emblematic scenarios to which they could be profitably applied.

11 EXPLORING CULTURAL AND ECONOMIC TRANSMISSION WITH AGENT-BASED MODELLING

Abstract author(s): Romanowska, Iza (Aarhus University) - Carrignon, Simon (University of Tennessee) - Brughmans, Tom (Aarhus University)

Abstract format: Oral

Cultural transmission is a dynamic field of research with new and exciting applications being published every week. Here, we turn to the less explored topic of the intersection between cultural and economic exchange. This question lies at the heart of current debates in Roman studies: how integrated was the economy of the Empire? However, the characteristics of the potential transmission of commercial information, usually used as a measure of economic integration, is not easy to derive from archaeological datasets.

Ceramic tableware offers one of the only comparable and quantifiable sources of information for Roman inter-regional trade over centuries-long time periods. For example, the distribution patterns and stylistic features of tablewares from the East Mediterranean dated between 200 BC and AD 300 suggest a competitive market where buying and selling decisions were highly informed implying high levels of cultural transmission between traders.

We test three competing hypotheses formalised in an agent-based model: success-biased social learning of tableware buying strategies (requiring access to reliable commercial information from all traders), unbiased social learning (requiring limited access), and independent learning (requiring no access). We compare their predictions to archaeologically observed tableware distribution patterns. Our results revealed success-bias is not a viable theory and we demonstrate instead that local innovation (independent learning) is the most plausible driving factor in inter-regional tableware trade. We also suggest that tableware distribution should instead be explored as a small component of long-distance trade cargoes dominated by foodstuffs, metals, and building materials.

SIMULATING MOVEMENT AND VISIBILITY OF ATLANTIC ROCK ART: AGENT-BASED MODELLING OF SCOTTISH CASE STUDIES IN NETLOGO

Abstract author(s): Bjerketvedt, Linda - Valdez-Tullett, Joana - Barnett, Tertia (Historic Environment Scotland) - Jeffrey, Stuart (School of Simulation and Visualisation, Glasgow School of Art) - Robin, Guillaume (School of History, Classics and Archaeology, University of Edinburgh)

Abstract format: Oral

Prehistoric rock art in Scotland is part of a wider Neolithic/Early Bronze Age carving tradition known as Atlantic Rock Art (ARA), found in open-air locations along the Atlantic seaboard (Bradley 1997). Cupmarks and cup-and-ring motifs were typically carved on boulders and outcrops in the landscape. Since the 1980s, rock art research has seen a growing focus on landscape settings to better understand the context of rock carvings. In his seminal work, Richard Bradley (1997) emphasised long-distance visibility and pathways as important facets of ARA. In order to analyse environmental parameters of the carvings, some studies have employed GIS-based approaches (Gaffney & van Leusen 1996; Fairén-Jiménez 2007; O'Connor 2006, Valdez-Tullett 2019). This type of spatial analysis is, however, inherently static in nature and struggles to address the processes behind emerging patterns (Davies et al. 2019: 185). Recently, a study has demonstrated that despite the homogeneity of Atlantic Rock Art, there are important regional preferences including variations in terms of ARA's landscape locations (Valdez-Tullett 2019).

In order to investigate these nuances more dynamically, we have explored data from Scotland's Rock Art Project through agent-based modelling. We addressed visibility and mobility, two key aspects commonly discussed in ARA research, with NetLogo, an open-source modelling environment. The simulations feature agents moving through or seeing a landscape linked to real elevation data. Our models deconstruct previous assumptions that the rock art was a) marking routes and pathways, and b) made in locations with extensive views to and/or from the landscape. Different case studies from geographically dispersed areas of Scotland were chosen to ensure diverse environments were captured by the model. This is a pioneer approach to rock art and the agent-based modelling will shed light on the perceived importance of visibility and mobility in relation to rock carvings.

MODELLING APPROACHES IN EPIDEMIOLOGICAL RESEARCH OF THE PAST SOCIETIES – SANDBOX OF ANCIENT DISASTERS

Abstract author(s): Vlach, Marek - Komoróczy, Balázs (Institute of Archaeology of the Czech Academy of Sciences, Brno)

Abstract format: Oral

In past societies documented through archaeological record and other available sources of information, an impact of epidemiological events usually leaves limited or no traces. Yet their occurrence is generally accepted and in "literary" civilization is also reflected through the vivid narratives. In epidemiological modelling as a part of health sciences, methods and approaches have long developed and advanced gradually from the elemental dynamics based on differential equations to the robust modelling approaches encompassing complex social structures including large numbers of individually acting entities. Therefore, modelling and simulation of such phenomena in past societies, yet based on merely approximated demographical representations, has justifiable theoretical grounds and methodological tools available to use. The presented model examples and modelling approaches aim to outline some possibilities of epidemiological impact modelling within the past demographical contexts at various scales (continental, regional, community) and contexts (Roman and barbarian world), either of explicit or implicit nature. Cross-sectionally, the modelled context lies mainly in the topic of potential impact of the so called Antonine plague during the 2nd half of the 2nd century AD. Yet, the certain parts of the models could provide an adjustable general framework for testing hypotheses of epidemiological impact within any context and such solution is intended to become a part of library of the NASA project.

HOW SOCIAL LEARNING SHAPES AMPHORA MAKING-TECHNIQUES DURING THE ROMAN EMPIRE

Abstract author(s): Coto-Sarmiento, Maria (University of Barcelona) - Carrignon, Simon (University of Tennessee; University of Cambridge)

Abstract format: Oral

The way people interact socially and how they transmit their knowledge from generation to generation leads to different habits and traditions. When these traditions are about pottery making techniques, these differences may have left a quantifiable trace in the remaining cultural material. However, to link the differences observed in the archaeological record with social learning strategies and how production techniques were transmitted is extremely difficult. In archaeology, this has been studied in handmade production but barely analysed in large-scale production implying long-distance social interaction during an extended period of time.

This work aims to analyse the modes of transmission of technical skills between amphora workshops during the Roman Empire in Baetica province (currently Andalusia) from 1st to 3rd century AD.

To achieve this goal we 1) compute the covariance matrix between morphometric measurements and use it as a way to represent different pottery-making techniques, 2) define different scenarios in an Agent-based model to represent hypotheses about how techniques were shared between potters, 3) quantifying how likely each scenario is to reproduce the correlation between morphometric similarity of the pottery and the distance between the workshops observed empirically.

Our analysis highlights that the spatial position of the workshops needs to constraint the social interaction between potters, but not too strictly as the close morphometries found even in relatively distant workshops quickly disappear when geography strongly constrains social interactions.

Finally, we believe this provides a versatile framework to explore the transmission processes related to large-scale production in archaeology.

AN AGENT-BASED MODEL TO IMPROVE ARCHAEOLOGICAL SOCIAL NETWORK RECONSTRUCTIONS

Abstract author(s): Gravel-Miguel, Claudine - Bischoff, Robert (Arizona State University) - Padilla, Cecilia (University of Zurich)

Abstract format: Oral

Agent-based models are powerful tools to reconstruct past dynamic human behavior from the static archaeological record available to us. Here, we use an agent-based simulation to test and improve on the methods used by researchers to reconstruct prehistoric social networks from artifact stylistic similarities and to shed light on how properties of such social networks contribute to the overall diversity of cultural traits observed in archaeological assemblages. Given that cultural transmission and evolution are affected by multiple interacting phenomena, our model allows us to simultaneously explore how different sets of factors - behavioral and environmental - affect how social networks are reflected in the material record. It also creates a simulated archaeological record that we use to test formal methods to reconstruct social networks and improve them. Whilst the archaeological record offers a unique glimpse on cultural changes happening over long temporal scales, our model will help improve our methods of reconstructing networks to better relate patterns observed in the archaeological record to past social processes.

WIDENING HORIZONS: SHARING PERSPECTIVES ON PROFESSIONAL PRACTICE IN EUROPE

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Robinson Wild, Esther (Chartered Institute for Archaeologists; University of York) - Schauer, Michaela (Chartered Institute for Archaeologists) - Hessing, Wilfried (Vestigia Archeologie & Cultuurhistorie)

Format: Discussion session

When we look around the world, we see professional practice frameworks for many disciplines built of an ethical code and supporting standards for person, process, and product. For archaeology, the frameworks have evolved on a national basis, and while the ethical principles are largely shared between countries, the more detailed standards and guidance for practice reflect their local origins.

This session, led by the Chartered Institute of Archaeologists (CifA), builds on the 2020 Networking session organised jointly with the EAA Community for Professional Associations in Archaeology. Starting with a tour d'horizon of established professional frameworks, of which CifA's is the best known but not the only option within which to practise in Europe, we will ask contributors:

- How much common ground do we have?
- How far do shared values extend and where do national requirements begin?
- Could collaboration on complementary approaches produce even better archaeology-related outcomes for European society?
- Is it easier to carry on working within our respective national frameworks? Is it right to do so?

And specifically

- Collaboratively, could we/should we share and adapt the CifA framework and make it work for Europe?

We are seeking contributions that explore the panorama of professional ethics and standards, are willing to speculate on what is beyond the current view, and share what more can be done to communicate, learn from and collaborate on a European scale.

ABSTRACTS:

WHAT AN INTERNATIONAL PROFESSIONAL ASSOCIATION CAN DO FOR GERMANY - AND WHAT IT CAN'T

Abstract author(s): Schauer, Michaela (CifA Deutschland/LMU München)

Abstract format: Oral

CifA Deutschland was founded as a branch of CifA in 2017 on request of German archaeologists. This step was based on a firm belief that the same shared values, the same ethical rules, should apply everywhere - no matter where you are from, what your background is, where you are working, with which method, material etc. We can all agree, that we need a set of rules - and CifA's code of conduct and its regulations are setting a baseline. While CifA Deutschland evolves, we learn more and more that there are parts of ethics - or in general parts of our shared values - that are more culturally embedded (or biased) than we thought. We learn that different legal and cultural systems demand communication and - even more stunningly - the approach for example to ethical dilemmas are different in different cultures. This also means that an international organisation needs to communicate, needs to include 'the specialists' (Germans, Australians etc.) and needs to trust them on establishing a professional association (and the thereby shared values) in their 'natural habitat'. And that's scary as their approaches might be different to those an organisation is used to until that point....

2 THE ARCHAEOLOGY DOESNT STOP AT THE BORDER, NEITHER SHOULD THE STANDARDS

Abstract author(s): Kyle, James (Institute of Archaeologists of Ireland)

Abstract format: Oral

The Institute of Archaeologists of Ireland is the representative body for professional archaeologists working on the island of Ireland and thus we find ourselves operating in dual jurisdictions with differing professional frameworks but with a shared archaeology. The aim of this paper will be to examine areas of commonality on the island, to look at the current drive towards the development of new professional standards on both sides of the border and to detail the ongoing efforts of the Institute regarding the collaborative production of standards for the whole island. The paper will also address what, if anything has changed in the last 20 years, what needs to change and where potential collaborations might occur. An examination of the ways in which we can improve and the ethics of our own archaeological model will be made to see where complementary approaches could be developed and learnings might be achieved which benefit the profession as well as the archaeology.

3 SUPPORTING PROFESSIONAL PRACTICE WITH GLOBAL QUALITY STANDARDS AND REGIONAL GUIDANCE

Abstract author(s): Geary, Kate (Chartered Institute for Archaeologists)

Abstract format: Oral

As well as setting and monitoring compliance with an ethical code, ClfA sets Standards covering a wide range of professional practice and issues guidance to its members on how the Standards may be met. ClfA Standards and guidance define good practice, expanding and explaining general definitions in the Code of conduct and are formulated in consultation with the sector. They are used by archaeologists commissioning or designing archaeological work to define measurable quality standards. Compliance with the Standards is a professional obligation for ClfA members and for its Registered Organisations.

Despite a growing (and increasingly structured) non-UK membership, the roots of these Standards are still firmly embedded in UK professional practice, and this presents us with a challenge. Even within the UK, archaeological policy and practice across England, Scotland, Wales and Northern Ireland is diverging resulting in a need to ensure the Standards are supported by guidance that is applicable to practitioners operating under different national policy frameworks. For our members across Europe (and the rest of the world), that need is even greater. So how do we go about setting Standards that are internationally applicable but supported by national/regionally specific guidance? ClfA has recently started a comprehensive review and redesign of its suite of Standards and guidance with this question at the heart of the project. This paper will present the work that ClfA has undertaken to date ensure its professional framework of Standards and guidance is applicable to members beyond the UK. A case study is included that highlights the approach taken to mapping the ClfA Standards and guidance against archaeological practice in Northern Ireland. This example highlights a potential pathway for the addition of guidance to the framework from other countries ensuring it is applicable at both an international and country specific level.

4 HOW SAFE ARE ARCHAEOLOGICAL ENVIRONMENTS? ARGUING FOR A COMMON EUROPEAN FRAMEWORK FOR PREVENTING AND COMBATING HARASSMENT, ASSAULT, BULLYING AND INTIMIDATION

Abstract author(s): Coltofean-Arizancu, Laura - Gaydarska, Bisserka - Plutniak, Sébastien (Archaeology and Gender in Europe - AGE - Community of the EAA) - Mary, Laura (Paye ta Truelle Project; Archaeology and Gender in Europe - AGE - Community of the EAA) - Hlad, Marta (Archaeology and Gender in Europe - AGE - Community of the EAA) - Algrain, Isabelle (Paye ta Truelle Project; Archaeology and Gender in Europe - AGE - Community of the EAA) - Vandeveld, Ségolène (Paye ta Truelle Project) - Pasquini, Béline (Paye ta Truelle Project) - Janežič, Polona - Wouters, Barbora (Archaeology and Gender in Europe - AGE - Community of the EAA)

Abstract format: Oral

This paper argues the importance of introducing measures to prevent and combat various forms of harassment, assault, bullying and intimidation in the codes of conduct and ethics of different settings where archaeology is being practiced, from fieldwork, universities and research institutes to museums, companies and organizations. It does so by discussing the preliminary results of two online surveys that have been carried out to determine the degree to which these offensive behaviours occur in European archaeology. The first was a pilot survey conducted in 2020 in four Central-East and South-East European countries (Bulgaria, Hungary, Romania and Serbia). The second survey, carried out one year later, is the result of the collaboration between the board and several members of the Archaeology and Gender in Europe (AGE) Community of the European Association of Archaeologists, and members of the Paye ta Truelle project. The aim of their joint effort was to extend and adapt the previous survey to a Europe-wide scope in order to map the occurrence of these types of misconduct on a broader scale. Both surveys assessed whether professionals and students in archaeology (regardless of gender) in Europe 1/ are aware of the existence of harassment, assault, intimidation and bullying in their work, research and study environments; 2/ have been the subjects of such acts and, if yes, 3/ in which ways these affected them on a personal and professional level, 4/ whether they reported them and 5/ if any measures were taken as a result. In addition, this contribution proposes the creation of a common European framework of recommendations which could contribute to making archaeology a safer and more empowering study, research, and work environment.

Elisavet Stamataki and Amanda Sengeløv (Archaeology and Gender in Europe EAA Community) are also authors of this paper and members of the research team.

490 UNIVERSAL DESIGN OR HOW TO GUARANTEE ACCESS TO ALL ON ARCHAEOLOGICAL SITES AND PARKS

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Dunning, Cynthia (ArchaeoConcept) - Larsson, Birgitta (Stiftelsen Kulturmiljövård) - Kienzle, Peter (LVR-Archäologischer Park Xanten/LVR-RömerMuseum)

Format: Regular session

Archaeological sites and parks open to the public should be accessible to all. This may seem to be a common-place statement. Yet many archaeological sites, through various difficulties of accessibility, are excluding to people with different disabilities, physical or cognitive.

Therefore, the initiators of this session would like to start a discussion to address the following points, emphasizing that clever solutions are necessary for a few, good for many and a bonus for all:

- What has been done up to now on archaeological sites and parks in different European countries to accommodate and allow access to persons with different disabilities?
- Who are the partners which can put into place initiatives for a general accessibility and how do they work together? And on which scale (national – regional – local)?
- How do we develop understanding of the perceptions and needs of people with a disability who would like to visit archaeological sites open to the public?
- Have any guidelines been put into place for the implementation of measures on site? And how have these been used by site managers?
- How can these measures and guidelines be integrated in national and international (EU, UNESCO) standards?

The session will be divided into two blocks. The first part will consider theoretical and socio-political questions regarding implementation, while the second will showcase examples of good practice.

ABSTRACTS:

1 INTRODUCTION TO THE SESSION: UNIVERSAL DESIGN OR HOW TO GUARANTEE ACCESS TO ALL ON ARCHAEOLOGICAL SITES AND PARKS

Abstract author(s): Dunning, Cynthia (ArchaeoConcept) - Larsson, Birgitta (Stiftelsen Kulturmiljövård) - Kienzle, Peter (LVR-Archäologischer Park Xanten/LVR-RömerMuseum)

Abstract format: Oral

When considering the accessibility of archaeological sites for people with disabilities, the site manager is often overwhelmed and in need of advice.

Since the UN Convention on the Rights of Persons with disabilities entered into force in 2008, persons with disabilities are entitled to full access on an equal basis with others to every public archaeological site. And the UN Global Goals for sustainable development, which mean to make the world better by 2030, include a number of targets considering inclusion, reducing discrimination, and providing access to inclusive public spaces; all elements affected by this issue.

Our session addresses the challenges of how to prepare archaeological sites for universal accessibility, considering physical, mental, intellectual, or sensory impairments. The contradiction between conservation strategies and building requirements for access of persons with disabilities is one aspect; others include access to sites in natural environments, which are often difficult to reach in general. Another question is the need of access for all on archaeological sites, knowing that many are problematic for total inclusive measures.

Our topic is also about communication to all visitors, to fully include those who have special requirements.

If major archaeological sites, mostly managed by official instances, develop inclusive presentation, this is certainly not the case for smaller sites, operated by volunteer-based associations.

One element does stand out though: the need of participation of associations and groups of people with disabilities throughout the development and implementation of accessibility and communication measures on the sites. Only in this way can the manager find clever solutions that may be necessary for few, good for many and finally a bonus for all.

2 IMPROVED ACCESS? PRESENTATION AND ACCESSIBILITY IN THE LVR-ARCHAEOLOGICAL PARK XANTEN

Abstract author(s): Quick, Stephan (LVR-Archäologischer Park Xanten/LVR-RömerMuseum)

Abstract format: Oral

The LVR-Archaeological Park Xanten/LVR-RömerMuseum (LVR-APX) protects the archaeological remains of the ancient Roman city Colonia Ulpia Traiana. While excavations take place throughout the year, research and education go hand in hand. It is a particular ambition for the Museum Educational Service, to convey the work of the archaeologists and Roman daily life at the time of the city's heyday in the middle of the 2nd century AD to a wide audience. To ensure participation of visitors of all target groups, accessibility and inclusion play a key role in the conception of exhibitions, events and educational programs. The aim of presenting and communicating archaeological findings and physical reconstructions to all is a particular challenge, especially in an open-air museum. In this regard, close cooperation with persons affected has proven to be particularly valuable to make educational concepts succeed in practice. Guided tours in sign language, the use of braille or special orientation aids try to make the visit to the LVR-Archaeological Park as comfortable and barrier-free as possible for people with visual, hearing or mobility impairments. As there are many and often varying needs, day-to-day business in museum education nevertheless shows that usually it is only possible to reach a specific group of visitors with impairments with matching educational offers. The presentation provides an overview of our approaches to improve accessibility in the LVR-Archaeological Park Xanten and puts them up for discussion.

3 PHYSICAL ACCESSIBILITY OF ANCIENT BUILDINGS - THE CASE OF THE AMPHITHEATER IN PULA

Abstract author(s): Gobic-Bravar, Đeni - Komšo, Darko (Archaeological Museum of Istria)

Abstract format: Oral

Ancient buildings and archaeological sites are often hardly accessible even to people with moving difficulties like elder people or parents with small children. Even more they can be inaccessible to wheelchair users. The existing standards and regulations that cover the problem of architectural accessibility can often not be applied to ancient or historical structures. The duality of making a structure accessible and at the same time keep it's historical values as well as limit the modern interventions is a hard task.

The first step is to understand in which ways a structure is not accessible and communicate with people with disabilities to understand their needs. Once the task is well understood communication between the conservator, archaeologist, architect and final user must be constant and open to adjustments.

For the case of the ancient amphitheater in the city of Pula, Croatia some steps towards a better accessibility have been taken. The structure has few areas to visit, the underground exhibition area, the ground floor and the upper floor with corridors and seats for the visitors. The areas are separated with steep ramps of stairs in no way concordant to the accessibility rules. The ground area is accessible, through adequate information, from a side entrance that is open on request. The underground exhibition has been made accessible by realizing a "wheelchair ramp" that leads to a side entrance avoiding the use of internal stairs. Also the path that leads to the exhibition has been realized in the form of a ramp in order to be accessible.

With this paper we want to show what are the possible and what are the impossible interventions on an ancient structure. How much communication and adaptability are important to achieve some results. Finally what are the tasks that lay ahead of us.

4 NORMALITY IS A CONSTRUCT: A CLAIM FOR DIVERSITY FROM THE PERSPECTIVE OF ARCHAEOLOGICAL SITES AND PARKS

Abstract author(s): Meier, Jessica (Römerstadt Augusta Raurica)

Abstract format: Oral

The Roman site of Augusta Raurica has been a label partner of 'Kultur Inklusiv', a competence center for inclusive culture in Switzerland, since 2018. In accordance with the charter of 'Kultur Inklusiv' and the label specifications, Augusta Raurica endeavors to make its archaeological site, exhibitions and educational services accessible to people with all forms of disabilities.

Among other measures, we carried out a site inspection with experts from 'Sensability' in preparation of a site plan for wheelchair users. Peep boxes with adjustable height were designed to be accessible to children and wheelchair users. A tactile model of the amphitheater was installed on site in cooperation with 'tactile studio' (DE/FR/CA). It includes drawings in raised lines and texts in braille for people with visual impairments. A second model is in the works. A guide in simple language for our Roman house is available free of charge. Our homepage and advertisements contain important accessibility information for people with disabilities. Currently we are working on videos in sign language and on improved signage for our outdoor sites and monuments.

Our Museum Strategy acknowledges the UNESCO Agenda 2030 for Sustainable Development. We perceive inclusive culture as a fundamental right for all people. When planning and realising new projects, we implement the 'five fields of action' from 'Kultur Inklusiv' and the label's charter as far as possible. While recognising human diversity, it is not possible to make all information equally accessible to all people. Augusta Raurica is working on finding a good mix of services to ensure individual opportunities for education and development for all our visitors.

5 WELCOME TO THE ROMAN FRONTIER! MAKING THE LOWER GERMAN LIMES AN ATTRACTIVE AND ACCESSIBLE UNESCO WORLD HERITAGE

Abstract author(s): Hazenberg, Tom (Roman archaeology; Archaeology and society - UNESCO-goals; Tourism; Archaeological Heritage Management) - Willems, Annemarie (Tourism; World Heritage) - Welling, Menno (Museology) - Dries, Monique (World Heritage) - Simjouw, Marco (Governmental Heritage management)

Abstract format: Oral

A group of different stakeholders is developing a holistic plan for an attractive presentation of the western Dutch segment of the Frontier of the Roman Empire. The group of site managers is diverse and consists of museums, private companies, volunteer groups and enthusiastic individuals.

Examples of projects presented in this paper are (a) NIGRVM PVLLVM (multiple disabled), (b) Park Matilo (resident of diverse background) and (c) National Roman Maritime Museum (elderly and visually and hearing impaired). The development of these Limes Presentation Units will show the ambition to let Roman archaeology contribute to the well being of people living along the Roman Frontier.

The focus on accessibility and inclusion is still young. By combining some local initiatives some cooperative partners try to join efforts and exchange experiences knowing that this ambition of inclusion fits in the future UNESCO World Heritage status of the Limes. The regional government encourages this development and emphasises the importance of co-operation in an open and bottom-up approach including an inclusive use of the Limes heritage. Inclusivity is not only focussed on physical accessibility and polyphonic presentations, but also on broad community ownership.

The presentation 'Welcome to the Frontier!' will show how multiple disabled get involved in limes tourism (NIGRVM PVLLVM), how two adjacent neighbourhoods will manage their own world heritage (Park Matilo), how elderly restore Roman ships and how the new museum will be an example for universal design accessible for the visual and hearing impaired.

The cooperation between these projects means a start of the ambition for inclusivity and will function as a pilot project for the Management Plan that will govern the Lower German Limes as an World Heritage for everyone.

6 GUIDELINES FOR THE IMPLEMENTATIONS FOR INCLUSIVE PROJECTS IN CULTURAL PLACES

Abstract author(s): Dall'Agnolo, Daniel (Laténium)

Abstract format: Oral

The necessity to create or facilitate access to archaeological sites for people with disabilities is no longer disputed. With the signing of the Convention on the Rights of Persons with Disabilities (2006), inclusion has been anchored in law in most countries. In the meantime, inclusion projects are not only supported ideally, but also financially. Once the financial means are secured, the question of how to implement inclusive projects arises. Which forms of organization are suitable, what should be taken into account so that communication with the different partner - but within the institution and the group - is successful, which procedures and tools are useful, which formats have a chance of success?

The Laténium, parc et musée d'archéologie in Neuchâtel (CH) has been successfully implementing inclusive projects since 2016. We are now able to summarize the experience and present a first guide for the implementation of inclusive projects.

Certainly, each project is embedded in a specific political and cultural environment and has its own characteristics. This means that guidelines will always be provisional and must be constantly adapted to new situations.

There are characteristics that are common to most projects and it is worthwhile write them down and made available to interested persons. In this way, some pitfalls and detours can be avoided.

The approach presented here was developed from the perspective of mediation, in close cooperation with people with disabilities.

7 NEANDERTHAL: TACTILE INFRASTRUCTURE FOR THE BLIND & VISUALLY IMPAIRED

Abstract author(s): Riethus, Anna (Stiftung Neanderthal Museum)

Abstract format: Oral

Since 2018, Neanderthal Museum has set itself the challenge to provide fully self-determined access to its permanent exhibition for blind and visually impaired guests. Whilst also developing an inclusive mobile game, the foundation for reaching this goal is a new infrastructure in the permanent exhibition of the museum.

Offering visitors a a new set of permanently installed tactile exhibits, the new infrastructure finally allows the museum's guests to access information about Neanderthals and Archaeology by touch. The exhibits include a wide range of different material in order to give a versatile tactile experience; f.e. a 3D-printed copy of the worldfamous neanderthal skeleton, replicas of flint and bone tools or comparative casts. All exhibits are complemented by Braille labels and additional tactile lettering. A floor guidance system and tactile plans help visitors with visual disabilities through crowded areas in the exhibition.

Besides presenting the design concept for the new inclusive infrastructure, this talk addresses the importance of inviting advisors with disabilities to the table, as well as the difficulties of creating tactile content on archaeology.

8 THE USE OF INDICATORS FOR THE ASSESSMENT OF ACCESSIBILITY TO ARCHAEOLOGICAL SITES

Abstract author(s): Salvà, Miquel Àngel (Universitat de les Illes Balears)

Abstract format: Oral

Access to archaeological sites should be a central concern for heritage managers. Constant efforts are being put into developing new interpretive displays, yet there are wide segments of the public which are still excluded from the enjoyment of archaeological heritage. Existing barriers, be they physical or cognitive, impede people with different disabilities from fully experiencing the visit to many monuments and sites. The aim of this contribution is to introduce indicators as a useful tool for the assessment of the degree of accessibility to archaeological sites open to the public. If correctly selected, indicators provide concise and relevant information regarding the strengths and weaknesses of access to a given site, allowing for comparison with other sites. This methodology enables us to a quick decision-making process, focusing on the areas which present more obstacles related to accessibility and inclusion. However, caution is due regarding the limited possibilities of the indicators' analytical value.

491 UNTANGLING LIFE CYCLES IN MULTI-FUNCTIONAL DOMESTIC AREAS: INTERDISCIPLINARY APPROACHES TO ANALYSE SPACE USE AND TRANSFORMATION IN THE MEDITERRANEAN

Theme: 6. Material culture studies and societies

Organisers: Valente, Rossana (British School at Athens) - Magno, Laura (UCLouvain) - Ragkou, Katerina (Philipps-Universität Marburg) - Harrington, Katherine (Florida State University)

Format: Regular session

The identification and the distribution of a range of human activities performed in domestic areas and their immediate surroundings rely on a variety of archaeological datasets and methodological approaches. From the analyses of architectural form and layout to the distribution of artefacts in that space, archaeological research investigates peoples' activities within inhabited spaces, as well as the social and cultural divisions visible within these spaces. Nevertheless, assessing the functional characterization of space in dwellings and workshops may not be straightforward. An implicit distinction between working and living spaces might not have occurred and living spaces could have been used for a variety of functions. Moreover, valuable invisible evidence in the archaeological record requires interdisciplinary scientific approaches to properly investigate it. Limitations to our knowledge of the different activities performed in domestic spaces can be due to the perishable nature of some artefacts and architectural features, to the intentional maintenance and modification of spaces, to the nature of abandonment and to the destruction or post-depositional events. All these factors may heavily affect the archaeological record of various activities performed in inhabited spaces. This session invites papers investigating and discussing the use of multi-functional domestic contexts in the Mediterranean from the Neolithic to the Late Medieval periods, with the aim of debating on complementary methods of research to tackle the comprehension of space use. Interdisciplinary papers can approach the topic through distributional models of artefacts and ecofacts, micro-archaeological scientific approaches, architectural and spatial analysis, and ethnographic comparisons. The overall aim of this session is to bring together complementary and decisive datasets from interdisciplinary and cross-cultural research environments to embrace a methodological debate on the different approaches in the investigation of the various activities performed in domestic spaces.

ABSTRACTS:

1 THE SOIL HAS MEMORY - IDENTIFYING PLANT PROCESSING AREAS AND THE USE OF DOMESTIC SPACES AT NEOLITHIC ÇATALHÖYÜK

Abstract author(s): Santiago-Marrero, Carlos (CaSEs, Department of Humanities, Universitat Pompeu Fabra) - Lancelotti, Carla - Madella, Marco (ICREA - CaSEs, Department of Humanities, Universitat Pompeu Fabra)

Abstract format: Oral

Dating to the eighth-millennium cal. BC, Çatalhöyük is considered one of the earliest farming communities of Western Asia. Due to the excellent preservation of architecture and botanical remains, the site has vastly contributed to our understanding of plant management and the use of domestic areas in the past. However, most of what is known about plant processing activities and multiple uses of domestic spaces at the site relies on the contextual deposition and location of macro-botanical and related artefactual remains. But how we interpret the use of domestic spaces and plant processing areas when there are no visible artefactual nor botanical remains? And when we do find these, how can we be sure that what we see in the archaeological record is accurately displaying the real distribution of everyday activities in the past. To tackle this issue we implemented a methodological approach based on the spatial distribution of phytoliths, starch grains, and geochemical signatures. This was achieved by collecting sediment samples from the whole surface extension of two Neolithic houses and one open space. Our results not only successfully identified previously unknown plant processing areas within domestic spaces but also revealed the presence and processing of wild plants that had not been previously identified in the archaeobotanical record. This in turn demonstrates the potential of this integrated methodology for identifying plant processing areas and the distribution of everyday activities even in areas where there is no visible remain for such tasks.

2 CRAFTWORK AND DAILY ACTIVITIES IN MINOAN DOMESTIC AREAS

Abstract author(s): Alberti, Maria Emanuela (Università degli Studi di Firenze, Dipartimento SAGAS)

Abstract format: Oral

Minoan domestic areas have recently received general attention as a mean to reconstruct the social structure of a society that largely escapes our understanding (Glowacki and Vogeikoff-Brogan 2011; Relaki and Driessen 2020). Some studies focus on the archaeological indicators of activities, especially at single structure or at site level. Actually, most of these buildings seem to have been multi-functional and the specific destination of single rooms is notoriously difficult to detect. Especially intriguing is the clear presence of indicators of specialised production (e.g. seal engraving, stone vases working, metallurgy, pottery production, purple extraction, oil and wine processing) within 'normal' houses, overlapping with cooking, storing, spinning and weaving evidence - a pattern that keep unchanged from the Protopalatial to the Mycenaean times (1900 - 1200 BC ca). The paper illustrates some of the most important cases from Malia, Mochlos, Gournia, Kommos, Papadiokampos, Haghia Triada and Phaistos, with a focus on spatial analysis, cross-craft, scale of activities, and discussing the possibility of 'mobile workshops' as known from ethnographic parallels

3 UNDERSTANDING ACTIVITIES AND THE USE OF THE SPACE OF A BRONZE AGE COMMUNITY THROUGH AN INTEGRATED INTRASITE SPATIAL ANALYSIS

Abstract author(s): Lucci, Enrico (Department of Antiquities, Sapienza - University of Rome) - Minniti, Claudia (Department of Cultural Heritage, University of Salento) - Recchia, Giulia (Department of Antiquities, Sapienza - University of Rome)

Abstract format: Oral

The use of spatial analyses to recognise and study activity areas in settlements, economic organisation and social patterns of behaviours has recently increased in Mediterranean Prehistory. These kinds of analyses allow us to consider various types of finds and their interplay in productive and symbolic activities. The study of organic materials plays an important role for the understanding of ancient economic and social practices and advanced analytical methods provide us with increasing available data. Besides these, the in-depth study of animal and plant still remains a pivotal source of knowledge, especially when data is considered in functional perspective as a part of an integrated system of analysis. Animal bones, for instance, are proxies for a wide range of human activities, from economic strategies and diet, to the productions of objects, tools, carpentry implements and processed animal skins.

In this presentation we will propose a case study from the Bronze Age sites of Coppa Nevigata (Southern Italy) focusing on an integrated spatial analysis of artefacts and ecofacts, specifically faunal remains. Beyond a species characterisation, faunal remains have been classified in categories that are specifically designed to cover and interpret all their potential range of usage in the specific context. The spatial distribution analysis has been processed using diverse geostatistical analyses on Qgis and R, among which Kernel Density Estimation and Ripley's L-Function represent the most significant. The discussion will focus on the adopted methodology and the results obtained, particularly as regards the possibility to figure out social patterns of behaviours at the site, exploring the interplay between the use of structures, animals (and animal-derived products) and the various classes of artefacts.

4 INDOOR-OUTDOOR LIVING: EXPLORING THE RELATIONSHIP BETWEEN EXTERIOR DOMESTIC ACTIVITY AREAS AND THE STRUCTURING AND USE OF INTERIOR SPACES IN GREECE

Abstract author(s): Jazwa, Kyle (Maastricht University)

Abstract format: Oral

Outdoor areas were fundamental components of Mediterranean domestic spaces. Whether built courtyards or unstructured spaces surrounding a building, they helped extend the household activity area during the many months of favorable weather. They also offered more opportunities for interaction with other households than interior spaces, while increasing the number of potential activities undertaken (e.g., pottery firing, metallurgy).

This paper examines how the use, form, and quantity of attached exterior domestic spaces changed over time. It also considers the influence of interior architectural arrangements, subsistence patterns, and broader settlement organization on the structuring of these areas. Focus will be on the Aegean in its pre- and proto-historic (Neolithic-Late Geometric) periods; this provides a robust dataset of well-excavated households and settlements for a productive diachronic analysis. Comparisons with sedentary populations in other Mediterranean regions, such as the Chumash (southern California) and Aconcagua culture (central Chile), will complement the discussion by underscoring, for instance, the integral relationship between the functionality of the spaces and the shared environmental system.

Several relevant observations and directions for future exploration are offered. I show, for instance, that outdoor domestic areas increased in size in the Middle Helladic and Protogeometric periods alongside changes in the periods' typical interior architecture, i.e., greater multi-functionality of rooms, less segmentation, and a reduction in the visual distinction between the interior and exterior. Such changes matched shifts towards lower levels of social complexity and more informal interaction within the settlements. Although the physical structuring of these periods' exterior spaces best resembles that of the pre-contact Chumash, the functionality of the Chumash households' outdoor areas was more limited and better reflective of periods like Early Helladic II period when less exterior space was devoted to each household and there were more opportunities for community-integrating activities organized outside the domestic realm, like monumental building projects.

5 SMALL FINDS IN ANCIENT EGYPTIAN HOUSEHOLD. MULTIFUNCTIONALITY AND ACTIVITIES IN BUILDING B AT TELL EL-GHABA (NORTH SINAI)

Abstract author(s): Calomino, Eva (Instituto Multidisciplinario de Historia y Ciencias Humanas (IMHICHU) - Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET); Buenos Aires University)

Abstract format: Oral

Tell el-Ghaba was an Egyptian frontier post, occupied during the 10th and 7th centuries BC, located on the eastern border of the Nile Delta. The site was connected to Egypt through the Pelusiac branch of the Nile and to southern Palestine through the coastal plain that stretches between the Suez Canal and the Gaza strip. The evidence suggests that, at least by the beginning of the 9th Century BC the site had already some degree of interaction with the trade network of the Eastern Mediterranean. In this frontier context both people and goods were in movement and interaction, therefore the predominance of small finds of local origin is striking, including wdjat, figurines, amulets, scarabs, earrings, rings, beads, platelets, seals and game pieces. The pottery contexts and other finds recovered in Building B (Area I, Level IV) allow us to infer the relationship established between their residents and the domestic artifacts they handled on a daily basis. The idea of 'multifunctionality' has been applied to the use of residential spaces, based on the presence of domestic contexts that point to the performance of a variety of activities- such as storage activities, consumption, etc. Specifically, we have proposed Building B at Tell el-Ghaba as a case study of an ancient Egyptian household. This work seeks to describe, complement and create ways of interpreting the activities from the study of small finds in this domestic space. This mobilier assemblage is being studied from a novel theoretical-methodological perspective, being classified into categories without referring to the functional question as the primary level of object classification. From these activities and the relationship of Building B's inhabitants with the materiality with which they interacted on a daily basis, the social and economic dynamics and the beliefs that would have been established in this space is analysed.

6 RE-EVALUATING THE "RECEPTION ROOM": PATTERNS OF MOVEMENT AND USE IN PUNIC DOMESTIC SPACE

Abstract author(s): Huemer, Max (SUNY University at Buffalo)

Abstract format: Oral

While "reception rooms" have been identified in Punic domestic architecture by several different scholars (e.g. Fantar 1985, Mezzolani 2000, and Helas 2011), this concept has not been properly defined or interrogated. Such rooms are commonly identified only by their size or decoration, and definitions vary. Reception rooms have been identified at several sites in the central Mediterranean, dating from the fourth to second centuries BCE, including Kerkouane and Carthage in North Africa and Selinus and Motya in Sicily. Some scholars seem to suggest that these spaces were exclusively used to receive guests, and those that suggest other uses fail to point to specific practices. The result is a working assumption of such a space in Punic houses without any real evidence to either support its identification or define its use.

This paper seeks to interrogate both the term "reception room" and the spaces themselves. First, by exploring the origins of the term in scholarly literature, along with related terms such as oecus and main room. Second, by identifying specific practices in these spaces outside their use for the entertaining of guests. There are several difficulties in identifying the usage patterns of these spaces, primarily due to the lack of scientific excavations of such spaces. Third, by placing the reception room in the context of the whole house, its potential use as a space for receiving guests can be better understood. Following the theoretical framework of scholars like Amos Rapoport and Penelope Allison, several fixed features can be identified, which were used to control movement and influence behaviors throughout the house, and especially in relation to the reception room. This paper seeks to challenge the current understanding of reception rooms and clarify their usage in Punic domestic architecture.

7 DOMESTIC USE OF SPACE IN THE CLASSICAL CITY OF OLYNTHOS – WHAT CAN GEOARCHAEOLOGY CONTRIBUTE?

Abstract author(s): Schumacher, Mara (Newcastle University)

Abstract format: Oral

As one of the best-known examples for classical Greek cities, Olynthos with its numerous residential buildings is an important site for the study of domestic space in Greek antiquity.

In domestic houses at Olynthos, most rooms are interpreted as multi-functional. That often leaves complex archaeological records that are shaped by a wide range of processes including not only human activities but also post-depositional processes that can be challenging to interpret. Understanding the impact of natural versus anthropogenic processes is therefore essential to infer human activity and use of space.

The investigation of domestic space in classical Greece is largely based on the study of architecture and spatial distribution patterns of artefacts. Although this approach provides a comprehensive picture of domestic life, it is incomplete as invisible traces of past human activity and formation processes are often not fully considered. A particular problem is that artefacts are rarely located in their systemic context.

Geoarchaeology has the potential to overcome these limitations, as it offers a range of micro-archaeological approaches that shed light on the invisible traces of past human activity. Sediment block samples from House Bix6 at Olynthos were analysed using thin

section analysis and XRF spectroscopy to identify ancient surfaces and associated occupation deposits. The results have enabled the identification of earthen floor surfaces that were not visible in the field, and also revealed geochemical differences between the archaeological deposits and the local soil. Deposits in House Bix6 are notably enriched in calcium levels which can be linked to past human activities like floor construction, burning or food preparation.

The study outlines the potential of geoarchaeological approaches for the investigation of domestic space that in combination with archaeological data allow reconstructing detailed life histories of buildings at Olynthos that can ultimately inform us about social relations in the domestic sphere.

8 WORKING ON THE HOME FRONT: HOUSEHOLD INDUSTRY AND ECONOMIC CHOICE IN TIMES OF DURESS IN ANCIENT GREECE

Abstract author(s): Harrington, Katherine (Florida State University)

Abstract format: Oral

Examples of domestic workshops, including weaving, stone-working, and agricultural processing, are known from many cities in Classical and Hellenistic Greece. These small-scale workshops, in aggregate, contributed much to the economy. While examples of household workshops have long been noted, they have often been considered permanent or long-term endeavors. Less commonly acknowledged is the dynamism of economic strategies employed by households as they responded to changing political, social, and environmental circumstances.

This paper will examine two case studies in which households intensified industry in response to threatening local events. At Olynthos, many of the houses have signs of domestic industry at a scale beyond household need. The North Hill was only settled after a group of local cities banded together in 432 BCE while rebelling against paying tribute to Athens. In the following decades, Olynthos faced numerous military conflicts, culminating in a final sack by the Macedonians in 348 BCE. The economic strategies of the households must be read in this context. I argue that many households scaled up productive activities they were already doing—such as weaving and grinding grain—to help meet their economic needs during the difficult final years of the city. This strategy made specific use of the labor of women, as weaving and grinding were tasks traditionally associated with the female members of the household. Similarly, at the Rachi Settlement at Isthmia, an unusually high percentage of households pressed olive oil in their houses, despite the bulkiness of pressing equipment. While this feature of the settlement has often been interpreted simply as a way to meet the nearby Sanctuary of Poseidon's need for oil, I instead argue that endemic warfare in the region made relocating pressing operations to this isolated ridge settlement a more attractive option than carrying out all stages of production in the countryside.

9 THE HOUSE OF FOURNI ON DELOS: AN INTERDISCIPLINARY APPROACH ON A MULTI-FUNCTIONAL COMPLEX

Abstract author(s): Martz, Anne-Sophie (Independent researcher) - Pagnoux, Clémence (French School at Athens) - Wurmser, Héléne (Lyon University)

Abstract format: Oral

Our paper will present an interdisciplinary approach of the House of Fourni, on the Aegean island of Delos, which perfectly illustrates the implication of multifunctional spaces in Hellenistic houses. This house, located beyond the urban centre of Delos and brutally abandoned in 69 BC, represents a kind of suburban house or villa, which is rarely observed in Greece during this period. The complex, with its three entrances and its intricate communication network, reveals many multi-functional spaces: beside spaces for reception, distributed around the peristyle and characterised by the presence of mosaics, we also find spaces for storage, production and, maybe, commerce.

Within the framework of the ArchCook project / Archaeology of Cooking in Ancient Greece: spaces, objects, recipes, supported by the French School at Athens, we will pay specific attention to the question of food in the House of Fourni: where and how the food was stored, prepared and cooked. Indeed, the articulation between domestic space and production / transformation / storage space is at the core of the question of the kitchen, understood as a space, as an action of transformation of the food and as a wealth of dishes and recipes. Various evidences will be examined to reconstruct the culinary practices at several scale of analysis (pottery, archaeobotanical and archaeological, organic residue, written sources).

In this paper, we intend to bring together the results and hypotheses provided by the analysis of its architecture, its instrumentum and its archaeobotanical remains, to draw a complete image of the House of Fourni and its activities.

10 TERRACOTTA FIGURINES AND THEIR DISTRIBUTION AS INDICATORS OF DOMESTIC CULTS IN AKRAI, SE SICILY

Abstract author(s): Chowaniec, Roksana (University of Warsaw) - Konrad, Aleksandra (Independent scholar)

Abstract format: Oral

This presentation aims to provide a preliminary analysis of cult/ritual-related terracotta material from excavations in the residential area of ancient Akrai in south-eastern Sicily. Presented artifacts were obtained from domestic contexts, from a single Graeco-Roman domus and can be interpreted as indicator of domestic cults. Because the dynamics of a household are strongly attached to broad social, cultural and political contexts, elaborating on the analyzed objects through the lenses of domestic dynamics raises

challenges in the interpretation and assignment of artifacts as related to cults or rituals. Through historical contextualization and iconographic methodology, it is however possible to identify cults present in particular areas of the excavated domus. This presentation also informs about distribution of particular groups of artifacts - terracotta figurines, terracotta altars (arulae), or fragments of miniature columns. Finally, a special attention will be drawn to materials indicative of domestic cults, found in spaces considered as "private" and "semi-private", as well as a semi-public space with foundation deposits. For the purpose of determining the level of "privacy" of the space, Oscar Newman's model of space organization will be considered as a theoretical framework.

11

WORKING FROM HOME: DOMESTIC PRODUCTION IN ROMAN COLONIES

Abstract author(s): Donoghue, Nora (Florida State University)

Abstract format: Oral

Since the earliest explorations of the Bay of Naples, Roman domestic architecture has been interpreted as a reflection of the relationship between the elite heads of households and visitors to the house. The Roman house has been defined as an important element in maintaining and displaying power in the public and political spheres, as well as an organizing force in the private sphere. Recent scholarship has attempted to broaden this approach to include households of varying status and architectural plans, however, terminology related to a Roman atrium house is frequently applied to spaces in houses preserving plans of different forms.

This paper analyzes the multifunctional spaces of the row houses constructed in the Republican and Early Empire colonies of the Italian Peninsula through the identification of activity areas with a focus on domestic production. The behaviors of the households inhabiting row houses are compared through spatial analysis and distribution of objects within architectural spaces, and the functions of the spaces are considered in separation from their previously published labels. The houses of Roman colonies in the period employ a variety of architectural plans, resulting in few discussions of Roman non-atrium living spaces that are compared between sites. Framing the discussion through the behaviors of the household facilitates comparison across differing colonial contexts and highlights the activities of the lower-class inhabitants of Roman colonies, traditionally understudied members of Roman society.

12

MATERIAL CULTURE IN CONTEXT: THE CHANGING LIVES OF RELIEF POTTERY IN THE LATE ANTIQUE URBAN MANSION OF SAGALASSOS

Abstract author(s): Uytterhoeven, Inge (Koc University - Department of Archaeology and History of Art) - Malfitana, Daniele (Consiglio Nazionale delle Ricerche; Istituto di Scienze per il Patrimonio Culturale) - Poblome, Jeroen (Leuven University - Department of Archaeology, Art History and Musicology; Sagalassos Archaeological Research Project) - Mazzaglia, Antonino (Consiglio Nazionale delle Ricerche; Istituto di Scienze per il Patrimonio Culturale)

Abstract format: Oral

Due to their long occupation history, the Late Antique elite houses in the cities of Asia Minor represent many different phases of construction, maintenance, repair, use and reuse. While most of these impressive residences were constructed in the 4th-5th centuries CE, they generally remained inhabited until the 7th c. CE. Moreover, since these mansions frequently integrated older structures, often reaching back to Hellenistic times, they reflect many layered levels, concerning their architectural features, ornamental programmes and material culture.

The late 4th-early 5th c. CE 'Urban Mansion' of Sagalassos (Ağlasun, Burdur - research by the Sagalassos Archaeological Research Project, KU Leuven, Belgium), which integrated several predecessor constructions, including late 2nd c. BCE walls and two Imperial Roman peristyle dwellings, remained occupied until the mid-7th c. CE. Consequently, the study of the mansion allows diachronic insights in the continuities and changes its architectural and decorative appearance, interior layout and related material culture underwent in close association with developments on the broader city level during the late Hellenistic, Roman Imperial and Late Antique periods.

By placing aspects of material culture, especially relief pottery that was retrieved from the residence, within their architectural and decorative framework, this paper intends to reconstruct the long life of objects in their varying spatial contexts throughout a period of nine centuries and this in relation to the developing political, socio-economic and cultural background of their users and the evolving living practices in Sagalassos and Asia Minor.

13

THE BYZANTINE HOUSE IN ASIA MINOR

Abstract author(s): Fildhuth, Jesko (Universität Freiburg)

Abstract format: Oral

The state of knowledge on the Byzantine-medieval domestic house in Asia Minor is poor, especially in comparison to houses of the ancient Greek and Roman period and most recently of late Antiquity. This is due to the fact that large-scale excavations since the late 19th century were mainly conducted in ancient cities, whereby the Byzantine layers were often removed without sufficient documentation in order to reach the supposedly more attractive ancient features. If, however, better-preserved Byzantine buildings were found, as it was the case in Pergamon, the main priority was the study of the architectural structure and the typology of houses, while the concrete use of the single rooms by the inhabitants was of minor concerns. In recent years, excavations as well as surveys have produced new archaeological data which allows a more specific approach to the material.

The paper aims to raise questions about the function(s) and use of Middle and Late Byzantine domestic houses on the basis of selected findings and in consideration of written sources. Houses of the (lower) middle class as well as of the upper class and buildings from rural as well as urban contexts will be included. In addition, especially for rural settlements, a comparison between the Byzantine and the Ottoman houses and farmsteads might also help to enhance our understanding of the use of space and the daily activities of the inhabitants.

492

SCIENTISTS, SUBMITTERS AND SCROUNGERS: ALTERNATIVE VIEWS ON RADIOCARBON DATING IN ARCHAEOLOGY

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Meadows, John (Leibniz-Laboratory for Radiometric Dating and Stable Isotope Research, Kiel University; Centre for Baltic and Scandinavian Archaeology - ZBSA, Schloss Gottorf) - Rose, Helene (Centre for Baltic and Scandinavian Archaeology - ZBSA, Schloss Gottorf) - McLaughlin, Rowan (The British Museum, London)

Format: Regular session

Radiocarbon (¹⁴C) dating has become an essential tool in archaeology, but how do we handle results that do not match expectations? This session will focus on ¹⁴C 'noise' in the form of outliers, offsets and misfits, and how such noise is interpreted within the broader 'radiocarbon community'. The radiocarbon community traditionally consisted of scientists whose research focussed on accurate measurement of ¹⁴C levels in different materials, including known-age samples used for ¹⁴C calibration. Archaeologists occasionally provided suitable reference materials, but generally acted as submitters of 'unknowns', whose calibrated ¹⁴C ages should constrain the chronologies of archaeological phenomena. Some submitters have developed close working relationships with laboratory scientists, and have taken an active interest in ¹⁴C basic research, while others have remained closely integrated in traditional archaeological research. In recent years, as the volume of published archaeological ¹⁴C data has grown, a third ¹⁴C 'tribe' has emerged: 'scroungers', whose research emphasises aggregating and re-interpreting existing ¹⁴C results, often looking for (spatial-)temporal patterns in archaeological phenomena. The proliferation of laboratory techniques and methods of statistical analysis, with attendant growth in our expectations of what radiocarbon dating can do for archaeology, mean that misunderstandings will inevitably arise. This session challenges participants to consider what each tribe in the wider ¹⁴C community can offer to and learn from the others. We invite papers on methodological approaches to identifying and handling ¹⁴C 'noise', and on its impact on archaeological chronologies.

ABSTRACTS:

1

HOW LONG DOES THE MEMORY LAST? BAYESIAN MODELING OF RADIOCARBON DATES AND ISSUES OF MEMORY AT AENEOLITHIC MONJUKLI DEPE (TURKMENISTAN)

Abstract author(s): Heit, Ilia (Institute for Ancient Near Eastern Archaeology, FU Berlin)

Abstract format: Oral

In recent decades, memory practices have become a focus of attention for archaeological research. However, studies that trace singular acts of remembrance and especially their temporal scope are rare. This paper takes a closer look at one such case at the site of Monjukli Depe. There, a burial of a more than 50 year-old man was found in an open area within the settlement. At this place there had been a house in an earlier settlement phase, which was destroyed by fire and subsequently completely covered by occupational deposits. The location of the burial suggests, however, that the position and interior arrangement of the past house was known quite precisely by those performing the burial. The timing of the interment raises questions: Could the old man and the people who buried him have experienced the house and remembered its furnishings? Or did the burial take place after all the contemporary witnesses of the house had passed away and the memories of it were transmitted to the next generation? In this regard it is important to know the duration of the processes in question. Did they encompass one or more generations of inhabitants?

This question can be approached by Bayesian modeling of radiocarbon dates. This method, which incorporates archaeological information into the statistical analysis of ¹⁴C measurements, has been used to more precisely estimate dates of individual events and the duration of specific processes. However, there are several possibilities of interpreting the history of events as they are captured in the stratigraphic sequence. I will examine different scenarios for the settlement history and show how they influence the estimation of the time span between the house destruction and the later human burial. I will use this to reconsider the place of memory and experience in contributing to the burial in question.

2

LOST IN SPACE - FOUND IN TIME. THE SYNCHRONIZATION OF AMS ¹⁴C-DATED CEMETERIES IN THE BALTIC REGION AND UKRAINE

Abstract author(s): Shiroukhov, Roman (Centre for Baltic and Scandinavian Archaeology - ZBSA)

Abstract format: Oral

During 2017-2020, the author collected 322 samples from 17 10-13th century AD cemeteries in the East-Baltic region and Ukraine. So far, 86 of 101 selected samples have been successfully dated at the Leibniz laboratory, Christian-Albrechts University Kiel. These samples provide dates for 73 graves: 47 cremations and 26 inhumations. Most of dated graves pertain to the East Baltic

sites, and 9 to the Ostriv cemetery in Ukraine, attributed to immigrants from the East Baltic region. 8 different materials have been dated: cremated/unburned human bone, horse bones/teeth, charcoal, textile, drinking horn, leather and wood, including samples of different chemical origin from the same grave (e.g. a cremated bone and a charcoal). As a result, 2 different samples from 11 graves of 6 cemeteries have been dated. In 9 cases, the dates of these two samples are compatible. Inhumated skeletal remains from 9 Ostriv cemetery graves and 10 East Baltic graves have been analysed by stable isotopes, aDNA and physical anthropology specialists. Comparative analysis of dietary stable isotope signatures and 14C dates of West Lithuania and Latvia inhumation graves with Ostriv cemetery data demonstrated no obvious risk of dietary reservoir effects, and thus no notable chronological differences. Establishing the age-at-death of skeletal remains has helped to determine the pattern of deviation of 14C dates, as in the case of child inhumations of the Daugava Livs. The most interesting for comparison of Ostriv and East Baltic material are the radiocarbon-dated burials with the same artefacts of Baltic origin. Thus 5 inhumation graves of 4 different East Baltic cemeteries and Ostriv grave 2 with identical brooches demonstrate the gradual emergence of the type in the Baltic region between 980-1020 AD and its appearance in the territory of Ukraine, 1000 km to the East, around 1030 AD. We can conclude that the Ukrainian burials are first-generation immigrants, rather than their descendants, but brooches could also be imports. Thus the synchronization of distant archaeological sites in the time-space pattern of the past is possible using the 14C dating and same types brooches in the funerary context.

3 NEW 14C DATES OF DOG ASSOCIATED BONE GROUPS IN THE LATE IRON AGE LIV CEMETERIES, LATVIA

Abstract author(s): Plankajs, Eduards (Institute of Latvian History, University of Latvia; National History Museum of Latvia) - Legzdina, Dardega (Institute of Latvian History, University of Latvia)

Abstract format: Oral

This paper provides a detailed overview of the newest 14C dates of the dog associated bone groups (ABGs) found in the eastern region of the Baltic Sea, corresponding to the areas inhabited in the Late Iron Age by Finno-Ugrs – Livs. ABGs of dogs have been found in cultural layers of settlements and hill-forts inhabited by Baltic tribes as well, but only in Finno-Ugric burials dog skeletons have been found associated with inhumations and cremation burials in both flat graves and barrows.

The archaeological context of the ABGs of Livs' dogs is definitely the Late Iron Age burials (10th-13th c. AD). However, the new 14C dates do not correspond with the well-established archaeological dating and thus indicate a significant impact of Freshwater reservoir effect. Paleodiet analysis of the Livs' dogs have been carried out by measuring carbon and nitrogen stable isotope ratios. The results were plotted against human isotope data and a large animal isotope dataset, showing that the paleodiet of Livs' dogs were very similar to that of the co-buried humans. Hypothetically, these dogs were not scavengers, but were fed by the leftovers of the owners' meals, dominated by freshwater fish, that, accordingly, have affected radiocarbon dates.

4 ARCHAEOLOGY, RADIOCARBON AND DIETARY STABLE ISOTOPES: NOVEL APPROACHES TO 14C DATING OF HUMAN REMAINS IN ESTONIAN BRONZE AGE

Abstract author(s): Torv, Mari (Archaeology Department, Institute of History and Archaeology, University of Tartu) - Oras, Ester (Institute of Chemistry, University of Tartu) - Meadows, John (Centre for Baltic and Scandinavian Archaeology) - Lang, Valter - Kriiska, Aivar (Institute of History and Archaeology, University of Tartu)

Abstract format: Oral

Rapid increase in 14C dating of archaeological material throughout the Baltic countries has resulted in a vast dataset of radiocarbon dates from different contexts. These, however, have mostly been used for ad hoc publication purposes with little critical evaluation and further analysis. We present an exemplary case study based on the material of stone cist graves – the first monumental graves in Estonia – where ca. 100 new radiocarbon dates from human skeletal remains have been employed for establishing a new chronology (Laneman & Lang 2013; Laneman et al. 2015; Laneman forthcoming 2021a, b). Although the dates are coupled with the information about dietary stable isotopes – carbon (13C) and nitrogen (15N) –, these proxies have not been used to evaluate the dating results.

We will revisit the previously obtained 14C dates from human bones in the Bronze Age burial contexts, focusing on their relations to the diet. The meticulously described archaeological context, 14C dates and stable isotope values allow testing novel analytical methods for interpreting radiocarbon dates. Moreover, the dates and stable isotope values from animal bones from the burials and other contexts provide a valuable input as baseline information. We employed quantitative palaeodiet reconstruction (FRUITS) and dietary reservoir effect estimation together with statistical modelling to indicate the complexities behind dating ancient human remains.

References

- Laneman, M. forthcoming 2021a. The date of the Late Bronze Age stone-cist cemetery at Jõelähtme reconsidered. – EJA.
- Laneman, M. forthcoming 2021b. Radiocarbon chronology of the stone-cist graves at Rebala, northern Estonia. – EJA.
- Laneman, M. & Lang, V. 2013. New radiocarbon dates for two stone-cist graves at Muuksi, northern Estonia. – EJA, 17: 2, 89–122. <http://dx.doi.org/10.3176/arch.2013.2.01>.
- Laneman, M., Lang, V., Malve, M. & Rannamäe, E. 2015. New data on Jaani stone graves at Vão, Northern Estonia. – EJA, 19: 2, 110–137.

5 UNRELIABLE DATES? - RADIOCARBON IN THE THRACIAN PLAIN

Abstract author(s): Brandtstätter, Lennart (University of Tübingen)

Abstract format: Oral

After a rough beginning, more than half a century ago radiocarbon dating became an essential tool in archaeology. Since these days, experts applied different models to archaeological sequences and experimented with sum functions for typological phases. Especially with the program OxCal, these methods are accessible for a large group of archaeologists.

By now for most areas within Europe a great number of dates have been individually published and collected in databases like CalPal, RADON or 14SEA. Still there are some regions, which are mostly unaffected by this trend.

This talk will focus on the Neolithic in the Thracian Plain, the Lower Danube and surrounding areas. The role of these regions (not only in the context of the spread of Neolithisation) is constantly discussed and projects like TOTL, BIRTH or Lepenski Vir have greatly enlarged the radiocarbon dataset. Still for some regions reliable data is missing on a larger scale. In the area of research, there are less than 400 radiocarbon dates, measured to a big extent before 2000 CE. These available data will be summed up, reevaluated and analysed specifically on the level of a single site. Problems regarding unreliable and corrupted samples will be discussed and possible ways to deal with will be compared. Methods include Gaussian Monte Carlo Wiggle Matching (CalPal), Sequence and Outlier analysis, as well as Sum and KDE functions integrated in OxCal and free R packages.

A. RADIOCARBON DATING WITH VILNIUS SSAMS: TREE RING RESEARCH, LAKE SEDIMENTS AND COMPLEX ANALYSIS

Abstract author(s): Pabedinskas, Algirdas - Maceika, Evaldas - Paužolis, Julius (State research institute Center for Physical Sciences and Technology)

Abstract format: Poster

Many of archaeological findings are dated by radiocarbon method and it's an important part of whole processes in archaeology. 14C is long-life radionuclide, so it's considered to be one of the most suitable tracers for subject age determination (Synal et al. 2013). Each year radiocarbon dating method improves and expands its usability in archaeology and other science fields. It is well known that naturally radiocarbon originates in upper atmosphere layers caused by cosmic radiation initiated n,p reaction with nitrogen. But in certain areas radiocarbon activity in bio samples may be increased by local Nuclear Power Plant (NPP) exploitation. To analyse longterm radiocarbon emission impact on environment, tree rings analysis is the most useful method. Tree rings and undisturbed lake sediments 14C activity measurements provides an undistorted data of chronology. This information could be used to reconstruct events occurred in time span of nuclear power plant exploitation.

In this research we analysed more than 400 tree ring samples from Ignalina NPP surroundings and 36 layers of Drūkšiai lake bottom sediments core. Pine tree rings were collected from 8 locations and lake sediments core was taken in the deepest lake point. Radiocarbon measurements were completed with preparation equipment AGE3 and measurement equipment - Single Stage Accelerator Mass Spectrometer (produced by NEC) (Skog et al. 2009, Wacker et al. 2010).

All these measurements provide chronological change of radiocarbon activity in NPP environment. Due to different origins of sample material and complexity of analysed processes this research expands radiocarbon measurement use in environment analysis.

This research was funded by a grant (No. S-MIP-19-16) from the Research Council of Lithuania.

493 'HOW THE NEOLITHIC CREATED THE BRONZE AGE': NEOLITHIC SOCIETIES OF EUROPE ON THE EVE OF METALLURGY

Theme: 6. Material culture studies and societies

Organisers: Brozio, Jan Piet (Institute of Pre- and Protohistoric Archaeology, Kiel University) - Johannsen, Niels (Department of Archaeology and Heritage Studies, Aarhus University)

Format: Discussion session

The adoption of metallurgy in Neolithic societies was a particularly formative episode in the cultural history of Europe. The Neolithic ended in different regions at different times, but technological changes associated with metal and their socio-economic consequences affected all parts of Europe sooner or later. Late Neolithic societies had their own forms of social organisation, economies and involvement in exchange and communication networks and had often already had contact and experience with metal, albeit more sporadically. But what were the different starting situations for this fundamental cultural development in Europe? In this session we will look at Neolithic societies on the eve of their transformation associated with metallurgy and focus on questions like:

- How were societies organised towards the end of the Neolithic period? Which developments had led to these?
- To which extent did the new technology of metallurgy and the exchange of metals have a push effect that speeded up changes that were already on the way?
- How were social differences presented in advance of the new metal objects? For instance, did house architecture possibly become the main medium of social representation instead of monumental burial architecture?
- Can socio-economic changes be observed on the eve of metallurgy? Did an intensification of agriculture or other forms of raised economic productivity promote the adoption of metallurgy?

The aim is to compare scenarios from different regions in Europe to characterise the complexity and to differentiate between alternative explanatory models for the foundation of transformations from stone- to metal-using societies.

ABSTRACTS:

- 1 THE SOCIO-ECONOMIC IMPACT OF THE EMERGENCE OF METAL ARTEFACTS IN THE 5TH MILLENNIUM BC IN SOUTHEASTERN ROMANIA**
Abstract author(s): Darie, Adelina (Bucharest Municipality Museum) - Mirea, Dragoş (Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering; Bucharest Municipality Museum) - Parnic, Valentin (Lower Danube Museum, Călăraşi) - Lazăr, Cătălin (Division of ArchaeoSciences, Research Institute of the University of Bucharest - ICUB, University of Bucharest)
Abstract format: Oral
This research focuses on the Eneolithic communities' changes from the Southeastern Romanian plain, in the 5th millennium BC concerning the manufacturing and exchange of metal artefacts in Southeastern Europe.
The present study refers to the maximum development of Kodžadermen-Gumelnița-Karanovo VI cultural complex (KGK VI), defined by the Carpathian Mountains to the North the Balkan Mountains to the South.
The progress made by the Eneolithic communities reflects in the economic changes such as the settlement organization, dwelling architecture, highlighted by the emergence of new raw material sources such as copper and gold which strengthens the previous exchange networks created by the prehistoric communities from Southeastern Europe.
Given the geographical background of the Romanian Plain, the absence of metal ores, it is necessary to evaluate whether raw material sources from the Carpathian, Balkan or Serbian ores, could be traced back to the manufacturing of the fine copper artefacts discovered in the settlements from target area (e.g., Chitila-Fermă, Gumelnița, Măriuța, Sultana-Malu Roșu, Sărulești, Șeinoiu, Vidra). An essential part of the research is represented by the discussion around using Ai Bunar and Majdanpek sources to manufacture the studied items.
Moreover, in the KGK VI, we observe morphological and technological similarities between the metal artefacts discovered to the north and the south of the Danube.
The samples were studied using two analytical methods in order to obtain information regarding the chemical composition of the samples and to confirm the results: the PIXE and XRF analyses. The third method of analysis was the Optical Microscopy (OM), used to determine the object's primary morphological analysis.
This work was supported by a grant of the Romanian Ministry of Education and Research, CNCS - UEFISCDI, project number PN-III-P2-2.1-PED-2019-4171 (351PED/2020), within PNCDI III and through the support of the Romanian Governmental Programme "Instalații și Obiective de Interes Național".
- 2 BUSINESS AS USUAL: THE SOCIAL SIGNIFICANCE OF THE FIRST BRONZE OBJECTS IN NORTHERN GERMANY**
Abstract author(s): Schultrich, Sebastian (Institut fuer Ur- und Fruehgeschichte Kiel)
Abstract format: Oral
According to established opinions, the beginning of the Bronze Age is associated with profound social change. According to the terminology, the Bronze Age in northern Central Europe begins half a millennium later than in Central Europe. However, this does not mean that the north was isolated from the innovations, nor that the advent of metal per se must be accompanied by changes. The last aspect in particular is often accepted uncritically.
The study of bronze artefacts in Late Neolithic (2250-1750 BC) Schleswig-Holstein has long been a desideratum. On all published distribution maps, there is a gap between the southern Scandinavian and central German sites, which can now be closed. The contexts of the metal objects follow a pattern that can also be observed in the Younger Neolithic. In the west, Late and Younger Neolithic bronze and stone artefacts were integrated into burials, in the east they were deposited as individual finds and hoards. Bronze artefacts were thus integrated into existing structures and did not significantly change them.
This has two consequences for established views of the southern Scandinavian research.
 1. In the Late Neolithic, Bronze artefacts were not kept out of burial contexts per se, as the southern Scandinavian findings suggest.
 2. The social consequences of the adoption of early bronze artefacts are less profound than has been assumed.
- 3 WHAT WAS GOING ON? - SOCIO-ECONOMIC TRANSFORMATIONS IN THE LATE NEOLITHIC SOCIETIES OF THE NORTH GERMAN PLAIN**
Abstract author(s): Brozio, Jan Piet (Institute of Pre- and Protohistoric Archaeology CAU Kiel)
Abstract format: Oral
The last phase of the Neolithic in the North German Plain starts late compared to other more southern regions. While metallurgy is already widespread in Central Europe, increasing reactions to this phenomenon can be observed in Southern Scandinavia and the

Northern European Plain. For the areas of the southern Kimbrian peninsula and Mecklenburg-Vorpommern (North Germany), can also be observed significant increases in land openings and a change in agricultural techniques from extensive to intensive cultivation. It seems that on the eve of metallurgy an economic boom can be detected which, in contrast to the earlier episodes of the Northern Neolithic, is not reflected in elaborate special burial complexes, but in a boom of new status objects and a house architecture that possibly becomes the main medium of social representation. At the end of the Neolithic, metallurgy may therefore have had a push effect on socio-economic changes in societies that had already been started. Therefore, in this talk I will address the questions of how the increasing impact of metal affects the Late Neolithic and which socio-economic transformations had already taken place before or were triggered by it.

495 COVID 19: ASSESSING THE IMPACT AND PLANNING FOR A DIFFERENT FUTURE FOR ARCHAEOLOGICAL HERITAGE TOURISM

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Gowen Larsen, Margaret (University College Dublin; EAA Community on Archaeological Heritage management and Tourism) - Willems, Annemarie (Cultural Heritage Agency of the Netherlands; EAA Community on Archaeological Heritage management and Tourism) - Dunning Thierstein, Cynthia (ArchaeoConcept; EAA Community of Archaeological Heritage Management and Tourism)

Format: Regular session

At the time of writing (November 2020) it is virtually impossible to imagine the longer term effects of the global pandemic. For many archaeological sites and other cultural sites open to the public, a vital stream of income has been disrupted. For some this is due to the loss of international cultural tourism visitors, local visitor activity and temporary closure. The collapse in income has resulted in job losses, loss of critical staff infrastructure and, by association, loss of knowledge. The impact on many local community economies has also been felt, sometimes acutely. For some destination sites, however it has offered welcome respite to get some conservation works done and the possibility to review the impact of visitors, how visitors are managed and who their target visitors are. 'Stay at home' tourism provided some welcome relief during the summer months and provided an indication of the potential for future marketing focus and future development. The home market, a link to rural tourism development, eco-tourism, and green-route tourism initiatives are all areas of increased interest as uncertainty grows about the future of international mass tourism.

This session seeks presentations from archaeological site managers and regional museum managers on how they have coped during the pandemic and how they see the way forward. It will also seek participation from destinations that are partners in European cultural routes and World Heritage to learn of what new promotion strategies that may be envisaged. It also seeks contributions from academic researchers in cultural heritage management, cultural heritage tourism.

ABSTRACTS:

- 1 TOURISM RECOVERY AND RENEWAL AT WORLD HERITAGE SITES: BALANCING SUSTAINABILITY AND RESILIENCY**
Abstract author(s): Maclaren, Fergus (ICOMOS ICTC)
Abstract format: Oral
The global spread of the COVID-19 pandemic has had devastating, consequential effects on the visitor economies of World Heritage sites. This stark challenge to what had been viewed as a substantial and sustainable form of economic development are causing authorities to rethink what it means to support and invest in tourism promotion, services and infrastructure. This reflection also involves immediate and longer-term climate change and sustainability-driven approaches on how to better address and manage the risks related to adapting or mitigating the economic and climate shocks to tourism systems and supply chains, while improving the local environments, livelihoods and well-being of surrounding communities. This presentation highlights initiatives by multilateral agencies such as UNESCO, the Organization of World Heritage Cities and individual sites that are trying to develop a better understanding of the issues and challenges affecting OWHC member cities stemming from the pandemic's ongoing impacts, and potential approaches to aid in improving the immediate tourism response, recovery, renewal and resiliency approaches, while integrating the necessary longer term thinking and initiatives to deal with pressing sustainability and climate change concerns.
- 2 THE FLÂNEUR, THE COLLECTOR, AND THE GAMBLER: HOW WILL WE READ AND REMEMBER THE EARLY 21ST CENTURY?**
Abstract author(s): Peterson, John (University of San Carlos; ICAHM)
Abstract format: Oral
Walter Benjamin's three types, the flâneur, the collector and the gambler were proposed as observers or players in his Arcades Project for 1920s Paris. They were engaged in a kind of "tourism" that enjoyed the luxury shopping corridors in the iron-girded structures of the "modern" Paris landscape of that era. It was a transformative time in European history, as is this 2020's decade just beginning. World Heritage is at the center of how we view landscapes and places. Are these just spaces for strolling to view the exotic and the unique, or are they holistic landscapes with real communities and histories, and do we celebrate their spiritual as well as community

and aesthetic character? The Pandemic of 2020 may be a powerful moment, a pause, for us to allow communities to re-occupy their places and landscapes while we are locked-down from the fin de siècle rush of global travel and tourism. As we come off the pause we can perhaps adapt to a world changing from climate impacts and find appropriate ways to appreciate our World Heritage, from homestays, trekking, pilgrimages, and other in-depth encounters. The course of preservation may require us to be more reflective and less invasive. What will be the perspective from AD 2030 as we look back on this decade one hundred years after the Arcades?

3 POST-PANDEMIC TOURISM DEVELOPMENT FOR THE LONG-TERM

Abstract author(s): Holtorf, Cornelius (Linnaeus University)

Abstract format: Oral

This paper is about the outcomes and lessons learned from a now ending project at Linnaeus University titled “Post-Pandemic Tourism Development: Navigating Uncertainty in the Visitor Economy.” Running from one year until September 2021, the project was a collaboration between Tourism Studies and Heritage Studies at Linnaeus University. It also involved active participation of 10 regional organizations and companies as project partners. The project comprised a series of joint discussions, formal interviews, and a full-day futures workshop. The project’s goal has been to understand how stakeholders in the visitor economy make sense in the short- and long-run of the uncertainty induced by the corona pandemic. It also aimed at building futures literacy and providing support to stakeholders in their decision-making. Besides these aspects, the project group believes that for addressing the challenges of post-pandemic tourism development much can be gained from strengthening interdisciplinary collaboration between our two research areas and from building lasting partnerships between the University and regional stakeholders. In this paper, I will discuss where we are near the end of the project and what we have learned thus far.

4 THE EUROPEAN ROUTE OF MEGALITHIC CULTURE: STRATEGIES FOR A SUSTAINABLE DEVELOPMENT FOR AN INTERNATIONAL ARCHAEOLOGICAL COOPERATION NETWORK

Abstract author(s): Kelm, Rüdiger (External Expert)

Abstract format: Oral

The European Route of Megalithic Culture (MR) serves as a cooperative platform for museums, Geoparks, scientists and tourism practitioners from Denmark, England, France, Germany, Italy, The Netherlands, Portugal, Spain and Sweden. It was formed to raise the profile of the outstanding importance of the megalithic culture in European history and to promote the tourism value of its monuments and surrounding landscapes. The goal of the association is to link the megalithic monuments of Europe in a cultural route committed to the principles of sustainable tourism. As a result of the Covid-19 pandemic, a recent Executive Board-approved “Road Map” has established new strategies and concepts for the future focused on the following points:

- Definitions - Megaliths/Megalithism in the frame of MR
- Marketing advice
- Development of the Homepage, Social Media platforms
- Improving cooperation with tourism agencies and institutions
- Reaching the public: public seminars and promotion (primarily digital communication channels in 2021)

Our Homepage is the highest priority, as it is here that we can best communicate internally and externally. In addition, we aim to make it more informative while also simplifying it (using English and German only – adding other members languages later on). Short promotional videos will be distributed for use in the social media platforms of our members.

The “Steinzeitpark Dithmarschen”, where the author is the managing director, will be presented as an example of local development of the MR in post-pandemic circumstances. The park is a certified member of a group that is cooperating on sustainable development in the federal state of Schleswig-Holstein. The regional tourism organization has been inspired by our sustainable tourism initiatives (e.g. bicycle tours, family and educational programmes etc., which fit well with the restrictions of Covid-19 management-conditions).

5 CREATING A TRANSNATIONAL CULTURE ROUTE IN THE MIDDLE OF THE COVID-19 CRISIS – THE IRON AGE DANUBE ROUTE EXPERIENCE

Abstract author(s): Czifra, Szabolcs - Fábíán, Szilvia (Hungarian National Museum) - Mele, Marko (Universalmuseum Joanneum) - Mihelić, Sanjin (Arheološki Muzej u Zagrebu)

Abstract format: Oral

EU-projects regularly present great opportunities to create transnational co-operations in research, monument protection and tourism. They provide funds for many archaeological stakeholders in Europe and sometimes give rise to truly great products. However, they also have an inherent major flaw – all of them sooner or later end. What happens with all the nice results and products of e.g. Interreg projects? Are they sustainable at all?

The partnership of the Interreg Danube Transnational project called Iron-Age-Danube was faced with the same questions as it approached the end of the project in 2019. The new network, a visitor app and an e-learning tool, boards in micro-regions in four countries and joint publications were all available at the end of the project, but now needed a new and sustainable solution. The partners decided to establish the Iron Age Danube Route, which is managed by the Iron Age Danube Route Association in Zagreb (<https://www.ironagedanuberoute.com/>). The goal is to permanently connect and jointly promote Iron Age landscapes and highlights, by joint

activities in touristic promotion and research. The Association was established in June 2019 with eleven members from four countries, which set themselves to develop necessary and attractive common activities. Developing a set of joint promotion products was one of the first such activities.

When the Covid-19 crisis started at the beginning of 2020 the Route was already well established and at that point aimed to expand to new members in different countries. The new situation forced the members to rethink and refocus their activities. How this was achieved and which measures are needed in the future in order to make it sustainable is the main topic of our paper.

6 NOVEMBER BLUES AND SPRING FEELINGS – THE LVR-ARCHAEOLOGICAL PARK AT XANTEN (GERMANY) IN THE TIME OF COVID19

Abstract author(s): Kienzle, Peter (LVR-Archaeological Park at Xanten)

Abstract format: Oral

Since 1973, the LVR-Archaeological Park at Xanten (APX), Germany, protects, researches and presents the remains of the former Roman city Colonia Ulpia Traiana (CUT). Being one of Germany’s largest archaeological sites, the park and the on-site museum attract more than 350.000 visitors annually – in usual years. In 2020, due to the CoVid19-Pandemic, there was the spring-lockdown from March 15th to May 5th and after a period of careful and gradual re-opening in summer a second lockdown from November 2nd until to date (February 2021), cutting the visitor figures in half.

The APX is a museum of the Rhineland Regional Council - an inter-communal public authority – and as such subsidised by tax money. Thus, the APX is not threatened by immediate closure and, besides some minor problems, it will do fine in financial terms. However, there is a severe loss of social interaction and of long established ties with the local self-employed guides, organisations, universities, schools and reenactors, in short, with all the people who brought the park to life each summer. All these stakeholders did and do have their own problems with the CoVid19-pandemic. Due to a wide range of reasons, they may not resume their part in the future life of the APX or, at least, not in the same intensity or manner.

This forces the staff of the APX to rethink its plans and activities. Once the circle is broken, it contains the threat and the opportunity to reshape the programme and the way of presentation which will require both, imagination and stamina. This paper explores the experiences to date and the future plans at the APX.

7 UNLOCKING ARCHAEOLOGICAL SITES TO PUBLIC IN LOCKDOWN: EXPLORING THE LOCAL AND NEGLECTED

Abstract author(s): Marik, Jan (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic, Prague) - Lečbychová, Olga (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic, Brno) - Dunning Thierstein, Cynthia (ArchaeoConcept Sàrl)

Abstract format: Oral

In 2020, international tourism slowed down and eventually came to a complete halt. The states more or less closed their borders and locked their citizens at home. By doing so, people’s attention focused essentially on local events and activities. Therefore, it opened up new possibilities for presenting archaeological sites that were so far outclassed by more famous monuments and tourist attractions.

To offer the opportunity to explore archaeological sites and present them as an integral part of the cultural landscape to the “locked-down” public, 43 archaeological institutions of the Czech Republic teamed up and prepared the Archaeological Summer. Altogether, 73 sites were presented, and 3,700 participants booked guided tours. According to Facebook data, we managed to reach over 38,000 people. Moreover, 30,078 accesses to the Archaeological Summer website from 9,133 unique IP addresses were recorded.

Several requirements preconditioned the organisation of such a national event: professional archaeologists understood its community nature and participated in it, and we could utilise digital tools for the presentation of archaeological heritage that had been developed in the pre-Covid times, such as the online Archaeological Atlas of the Czech Republic and 3D and augmented reality tools. The Archaeological Summer became very welcome and popular, mainly because there were limited recreation possibilities in cities during the lockdown, and the people enjoyed the benefit of having “one’s own archaeologist” at disposal right on the site. These activities have contributed to promoting cultural heritage, supporting local tourism, and raising awareness of cultural heritage and historical landscape knowledge. The event has become a national case study. It showed us paths we can take while presenting archaeological sites, their sustainability and limits. At the same time, it outlined the possible role of archaeologists while cooperating with local communities.

«THE STONES OF THE ANCESTORS»: AN EXPERIENCE OF HOLDING A MODERN IMMERSIVE EXHIBITION OF STONE TOOLS DURING A PANDEMIC

Abstract author(s): Kholkina, Margarita - Muravev, Roman (Saint-Petersburg State University) - Directorenko, Anastasia (independent researcher) - Ivitskaya, Anna (Military Historical Museum of Artillery, Engineers and Signal Corps) - Korneva, Tatyana (Institute for the History of Material Culture RAS) - Sevastyanov, Nikolay (Saint-Petersburg State University) - Mikishat'yev, Fedor (Scientific archive of the Russian Geographical Society) - Yatsentkovskaya, Maria (Saint-Petersburg State University of Film and Television) - Loginova, Ekaterina (ITMO University)

Abstract format: Poster

One of the main problems of archaeological expositions dedicated to the Stone Age is the lack of appropriate background among the mass visitor. Such a high "threshold of entry" often scares off museum visitors and makes it impossible to fully enjoy the masterpieces of the prehistoric creators. With our team of archaeologists, architects, illustrators and animators we have tried to create such an exposition of ancient artefacts that could easily attract the eyes of an unprepared viewer and awaken in him a passion for search and knowledge. Unfortunately, the organization of the exhibition fell on the period of Covid 19 restrictions, which became a challenge for us. Pandemic conditions led to a decrease in the number of visitors, especially among foreigners. In addition, the need to keep social distance to a large extent defined both the "intimate" nature of the exhibition and the organization of the space on it itself.

The exhibition consists of seven stone tools in total, separated from each other in time and space. Each artefact in our exposition tells its story, opening the doors to the mysterious era when tools were made of stone.

Each object is displayed on a separate pedestal in an isolated room with individual design. This corresponds with the concept of exhibiting artefacts, transmitted by the modern socio-cultural environment through popular films, computer games and science fiction literature. Such an approach, combined with the particular music ambience as well, creates a mysterious atmosphere and feeling of importance of what is happening. In the context of a pandemic with its social distance, the exhibition acquired a special intimate character and visitors got an opportunity to find themselves "face to face" with the artefact and its history in a space filled with light and music.

A WORLD OF CLAY I: WIDENING ANALYTICAL HORIZONS

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Arntz, Monique (University of Cambridge, Department of Archaeology) - Delbey, Thomas (Cranfield University, Cranfield Forensic Institute) - Jean, Mathilde (Université Paris 1 Panthéon-Sorbonne) - Delvoye, Adrien (University of Geneva, Department of Genetics and Evolution) - Kroon, Erik (Leiden University, Faculty of Archaeology)

Format: Regular session

Pottery production should not be studied in isolation. As studies focus on ceramic production as a craft, we come face to face with the full diversity of clay materials: from figurines to architecture, from medicine to soils. A diversity which is mirrored by the myriad of specialisms dedicated to the study of clay materials.

Yet, many commonalities and interdependencies existed between techniques and activities associated with the utilisation of different clay materials at any given time in the past. As such, specialists who work with these materials often use similar, but slightly different analytical concepts and techniques.

For example, a key concept such as chaîne opératoire is well-established in ceramic analysis, but less so in the analysis of figurines. Petrography is a good example of a method which is widely used for the analysis of many different clay materials, but in slightly different manners for each. Subtle differences also exist between research traditions, such as between Francophone and Anglophone analyses of ceramics: with more attention for technical know-how and creating an empirico-inductive model in the former, and understanding social dynamics through an hypothetico-deductive model in the latter.

In this session, we take a holistic stance towards clay materials. Our aim is to draw upon the wealth of analytical concepts and techniques which exists within the various specialisms of 'clay material studies'. We welcome papers on all possible clay materials, regardless of region or period, analytical or theoretical. We encourage prospective speakers to delve into the methodologies and concepts employed in their analyses, and to actively engage in discussions with researchers from other fields. Clay material studies is a rich and varied field of research, with ample opportunity for cross-fertilisation and multi-disciplinary enrichment.

ABSTRACTS:

1 AN INSIGHT INTO THE SUITABILITY OF CLAYEY RAW MATERIALS: THE CERAMIC PROVINCES OF NORTHERN PELOPONNESE AND SOUTH EPIRUS, GREECE

Abstract author(s): Xanthopoulou, Vayia (Department of Geology, University of Patras; Laboratory of Electron Microscopy and Microanalysis, School of Natural Sciences University of Patras; University of Henan, Key Research Institute of Yellow River Civilization and Sustainable Development, School of Geography & College of Environment and Planning, Kaifeng) - Kougia, Nickoula (Department of Geology, University of Patras; ERAAUB, Facultat de Geografia i Història, Departament d'Història i Arqueologia, Universitat de Barcelona) - Iliopoulos, Ioannis (Department of Geology, University of Patras; ERAAUB, Facultat de Geografia i Història, Departament d'Història i Arqueologia, Universitat de Barcelona)

Abstract format: Oral

Corinth, Achaia in Northern Peloponnese and Nicopolis in Epirus (Greece) have a strong archaeological record of ceramic production, from the Early Helladic to Late Roman periods. The geographical location of Western Achaia permitted its control on the seaways of the Ionian Sea, whereas the Eastern Achaia lies at the junction of land roads connecting it with Central Greece. Important archaeological sites, such as Helike, Aigeira, the settlement of Derveni, the cities of Patras and Nicopolis, offer data and findings of unexpected quality. One of the main pillars of the development of the ceramic production in these areas was the availability of local natural resources, among which are the clayey sedimentary deposits that outcropping in the area.

The current study deals with the physical-technological properties (plasticity and granulometry), the mineralogical composition of clayey raw materials (67 samples) in terms of their suitability for ceramic production across all this geographic area. Experimental briquettes were prepared and fired at 700, 900 and 1050°C for a soaking time of 6h. Our aim was to differentiate the three main "ceramic" provinces, based upon the above mentioned properties. The results obtained showed that the clays sampled from Corinth and eastern Achaia are carbonatic materials of poor plasticity, whereas those from Western Achaia and Epirus are both Ca-rich and Ca-poor materials with the majority exhibiting a better plasticity. The macroscopic examination of the experimental briquettes suggests significant differences in firing color and fabric consistency, between the samples from Corinth-Eastern Achaia and Western Achaia-Epirus. The results from this study are expected to constitute an important archaeometric tool for tackling archaeological issues by means of provenance and ceramic technology within the region and in the surrounding areas.

2 IDENTIFICATION OF MANUFACTURING TECHNIQUES AND FIRING TEMPERATURES ON YCHSMA CERAMICS. ARMATAMBO (1250-1532 AD) LIMA PERU

Abstract author(s): Pareja Anyosa, Dante (IRAMAT-CRP2A, Université Bordeaux Montaigne - UBM; GPAC, C.I. Micaela Portilla Universidad del País Vasco - UPV/EHU; Grupo de Investigación Sociedades Prehispánicas del Litoral-Yungas. Universidad Nacional Mayor de San Marcos) - Iñañez, Javier (Ramon y Cajal Researcher, GPAC, C.I. Micaela Portilla. Universidad del País Vasco) - Chapoulie, Rémy (IRAMAT-CRP2A, Université Bordeaux Montaigne - UBM) - Diaz, Luisa (Grupo de Investigación Sociedades Prehispánicas del Litoral-Yungas. Universidad Nacional Mayor de San Marcos)

Abstract format: Oral

The Ychsma society was one of the most important civilizations developed between 900-1530 AD in Lima, the Peruvian capital, situated in the central coast of Peru. The Ychsma territory included the lower basin of the Rímac and the Lurín valleys, located in the department of Lima (Peru). Between 1470 - 1532 AD, it was conquered and placed under control of the Inca Empire which allowed local elites to maintain their position and control of the population.

Our project addresses the study of the technical traditions of making ceramics at the archaeological site of Armatambo, one of the main Ychsma sites, which developed between the Middle (1250-1350 AD) and Recent Ychsma (1350 - 1532 AD) phases. This archaeological site was a strategic place for economic interaction and exchange between the various coastal sites associated to the Ychsma culture.

The first results obtained by macroscopic observation of sherd fractures and ceramic surface treatments, showed continuity in the technological tradition between the Middle and the Recent Ychsma phases. This continuity is related to the use of the coiling technique in those phases. We also carried out mineralogical analyses (petrography, XRD) identifying the provenance and relative cooking temperatures. We also made observations with SEM to determine technological features. The first archaeometric results enable us to suggest a regional production in the Rímac Valley, implying in addition, a short distance distribution and low representation of non-local ceramics.

3 DIFFERENT METHODS FOR DUNG DETERMINATION IN THE CERAMICS (BY THE MATERIALS OF YARIM TEPE I SETTLEMENT, NEOLITHIC OF NORTHERN IRAQ)

Abstract author(s): Babenko, Anna (Institute of Archaeology RAS, Moscow) - Petrova, Natalia (Department of Archaeology State Historical Museum)

Abstract format: Oral

From the beginning of the Northern Mesopotamian Neolithic pottery study researchers noted the presence of organic inclusions in the vessels pottery paste. The study of Protohassuna and Hassuna culture ceramics allowed to determine it like dung. The com-

prehensively research of this inclusion was carried out on the materials of the Yarim tepe I settlement (the end of the 7-th mill. BC - beginning of the 6-th mill. BC). Three methods were used: analysis of plant prints, dung spherulites and pollen analysis.

The determination of the dung by the plant prints based on the microscopic study of their shapes and sizes. Very small plant prints with rounded and pointed tips specific to the dung were highlighted by the data of experiments and archaeological material. Dung spherulites (calcium carbonates that form in animal guts) may be use as the markers of dung. Spherulites are readily visible under cross-polarized light (XPL). Dung spherulites and pollen analysis are known methods for investigation different objects from archaeological sites. But we tried to apply these non-traditional for studying ceramics analyses in order to determine the presence of dung in the pottery paste. The thickest ceramic fragments were selected for pollen analysis. Such fragments are most likely to contain unburned pollen during firing.

The experience of using spherulites and pollen analysis was positive. Dung spherulites and pollen were found in the studied ceramics. The concentration of pollen in ceramics is low, but its content is sufficient for pollen analysis. The largest share of pollen accounts on such taxa as birch (*Betula*), grass (*Poaceae*), wormwood (*Artemisia*), and compositae (*Asteraceae*). A large proportion of insect pollination species pollen (*Asteraceae*) may indicate the presence of dung in the pottery paste.

4 A MATTER OF SCALE! FIELD OBSERVATIONS AND MICROMORPHOLOGICAL ANALYSES ON EARTHEN MATERIALS AT MENTESH TEPE (AZERBAIJAN) IN THE NEOLITHIC PERIOD

Abstract author(s): Bellat, Mathias (Museum National d'Histoire Naturelle) - Baudouin, Emmanuel (Université Toulouse Jean Jaurès, UMR 5605 TRACES) - Cammas, Cécilia (AgroParisTech, UMR 5140 ASM; INRAP)

Abstract format: Oral

The beginning of the VIth millennium matches with the implementation of Neolithic communities in the Southern Caucasus. This socio-cultural change is based on the adoption of a sedentary way of life with farming and animal herding seemingly inherited from Near East. Cultural exchanges between Mesopotamian and Caucasian communities are also attested by the presence of Mesopotamian sherds in the Southern Caucasus. In this context, specific research on architecture has been undertaken to clarify if Caucasian communities benefited from "Mesopotamian skills" and how knowledge has been transmitted between techno-cultural groups.

Architecture is an original technical marker to define socio-cultural relationships between communities because of its strong inertia. Therefore, architecture gives us a closer vision of Neolithic social dynamics in the Southern Caucasus. Until now, field analyses and bibliographic data define an autonomous implementation of architectural techniques in the Middle Kura Valley. Specific studies in Mentesh Tepe proved the invention of molded mud-brick in the Early Neolithic. However, some materials, undefined on the field, were sampled for micromorphological analyses. The need to carry out microscopic studies on earthen materials has emerged because macro features are not always enough to distinguish specific technical aspects.

The aim of this paper is to prove the interest of a multiscale approach. A specific protocol has been established to combine macroscopic field observations (rims and slight ridges, equalization marks...) with micromorphological analysis (pedo-features, grain consistency, micro-stratigraphy...) in order to define the material used, its degree of mixing and the technicity. Whereas some field interpretations have been approved by laboratory analysis (mud-brick), other were reinterpreted (rammed earth) or identified (straw wastes). This approach – used for a long time to study clay materials for potteries – is pioneering in the Southern Caucasus architecture. We offer new reflections to understand technical exchanges and new ways to interpret social phenomena.

5 CERAMIC BUILDING MATERIAL – A UNIQUE SOURCE OF DOG HISTORY. THE CASE OF VILNIUS (LITHUANIA)

Abstract author(s): Blaževicius, Povilas (Vilnius University)

Abstract format: Oral

One of the most abundant groups of archaeological finds in urban Medieval and Early Modern archaeological sites is ceramic building material (CBM). Bricks, floor or roof tiles are usually analysed by scientists according to their original purpose and function. Although this group of artefacts is especially abundant, it is often overlooked and the questions raised are mostly limited to the typology or production technologies. For more detailed and varied results, these objects can be studied using trasological methods. By analysing the different imprints in clay artefacts, we can reveal important data not only about the craftsmen who produced them, but also about their pets who roamed around. The purpose of this presentation is to present the results of a case study, when traces of dogs on ceramic artefacts from Vilnius (Lithuania) were thoroughly analysed. Preliminary research data allows us to speak with sufficient accuracy about the dogs bred by artisans engaged in the manufacture of clay products in 14th – 17th cent. Research reveals a variety of dog sizes, their fur length, nail wear, leg traumas, movement specifics, etc. In the light of the results, it can be stated that trasological studies of dog traces significantly complement the zooarchaeological and historical data that have been most relied on to date. It can be argued that the trasological analysis of archaeological clay artefacts provides an opportunity to take a fresh look at various aspects of everyday history.

6 SHAPING AND WRITING ON CLAY: PRODUCING THE LINEAR B TABLETS OF MYCENAEAN PYLOS

Abstract author(s): Judson, Anna (British School at Athens)

Abstract format: Oral

Writers in the Mycenaean palaces of Late Bronze Age Greece (c.1400-1200 BCE) used the Linear B script to write administrative documents on unfired clay tablets, which were accidentally fired during these palaces' destructions. The texts of these tablets reveal the palaces' economic and administrative concerns, while identifications of the work of individual writers through handwriting analysis have been crucial to understanding the palatial administrative systems and the actions of individuals working within them. Less attention has been paid, however, to the first stage of the administrative process – that of shaping clay into tablets in preparation for writing on them, which palmprint analysis suggests was sometimes done by the writers themselves and sometimes by assistants. Although differences have been noted in the way certain tablets were produced – for instance, whether the clay was rolled out and then folded to produce a flat tablet, or only pressed into shape with the hands – these methods have not yet been systematically studied.

This paper will present my ongoing research into the production of the Linear B tablets, focusing on the site of Pylos in south-western Greece, whose large collection of contemporary tablets offers the opportunity to study the practices of a community of tablet makers and writers. In this project, I combine experimental archaeology – recreating different methods of producing tablets, in order to understand the physical gestures involved in manipulating the clay and the impact of its material properties – with observation of the traces left by these production processes on the original tablets. This combination of methodologies will allow me to compare tablets' different methods of production with their attributions to particular makers and/or writers, and thus to explore individuals' differing approaches to the formation of the clay tablets on which the Linear B texts would be written.

7 LATE NEOLITHIC ANTHROPOMORPHIC FIGURINES TECHNOLOGY: PRODUCTION SEQUENCE AS AN INDICATOR OF IDENTITIES AND SYMBOLIC ACTIVITIES

Abstract author(s): Vukovic, Jasna (Department of Archaeology, Faculty of Philosophy, University of Belgrade)

Abstract format: Oral

Late Neolithic anthropomorphic figurines from the Balkans for decades attract the attention of the researchers. The analyses were usually focused on iconography, corporeality, or personhood, while considerations about the technological processes are still rare. A large quantity (cca. 800 specimens) of Vinča figurines from the site of Pavlovac-Čukar in southern Serbia enabled detailed analyses of their manufacture and firing, and several different forming, as well as firing procedures, were identified. The two largest groups are represented by pillar-like figurines, representing predominantly males, and more realistic ones, representing predominantly females. In the case of the first group, the results revealed that the complexity of the manufacturing process, i.e. large number of steps in the operational sequence is in contrast to the simplicity of figurine form. Moreover, a large number of steps in the majority of cases correspond with low artisan's skill. In the case of realistic figurine types, in most cases representing females, the separate shaping (and possibly firing) of figurine parts indicates the presence of highly skilled and specialized artisans. This talk therefore will address some of the following questions: Do the differences in the operational sequence indicate different meaning/purpose/usage of figurines? Do the number of steps in the manufacturing process imply the importance of the process itself instead of the finished object? Does the low artisan's skill indicate the importance of the person who made the figurine instead of a skilled artisan? Do these differences indicate different gender roles connected with figurine usage and manufacture? Do they reflect the presence of several different group identities?

8 TECHNO-PETROGRAPHIC STUDY OF EPN CERAMIC ASSEMBLAGES IN THE SOUTHERN LEVANT (7TH MILLENNIUM CAL. BC): MULTI-SCALAR ANALYSIS TO HIGHLIGHT POTTERY PRODUCTION

Abstract author(s): Harivel, Carine (University Paris Nanterre) - Coquinot, Yvan (C2RMF) - Vieugué, Julien (CNRS - UMIFRE 7 Centre de Recherche Français à Jérusalem)

Abstract format: Oral

The earliest pottery of the Southern Levant are quite well studied in terms of shapes and decorations, but only a few studies deal with the manufacturing processes. The main objectives of our study are (i) to identify the clay sources extracted by the potters, (ii) to determine the way raw materials were transformed into clay paste, (iii) to characterize the properties of the clayey material and, beyond, (iii) to better understand the technical choices made by the potters. With these objectives in mind, we applied a techno-petrographic approach to two large Early Pottery Neolithic ceramic assemblages from the Jordan Valley, namely Munhata and Sha'ar Hagolan.

Techno-petrographic analysis implies a multi-scale observation of the fine mass and the coarse inclusions (stereomicroscope, optical microscope and electron microscope), which is here combined with chemical analysis (PIXE) in order to characterize the chemical composition of the clay paste. These different analyses aims at characterizing the petrofacies and petrofabrics of the assemblages in order to specify respectively the sources of the raw materials and the way they were transformed into clay paste. These are the first steps before raising the question of the physico-chemical properties of the clay paste which regard to the different stages of the manufacturing process (shaping, drying, firing).

9 PETROGRAPHIC-GEOCHEMICAL CHARACTERIZATION OF CLAY DEPOSITS IN THE CEYHAN PLAIN (SOUTHERN TURKEY): THE IMPLICATIONS FOR ARCHAEOLOGICAL STUDY OF ANCIENT CERAMICS

Abstract author(s): Haciosmanoglu, Sinem (Eberhard-Karls University of Tübingen, Institute of Scientific Archaeology - INA) - Kibaroglu, Mustafa (Eberhard-Karls University of Tübingen, Institute for Pre-and Protohistory and Medieval Archaeology)

Abstract format: Oral

Ceyhan Plain which is also called Yukarı Ova constitutes eastern part of Plain Cilicia, is located in south of Turkey (north of eastern Mediterranean coast) to the 40 km east of city of Adana. It is a well-watered, fertile plain and densely settled in the Bronze and Iron Ages. Its geographic position is strategically located between Central Anatolia, Cyprus and North Syria and historically played important role between the ancient cultures of Anatolia (Hittite), Eastern Mediterranean (Aegean and Cyprus), and northern Syro-Mesopotamian (Hurrian/Mittani and Assyrian-Babylonian).

In this paper, we will report results of archaeometric analysis carried out on a total of 54 clay samples collected from different locations throughout the Ceyhan Plain. The aim is to explore compositional characteristics of the clay deposits within the plain and for distinguish chemical and petrographic groups that can be used as reference material in archaeometric studies of the ancient ceramic materials in this region. The chemical composition of the clay samples was determined by LA-ICP-MS (Laser Ablation Inductively Couple Plasma Mass Spectroscopy) and mineralogical contents and textural analysis were investigated using Petrographic and XRD (X-ray diffraction) techniques. As a result, this paper reports about the identified possible clay sources in Ceyhan Plain and its implications for the archaeometric study of ancient ceramics.

10 CERAMIC MATERIAL CULTURE OF THE EASTERN ADRIATIC ISLAND OF HVAR TO REVEAL CULTURAL EXCHANGE BETWEEN THE LOCALS AND GREEK SETTLERS

Abstract author(s): Doyle, Emily (Department of Geosciences, Texas Tech University) - Ugarković, Marina (Institute of Archaeology, Zagreb) - Šegvić, Branimir (Department of Geosciences, Texas Tech University)

Abstract format: Oral

During the 4th c. BC, the area of the Eastern Adriatic was home to different indigenous communities and Greek cities such as Pharos at the island of Hvar. Discussions on the relationship between the local population and Greek settlers are still in their infancy. Study of the pottery production technology offers a wealth of information on multicultural interactions since technological traditions normally change through cultural diffusion. Prior to Greek settlement at the island the local Iron Age pottery consisted of exclusively coarse wares, marked by simple production techniques and recipes with possibly limited raw material sourcing. Conversely, fine ware production was first introduced in the 4th c. BC and was superior in terms of material quality with regard to Iron Age pottery. This indicates a technological know-how of ancient potters and their sense for raw clay procurement strategies and advanced paste preparation techniques.

This paper aims to examine the coarse wares from the island of Hvar which pre- and postdate the colonization, from both local and Greek settlements to report on and exemplify the possible transfer of knowledge between the two communities. In order to achieve these goals, we are undertaking an extensive archaeometric investigation of ceramic potsherds by means of multiple spectroscopic and microscopic methods. In addition to ceramic potsherds, this paper will look into the available clay material to inspect its possible use in the pottery production during the Late Iron Age and Hellenistic times. Detailed geological prospection has heretofore identified two plausible clay sources – the fine-grained Quaternary accumulations recovered at the chora of Pharos and the Eocene Flysch from the SW of the island. In brief, interdisciplinary study of the island's material culture will supplement traditional archaeological inquiry by providing more insights into the behavioral patterns, traditions and innovations of the time.

11 STUDYING ROMAN-PERIOD PLAIN ROOF TILES IN THE EASTERN MEDITERRANEAN AREA: A NEW LOOK AT AN OLD MATERIAL

Abstract author(s): Hamari, Pirjo (Finnish Heritage Agency; University of Helsinki)

Abstract format: Oral

Although ceramic roof tiles have been the focus of archaeological research for a considerable period of time, the topics of research have been quite restricted. Tile stamps, decorative terracottas, and the early Archaic tiles all have been the focus of relatively frequent studies. On the other hand, plain, undecorated tiles are only infrequently studied, and questions related to tile production are still not well known. Likewise, the range of methodologies used in researching tiles have only lately started to diversify and expand. This is contrary to the fact that fragments of ceramic tiles form one of the largest find categories from the Roman period in the Mediterranean.

This paper uses Roman-period roof tiles from the eastern Mediterranean as an example on what kinds of methodological approaches can be used in studying plain ceramic roof tiles, extending from traditional typological studies to chemical analyses of the fabrics with p-XRF. It presents the key outcomes resulting from different research methods, highlighting the hitherto unrealised research potential in this particular clay material.

The results not only provide new data on the material, but also on the communities that produced and used the tiles, extending into the social dimension.

12 WALLS AND RAMPARTS OF CLAY: GEOCHEMISTRY OF IRON AGE MUDBRICKS

Abstract author(s): Kailamaki, Uine - Lorenzon, Marta (University of Helsinki)

Abstract format: Oral

This paper presents preliminary results of a geoarchaeological investigation of earthen architecture in the Eastern Mediterranean. Our study is a part of the #buildingsustainability project, hosted at the University of Helsinki, which focuses on investigating the relationship between natural and built environments of the past societies in the Iron Age Levant. Mudbricks are a form of material culture that has thus far received little attention in the study of clay materials. However, interest in earthen architecture and the archaeological information it contains has increased during the recent decades, as it provides us with a new set of data to explore the architectural practices and craft specialization in Iron Age societies.

Geoarchaeological analyses were conducted on Iron Age earthen building materials from archaeological sites of Palaepaphos in Cyprus and Ashdod-Yam in Israel. Mudbricks, mud plaster and soil samples were analysed using X-ray fluorescence spectrometry (pXRF), thin section petrography, loss on ignition and SEM-EDS. Our data reveals specific patterns of interaction between the Iron Age communities and their built and natural environments during the manufacturing and construction processes; for example, in the use of vegetal temper and soil selection. The preliminary results identify possible manufacturing events and, for instance, seem to suggest a relatively simultaneous construction of the sampled Ashdod-Yam acropolis and wall features. Additional analysis, such as micromorphology, will be implemented at a later stage to further explore these findings.

A. TECHNICAL AND TECHNOLOGICAL ANALYSIS OF CERAMICS OF THE SETTLEMENT UST-VAS'YEGAN 1

Abstract author(s): Chikunova, Irina - Ilyushina, Victoria (Tyumen scientific center SB RAS)

Abstract format: Poster

The ceramic complex of the Middle Ages was obtained from the excavations of the settlement Ust-Vas'egan 1, Northern Ob region). 20 vessels included in two (I and II) morphological groups were subjected to technical and technological analysis. The groups differ from each other in their ornamentation and cultural identity. In the cultural layer of the settlement, the pottery lies together. In the vessels of both groups, the use of one type of plastic raw material was revealed - natural ferruginous clay with a small admixture of sand. For the entire complex, the following compositions of molding masses were determined: "clay + crushed granitoids", "clay + crushed granitoids + wool" - for group I, "clay + crushed granitoids + organic solution" - for group II. The outer surface of the vessels was smoothed with a wooden knife or spatula. The vessels were fired in a mixed redox medium, with limited oxygen access, most often with short-term exposure to products at a temperature of at least 650°C. The firing was carried out in a simple fire pits or fireplaces. As a result of the technical and technological analysis, the similarity of the morphological groups I and II of the ceramics of the settlement Ust-Vas'yugan 1 was revealed. Gneiss or Granite soil was a traditional additive in the composition of the molding mass in various cultural and chronological groups of the Arctic. The correlation of the obtained data on the characteristics of raw materials and the composition of the molding masses of the studied ceramics allows us to speak about the mutual influence (family-marriage relations) of two groups of potters who lived within the same settlement.

497 WHAT DO MY DATA SIGNIFY? HOW CAN THIS THEORY BE SUPPORTED? INTERROGATING CONNECTIONS BETWEEN SCIENCE AND THEORY IN FUNERARY ARCHAEOLOGY

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Monetti, Lisa (UCL Institute of Archaeology) - Nilsson Stutz, Liv (Linnaeus University) - Snoeck, Christophe (Vrije Universiteit Brussel)

Format: Regular session

Theory is intangible without application to data and data are not easily interpreted without theory. This session highlights research within funerary archaeology interpreting treatment, study, and conceptions of the body which bridge the gap between archaeological science and theory. Goals of this session include highlighting and advancing a holistic, body-centric funerary archaeology and creating space for sustainable collaboration within our field.

We welcome papers with strong theoretical or scientific backgrounds and methodology from authors open to augmenting their work through collaboration. We encourage those already working with both scientific data or methods within theoretical frameworks to submit. We invite papers on theoretical concepts including sensory archaeology, ritual practice, embodiment, identity, lived experiences and biography, and digital and medical humanities. Scientific methodology including isotope analysis, aDNA, archaeoethnology, infrared spectroscopy, and osteology are all welcome. These themes are not exhaustive and we particularly welcome research that is innovative, collaborative, and open to future collaboration.

To adapt to the COVID-19 crisis and to benefit from the increasing accessibility that online conferencing allows, we ask that every submission culminates with a new research question to be provided ahead of the session, which the presenters cannot yet answer, but to which their research can contribute. During the session, the research questions will be discussed by the attendees to identify intersections in our work, to realize new future directions, and to seek out the skills and expertise required to answer them. Ultimately, these discussions can contribute towards the development of collaborative projects. We believe that academic thought

and scientific innovation require diversity and inclusivity to progress and the session organizers will work to create an equitable and respectful environment that welcomes participation from all individuals.

ABSTRACTS:

- 1 THROUGH THE LENS OF THE DEAD: LINKING THEORY TO AN INTEGRATED ARCHAEOLOGY OF CREMATION IN THE SOUTHERN BRAZILIAN HIGHLANDS**

Abstract author(s): Ulguim, Priscilla (Teesside University)

Abstract format: Oral

Cremation is a complex funerary practice, combining technological, biological, and social phenomena in a fiery transformation, intersecting the body and society. Improvements in our understanding and analysis of physical and chemical heat-induced changes in the body have enabled us to tackle questions from dating to funerary practice and mobility. However, analytical work often lacks contextualisation within funerary archaeology and archaeological theory. Likewise, funerary archaeology sometimes fails to integrate data from the most direct evidence of past people: their remains.

Following calls for an “archaeology of cremation” to interpret ritual, social and technological aspects, I propose a holistic framework for analysing burned human remains from archaeological sites. Placing humans at the centre of an interdisciplinary model linking theory, methods, and evidence from bioarchaeology, funerary taphonomy and bioanthropology with forensic science, chemistry, biology, social anthropology.

The framework is applied to evidence from mound and enclosure complexes across the southern Brazilian highlands, where funerary practices focused on cremation emerged from the turn of the second millennium AD. Current hypotheses focus on the implications for migration, power, status, and society. Few are based on human remains, presenting an opportunity to apply the framework from recovery to analysis.

Integrated planning commenced pre-excavation, with excavation conducted using archaeothanatological principles followed by advanced methods to analyse primary level heat-induced change in bone structure and composition, including FTIR-ATR, XRF, digital colour quantification, digital imaging and SEM.

All the data is integrated with evidence from archaeology, ethnography and ethnohistory to offer a comprehensive interdisciplinary insight into society across the southern Brazilian highlands during the second millennium AD. While other interpretations have focused on inequality, aggrandising strategies, differentiating powerful ‘male leaders’, and territoriality, this paper aims to leave paradigm-focused interpretations behind and test each in the context of a funerary process focused on cosmology, ritualisation, community, and integration.
- 2 CRIME – CREMATION OR INHUMATION OF ANCIENT POPULATIONS? A MULTIDISCIPLINARY QUESTION AT THE EUROPEAN LEVEL**

Abstract author(s): Leskovar, Tamara (University of Ljubljana, Faculty of Arts) - Snoeck, Christophe (Vrije Universiteit Brussel) - Črešnar, Matija (University of Ljubljana, Faculty of Arts) - Potočnik, Doris (Jožef Stefan Institute) - Goderis, Steven - Gerritsen, Carina (Vrije Universiteit Brussel)

Abstract format: Oral

CRIME is a joint multidisciplinary Flemish-Slovenian research project funded by the Flemish Research Foundation (FWO) and the Slovenian Research Agency (ARRS). The aim of the project is to improve and increase international research and development cooperation by using state-of-the-art techniques to develop new and upgrade the existing methodological procedures for the study of archaeological heritage. It focuses on the research of prehistoric funeral rituals and their changes, searching for the answers on how and most importantly why these changes happened. The main objectives of the project are to investigate differences in the archaeological record, demography, diet, and mobility within and between communities, and the preparation of a map of biologically available strontium for Slovenia, which will be the basis for understanding the mobility of humans and animals.

Designed on the foundations of international and interdisciplinary cooperation, with the focus on the funerary rituals and their changes, the project stresses the importance of the holistic-oriented research designs within the field of funerary archaeology, and the transfer of knowledge and expertise, crucial for sustainable collaboration and development. This paper will present the main questions of the CRIME project and critically discuss the methods used to answer them.
- 3 HANDLING THE DEAD. HOW CAN WE LEARN FROM DEATH INVESTIGATORS TO UNDERSTAND THE PAST SENSORY LANDSCAPE OF DEATH AND DECAY?**

Abstract author(s): Mickleburgh, Hayley (Linnaeus University; Forensic Anthropology Center Texas State University) - Nilsson Stutz, Liv (Linnaeus University)

Abstract format: Oral

Distinct phases of human decomposition – e.g., skin discolouration, stiffening of the body during rigor mortis, release of different odours – along with the sensory experiences they can create, are universally recognized by those who handle the dead. In fact, these

physical transformations are often the focus of body treatment and mortuary ritual, aimed at either concealing or revealing them. Archaeology provides us with information to reconstruct some of these sensory experiences related to death, and can help us understand how most living able bodies may have experienced handling dead bodies. Sensory perceptions are also culturally filtered, and can vary distinctly. Archaeology is well placed to explore how both biological and sociocultural factors structure sensory landscapes.

Yet, perception of corpses and decay also depends on the emotional and social relationship with the deceased and can potentially vary greatly from person to person. Personal sensory and emotional experiences related to (decay of) the dead body could perhaps be as varied as the decomposition processes themselves, which depend on environmental conditions (temperature, humidity, insect access), age, health, biological sex, and treatment of the body before/during the funerary ritual (washing, anointing, wrapping, de-fleshing). In this paper we explore the sensory landscape of handling the dead through forensic taphonomic experiments on human decomposition at an outdoor taphonomy facility. These experiments were designed to document processes of decomposition under different conditions and body treatments, but next to taphonomic data, they produced a rich body of sensory memories in the researcher. While it is clear to us that the sensory observations made when handling dead and decomposing remains could potentially enhance what we know of past experiences, we ask how the individual, personal, culturally embedded, and emotionally distinct experiences of death investigators could be harnessed to improve our understanding of past experiences of death and decay.

4 SENSORY ENGAGEMENTS WITH THE DEAD IN MESOLITHIC EUROPE

Abstract author(s): Gray Jones, Amy (University of Chester)

Abstract format: Oral

The treatment of the dead in the Mesolithic of north-west Europe included inhumation, cremation, secondary burial, manual disarticulation and dismemberment and, potentially, anthropophagy. Osteological and taphonomic studies show that many of these practices also involved the living engaging with the dead body in various states of decomposition or skeletonisation, such as preparing and posing the recently dead for immediate burial or cremation, retrieving specific bones from a skeletonised burial, or disarticulating and cleaning tissue from the bones of an exposed body. Such practices clearly involved sensory and affective engagements with bones and other bodily substances, such as decomposing soft tissues. This paper will argue that these engagements with the dead were informed by an appreciation of the affective and powerful properties of these substances. It also poses the question of whether we can gain a better understanding of these acts of engagement with soft tissue through other forms of scientific analysis, other than macroscopic osteological analysis.

5 MOURNING AND RITUALIZING THE DEAD: AN ARCHAEO THANATOLOGICAL ANALYSIS TO TRACE BACK TRANSFORMATIONS IN MORTUARY PRACTICES AT CHECUA, COLOMBIA (9500-5000 BP)

Abstract author(s): Ospina, Juan (Cultural Heritage Studies Faculty, Universidad Externado de Colombia; Department of Anthropology, University of Los Andes) - Archila, Sonia (Department of Anthropology, University of Los Andes)

Abstract format: Oral

Death commemoration is an active way to mark places and inscribe powerful ideas in the landscape, and those inscriptions are quite related to people’s attitudes towards death, body and place. The milieu for the dead is not random or indeliberate, nor is every single action that is conducted for the sake of the dead during ritual practices. The study of mortuary practices by articulating theory, methods and data enrich our interpretations about how the commemoration of death could operate as an agent of change, and as a powerful mechanism to express meaningful ideas of social life. In this paper, we will present the results of an archaeothanatological analysis which allowed us to accurately register unknown patterns of mortuary practices at Checua. We observed that the living invested big amounts of energy and implemented innovating ideas to accomplish proper rituals for the dead. Some of those actions persisted on time, while others were progressively neglected and replaced. Although the precise reasons why people abandon or adopt funerary patterns may remain unknown, it is accepted that remains of mortuary practices may indicate how ideas about death, body and place can drastically change. Here, we will present how the method provided us with high-resolution data to trace back mortuary ritual transformation in a period of ca. 4500 years. We use this information to discuss how diachronic changes can be studied in hunter-gatherers societies, whose ideology and social dynamics have generally been difficult to be recorded, especially in the Neotropics. Hence, we will highlight how theory of ritualized bodies and places can contribute to the understanding of social changes, which in this case can be seen materialized in the arena of mortuary practices.

6 SIT, SNA AND ANT: BUILDING FRAMEWORKS FOR STUDYING FUNERARY IDENTITIES AND MENTAL DISTANCES IN CENTRAL ITALY C. 1000-31 BC

Abstract author(s): Rajala, Ulla (Stockholm University)

Abstract format: Oral

In this paper I will present my take on the Social Identity Theory (SIT) and combine it with the Actor-Network Theory (ANT) and some aspects of the Social Network Analysis (SNA). I use SIT, SNA and ANT as a framework for studying funerary architecture in a long-term in order to explore funerary identities and mental distances in central Italy during the first millennium BC. The study of the main cemetery areas will analyse the changing social networks from Early Iron Age to the end of the Hellenistic period. I will look at the tomb types in different communities along the Tyrrhenian and Adriatic Seas and in the Apennines and how this category of evidence can act as a proxy in defining identities and belonging to different socio-political networks. I will discuss the burial grounds in south-

ern Etruria, Latium, Umbria, Campania, Samnium and Picenum in order to consider the mental distances, the relative closeness and distance, reflected in the regional and supraregional networks. As part of the theoretical and methodological discussion, I will assess the usefulness of SIT, SNA and ANT as the frameworks for such an analysis. I will also explore briefly the effect of the background landscape had in forging contacts and try to discover the effects of the cultural change related to the expansion of the Roman state.

7 EXPRESSIONS OF KINSHIP IN THE CEMETERIES OF EARLY MEDIEVAL WALES

Abstract author(s): Butler, Ciara - Madgwick, Richard - Lane, Alan (Cardiff University)

Abstract format: Oral

This presentation will summarise the findings of PhD research investigating kinship within the cemeteries of Early Medieval Wales. The apparent homogeneity of burial practice in Wales at this time, at least relative to earlier periods, masks an interesting level of variability. Grave “groups” are often identified within cemeteries, which may be based on similarities in construction, location within the cemetery, or orientation. This can indicate connections between individuals and may be seen as evidence for social relationships and shared identities. Clan or family groupings have been suggested as a factor influencing differential burial practice in Wales in this period, though this has never been investigated osteologically, principally due to poor preservation in the acidic soils. However, in recent years the excavation of several well-preserved cemetery sites has significantly added to the corpus of Welsh osteological material. Some of these have yet to be published and the skeletal material has never been the subject of in-depth research and analysis. The primary methodology of the project is biological distance analysis based on dental metric data, used to identify potential genetic kin groups within a burial population. Data has been collected and analysis is now underway. GIS methods such as kernel density will be used to identify the statistical significance of the aforementioned grave groupings. However, genetic kinship is only one aspect of affiliation in Early Medieval Britain, though historical evidence indicates it is an important one. The presence of genetic relationships does not establish whether individuals attributed significance to these relationships in life. This presentation will deliver the results of the biological distance analysis and compare these to the archaeological evidence for grave groups, while exploring the question of alternative means to assess non-biological kinship.

Research question: How can osteological data be used to explore non-biological kinship?

8 BURNED BONES, SCIENCE AND THEORY: HOW THEY CAN BE COMBINED TO UNDERSTAND THE CREMATION SETTINGS IN THE ARCHAEOLOGICAL CONTEXT?

Abstract author(s): Stamataki, Elisavet (Vrije Universiteit Brussel; Université libre de Bruxelles) - Kontopoulos, Ioannis (Vrije Universiteit Brussel; University of Copenhagen) - Salesse, Kevin (Université Libre de Bruxelles) - Veselka, Barbara (Vrije Universiteit Brussel) - Sabaux, Charlotte (Ghent University; Université Libre de Bruxelles) - Dalle, Sarah (Ghent University; Vrije Universiteit Brussel) - Hlad, Marta (Vrije Universiteit Brussel; Université Libre de Bruxelles) - Sangelov, Amanda (Université Libre de Bruxelles; Ghent University) - De Mulder, Guy (Ghent University) - Snoeck, Christophe (Vrije Universiteit Brussel)

Abstract format: Oral

The study of burned human remains, is a major source of information to understand the way in which past societies faced, perceived and interacted with death. Despite the limitations that cremated bones present due to the structural, chemical and isotopic changes that occur to the inorganic fraction of bone (bone apatite) during burning, they play an increasingly important role in understanding pyre technology as well as body and pyre managements in ancient societies in which cremation was the dominant funerary practice.

The aim of this study is to understand the way cremation was performed in the Metal Ages using a combination of archaeological theory and state-of-the-art analytical tools on burned human remains from Belgium. The lack of written sources from the Metal Age makes it challenging to approach questions related to the specialisation in the performance of funerary rituals and creates a gap in our understanding of funerary practices from a period where cremation was the dominant funerary rite. As a result, the combination between theory and science contributes to addressing not only questions about the body management and the cremation settings but also about who was managing the cremation ritual and what the skills and the specialisation of the cremator were.

9 HOW CAN WE IDENTIFY TRANSPORTATION OF THE CADAVER THROUGH THE ANALYSIS OF HUMAN BONE?

Abstract author(s): Peyroteo Stjerna, Rita (Dep Organismal Biology, Human Evolution, Uppsala University)

Abstract format: Oral

Transportation of a cadaver is a costly endeavour, in particular if the place of death is distant from the designated place of disposal. Evidence for corpse transportation in prehistory is speculative mostly due to the lack of direct archaeological data. This is unfortunate, because investigating mobility of the dead in the past is interesting from social-culture perspective as it allows to explore choices in the selection of places for the dead.

Taphonomic approaches such as archaeoethanatology allow the determination of funerary depositions in primary or secondary position, the identification of spaces of decomposition, or the documentation of wrappings and other binding elements. These observations have great potential to address questions about the transportation of the cadaver but require other evidence so correlation of practices could be made. On the other hand, current methods used in archaeology to investigate patterns of mobility, such as stable

isotope analysis of strontium and oxygen, offer a resolution in the order of years, and can only be used to explore larger scale mobility patterns by identifying the geographic origins of the deceased.

The purpose of this exploratory paper is to discuss which skills and expertise would be required to answer questions about the transportation of the dead. While I think this may be methodologically challenging, I believe that a multi-method approach may be the way forward. The discussion of this theme at the EAA, can potentially open new collaborations and testing grounds on methodologies that could help us address the question: how can we investigate if the cadaver was transported to the place of burial?

The development of a robust methodology that could accurately address the transportation of the dead could be used not only by archaeologists working across any chronological period, but also in forensic applications.

10 THEORIZING DIETARY PREFERENCES IN THE ROMAN PROVINCE OF MACEDONIA: REFLECTIONS FROM THE HUMAN BONES

Abstract author(s): Vergidou, Chryssa (Groningen Institute of Archaeology - GIA; The Science and Technology in Archaeology and Culture Research Center - STARC - of The Cyprus Institute)

Abstract format: Oral

The application of an integrative biocultural model in the study of past human remains is by now given a clear and strong awareness within the discipline of archaeology. The theoretical framework upon which relevant interpretations will unfold is of equal importance. Building upon this session’s premises, the aim of my paper is to theorize dietary preferences in Roman Macedonia and to conceptualize how different social groups in this province experienced life under the Roman Empire. This will be attempted by looking at the human remains from two contemporaneous cemeteries (1st to 5th c. CE) of the Roman Macedonia, belonging to two diametrically different communities in terms of micro-ecology and connectivity. The theoretical approach is inspired by globalization theory, which seeks to study networks of connectivity that can bind but also differentiate groups of people from each other. Within this theoretical framework, the distinctive micro-ecological identity of each community under study is expected to be reflected in the consumption preferences of the population. However, the two different communities, or social groups within them may share common characteristics, including dietary patterns, which were transmitted through networks of interaction. The different communities therefore become entangled in local and broader food systems, thereby creating a sense of interconnectedness parallel with the emergence of new and complex intra- and inter- power structures. In this context, individuals or groups may continuously balance between different social, cultural and/or ethnic identities. Therefore, the question to address here is: To what extent do dietary patterns relate to the way in which different communities of the Province of Macedonia, as well as social or ethnic groups within them, positioned themselves within the region and within the Roman Empire?

A. DOOMED TO BE FORGOTTEN? CAN SMALL FIELD ANTHROPOLOGY DATASETS STILL CONTRIBUTE TO BIG DATA RESEARCH IN BIOARCHAEOLOGY?

Abstract author(s): Lema Seabra, Ana (CIAS; ICArEHB)

Abstract format: Poster

The current increase of commercial/rescue archaeology due to the boom in the construction, has led to massive interventions similar to open-area excavations that result in full cemeteries and necropolis being excavated and sizable number of human remains being exhumed. However, this scenario might not be sustainable long term, especially in urban historical centres, where much of the construction is driven by the tourism industry to which the effects of Post-Covid are unknown. Traditionally, urban archaeological interventions tended to be small scale and geographically disperse. In areas where human remains were found, this resulted in numerous small-size samples that were exhumed and remain “buried” in grey literature archives. In this presentation we explore the value of this small samples for scientific research, especially when integrated within bigger datasets. We will present examples from our ongoing PhD project which aims to analyse Late Medieval to Modern Portuguese burial practice.

Our research aims to characterize burial practice through the analysis of burial position, grave goods and other information observed on-site prior to exhumation which is mandatory recorded in archaeological intervention Field Reports when Human Remains are detected. Although we will cross the information with various existing written sources, and question the possibility of intra-site comparison, this presentation focuses on the datasets themselves, the methods and the criteria for collection. One of the proposed criterion relates to sample size, and as such we will debate the inclusion of small samples and ascertain their influence in the results through comparison of datasets which only include samples with a Minimal Number of Individuals above 20, with another dataset that does not include this criterion. Since one of the main cornerstones of archaeological burial exhumation relates to their scientific interest as samples, we question the potential of small size samples for large-scale integration in data analysis.

B. EXPLORING KINSHIP AND COMMUNITY THROUGH LANDSCAPE ANALYSIS OF CEMETERY AND SETTLEMENT PLACEMENT IN EARLY MEDIAEVAL BRITAIN

Abstract author(s): Fry, Megan (University of Florida)

Abstract format: Poster

This research explores the relationship between landscape and site placement for the people of Lindissi, an Early Medieval Kingdom in Britain (4th – 9th centuries AD). Little is known about the association of settlements to cemeteries during the pre-Christian era,

although it has been suggested cemeteries may have been utilized by multiple settlements simultaneously, and arranged in familial plots. In this study, landscape features that may have affected site placement choice were assessed to understand if cemeteries and settlements associate in ways that may indicate kinship ties. Point data was compared for elevation, ecological features (e.g., rivers, bodies of water), remnants of previous occupation (Roman roads, villas, forts, and Bronze Age barrows, etc.) to cemetery and settlement locations. GIS techniques (viewshed, intervisibility indices, distances) evaluated statistically reveal patterns relating to site settlement choice. For example, there was a significant association between elevation and site location ($p=4.533e-06$), where cemeteries were more likely to be located at elevations above 96.7m. Intervisibility analysis indicated particular cemeteries were used by multiple settlements, which may imply familial ties. Viewshed also demonstrated specific landscape features (barrows, rivers, other settlements) were visible from cemeteries, but were not viewable from settlements, which suggests an important connection to the landscape for the dead that may not have been vital to the living. This research provides insight into settlement versus site choice, as well as possible applications in predictive modelling, allowing archaeologists to estimate undiscovered site locations which may be useful for finding at risk heritage sites.

C. A SPATIAL ANALYSIS OF THE CEMETERY SITE AT EASTGATE SQUARE, CHICHESTER, WEST SUSSEX

Abstract author(s): Welty, Shannon - Rando, Carolyn (University College London)

Abstract format: Poster

The excavation of St Michael's Litten at Eastgate Square, Chichester revealed an expansive cemetery site ranging from the Roman to post-medieval periods. This yielded 1644 skeletons which were subsequently mapped in AutoCAD for the excavation report. Stratigraphic analysis of the cemetery sequence undertaken to date is limited and thus much of the sequence remains unphased. A number of variables were initially thought to indicate separate phases of interment, however lacking associated archaeological finds no concrete phases were presumed. This research examines the available data to determine if spatial evidence exists to understand chronological phasing, and to consider if further applying archaeological theory may help elucidate social and temporal patterning of the site. Spatial analysis was conducted, including visual assessment of each variable layer, kernel density analysis, nearest neighbour indices, orientation calculations, and depth analysis. The cemetery demonstrated considerable variation in the treatment and construction of the graves expressed by the number of individuals per grave, orientation, position, presence of associated burial furniture, and biological profile. However, the results of this research found that there is limited spatial data which may be used to reconstruct the chronology of the cemetery space. This research demonstrated that variables including orientation and burial type are not good indicators for chronological phasing in statistical isolation. Conceptualising the funerary archaeology through a theoretical framework may add to the depth of understanding about the assemblage that cannot be gleaned from the spatial data alone.

498 INTERDISCIPLINARY STUDIES ON SICILY: CASE STUDIES AND METHODOLOGY

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Montesana, Roberta (Universitat de Barcelona) - Speciale, Claudia (Istituto Nazionale di Geofisica e Vulcanologia)

Format: Discussion session

The central Mediterranean has been a crossroad of cultures since prehistoric times. A system of larger islands, such as Sicily and Malta, surrounded by smaller isles and archipelagos, created an ideal land/seascape where people could move and share their material culture. However, far from creating a homogeneous cultural entity, Sicily and the islands around followed different trajectories of development. In the last years, the application of analytical methods (i.e. landscape archaeology, bioarchaeology, geochemical analyses, ...) shed lights on patterns of human-landscape interactions, knowledge transfer, diet change, and people movements, which however remained limited to some spot-areas unbalancing our perspective of the wider region.

This roundtable aims at providing a discussion on the current status of the interdisciplinary studies on Sicily and how to move forward to the advancement of our knowledge of its cultural landscape from prehistoric times to recent times. The discussion will be encouraged around these main topics: interdisciplinary studies over time (historiography); new approaches and techniques (methodology); knowledge advancement (research); specialisation and knowledge gaps (academic formation). While focused on chronologically and geographically, this roundtable can provide insights for researchers working on other regions for the broadness of the subjects discussed.

The discussion will be guided by the presentations of three key speakers, who have extensive experience in the field of material culture studies, landscape analysis, and digital archaeology, and who will introduce some of the topics listed. Besides these main presentations, a maximum of 8 short presentations (the 6 slides in 6 minutes format) will be chosen from those early-stage researchers who are currently performing interdisciplinary research in order to give an up-to-date view of the status of the field. For this last part of the session, we welcome short presentations by early-stage researchers working on material culture, digital, landscape, and experimental archaeology in Sicily.

ABSTRACTS:

1 THE BIOCULTURAL HERITAGE OF SICILIAN OLIVE TREES

Abstract author(s): Ferrara, Vincenza (Department of Archaeology and Ancient History, Uppsala University; Department of Human Geography, Stockholm University) - Ekblom, Anneli (Department of Archaeology and Ancient History, Uppsala University) - La Mantia, Tommaso (Dipartimento di Scienze Agrarie e Forestali, Università degli Studi di Palermo) - Brun, Anders (Department of Information Technology, Uppsala University) - Wästfelt, Anders (Department of Human Geography, Stockholm University)

Abstract format: Oral

We would like to present the new transdisciplinary research project "The Biocultural Heritage of Sicilian Olive Trees" (2021-2024), recently funded by Vetenskapsrådet (The Swedish Research Council), coordinated by the Department of Archaeology and Ancient History at Uppsala University (Sweden) and co-designed in collaboration with local olive small-holders in Sicily.

Mediterranean perennial agrosystems are the results of long term entanglements between humans and nature, playing a crucial role for local livelihood but today critically under pressure due to global market forces and climate change.

Sicily represents a unique case for its position, geomorphology and biological diversity of endemic species, being moreover the cross-road of diverse cultures for millennia, which have brought to an extraordinary melting pot of different traditional ecological knowledge. Olive cultivation is the non-discursive result of the long cultural negotiation process among all these different ecological practices crossing the island.

Before too late, we need to secure this knowledge and the biocultural heritage represented by ancient olive orchards since, thanks to their extraordinary longevity, these long-lasting agrosystems may offer insights on how to tackle adaptation challenges and manage agrobiodiversity sustainably in the future.

To reach these objectives, we have developed a transdisciplinary methodology combining:

1. spatial analysis: regional reconstruction of vegetation dynamics at different temporal and spatial scales over the last two millennia (by developing and applying new contextual segmentation algorithms of remotely sensed data), and their interpolation with regression analysis of climatic variability reconstructions;
2. local-scale archaeological and palaeoecological analysis of individual olive trees/stands (experimental analyses of stable isotopes, $\delta^{13}C$ and $\delta^{18}O$, wood anatomy and phytoliths), to be then used to crossvalidate results from spatial analysis;
3. collaborative collection of local ecological memory and non-discursive knowledge on agricultural practices related to olive trees.

2 HUMAN-ENVIRONMENT INTERRELATIONSHIPS AND CO-CREATION IN LATE PREHISTORIC SICILY: INTEGRATED METHODOLOGICAL AND THEORETICAL PERSPECTIVES

Abstract author(s): Cantisani, Matteo (Institute of Archaeological Studies, Bochum University; Center for Mediterranean Studies, Bochum University)

Abstract format: Oral

Recent narratives of later Sicilian prehistory, particularly those of the transition to the Early Bronze Age, testify to increased cross-disciplinary methodologies. Combined with pollen analysis data, recent surveys opened up new understandings of the economic processes which were essential for developing the integrated system of farming and herding, especially in the upland regions of Sicily. These studies also engendered new theoretical speculations which highlighted the importance of looking at the relationship of humans with the landscape, and the early impact of humans upon the environment. Yet, there remains much to say in terms of appropriation of multiple-resource landscapes into wider fields of practices, possibly underlying mechanisms of co-creation with the environment. Understanding appropriation and use of resources is essential to investigate dynamic societal processes indeed, but appropriations can also endanger ecological sustainability and foster social tensions. Inspired by the former approaches, this paper tackles a new materialist, phenomenological approach to stimulate a discussion about the opportunity of less reductionist models of longer-term societal developments; it integrates a science-based study of landscapes of resources with an experiential understanding of the clay affordances and locations, in order to explore also entangled landscape management practices. It aims to discuss human-environment interrelationship in terms of symbiotic interaction and co-creation. It proposes to uphold this discussion through looking at the appropriation and use of clay sources within the 6 km² area centred on the site of Monte Grande (Agrigento), along the coastal strip between the Naro and Salso river, and including the new evidence discovered by the Author of MCA-EBA occupation. It is argued that this evidence, if understood in combination with landscape managements of the coastal environments and the transhumance practices already known for the uplands, will offer new scope to discuss human-environment co-creation and societal transformations throughout the island.

3 MULTIDISCIPLINARY STUDY ON ANCIENT HUMAN IMPACT ON THE NATURAL LANDSCAPE. AKRAI/ACRAE, CASE STUDY

Abstract author(s): Chowaniec, Roksana (University of Warsaw)

Abstract format: Oral

Multidisciplinary study on ancient human impact on the natural landscape. Akrai/Acrae, case study

The recent approaches of the ancient human impact on the natural landscape in the region of ancient town Akrai / Acræ, in the Hyblaean Mountains, south - eastern Sicily can be presented here. The discussion is focus on the changes in the environment with particular emphasis on the Late Hellenistic period till Byzantine periods. The multidisciplinary observations include the studies on the ancient town, founded in the Sicilian interior in the 7th century BC, located close to the modern town of Palazzolo Acreide, in the Palazzolo Formation. The research comprises interdisciplinary studies, which enable the observation of changes in nature and land usage due to breeding, farming, building, manufacturing, etc. The presented research provides insight into the historical changes and degradation of the landscape and human impact on the Mediterranean environment. The data were collected within the recently excavated residential areas of the ancient town and in its vicinity.

4 DIET AND MOBILITY IN SICILY AND THE CENTRAL MEDITERRANEAN: ISOTOPIC AND ELEMENTAL ANALYSES

Abstract author(s): Tykot, Robert (University of South Florida)

Abstract format: Oral

The analytical study of human remains has become a highly important aspect of modern archaeology. Isotopic and elemental analysis can provide a life history of individuals regarding dietary practices and mobility, especially when integrated with other archaeological data. In Sicily, research questions specifically address the importance of seafood in the overall diet; the proportions of meat, milk and cheese from domesticated cows, sheep, and goats; their geographic origins if non-local; potential differences between individuals based on sex and/or status; and changes over time from the Mesolithic thru Medieval periods. This research has been conducted on several different sites in Sicily, dating to Copper Age, Bronze Age, Greek, and Roman time periods, and may be compared to other studies in Malta, peninsular Italy, and Sardinia.

In general, it appears that in Sicily and Malta for all time periods seafood was rarely a dietary staple, if consumed at all, even in coastal zones, and despite the maritime travel involved with these islands. Of low importance was millet, a C4 plant used in many areas of peninsular Italy by the Bronze Age. There also seems to have been negligible differences based on status prior to Roman times. Refined research questions for future studies will be discussed.

500 INTEGRATING NEANDERTAL LEGACY: FROM PAST TO PRESENT (IPAM)

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Mihelic, Sanjin (Archaeological Museum in Zagreb, Croatia) - Leskovar, Tamara (Faculty of Arts, University of Ljubljana, Slovenia)

Format: Regular session

Neandertals are the first human population that can be truly recognized as a pan-European phenomenon. Traces of their cultural and skeletal remains are found in most European countries, covering a quarter-million years. A lot of scientific work has been undertaken on various aspects of their heritage and there is a vast collection of archaeological and anthropological data available. However, there is still a discrepancy in available and updated datasets from various countries, which often reflects negatively on research, but also on management of Neandertal heritage.

Arguably, the Covid pandemic has only exacerbated the negative aspects of this situation. But, has it really? Is it not quite the opposite? Could not this 'new normality' also represent a new context for best overcoming the real and self-imposed boundaries of communication within Neandertal scholarship? Furthermore, the Covid virus notwithstanding, what really prevents us from enhancing our focus on the methods and conduits of dissemination and communication with lay audiences? Likewise, arguing for Neandertals to become stakeholders in cultural tourism may seem far-fetched, but we still welcome in this session all those who are willing to try. Bring your museum display scenarios, your visualisations, your ARs and your VRs and let's discuss them all together in Kiel for the sake of our Neandertals' future.

This session aims at fostering dialogue among Neandertal scholars from different countries and disciplines. Papers may range from topics related to stratigraphy and typology, through genetics, object interpretation and the spiritual aspects of Neandertal populations, to methods of site presentation and heritage tourism. We especially welcome contributions that offer proactive, realistic and feasible solutions leading to synergistic effects in research and valorisation of Neandertal heritage.

The session is organized in partnership with the network of scholars gathered around COST Action 19141: Integrating Neandertal Heritage: From Past to Present (<https://www.cost.eu/actions/CA19141/#tabs|Name:overview>).

ABSTRACTS:

1 COST ACTION: INTEGRATING NEANDERTAL LEGACY: FROM PAST TO PRESENT (INEAL)

Abstract author(s): Jankovic, Ivor (Institute for Anthropological Research)

Abstract format: Oral

Neandertals are the first human population that can be truly recognized as pan-European phenomenon. Traces of their cultural and/or skeletal remains can be found in most European countries and cover a period of more than 250 000 years. A lot of scientific work

has been done on various aspects of their heritage and there is a vast collection of archaeological and anthropological data available. However, there is still a discrepancy in available and updated datasets from various countries. In addition, communication between scientists from various fields and from various countries is still based on personal connections between individual scientists, mostly related to specific projects. This Action is a long overdue attempt to bridge the geographic, language, disciplinary-and-data specific gap, as well as a gap created by traditions of different disciplines in different European countries. Through a combined, scientifically-based and geographically inclusive approach, creation of a growing inclusive database, and promoting dialogue among scientists and creating guidelines for research, a solid base for better understanding of Neandertals can be reached. Further, this will allow a base for inclusion of Neandertal legacy into the present, through scientifically based guidelines for public presentation and further actions for promoting their heritage via inclusion of non-scientific stakeholders, such as administrators, museum and cultural workers, touristic sector, small and medium enterprises and other interested parties.

2 A 2.0 CATALOGUE OF FOSSIL HOMINIDS: NEANDERTALS MOVING INTO THE 21ST CENTURY. A COMPREHENSIVE KNOWLEDGE REPOSITORY ON THE NEANDERTAL LEGACY

Abstract author(s): Voisin, Jean-Luc (CNRS, EFS, ADES, Aix-Marseille université) - Hermon, Sorin (The Cyprus Institute) - Benazzi, Stefano (Department of Cultural Heritage, University of Bologna) - Degioanni, Anna (Aix Marseille Université, CNRS, Ministère de la Culture, LAMPEA) - Hajdas, Irka (Laboratory of Ion Beam Physics, ETH Zurich) - Hajdu, Tamas (Eötvös Loránd University, Faculty of Science, Institute of Biology, Department of Biological Anthropology; Hungarian Natural History Museum, Department of Anthropology, Budapest) - Harvati, Katerina (Palaeoanthropology, Senckenberg Centre for Human Evolution and Palaeoenvironment, Eberhard Karls, University of Tübingen) - Janković, Ivor (Centre for Applied Bioanthropology, Institute for Anthropological Research, Zagreb) - Soficaru, Andrei Dorian (Department of Paleoanthropology, 'Fr. J. Rainer' Institute of Anthropology, Romanian Academy)

Abstract format: Oral

Traces of Neandertal cultural and skeletal remains are found in most European countries, covering a time-span of more than 250,000 years. Since the recognition of Neandertals as a specific human group, following discoveries in the Neander valley in 1856, much work has been taken on many aspects of their heritage (cultural, anthropological, genetic, etc.); human remains and associated artefacts have been discovered since then in large quantities, and new discoveries of recent excavations are published yearly. However, there is still a discrepancy in available datasets from various countries, which often impacts negatively on research, but also on the overall management of Neandertal heritage. The most updated record is still the "catalogue of fossil hominids" published by Oakley and colleagues in ... 1967! The EU funded Neandertal Tools Project* was a very promising initiative set in 2004, which however did not succeed to develop a sustainability plan and maintain its developed tools and services and nowadays it is not functional.

The recently launched initiative iNEAL (COST Action 19141) set as one of its primary ambitious tasks (in Workgroup 1) to establish a comprehensive knowledge repository on the Neandertal legacy. Such a repository should include as many aspects related to the study of Neandertals as possible, such as climatological, environmental, chronological data, as well as material culture and skeletal remains. It might also include data about DNA. Data has to be organized in a semantic way and according to the FAIR data principles. As first steps, WG1 of iNEAL aims to gather updated information on Neandertal remains and related research particularly from countries with scarce data so far, followed by work on defining an ontology for the Neandertal legacy, the backbone of the planned knowledge repository.

* <https://cordis.europa.eu/project/id/507909>

3 NEANDERTALS: NEW INSIGHTS FROM OLD BONES

Abstract author(s): Röding, Carolin (Paleoanthropology, University of Tübingen) - Harvati, Katerina (Paleoanthropology, University of Tübingen; DFG Centre of Advanced Studies 'Words, Bones, Genes, Tools', University of Tübingen; Museum of Anthropology, Medical School, National and Kapodistrian University of Athens)

Abstract format: Oral

When hearing the word Neanderthals most people have a few famous fossils in mind. However, besides well-known, iconic specimens, many less known and sometimes forgotten materials can be found in storage rooms and museum basements. These little-known materials have great potential to provide us with new insights about Neanderthals and human evolution in general. Technological improvements of the last decades allow us to analyze even very fragmented and damaged fossils in a comprehensive framework and thereby, to study materials that could not be analyzed in depth at the time of their discovery. The fossil crania from Apidima and the isolated molar from Megalopolis, Greece, are examples illustrating the potential of new analyses of materials excavated decades ago to our understanding of Neanderthal legacy. On the one hand, the virtual reconstruction, direct dating and comparative shape analysis of the Apidima remains overturned previous hypotheses by indicating the presence of an early Homo sapiens population, followed by a Neanderthal one, at this site (Harvati et al., 2019). On the other hand, the previously unidentifiable Megalopolis molar, likely assigned to the Neanderthal lineage through its crown shape comparative analysis, contributes to the scarce Pleistocene human fossil record of Greece (Röding et al., in press). Such re-evaluations of old materials can therefore provide important new insights, and are particularly crucial in cases where new excavations are not always possible, to better integrate our knowledge of the Neanderthal legacy across the European continent.

4 A TENTATIVE SUMMARY OF VARIATION IN TERMINOLOGY, INTERPRETATION, PROBLEMS AND PERSPECTIVES OF SMALL TOOL TECHNOLOGY BETWEEN NEANDERTHALS AND EARLY SAPIENS

Abstract author(s): Romagnoli, Francesca - Mellado, Miriam (Universidad Autónoma de Madrid) - Cieśla, Magda (Institute of Archaeology, Jagiellonian University) - Elefanti, Paraskevi (National & Kapodistrian University of Athens) - Mihailović, Dušan (University of Belgrade) - Pereira, Telmo (Universidade Autónoma de Lisboa Luís de Camões) - Peresani, Marco (Università di Ferrara) - Škrdla, Petr (Institute of Archaeology, Czech Academy of Sciences) - Stefański, Damian (Archeological Museum in Kraków) - Valde-Nowak, Paweł (Institute of Archaeology, Jagiellonian University)

Abstract format: Oral

The microlithic component was traditionally considered a trait of modern human behaviour from *Homo sapiens*, attesting the more advance of our species. Recently, the production of small tools has been highlighting the relevance of this technological behaviour by Neanderthals [1–8]. Within the Middle Palaeolithic, the small-sized tool production has been progressively incorporated different phenomena, including core-on-flake, single core reduction progressively using different knapping systems (Levallois, discoid, blade etc.), configuration of retouched tools, bipolar knapping and the search for unmodified cutting edges. In addition to the variability of production processes and stylistic patterns, recent studies also highlight a variety of economic strategies (expediency, planning, recycling, and integration), and its relations with raw material constraints and mobility patterns. Furthermore, some methodological problems in the identification and terminology of the microlithic stone tool component (e.g., the notion of size, the distinction between knapping waste and searched tools, and the use-wear data) are contributing to enlarge the discrepancies in the knowledge of small-sized tools in time and space. This work is an attempt to present a systematic overview of this variability and to propose a collective discussion of problems and perspective in this topic through some archaeological examples. This work is expected to be a first step to identify geographical and substantive shortcomings, improve future systematic studies of small tools, and facilitate comparisons between sites.

BIBLIOGRAPHY:

1. Rios-Garaizar, et al. 2015. *Quat. Int.* 361, 188–199.
2. Eixea, Chacón. 2020. *J. Archaeol. Sci. Reports* 31, 102297.
3. Bourguignon, 2004. *Paléo* 16, 37–48.
4. Romagnoli, et al. 2018. *Quat. Int.* 474, 168–181.
5. Dibble, McPherron, 2006. *Curr. Anthropol.* 47, 777–803.
6. Moncel, Neruda, 2000. *Anthropol.* 38, 219–247.
7. Moncel, Svoboda, 1998. *Préhistoire Eur.* 12, 12, 11–49.
8. Venditti, et al. 2019. *J. Hum. Evol.* 131, 109–128.

5 NEW ADVANCES IN ZOOARCHEOLOGICAL METHODS UNVEIL NEANDERTHAL BEHAVIOUR

Abstract author(s): Marin-Arroyo, Ana (Grupo de I+D+I Evoadapta. Universidad de Cantabria) - RIVALS, Florent (ICREA; Institut Català de Paleoeologia Humana i Evolució Social - IPHES; Universitat Rovira i Virgili, Departament d'Història i Història de l'Art)

Abstract format: Oral

In the last two decades, the advances in Archaeological Science have widened and diversified the information we can obtain today from material artefacts and ecofacts. The study of the subsistence strategies carried out by Neanderthals during Pleistocene has revealed exciting and, sometimes, surprising results when material remains are approached from a multidisciplinary point of view. In addition, the reconstruction of the past environments and climatic conditions is revealing new local and regional data that allows understanding the adaptation and resilience skills of this human species to changing scenarios. Today, in combination with vertebrate archaeozoology studies, the application of stable isotopes, dental macro and microwear, dental calculus, ancient DNA and proteomic analyses, such as ZooMS, on animal remains found in archaeological contexts and directly related with Neanderthal societies, is providing exhaustive information. All these proxies provide high-resolution data at the scale of human behaviour. It is possible to reconstruct Neanderthals' diet, the mobility of animal populations, the surrounding vegetation and climate data when both animals and humans lived, the interaction and relationships between past and present populations or the origin of the species. In this presentation, we will present these current advances within iNEAL, a COST European funded project dealing with Neanderthal heritage.

6 THE MIDDLE PALEOLITHIC RESEARCH IN ROMANIA: DRAWBACKS AND ACHIEVEMENTS

Abstract author(s): Dobos, Adrian (Institute of Archaeology "Vasile Parvan", Bucharest)

Abstract format: Oral

Romania holds a key geographical position in understanding the population dynamic throughout Pleistocene Europe. My presentation discusses several older and recent problematic aspects related to the current state of the art of the Middle Paleolithic (MP) in Romania. These aspects tend to be obscured by the recent important (re)discoveries of the Anatomically Modern Human fossils that took place in Romania.

The current MP evidence comes from a bit over 20 sites of various sizes excavated during the 20th century. There are different problems regarding the traditional MP research in Romania: field research methods were non-standardized and in many cases inac-

curate; interpretations on lithic assemblages were centered on typological descriptions; the oldest MP occupations were considered to be dating only from early Würmian stages.

Recent re-assessment of the age of some sites in Romania has revealed that the timescale for the MP evolution spans to late Middle Pleistocene, being much older than previously assumed. New research on loess sequences and cave sediment dynamics has led to a better understanding of climatological aspects and intensity of taphonomic processes.

Similarly, fresh perspectives on lithic assemblages have gone beyond cultural-historical interpretations and provided a broader picture on the dynamics of the MP groups.

Despite these recent advancements, issues in the research of the Middle Paleolithic persist: incomplete lithic and faunal assemblages, uncertainties regarding the tridimensional provenience of the pieces, the impossibility to resume excavations in some sites (destroyed by industry or fully excavated).

However, in spite of these old and new problems, MP still presents significant research interest, since the number of potential sites in Romania is much larger than the excavated sites, as is indicated by the over 150 findspots with surface lithics which can belong to the MP, and also by the great number of fossil caves which have not been tested.

7 ON THE EDGE OF THE ICE SHEET, POLISH CONTRIBUTION TO THE RESEARCH ON THE NEANDERTAL MAN

Abstract author(s): Stefanski, Damian (Archaeological Museum in Kraków) - Cieśla, Magda - Valde-Nowak, Paweł (Institute of Archeology of the Jagiellonian University)

Abstract format: Oral

Finds from the region of Poland designate the outline of the northern periphery of the Neanderthal ecumene. The discussed area was under a strong influence of middle and upper Pleistocene climate changes. The repeated episodes of cold climatic conditions affected the dynamics of the Middle Paleolithic settlement. We can surmise that periodic transgressions of the northern ice sheet changed the readability of the cultural record in the northernmost areas of the ecumene. A significant part of the archaeological sites from the times of Neanderthals is situated in southern Poland. These are loess open-air sites as well as and cave sites. A significant part of them were investigated in methodical excavations, during which the stratigraphy and the chronology of the finds were determined. It can be assumed, that the area of northern Poland – possibly also accessible for Neanderthals in the warm climatic phases – was wiped out by an ice sheet, mainly during the ice transgression in LGM. This article aims to present the characteristics of the Polish MP archaeological sources which consist almost entirely of remnants of the material culture, although the biological remains of Neanderthals have recently been reported. We would like to brief you with key points of the regional Middle Paleolithic discussion and to present selected finds that could be incorporated into the global reflection of the discussed issue.

8 NEANDERTAL MIGRATIONS THROUGH EUROPE AND THEIR LEGACY IN NORTHERN AND EASTERN FRANCE (MIS5-3)

Abstract author(s): Lamotte, Agnes - Desmadryl, Thomas (University of Lille)

Abstract format: Oral

At the end of the Middle Palaeolithic, Northern and Eastern France had many archaeological sites whose typo-technological content (especially leaf-shaped tools) indicate origins from outside this region. During OIS 8 to 5e, the differences between the lithic series relate to the knapping and shaping function and also to the presence or absence of bifaces. During that time, in Europe, there is no clear evidence of real ruptures in typo-technology except in the shapes of the bifaces and the presence of specific knapping methods (Quina, laminar, Levallois, Discoid). However, during OIS 5d and especially the OIS 3, changes are noticeable and similarities between France and Central and Eastern Europe become more common. They are the signature of the migratory movements of Neanderthals modelled on that of the fauna. Evidence for this in the North-Eastern region of France and beyond this region is provided by typological and technological aspects like Kostienki thinning, plano-convex biface, flat retouching, bipointed tools, handle to tools, clearly evoke affinities with Poland (Prondniks), Germany (blattspitzen), leafpoints (Central Europe), scrapers and bifacial tools from Crimea. Undoubtedly, these are the best neanderthal craftsmanship demonstrations that allow us to propose much more precise migration routes like danubian way or the plains of northern Europe and when they were used during the late middle Palaeolithic.

9 NEANDERTHAL OCCUPATION IN WESTERN IBERIA DURING THE MIS 6: THE MONTE DA REVELADA OPEN-AIR SITE

Abstract author(s): Pereira, Telmo (Universidade Autónoma de Lisboa. Departamento de História, Artes e Humanidades; Instituto Politécnico de Tomar, Instituto Terra e Memória, Centro de Geociências da Universidade de Coimbra; UNIARQ, Centro de Arqueologia da Universidade de Lisboa) - Cunha, Pedro (University of Coimbra, Dep. Earth Sciences; MARE – Marine and Environmental Sciences Centre) - Martins, António (Universidade de Évora, Departamento de Geociências; ICT – Instituto de Ciências da Terra) - Monteiro, Mário - Caninas, João - Henriques, Francisco (Emerita - Empresa Portuguesa de Arqueologia, Unipessoal Lda) - Paya, Alexandre (Câmara Municipal de Vila Velha de Ródão; Instituto Politécnico de Tomar, Instituto Terra e Memória, Centro de Geociências da Universidade de Coimbra)

Abstract format: Oral

Monte da Revelada, at 112 m a.s.l, is an open-air and multi-component site located in western Iberia (Vila Velha de Rodão, central Portugal). The site was excavated due to the construction of a factory. The archaeological sequence revealed Modern, Neolithic, Epipaleolithic and Mousterian occupations. Over 40,000 artefacts were found, some associated with hearths and postholes.

The site Quaternary sedimentary sequence overlays, by disconformity, a Paleogene sedimentary unit. The Mousterian industry is associated with the lower bed of the sequence and can be correlated with the topmost deposits of the T4 terrace (~45 m above the riverbed). Up to the present, the age of this bed was not yet obtained by a numerical method.

The lithic analysis of the lower bed of Monte da Revelada shows a typical Mousterian industry with Levallois and Discoidal debitage made on different types of local quartzite and milky quartz, although rare small flint nodules exist in the gravels.

In Ródão area, Mousterian industries were found associated to the topmost deposits of the T4 terrace (probable age of ~200-170 to 155 ka), to the T5 terrace (~140 to 70 ka) and to the lower division (gravels) of the T6 terrace (~62 to 44 ka) (Cunha et al., 2019).

The Vila Velha de Ródão region, located at the beginning of the Lower Tejo River, in the NE edge of the Lower Tejo Cenozoic basin, is an exceptional study case for the ecodynamics during the presence and demise of the Neanderthal populations, as it has corresponded to the ecotone between the coastal (Atlantic) and the inland environmental and climatic conditions.

- Cunha, P. et al. 2019. The Lowermost Tejo River Terrace at Foz do Enxarrique, Portugal: A Palaeoenvironmental Archive from c. 60–35 ka and Its Implications for the Last Neanderthals in Westernmost Iberia. *Quaternary* 2(3), 31-60.

10 HOLDING ON. COMMUNICATION OF CONTENT DURING THE PANDEMIC. THE EXAMPLE OF THE NEANDERTHAL MUSEUM

Abstract author(s): Auffermann, Bärbel - Schneider, Beate (Neanderthal Museum)

Abstract format: Oral

The Neanderthal Museum has a unique selling point in the mediation of human evolution. Every year, more than 600 groups book our offers on this topic in preparation for biology exams.

In order to be able to provide a professional offer despite the lockdown, we created eight short videos on selected topics of human evolution in spring 2020. The links to the videos were distributed via social media, but also directly through the teachers and we received positive feedback.

This experience subsequently led to the need to monetize the digital offerings. The Neanderthal Museum is largely self-sustaining and revenue including from bookings of educational programs is one of the pillars of funding. Thus, the idea of paid online tours came up.

For the preparation of graduation exams, it is now possible to book an exclusive online live guided tour on the evolution of humankind, which is conducted in dialogue with an educator of the museum. During and after the tour, there is time and opportunity to ask questions. In the online live workshop, fossil skulls from 6 million years of human history are presented live and examined together using various scientific methods. Participation in the guided tour or seminar works via Zoom. This offer is very well received and expands the catchment area of the museum, as schools from other federal states also book. Together with European partners, we are thinking the offer further and are also planning guided tours in Spanish and Italian, for example. We are planning an evaluation of the 2019-2020-2021 ranges in comparison.

With our presentation we would like to share our experiences with other institutions and stimulate an exchange.

11 NEANDERTHAL RESEARCH, EARLY HUMAN HISTORY AND THE ISSUE OF MASCULINITY. THE ROLE OF GENDER IN SCHOLARLY AND POPULAR NEANDERTHAL DISCOURSE

Abstract author(s): Peeters, Susan (Erasmus School of Philosophy - ESPhil, Erasmus University Rotterdam; Institute for Science in Society - ISiS, Radboud University Nijmegen) - Zwart, Hub (Erasmus School of Philosophy - ESPhil, Erasmus University Rotterdam)

Abstract format: Oral

Recently, Neanderthals have metamorphosed from the losers of the human family tree to people like us, full-fledged humans. However, the persistent quest for a minimal difference which separates them from us continues. Palaeoanthropology primarily studies ancestors from a distant past, but its findings also affect the identity and self-image of us, modern humans, defining what it means

to be human today. This raises several questions, ranging from more general ones (e.g. How have we used Neanderthals to conceptualize ourselves as human beings?) up to more specific ones (e.g. How are gender issues constructed in narratives about Neanderthals and what does that reveal about current implicit views about gender identities?). This is not only visible in academic discourse, but also in popularisations of research. Popularised versions of Neanderthal research function as spotlights, conveying and amplifying the stereotypes and ideologies which are also at work in scholarly discourse more explicitly. Explicit attention will be given to how males and masculinity are presented. Implicit biases underlying our ideas and ideals of human and humanness, we argue, should be acknowledged and addressed. This will allow us to become open to more inclusive visions of the past, and of what it is to be human.

12 IN THE MIND'S EYE. COMMUNICATING NEANDERTHAL RESEARCH THROUGH FICTION

Abstract author(s): Dielemans, Linda (Independent researcher)

Abstract format: Oral

Neandertals have captured people's imagination since the discovery of the first Neanderthal bone. The way we think of our long-lost cousins evolves as science advances. Or does it? The witless caveman stereotype seems to persist with the general public, despite researchers' best efforts to communicate the results of their hard work. But perhaps that is no wonder. From picture books to even the most well-intended films and novels, Neandertals are consistently portrayed as 'the Other': creatures not-quite-human, dumb or silly, limited compared to ourselves at best. No front-page headline or science book, however brilliant, seems to be able to erase the image popular culture has been feeding us since childhood. In this paper, I propose to fight fire with fire, utilising science-based fiction to tip the scale. Instead of waiting for an author or filmmaker to come and ask for advice, researchers could – or even should – make the first move by actively reaching out to and working with the creative community. Through examples from my own experience as an archaeologist and professional novelist, I hope to make a case for the idea that fiction can be an important tool, that is not only powerful enough to finally beat Boule's Neandertal, but, if used well, also has a way of aiding and enriching original research.

13 EXPLORING OPPORTUNITIES OF CROSS-BORDER DIGITAL HERITAGE APPLICATIONS USING EMBODIED INTERACTION IN VIRTUAL REALITY SIMULATIONS TO DISSEMINATE THE NEANDERTHAL LEGACY

Abstract author(s): Rodil, Kasper - Danevičius, Edvinas - Stief, Frederik (Aalborg University)

Abstract format: Oral

In collaboration with "COST Action Integrating Neanderthal Legacy: From Past to Present," this project details how to design, validate with field experts, and demonstrate a Virtual Reality application to be experienced by the wider public, and as a space for making live the theories of Neanderthal tool crafting.

This merger of Virtual Reality, gamification, and efforts for the protection and dissemination of the Intangible Cultural Heritage has, as an example, recently been explored with contemporary indigenous people (Rodil, Maasz and Winschiers-Theophilus, 2020). Yet, the potential impact for better understanding and disseminating the Neanderthal legacy using VR both in terms of appeal and opportunity to offer alternative learning materials is quite large.

By utilizing VR, there is a dissemination and engagement potential through embodied interaction (Winn, 1993). Embodied interaction is human-computer input responding to the body rather than relying on symbolic interfaces and has been shown to enhance learning and engagement through the feeling of grounding, immersion, and presence while accomplishing a task (Lindgren et al., 2016). Focusing on learning through embodied interaction rather than text or speech enables circumventing the need for adapting an application to the linguistic patchwork that is Europe, thereby making it as accessible as possible.

- Lindgren, R., Tscholl, M., Wang, S., & Johnson, E. (2016). Enhancing learning and engagement through embodied interaction within a mixed reality simulation. *Computers & Education*, 95, 174-187.
- Rodil, K., Maasz, D., & Winschiers-Theophilus, H. (2020). Moving Virtual Reality out of its Comfort Zone and Into the African Kalahari Desert Field: Experiences From Technological Co-Exploration With an Indigenous San Community in Namibia. In 26th ACM Symposium on Virtual Reality Software and Technology.
- Winn, W. (1993). A conceptual basis for educational applications of virtual reality. Technical Publication R-93-9, Human Interface Technology Laboratory of the Washington Technology Center, Seattle: University of Washington.

14 "NEANDERTHAL: MEMORIES" I WRITING AN AUDIO GAME ABOUT NEANDERTALS

Abstract author(s): Riethus, Anna (Stiftung Neanderthal Museum)

Abstract format: Oral

Within reserach project NMsee - a cooperation between the federation of the blind and visually impaired and the Neanderthal Museum in Germany - an inclusive mobile game on Neanderthals was developed in the last 3 years. "Neanderthal: Memories" offers museum visitors a new, accessible and playfull form of access to explore our past.

The game copies simple screenreader gestures and audio game mechanics in order to guide visitors trough Neanderthal Museum. The main character of the game, the Homo sapiens-Ice-Age huntress Nami, remembers her last journey with her adolescent son Lemminki, together with the strange encounters and difficult decisions they made along the road. As they proceed on their way to the family's new camp, both Lemminki and the player learn more about their ancestors, the mysterious "elders" (our modern-day Neanderthals) and the Ice Age way of life.

Whilst game design & development was done by specialized companies, the narrative design of Neanderthal: Memories was done by project leader Riethus. This talk presents the game narrative and addresses the advantages and difficulties when writing a solely audible game story about our favorite ancestors - the Neanderthals. Furthermore, the potential of (audio) games as informational museum media is put out for discussion.

A. LONG DISTANCE RAW MATERIALS IN THE MIDDLE PALAEOLITHIC OF NORTHERN HUNGARY: NEANDERTHALS OR ANATOMICALLY MODERN HUMANS, WHO DID WHAT?

Abstract author(s): Mester, Zsolt (Institute of Archaeological Sciences Eötvös Loránd University; UMR 7194 HNHP CNRS/MNHN/UPVD, Equipe NOMADE, Paris) - Lamotte, Agnès (UMR 8164 HALMA CNRS, University of Lille)

Abstract format: Poster

Studies dealing with the procurement and circulation of raw materials during the Middle Palaeolithic tend to demonstrate that Neanderthals used raw materials from local and regional sources. In Western Europe, the distance of the sources rarely exceeded 25-30 km from their settlements. It has also been demonstrated that the use of long distance raw materials increased during the Upper Palaeolithic by Anatomically Modern Humans (AMH). In Eastern Central Europe, the distances of the sources are usually higher in both periods. The case of Northern Hungary provide an interesting situation for the study of the procurement problem. The region is rich in siliceous rocks (limnosilicites, quartz-porphyr, silicified rocks) of different abilities for knapping, but good quality raw materials (radiolarite, flint) are almost lacking. Sources of these latter are located at around 200 to 400 km, mainly outside the Carpathians. However, the use of extra-Carpathians raw materials was reported in Middle Palaeolithic context. During new excavations at Sajóbáony open-air site (dir. A. Lamotte & Zs. Mester, 2019-2022) the eponymous of the Middle Palaeolithic Bábonyian industry, artefacts made of flint from Poland have been discovered in archaeological contexts. They are blades, crested-blades and ordinary flakes, scrapers and end-scrapers. As demonstrated in France in the 1990s and later in other part of Europe and Africa, these artifacts can also be produced by Neanderthals. Taking into account the archaeological context of this specific raw material, the question could be posed: Neanderthals or AMH, who did what?

B. FRACTURED LEAFPOINTS FROM SAJÓBÁONY (BÜKK MOUNTAIN, HUNGARY) : CULTURAL-SIGNATURE NEANDERTHAL LEGACY OR SHAPING/USING ACCIDENT?

Abstract author(s): Lamotte, Agnes (University of Lille) - Mester, Zsolt (University of Budapest) - Ringer, Arpad (University of Miskolc)

Abstract format: Poster

In the study of a lithic assemblage, the fractured pieces are just as important as whole or unbroken artifacts. When we devote time to the source of the artifact fracture in an assemblage, we are trying to determine between typology, technology, quality of raw materials but also the skill or cultural legacy of the Neanderthals. The relevant criteria in our study are based on the morphology of the fractures (rectilinear, angular, convex, concave, mixed and irregular), the direction of the fracture (transverse, parallel, oblique), and where on the tool the fracture is located. Similarly, significant progress has been made on the fracture hypothesis: whether fracture resulted from poor quality of the raw materials undetectable before shaping, use by flexion, clumsiness of the knapper or voluntary anthropic fracturing. Whatever the fractures are, they leave waves very specific to each situation. By analysing fracture patterns and other typological, technological and techno-economic characteristics, we are able to measure the relative frequencies of these 3 consequences : fracture as a result of poor quality raw material, fracture through use, or deliberate, intentional fracturing by man as a cultural criteria. We apply this analysis/method to the site of Sajóbáony (eponymous site of the bábonyien) where whole leafpoints are present as well as numerous broken leafpoints (excavations of 1986-87-1991 (dir. A. Ringer, Ringer & Adams, new excavation of 2019-2022 A.Lamotte & Zs. Mester). About 50 pieces help us to build our demonstration of fracture pattern, with a special focus on whether intentional fracture is a legacy of neanderthals from Central Europe.

501 WIDENING THE HORIZONS OF ARCHAEOLOGICAL METALWORKING STUDIES - ARCHAOMETALLURGY@EAA, PART 2

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Wärmländer, Sebastian (Dept. of Archaeology and Classical Studies, Stockholm University; UCLA/Getty conservation programme, Cotsen Institute of Archaeology, UCLA) - Saage, Ragnar - Roxburgh, Adrian (University of Tartu) - Neiß, Michael (Uppsala University) - van der Stok, Janneke (Metals Inc.; University of Amsterdam)

Format: Regular session

Archaeometallurgy is a multidisciplinary field where researchers from different fields come together to answer a range of different questions related to ancient metalworking. In this session we welcome full-length papers on archaeometallurgy that relate to the two main themes of the 2021 EAA meeting, i.e. "widening horizons" and "environment". Large-scale metalworking can have large effects on the surrounding environment, but the local environment – including the locally available resources as well as social environment – may dictate which metal-working activities can be carried out. On a smaller scale, microenvironments and microclimates – in a workshop or in a burial - influence how metal objects are created but also how they deteriorate. Some of the best research on ancient metalworking has been done as collaborations between different disciplines, such as engineering, field archaeology, and

social sciences. In order to widen the horizons of archaeometallurgy, we encourage presenters to involve in their research projects novel ideas and methods from other academic fields. The horizons of ancient metalworking can be expanded also by demonstrating long-distance trade networks, or technological similarities between cultures of different time periods or geographic regions. To encourage such comparisons, the papers in this session are not limited to a particular time period or culture. We especially welcome contributions from young researchers.

ABSTRACTS:

1 A LOST TECHNIQUE OF ORNAMENTATION FROM 12TH-13TH CENTURY ESTONIA

Abstract author(s): Saage, Ragnar - Rammo, Riina (University of Tartu)

Abstract format: Oral

The cemetery of Kukruse in North Estonia has richly decorated burials dating to the 12th-13th century. A central part of a woman's burial dress included a chain assembly, which is composed of two decorated pins that attach to the dress, and two chain holders that hang from the pins and supported the chain itself. Elemental analysis from the copper alloy chain holders has revealed an ornamentation technique that only preserves in certain depositional environments. In the best cases, the tin-rich decoration layer is corroded on the copper alloy, while the worst examples show no visible traces of it. The most interesting example has a tinned surface with a silver inlay, which is an unknown way of ornamentation that is very susceptible to the environment. Hence, there are two primary questions to answer: what did this technique look like before the artefacts were deposited, and how not to miss the use of this technique.

2 WROCŁAW, GDAŃSK- TWO MEDIEVAL HANSEATIC TOWNS. COMPARISON OF THE QUALITY OF PROTECTIVE WEAPONS ON THE BASIS OF THE ARCHAOMETRIC RESEARCH

Abstract author(s): Miazga, Beata - Marek, Lech (University of Wrocław)

Abstract format: Oral

Mail and brigandine, as universal forms of body protection, often recycled and reused over long periods of time, are not unusual finds in medieval towns. Small scraps of mail and single brigandine plates, which are the most common, could have been lost during tailoring or repairs of armor. Although modest in size, their careful archaeometric analysis gives us invaluable insights into everyday activities of our ancestors, their customs, prevailing fashions and, above all, their technical culture (in terms of raw materials and the technology). The quality of these items varies. If we take mail as an example, it turns out that not only is it made of wire or sheet metal, riveted or not, but most of all it has different properties, including hardness - a parameter very important not only from a functional point of view, but also in ascertaining the age of a given mail fragment. So the question is whether the quality of mail is an accident or a conscious activity of the craftsman? This presentation will be an attempt to resolve this issue. The results of archaeometric research on elements of armor, obtained during archaeological investigations in Wrocław and Gdańsk will be shown. The data from the microscopic studies in visible light and SEM, microhardness tests or spectrometric analyzes (ED-XRF, EDS) will be discussed. The other important fact is that most of the artifacts were conserved before sampling, which also affects the results obtained.

3 TIME MACHINES; A PXRF EXPLORATION OF COPPER-ALLOY OBJECTS FROM THE STONE ENCLOSURE GRAVES OF NORTH-EAST ESTONIA (C.200BC-200AD)

Abstract author(s): Roxburgh, Marcus Adrian (Tartu University)

Abstract format: Oral

Rome had been a republic for over 500 years before Augustus became its first Emperor in 27 BC. In Estonia, in the North Eastern reaches of the Baltic, this period is still defined as the Pre-Roman Iron-Age, a period of time and geographic space set aside from the intensifying "Roman" world far to the south. For Estonia, the Roman Iron-Age only begins in the middle of the 1st Century AD, with a change that is traditionally defined by a surge in imported objects being deposited in the regions communal stone enclosure graves. This period also coincides with the 'Roman industrialisation' and widespread distribution of brass, a new type of copper-alloy containing zinc. A great many of the new objects in these graves were made of copper-alloy and as these objects tend to survive rather well in the archaeological record, they have received much typological attention. But for these objects, especially for those recovered in the cemeteries of the Eastern Baltic, the nature of the raw material choice is less well understood. This short talk presents an innovative use of pXRF, whereby copper-alloy artifacts from well documented graves are qualitatively sorted into basic categories, in turn allowing for innovative new geo-temporal analyses.

4 „THE ITALIAN CONNECTION“– LONG DISTANCE METAL EXCHANGE BETWEEN THE SOUTHEASTERN ALPS AND THE WESTERN BALKAN DURING THE 2ND MILLENNIUM BC

Abstract author(s): Mehofer, Mathias (Vienna Institute for Archaeological Science, University Vienna) - Gavranović, Mario (Austrian Archeological Institute, Austrian Academy of Sciences)

Abstract format: Oral

In the last decades numerous archaeological and archaeometallurgical publications focused on the examination of copper ore deposits, slags and metal artefacts in order to investigate the copper exchange systems during the Bronze Age. In this context, the Balkan peninsula with its rich copper ore deposits delivered remarkable new insights into the beginning of metallurgy during the Copper Age. Unfortunately, for the Bronze Age one has to state that there was a lack of such systematic analytical research in the region. This lecture will present new archaeometric data, which was obtained within the research project “Bronze Age metal producing societies in western and central Balkans” (FWF, pr. no. P32095). Ores, slags and approximately 560 copper and bronze samples from Bosnia-Herzegovina, Serbia, Northern Macedonia and Croatia. were investigated by chemical (SEM-EDS, ED-XRF, XRD) and lead isotope analyses (MC-ICP-MS). Special emphasis was laid on the examination of the exchange networks that provided copper for the local workshops during the 2nd millennium BC. Our analyses confirmed the production of copper around 1800 calBC near Bor in Eastern Serbia and the use of this metal in regional casting workshops. During the Middle and Late Bronze Age the picture changes fundamentally. Now, copper with a geochemical signature comparable to the South Eastern Alpine mining regions (Trentino) became the dominate metal in the analysed ingots and finished products. How the underlying metal exchange systems which are centered around the mining regions e.g. in the Alps, the Slovakian ore mountains as well as the Mediterranean are interwoven and which role the copper ore deposits in the Eastern Alps played for the metal consumption on the Balkan peninsula will be in the focus of the presented archaeological research.

5 SHIFTING NETWORKS AND MIXING METALS: CHANGING METAL-TRADING ROUTES TO SCANDINAVIA CORRELATE WITH NEOLITHIC AND BRONZE AGE TRANSFORMATIONS

Abstract author(s): Noergaard, Heide (Moesgaard Museum, Department of Archaeology; Aarhus University, School of Culture and Society) - Pernicka, Ernst (Curt-Engelhorn-Centre for Archaeometry, CEZA) - Vandkilde, Helle (Aarhus University, School of Culture and Society)

Abstract format: Oral

550 metal analyses shed decisive light on how the Nordic Bronze Age was founded on metal from shifting ore sources in correlation with altered trading routes. It was shown that an on-and-off presence of copper characterised the Neolithic. A continuous rise in metals to southern Scandinavia began around 2100-2000 BC. First, high-impurity metal from the Austrian Inn Valley and Slovakia arrived via central German Únětician hubs complemented by high-tin British metal allowing for early local production of tin bronzes. Metal growth locally fuelled leadership competitions visible in the metal-led material culture.

The Únětice downfall 1600 BC resulted in raw materials shortage during a short period visible in the reuse of existing resources; however, brought direct Nordic access to the Carpathian Basin. This expedited metalwork innovations, relying on chalcopyrite from Slovakia and the opening of new sources in the eastern Alps along an eastern route, also bringing Baltic amber as far as the Aegean. During this period, British metal played a central role. Finally, from c.1500 BC British copper had ceased while the predominance of novel north Italian copper coincides with the full establishment of the NBA and highlighting a western route connecting the NBA with the southern German Tumulus culture and the first trans-Alpine amber traffic.

This presentation will lead you through the scientific and archaeological analyses behind the presented results concerning the metal trading networks that promoted the Nordic Bronze Age's establishment to its peak around 1300 BC. A threefold approach, using source-critical artefact classification analyses, trace-element analyses, together with and lead-isotope analyses, allowed to create a realistic assumption regarding the alliances and networks around the metal trade towards Scandinavia.

6 COPPER PRODUCTION AND TECHNOLOGY AT THE MID-LATE BRONZE AGE TALDYSAI WORKSHOP (KAZAKHSTAN): ITS PLACE IN THE WIDER EURASIAN METALMAKING FRAMEWORK

Abstract author(s): Calgario, Ilaria - Veronesi, Umberto (Institute of Archaeology, University College London) - Yermolaeva, Antonina (Margulan Institute of Archaeology) - Radivojević, Miljana (Institute of Archaeology, University College London)

Abstract format: Oral

Second millennium BC Eurasian copper extractive metallurgy is widely assumed as large-scale and standardised, with its highest technological peak reached during the Mid-Late Bronze Age. Present-day Kazakhstan and Southern Urals host among the richest polymetallic ore deposits of Eurasia, massively exploited since the Early Bronze Age by the Steppe pastoralist communities. The metallurgical workshop of Taldysai in the steppes of central Kazakhstan was one of these production centres and represents the focus of this study. Extensive evidence of metalmaking has been unearthed at this site, including complex smelting furnaces, production debris, mining and beneficiation tools and finished metal artefacts.

Out of these, seven copper smelting slags were chemically and microstructurally analysed by Optical and Energy Dispersive Scanning Electron Microscope and provided a first insight into the multi-step metallurgical chaîne opératoire carried out onsite. Then, in order to test the estimated uniformity of Mid-Late Bronze Age copper extractive metallurgy, data collected from Taldysai were

integrated with a comparative reference database of thirteen coeval metalmaking sites located between Eastern Alps and Central China and analysed through multivariate statistics in form of principal component analysis (PCA) and ternary diagrams. Chemical data were interpreted paying attention to the function of the comparative sites entered in database, i.e. extractive centres, workshops, settlements.

Overall, this study sheds light on the metallurgical process carried out at Taldysai and presents preliminary elements to fit in the wider second millennium BC narrative. Results highlight how specific choices dictated by local/regional-scale inventiveness, the exploitation of different mineral ores and the technological solutions adopted by Bronze Age metalsmiths determined variations in smelting steps, technological parameters and efficiency of copper production across Eurasia.

7 COPPER AND TIN BRONZE METALLURGY AT THE LATE BRONZE AGE SITE OF SEMIYARKA (KAZAKHSTAN)

Abstract author(s): Amirova, Saltanat (McDonald Institute for Archaeological Research, University of Cambridge) - Radivojević, Miljana (Institute of Archaeology, UCL) - Mertz, Ilya (S. Toraihyrov Pavlodar State University) - Lawrence, Dan (Archaeology Department, Durham University) - Mertz, Victor (S. Toraihyrov Pavlodar State University)

Abstract format: Oral

Copper and copper alloys, especially tin bronze, played a crucial role in the development of the Eurasian Steppe region during the Bronze Age. Tens of thousands of copper and tin bronze artefacts have been found in the region, however, the vast majority originated from the burial complexes. Here we present the unique case of Semiyarka, a large mid 2nd millennium BCE settlement located in east Kazakhstan, with evidence for copper and tin bronze production. A recent survey confirmed the distribution of dwelling and materials debris across c. 100 ha, and included more than 40 remains of various metallurgical processes on this site, the analysis of which are presented here.

We conducted microstructural and compositional analysis of copper ores, crucible slags, metal debris and finished artefacts in order to characterize the nature of metal making processes on this site, infer their potential scale and finally, learn about the organisation of production. The highlight of our results is detecting six crucibles for tin bronze making, alongside copper production, the combination of which has not been identified anywhere in the settlement archaeology of the Bronze Age of Eurasian Steppes. We also suggest potential resources for copper and tin exploitation, alongside routes for trade and exchange of metals during the stated period in east Kazakhstan, and across the steppes.

8 NEW INSIGHTS INTO THE MANUFACTURE OF HIGH-LEADED BRONZE PALSTAVES THROUGH EXPERIMENTAL CASTING AND NEUTRON TECHNIQUES

Abstract author(s): Armada, Xose-Lois (Institute of Heritage Sciences - Incipit, Spanish National Research Council - CSIC) - Arcidiacono, Laura (ISIS Pulsed Neutron and Muon Source) - Comendador, Beatriz (Grupo de Estudios de Arqueología, Antigüidade e Territorio, Universidade de Vigo) - Faro, María G. (Institute of Heritage Sciences - Incipit, Spanish National Research Council - CSIC) - Lackinger, Aaron (Grupo de Estudios de Arqueología, Antigüidade e Territorio, Universidade de Vigo) - Martín-Torres, Marcos (Department of Archaeology, University of Cambridge) - Silva-Sánchez, Noemí - Sureda, Pau (Institute of Heritage Sciences - Incipit, Spanish National Research Council - CSIC)

Abstract format: Oral

Bronze palstaves are the most abundant metal object in the northwestern Iberian Peninsula during the Late Bronze Age and the transition to the Earliest Iron Age. They usually occur in isolated hoards and many of them contain high quantities of lead and have morphological features (such as the presence of the casting jet) that are incompatible with their use as ‘functional’ tools or weapons.

Some of these palstaves have massive lead cores, which show a spherical shape in the casting sprue. Two hypotheses have been suggested to explain this phenomenon: 1) the intentional casting of pure lead inside a bronze casing; and 2) massive lead segregation during solidification. As the production and hoarding of these palstaves may have strong social implications, the analysis of this issue matters not only from a technological perspective.

An ongoing research project, “Mass production and deposition of leaded bronzes in Atlantic Europe during the Late Bronze Age - Iron Age transition” (ATLANTAXES), focuses on these high-leaded palstaves dealing with issues such as technology, metal provenance and hoarding patterns.

This contribution introduces some of the experimental and analytical work carried out within the project, aiming a better understanding of the manufacturing process of these palstaves. On the one hand, a non-invasive characterisation through neutron tomography and radiography, prompt gamma activation analysis and neutron diffraction of one of these palstaves at the ISIS Pulsed Neutron and Muon Source (Oxfordshire, UK) provides unique insights about the bulk of this object. On the other, experimental casting under laboratory conditions allows a better understanding of the factors that determine the internal structure of these palstaves, suggesting that their lead cores are massive lead segregations resulting from high-leaded ternary alloys. Finally, the paper also discuss the advantages of combining such analytical and experimental approaches.

9 SHIFT IN THE ELEMENTAL COMPOSITION OF COPPER ALLOYS AND METALWORKING TRADITIONS IN LITHUANIA IN THE FIRST MILLENNIUM AD

Abstract author(s): Bliujiene, Audrone (Klaipėda University, Institute of Baltic Region History and Archaeology) - Bagdzevičienė, Jurga (Klaipėda University, Institute of Baltic Region History and Archaeology; Lithuanian National Museum of Art, Pranas Gudynas Centre for Restoration) - Petrauskas, Gediminas (Klaipėda University, Institute of Baltic Region History and Archaeology; National Museum of Lithuania) - Vybernaitė-Lubienė, Irma (Klaipėda University, Institute of Baltic Region History and Archaeology; Klaipėda University, Marine Research Institute)

Abstract format: Oral

The elemental analysis of copper alloy composition of almost 2,000 artefacts recovered from 151 find spots dated to the first millennium AD was performed in Lithuania between 2019 and 2020. The samples for the analysis were obtained from the surface and core of the artefacts. They were examined with the aid of portable and stationary X-ray fluorescence (XRF) devices, as well as the inductively coupled plasma mass spectrometry (ICP-MS) method, using certified reference materials (CRM) and standards. The samples, drilled both from the surface (patina) and metal core of the finds, were analysed through the ICP-MS method. The XRF and Energy dispersive X-ray fluorescence (EDXRF) methods were employed for studying the surface of the finds, as well as shavings of the metal core and alloys compressed into tablets were also taken into analysis. The obtained results were normalised and further analysed by using simple descriptive and multidimensional statistics. The performed analyses enabled the classification of copper alloys into basic alloy groups, i.e. brass, gunmetal, leaded gunmetal, bronze, etc. Furthermore, shift in the composition of copper alloys was evaluated in regards to chronology. The distribution of copper alloys revealed certain regional differences, which led to considerations of different directions of exchange that could have been used to source raw metal. The obtained results allowed a more accurate description of corrosion processes (such as the formation of lead on the surface of artefacts), metalworking traditions (e.g., tinning of the surface), whereby the surface is not visible due to being entirely covered by corrosion. The shifting elemental composition of copper alloys is associated with changes in the sources of raw material, exchange routes, and development of metalworking technologies.

10 METALLURGICAL ANALYSIS OF IRON BARS FROM BALTIC SEA SHIP WRECKS

Abstract author(s): Wärmländer, Sebastian (Stockholm University)

Abstract format: Oral

Iron and steel, in different stages of refinement, has been a major Swedish export good since at least the Viking Age. However, the different iron manufacturing processes employed in Sweden from the Viking Age to the modern era are not fully understood. Nor is it fully known what kind of iron qualities were exported during the centuries. Iron from cargo ship wrecks, which preserve well in the Baltic Sea, is an important source for understanding the history of iron production and iron trade in Sweden and the larger Baltic region. Here, we present the analysis of different kinds of iron, such as Osmund iron and bar iron, excavated from Baltic ship wrecks dating to the 16th and 17th centuries. The analytical results increase our understanding of the iron manufacturing technology used in these centuries, and the results are interpreted in relation to the changing patterns of iron trade during this period.

11 IRONWORKING AT THE SCYTHIANS

Abstract author(s): Zavyalov, Vladimir - Terekhova, Nataliya (Institute of Archaeology, Moscow)

Abstract format: Oral

The Scythian period (7th-3th cc. BC) occupies a special place in the history of iron production in Northern Eurasia. It was the time when the local population started using iron in everyday life. In the context of overall iron production development, transition of nomadic steppe population to a sedentary lifestyle played an important part. The Kamenskoe hillfort is the most outstanding center in steppe Scythia of that time. It was a permanent settlement of settled metalworkers in the country of the Scythian nomads. More than 80 items (knives, sickles, chisels, awls, etc.) were examined by archaeometallographic method. These studies provide an insight into the process of the blacksmith craft development among nomadic groups during this transition to sedentary life. The results suggest that in the 5th-4th centuries BC highly developed craft centers appeared in steppe Scythia. These centers served as a stable source of blacksmithing products of the Scythian population. The obtained data demonstrate that contacts between nomads and population groups which possessed technological knowledge played a key role in this process.

12 FROM THE ASHES: UNPRECEDENTED ARCHAEOLOGICAL INVESTIGATIONS IN NOTRE-DAME-DE-PARIS FOLLOWING THE FIRE

Abstract author(s): L'Héritier, Maxime (Université Paris 8 - ArScAn UMR 7041) - Azéma, Aurélie - Syvilay, Delphine (Laboratoire de Recherches sur les Monuments Historiques) - Delqué-Kolic, Emmanuelle (Laboratoire de Mesure du Carbone 14 - LSCE) - Ivan, Guillot (Université Paris Est Créteil - ICMPE) - Sarah, Guillaume (IRAMAT CNRS UMR 5060) - Baron, Sandrine (TRACES CNRS UMR 5608) - Dillmann, Philippe (Laboratoire Archéomatériaux et Prévision de l'Altération : LMC IRAMAT UMR5060 CNRS et NIMBE UMR3685 CEA/CNRS)

Abstract format: Oral

Metallic structures are omnipresent in medieval great stone monuments. The newly opened restoration yard in Notre-Dame-de-Paris following the 15th April 2019 fire gives a unique opportunity to question the evolution of practices related to these metals over the centuries: quality and use for construction, provenance, recycling... This contribution aims to present the research themes and first results of the "Metal workgroup" of Notre-Dame-de-Paris scientific program coordinated by French National Research Centre and Ministry of Culture.

On the one hand, the restoration works reveal various iron cramps, chains and series of hitherto unknown iron armatures. Their archaeometallurgical study enables to clarify their role in the structure of the building, their chronology, but also their quality and origin, enlightening the builders choices and the ancient supply circuits. More than 30 iron cramps and pins coming from diverse parts of the masonry (tribunes, upper walls...) or collected in the archaeological remains of the burnt framework were sampled and analysed by metallography. Slag inclusion were analysed by SEM-EDS to study the production processes and by LA-ICP-MS to look for iron provenance. Eight samples were also submitted to tensile tests to determine their mechanical behaviour. At last, ten artefacts were radiocarbon dated, revealing the use of iron as early as the 1160's, almost 50 years before the earliest examples known so far for such monuments.

On the other hand, the research focuses on the different uses of lead (covering, decoration, sealing...) and on the practices of craftsmen according to the period. The identification of the different sources of lead and recycling practices is conducted by means of elemental (LA-ICP-MS) and isotopic analyses (MC-ICP-MS) of more than 300 lead samples coming from lead joints still in place and from the remains of the spire and the roof.

13 USE OF COAL IN FLEMISH FORGES DURING LATE MIDDLE AGES

Abstract author(s): Jagou, Benjamin (INRAP; UMR 5060 IRAMAT - LMC; UMR 7041 ArScan TranSphères)

Abstract format: Oral

For some time now, many operations of preventive archaeology have been conducted in the former territory of the County of Flanders. These have often allowed to discover traces of metalworking. Studies related to these late Middle Ages metallurgical spaces showed that these crafts used coal. Moreover, these studies revealed that this particular use led to specific slags. Afterwards, the first researches could determine that this early use was caused by a lack of wood in this territory. This period is known for its extensive economic and demographic growth. Indeed, this expansion led to open the landscape widely in order to gain some new farming and housing areas. Then, this brought about a shortage of forest resources and a price inflation, which forced craftsmen to choose another fuel. At this time, the English territory took a leading role in the spread of coal in Flanders. In fact, the English people had been confronted with a lack of wood earlier, so they had to use coal soon, considering that this fuel was abundant in their territory. Moreover, this transition was facilitated by numerous exchanges between Flemish and English cities, particularly related to wool trade.

The use of coal had few impacts on the forge technical processes, nevertheless its combustion had many undesirable effects. Indeed, noxious smoke and bad smells produced by urban workshops had led to regular conflicts between the craftsmen and their neighbours. Therefore, the urban network of these Flemish cities was modified: blacksmiths had to move their workshops to sub-urban areas.

14 COMPARISONS OF CHEMICAL COMPOSITIONS AND MICROSTRUCTURES OF SLAGS RECOVERED IN RECENT ARCHAEOLOGICAL EXCAVATIONS IN THE ROGALAND REGION, NORWAY

Abstract author(s): Gebremariam, Kidane (University of Stavanger)

Abstract format: Oral

A number of slag and slag-like materials were recovered in recent archaeological excavations in the Rogaland region of Norway. Attempts are made to determine the compositions of these materials and characterize their micro-structural features. Such investigations, among others, help to identify whether the slag materials are associated with smelting or smithing activities. In the case of smelting slags, information about the nature of the ores and other raw materials utilized can be acquired along with the conditions under which the slags were produced. Manganese appears to be the most commonly element associated with the smelting slags acquired from different excavation sites. Could this element be used as a marker to iron ore sources available in this particular region? Some micro-structural characterizations and elemental microanalyses are conducted to trace the distribution of this element in different phases of the slag micro-structures. The similarities and differences between the various slags recovered will also be highlighted.

METALWORKING OF THE YENISEI KYRGYZ OF THE US RIVER VALLEY BASED ON RESEARCH MATERIALS OF IRON TOREUTICS AND SMITH TOOLS

Abstract author(s): Davydov, Roman (Humanities Research Laboratory, Novosibirsk State University) - Kuleshov, Dmitry (Institute of Archaeology and Ethnography SB RAS)

Abstract format: Oral

The metalworking of the nomads has a number of peculiar features. The study of smithing and jewelry of medieval nomads allows us to fix the specifics of their production in the conditions of mobile life in steppes of Eurasia. Mass material is of great interest. It contains information on trends in blacksmithing and jewelry. For the culture of the Yenisei Kyrgyz (Southern Siberia, VI-XIV centuries AD), this is toreutics.

The object of the study was iron toreutics with silver inlaid from the burial sites of the Yenisei Kyrgyz in the Us river valley (south of the Minusinsk Basin). This is a local group of burials of the X-XII centuries AD.

A total of 142 things were studied using the technological-traceological method, 4 technological schemes were reconstructed. The gradual development of technology with the optimization of techniques is revealed. The items were made by a group of craftsmen, including apprentices.

The results of the analysis of the elemental composition of silver and iron (104 samples) showed that artisans used metals from the Minusinsk Basin and from the Tuva. At the same time, there was a secondary processing of material, the use of scrap.

Additionally, metalworking tools of the Yenisei Kyrgyz have been researched in the museum collections. These are compact items for use in a mobile workshop, include multi-functional tools.

The workplace of the Usinsk Kyrgyz metalworkers is a mobile workshop with some craftsmen, including apprentices. They used small and versatile tools, and the costs were extremely rational, with recycling. Such a reconstruction has parallels with ethnographic data on nomadic metalworkers.

The study was supported by a grant from the Russian Science Foundation (project No. 20-18-00111). The analysis of the elemental composition was carried out within the framework of the State assignment in the field of scientific activity No. 0329-2019-0008.

A. BRONZE AGE METAL: METALLOGRAPHIC AND ISOTOPE ANALYSES OF BRONZE WEAPONS FROM BOHEMIA, MORAVIA AND SW SLOVAKIA

Abstract author(s): Havlíková, Markéta (Masaryk University)

Abstract format: Poster

The aim of this poster is to demonstrate the application of modern metallographic analysis on Bronze Age metal weapons from Bohemia, Moravia and SW Slovakia. My research focuses on their functional properties, as well as questions of their production and provenance. If we want to understand the social and economic role of Bronze Age weapons, then data acquired with the help of archaeological science are of tremendous importance. My analysis is based on the combination of optical and scanning electron microscopy in the modern metallography analyses (SEM/EDS, p-XRF, X-ray etc.), use-wear analysis and lead isotopes analysis (MC-ICP-MS method). The results of a research sample of data from this area will complement the international research data network and permit the clarification of these issues in the Czech Republic. The aim is also to obtain a comprehensive source of data for further research and discussion of Bronze Age material culture in Europe.

TOWARDS AN INCLUSIVE FUTURE: A STRATEGY FOR ROCK ART RESEARCH, MANAGEMENT AND SOCIAL VALUE

Theme: 6. Material culture studies and societies

Organisers: Valdez-Tullett, Joana (Historic Environment Scotland) - Figueiredo, Sofia (University of Minho) - Barnett, Tertia (Historic Environment Scotland) - Botica, Natália (University of Minho)

Format: Discussion session

Rock art is at the heart of passionate debates which often relate to identity, ancestry or political claims. The associated lore which survives in many countries demonstrates its active role in people's ontologies until recent times. On the other hand, only in the last three decades has rock art become the subject of more scientific approaches, and it still does not feature comfortably within wider historical and archaeological narratives. There is a dichotomy in the relationships with rock art between heritage sector professionals and communities. In fact, in some cases, due to claims for preservation, local communities have been barred from accessing their local rock art.

In this session we will introduce UNESCO's 5Cs' – Credibility, Conservation, Capacity-building, Communication, Communities - to explore models of research, management, outreach and public engagement with rock art of various chronological and geographic scopes. We are interested in hearing and discussing projects that have or are currently implementing inclusive strategies to research rock art whilst promoting community engagement and social value, in view of long-term safeguard, preservation and management. We also welcome contributions that discuss contemporary issues that affect rock art on a daily basis such as restricting

physical and knowledge accessibility, climate change, rapid changes to modern land use, and the role of digital recording techniques as methods for preservation and outreach.

ABSTRACTS:

1 INTRODUCTION

Abstract author(s): Valdez-Tullett, Joana (Historic Environment Scotland)

Abstract format: Oral

The "Towards an Inclusive Future: A Strategy for Rock Art Research, Management and Social Value" session originated from the realisation that, as researchers, we face many obstacles when dealing with rock art, regardless of its type, tradition or chronology. From the issues with safeguarding and conservation, to management, research, public engagement and social value there are a number of elements that are common to a variety of projects being developed in several countries.

In this Introduction slot, we will have a short presentation of the session and explain why we thought about it, and which are the issues that we are more concerned about. We will set out the main goals and objectives for the day, carrying out a short introduction of our speakers.

Since this is a discussion session, we will outline some thoughts and ideas that may be useful for the debate, which are relevant for all contributions.

2 ROCK ART DATA SHARING TOWARDS A MORE INCLUSIVE KNOWLEDGE

Abstract author(s): Botica, Natalia (Universidade do Minho; Lab2PT; Unidade de Arqueologia) - Figueiredo, Sofia (Universidade do Minho; Lab2PT) - Magalhães, Fernanda (Universidade do Minho; Lab2PT; Unidade de Arqueologia)

Abstract format: Oral

The access to rock art data, whether for scientific research, management issues, dissemination or to raise interest of a wider public and involvement of local communities, implies the collection of data into open repositories. By doing so, we set the ground for up-to-date interpretations among the scientific community through new analysis and visualization tools, as well as for their reuse in other areas such as cultural and creative tourism. However, to produce FAIR data (Findable, Accessible, Interoperable and Reusable), they must obey certain guidelines that include the use of an appropriate metadata scheme, persistent identifiers, well-defined vocabularies, sustainable file formats, as well as procedures that standardize and improve the quality of data. Taking these principles into account, we aim to present the developed methodology for the RARAA project. The RARAA project intends to do the survey of four sites with impressive Iron Age rock art, all located in the Côa Valley, classified as World heritage since 1998.

3 TREASURES OF THE DESERT: VALUE OF COMMUNITY ENGAGEMENT IN ROCK ART MANAGEMENT WITHIN THE WADI RUM PROTECTED AREA, JORDAN

Abstract author(s): Groom, Kaelin (Stone Heritage Research Alliance LLC; Arizona State University) - Al-Noaimat, Saleh (Wadi Rum Protected Area)

Abstract format: Oral

In 2017, the Community-Based Rock-Art and Epigraphic Recording (CB-RAER) Project, funded through the USAID-SCHEP program, completed several interrelated goals in the Wadi Rum Protected Area (WRPA). Besides providing an effective monitoring program for this World Heritage site via smartphone-based GIS data-collection using the Rock-Art Stability Index (RASI), the project combined Jordanian and foreign CB-RAER team leaders' expertise with data gathered during field surveys to create the Rock-Art Rangers (RAR) program, expanding local guides' knowledge and skillsets. Upon successful completion of this program, tour guides were accredited as Rock-Art Rangers and as guides qualified to offer enhanced tours that focus on the region's rock-art heritage. As more tourists seek out new experiences in Wadi Rum that go beyond its spectacular natural heritage, this RAR accreditation will become ever more important for local guides. Now several years later, the area is still reaping the longer term benefits of local engagement in rock art management, research, and promotion of the region—as will be shared in this presentation.

4 THE PREMEDIA PROJECT: A CROSS-BORDER STRATEGY FOR ROCK ART PAINTINGS IN A CROSS-BORDER REGION (SPAIN-PORTUGAL)

Abstract author(s): Comendador Rey, Beatriz Pilar (GEAAT - Group of Studies of Archaeology, Antiquity and Territory, University of Vigo; GIDEP - Group of Educational Innovation in Heritage Education, University of Vigo) - Vilas Estévez, Benito (GEAAT - Group of Studies of Archaeology, Antiquity and Territory, University of Vigo; GIDEP - Group of Educational Innovation in Heritage Education, University of Vigo; Árbore Arqueoloxía e Restauración S. Coop) - Braña Rey, Fátima (Cultural Anthropology Area, University of Vigo) - Rodríguez González, Manuela Elizabeth (Group PE4 Images and Contexts, University of Vigo)

Abstract format: Oral

The northwest of Iberia is a particular region due to the convergence of different types of rock art traditions, like engraved Atlantic Art and painted/engraved Schematic Rock Art. Furthermore, during the past three years several sites with prehistoric paintings were

found in the inner part of Galicia (Spain) at the archaeological sites of Lobarzan (Monterrei, Ourense) and Penedo Gordo (Vilardevós, Ourense) which were discovered by locals, linked to the cultural networks of the region. The University of Vigo has coordinated the research of these sites, within the framework of collaboration agreements.

Due to their singularity, the identification of these two archaeological sites with schematic paintings in the valley of Monterrei in the cross-border area between Galicia /Tras-os-Montes (Portugal), represents a milestone in the literature of Galician Rock Art. However, it also poses significant challenges in terms of their preservation, research and management, due to their location in a depopulated region, with strong aging demographics and affected by a predatory model of land management.

The PREMedia project undertook a number of varied actions including the design of virtual visits, incorporating interpretative resources, and an innovative experience in the use of artistic illustration and animation. Also, the joint collaboration between Prehistory (Arts and Humanities) and Social and Cultural Anthropology (Social Sciences) in the development of this project, opens a new line of work focused on social aspects by involving the local people. An innovative ethnographic approach to the surroundings of the sites enables a more realistic approximation to the interests and needs of the local communities. Finally, it highlights the need for more direct communication and engagement with the local population.

5 AN EMPTY STOMACH HAS NO EARS: PROJECT TO INVOLVE DOURO VALLEY LOCAL COMMUNITIES IN THE IRON-AGE THROUGH ROCK ART HERITAGE

Abstract author(s): Figueiredo, Sofia (Lab2PT, Universidade do Minho) - Silva, Andreia - Maciel, José (Independent Researcher) - Figueiredo, Elin (CENIMAT/i3N - Centre for Materials Research, Universidade Nova de Lisboa) - Galarza, Javier (Lab2PT, Universidade do Minho) - Borges, Adriano (Departamentos de Ciências da Comunicação e de Sociologia, Universidade do Minho) - Botica, Natália (Lab2PT, Universidade do Minho; Unidade de Arqueologia, Universidade do Minho)

Abstract format: Oral

In 2007, in the frame of the Portuguese national program of dams with high hydroelectric potential, the hydroelectric exploitation of Baixo Sabor was approved. Construction of the dam started in 2009, integrating an ambitious Plan of Heritage Protection, given the great impact on the landscape, which included 3000 hectares to be submerged. The preventive archaeological work, which ended in 2015, uncovered an immense heritage with exceptional findings related to the Iron Age. Two of the major archaeological sites excavated revealed an unknown reality, composed by hundreds of engraved plaques from the Iron Age period, unique in the world. In 2015, scientific studies on these discoveries were initiated at an academic frame. But it was not until 2021, that a first proposal towards the engagement of local communities in the archaeological research materialized. Our aim is to present the first steps of the development of a project involving local communities through a culinary framework, that take into account the archaeobotanical and archeozoological findings as well as the representations in rock art, where wild boars and deer are hunted. A set of recipes will be created based on archaeological information, regional ingredients and the local community's imagination guided by Kitchen chef's expertise. With the support of local restaurants, Iron Age ritual banquets will be recreated. With these actions we do also seek to undertake a critical discussion on the social function of archeology, and possible ways to share scientific knowledge, in a playful way, and very Iberian: with a full stomach!

6 WORKING TO AN INCLUSIVE MODEL OF DIALOGUE AND CROSS-CULTURAL EXCHANGE: FLUTEPLAYER IMAGERY IN CHACO CANYON, MEXICO

Abstract author(s): Vendome-Gardner, Charlotte (University of Exeter)

Abstract format: Oral

The Fluteplayer is a widely recognised figure within Southwestern American rock art, characterised by a figure, anthropomorphic or ambiguous, with a flute being held or played and is characteristic of an Ancestral Puebloan culture who's ideological center was located in Chaco Canyon, New Mexico. Over the past century the Fluteplayer has been miss-interpreted, appropriated and widely commodified as the Kachina Kokopelli, part of a belief system which succeed the Chacoan ideology, and Fluteplayer imagery is now entangled with modern, predominantly western, interpretations of the Kokopelli character, which are subsequently rooted in shamanistic interpretations of fertility. Although the association with Kokopelli has been discredited and widely accepted within rock art research, the propulsion of this character continues on a monumental scale. The universal interpretation of Fluteplayers in this way detracts from the true value of individual and unique imagery and creates the notion of a static culture for the Native American people. This discussion will present current PhD research and will discuss how the Fluteplayer can be studied to move beyond the stereotypes pertained by the Kokopelli association using a landscape-based approach to establish a context, in Chaco Canyon, and the wider socio-cultural placement of the image in Chacoan society. Specifically, there will be a focus on cross-cultural dialogue. Establishing an open and respectful sharing of knowledge with the descendants of the Chacoans, the Pueblo, a greater understanding of Fluteplayer imagery can be gained and shared within communities, aiding the dismissal of the Kokopelli association and opening up new avenues of research and discussion. It will also highlight the importance of working with Native American people when studying aspects of their culture to aid the long-term management and heritage of rock art sites between two cultures who share a mutual, but sometimes conflicting, interest.

7 DISCOVERING THE VALUE OF SCOTLAND'S ROCK ART THROUGH DIGITAL CO-PRODUCTION

Abstract author(s): Jeffrey, Stuart (School of Simulation and Visualisation, Glasgow School of Art) - Tertia, Barnett - Bjerketvedt, Linda Marie (Historic Environment Scotland) - Robin, Guillaume (School of History, Classics and Archaeology, University of Edinburgh) - Valdez-Tullett, Joana (Historic Environment Scotland)

Abstract format: Oral

Scotland's Rock Art project (ScRAP) is a five year AHRC funded project run by Historic Environment Scotland, the University of Edinburgh and the School of Simulation and Visualisation at the Glasgow School of Art (AH/N00745X/1). At the core of the project is a collaborative endeavour with multiple avocational community groups to enhance the recording of Scotland's Rock Art. Building on the models provided by such projects such as England's Rock Art and others (Barnett 2010, Jeffrey et al 2015), the project has involved significant effort in community capacity building in technical recording approaches such as photogrammetry. Working together with these groups, over 1400 sites (including 200 previously unknown) have been fully recorded, have 3D models made available and details submitted to the National Record of the Historic Environment of Scotland.

Central to the project was the opportunity that the co-production process offers for rapid ethnographic intervention (Pink & Morgan 2013), specifically to capture the multiple strands of contemporary social value associated with Scotland's Rock art. This process looks at the changing values around this type of site during the lifetime of the project as well as the changes to specific sites' significance precipitated by the recording process (Jeffrey et al 2020) and the implications this has for the perceived authenticity of both site and record (Jones et al 2017). This paper will present for the first time detailed outcomes of our analysis of the social value capture element of the ScRAP project through multiple lenses. However, we focus on what changes in value have been revealed by medium term engagement and our longitudinal study of this engagement, as well as the relationship between the wider social benefits of engagement, as identified by the community participants, and the specifics of engaging with rock art in the field and through the record.

8 PROTECTING, PROMOTING AND TRANSMITTING THE AFRICAN ROCK ART HERITAGE AS A MEANINGFUL TRANS-CULTURAL AGENT

Abstract author(s): Gallinaro, Marina (Dipartimento di Scienze dell'Antichità - Università di Roma La Sapienza)

Abstract format: Oral

Rock art is a fragile and threatened heritage. However, being a unique visual archive into the social and symbolic worlds of past human societies can have an emotional impact on the contemporary observers effectively contributing to raising the awareness on specific critical topics:

- the informative value of rock art in the reconstruction of past living societies;
- the challenge to preserve the cultural heritage for future generations;
- the past and present cultural dynamics connected to climate change, and the exchanges and connections between different cultural systems, including migration.

Africa hosts an impressive presence of rock art, widespread all over the continent, of different styles, techniques and age. Up to now, 11 African UNESCO World Heritage sites include rock art, ca. 20 more sites are in the tentative list, more than in any other continent.

This paper aims to trace the main paths that have been followed in different African contexts to connect or re-connect the rock art stakeholders and the local communities, both inside and outside the continent. The balance is not always even, and it shows traits that require careful evaluation, in terms of cultural, political and economic backgrounds. Facts and figures (as far as available) on the impact that the UNESCO aegis has on conservation and sustainable development issues will be discussed, as a stimulus to isolate the best practices to fill the existing gaps.

A particular focus will be placed on the Saharan context of the "Tadrart Acacus rock art sites", one of the first African sites recognized by the UNESCO in 1985 and currently in the Endangered List (since 2016). This research is part of the ASArt-DATA Project (Funded by the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 795744).

504 NEWS FROM THE BRONZE AGE – SCALING DYNAMICS AND NARRATIVES

Theme: 4. Globalisation and archaeology

Organisers: Burkhardt, Laura (Institute for Oriental and European Archaeology - Austrian Academy of Sciences; German Archaeological Institute - DAI) - Brunner, Mirco (University of Bern, Institute of Archaeological Sciences, Prehistory Department; University of Bern, Oeschger Centre for Climate Change Research - OCCR) - Laabs, Julian (Institute of Pre- and Protohistoric Archaeology, Christian-Albrechts-Universität zu Kiel; Department of Geography, Physical Geography, Christian-Albrechts-Universität zu Kiel) - Massy, Ken (Ludwig-Maximilians-Universität München, Institut für Vor- und Frühgeschichtliche Archäologie)

Format: Regular session

The Bronze Age is a well-researched epoch in most regions of Europe, where strong narratives are built upon rich data sets and mostly top-down theoretical approaches. Those narratives, however, are not going undoubted or undebated and currently a reas-

assessment of the Bronze Age – or Prehistoric – World is ongoing. Influenced by reflexive approaches towards the social interpretation of archaeological data and scientific studies as well as the incorporation of bottom-up approaches this session aims at challenging old narratives about the European Bronze Age.

Widening up perspectives, we would like to bring together a - theoretically, methodologically, geographically and thematically – diverse and interdisciplinary group of researchers to (re)present the broad spectrum of studies and opinions on the Bronze Age.

Within the framework of our integrative and multifaceted approach, we would like to draw special attention to the emerging dynamics that are visible on different spatio-temporal scales, settings and data sets (from site data to big-data, from artefacts to aDNA, between long-durée and adaption of innovation). Hereby, we define dynamics as the effect and interplay of forces over time and space that can be identified from the evidence of archaeological remains – investigating dynamics, as well as their theoretical and methodological exploration, is of our main interest.

Based on case studies from all over Europe dealing with dynamics of and within site occupation sequences, settlement systems, exchange networks, socio-political organisations, economic relations or the ideological framework, we want to explore the often fostered unity/heterogeneity of the European Bronze Age starting from regionally diverse settings. Therefore, we would like to invite especially contributions dealing with demography, mobility, identity, economy, politics and social organisation to discuss with us the identification and scaling of dynamics in the European Bronze Age and their theoretical and methodological investigation and to widen up horizons.

ABSTRACTS:

1 THE YAMNAYA “INVASION” OF EUROPE: THE ARCHAEOLOGICAL DATA AGAINST OLD AND NEW NARRATIVES

Abstract author(s): Palalidis, Stefano (Institut für Prähistorische Archäologie, Freie Universität Berlin)

Abstract format: Oral

Since its first formulation by Marija Gimbutas in the 1950s, the “Kurgan hypothesis” has seen numerous peaks in popularity and revivals. Though being largely rejected in its original articulation, some scholars have used it as the basis for further studies and partially revised it, ultimately landing to what is nowadays known as the “steppe hypothesis”, which is generally more accepted. The recent introduction of paleogenetic data in the scientific discussion has caused the latest revival of “Gimbutas-was-right-all-along” feelings, especially among the non-specialized audience and mass media. The aim of this paper is not to question the steppe influence that is testified in Bronze Age Europe from a wide array of sources, but rather the emphasis put on its violent nature. Claims of a murderous invasion and even of male genocide have caused great sensation inside and outside the scientific community, yet the actual archaeological data is often underrepresented. The basis for this paper is a dataset of 5704 Yamnaya graves from the Great Hungarian Plain to the Ural Mountains containing detailed information on the grave construction, grave inventories, demographic and radiocarbon data which is used to address general and specific research questions. The archaeological evidence provides scarce indications for violence in the Yamnaya horizon, while suggesting on the other hand a peaceful interaction with local communities in the contact zones.

2 MIKULOVICE – THE ÚNĚTICE FAMILIES IN FOCUS

Abstract author(s): Ernée, Michal (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Papac, Luka (Department of Archaeogenetics, Max Planck Institute for the Science of Human History, Jena) - Langová, Michaela (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Massy, Ken (Ludwig-Maximilians-Universität München - LMU Munich) - Friedrich, Ronny (Curt-Engelhorn-Center Archaeometry, Mannheim) - Haak, Wolfgang (Department of Archaeogenetics, Max Planck Institute for the Science of Human History, Jena)

Abstract format: Oral

In recent years, archaeogenetics has progressed from continent-wide, broad-scale studies to more targeted and detailed investigations of smaller regions and even single sites and communities. Through the combination of archaeology, anthropology, paleopathology, isotopes, 14C dating and genetics, it is now possible to gain insights into biological kinship structures of local communities and family networks, both within and between sites. Here we present the results and interpretations of the first detailed interdisciplinary analyses of the rich Early Bronze Age Únětice cemetery in Mikulovice, Eastern Bohemia, Czech Republic. Thanks to rich grave assemblages of the cemetery (e.g. large collections of amber jewellery, bronze and gold artefacts, sea shells, bone artefacts etc.), which were completely analysed and published during the last years, it is also possible to integrate the results of archaeological, bioarchaeological and isotopic research into the more complex picture of the Early Bronze Age local community living and buried on the important long-distance road - the Amber Road.

3 UNLOCKING THE SECRETS OF CREMATED HUMAN REMAINS FROM LATE BRONZE AGE AUSTRIA

Abstract author(s): Rebay-Salisbury, Katharina (Austrian Academy of Sciences)

Abstract format: Oral

Cremation as a new way of dealing with the dead resulted in large cemeteries with several hundred urn burials in the Late Bronze Age (c. 1300–800 BC). In recent years, scientific advances in osteological sexing, strontium isotope analysis and radiocarbon dating have widened the information value that can be extracted from cremated bones.

The FWF-funded project ‘Unlocking the secrets of cremated human remains’ makes use of these developments and investigates aspects of over 1000 burials from the Lower Austrian Traisen river valley, which came to light through rescue excavations in the late 20th century.

‘Unlocking the secrets’ aims to track social changes through time by establishing a chronological framework that combines artefact-based and radiocarbon dating of selected funerary contexts. People’s geographic origin and mobility will be analysed through isotopes, and better methods of sexing cremated human remains will enable the investigation of gendered mobility and family relations in the Late Bronze Age. Dating burnt and unburnt bones from the same contexts will reveal ritual practices such as delayed deposition and ancestor curation.

This presentation will introduce the new project and aims to discuss the learning potential of linking scientific analysis of cremated human remains with context information.

4 BRONZE AGE SETTLEMENT DYNAMICS IN CENTRAL GERMANY: A CASE STUDY FROM THE WEISSE ELSTER RIVER CATCHMENT

Abstract author(s): Miera, Jan (Institute for Pre- and Early History, University of Leipzig; Institute for Pre- and Early History, Friedrich-Schiller-University Jena) - Schmidt, Karsten (eScience-Center, University of Tübingen) - von Suchodoletz, Hans - Ballasus, Helen (Institute of Geography, University of Leipzig) - Werban, Ulrike (Helmholtz Centre for Environmental Research - UFZ) - Fütterer, Pierre (Institute for the History of the Middle Ages, Otto von Guericke University of Magdeburg) - Werther, Lukas (Department of Medieval Archaeology, University of Tübingen) - Zielhofer, Christoph (Institute of Geography, University of Leipzig) - Ettl, Peter (Institute for Pre- and Early History, Friedrich-Schiller-University Jena) - Veit, Ulrich (Institute for Pre- and Early History, University of Leipzig)

Abstract format: Oral

The conference contribution focuses on long-term settlement dynamics during the Bronze Age in the immediate catchment of the Weiße Elster river between Leipzig and the German-Czech border in the western Ore Mountains. The study area covers a territory of about 3026 km² and extends over administrative districts of the federal states of Saxony, Saxony-Anhalt and Thuringia. Geographically, it extends from the Northern German Plain into the Central Uplands. The Northern German Plain is characterized by gentle rolling slopes and fertile soils on loess as well as annual average temperatures of ca. 10° and an annual precipitation between 550 and 650 mm. The Central Uplands are marked by a heterogeneous topography with steep slopes, low-yielding soils, lower average temperatures, increasing amounts of annual precipitation as well as longer periods of winter.

Between 2017 and 2020, ca. 2900 pre- and early historic sites were recorded using local area files from the Saxonian Archaeological Heritage Office, the State Office for Preservation of Monuments and Archaeology Saxony-Anhalt and the Thuringian State Office for Heritage Management and Archaeology. The archaeological data base includes 350 sites that can be used for the analysis of Bronze Age land use.

Initially, the presentation will discuss the pre-processing of archaeological data from the three archives to generate a unified data base and the reconstruction of the digital elevation model, because the topography south of Leipzig is distorted considerably by open-cast mines. The Bronze Age site distribution is evaluated by discussing the potential impact of archaeological field work and geographical filters (modern land use, erosion, weathering conditions etc.). The description of land use is based on various aspects such as analyses of site density, site frequency, and the geographic location of the sites. Finally, a supra-regional discussion of the results is carried out by comparison with other study areas.

5 BRONZE AGE SETTLEMENT AND POPULATIONS DYNAMICS IN THE NORTHWESTERN ALPINE REGION

Abstract author(s): Brunner, Mirco (Institute for Ecosystem Research, Christian-Albrechts-University Kiel; Oeschger Centre for Climate Change Research - OCCR, University of Bern) - Laabs, Julian (Institute of Pre- and Protohistoric Archaeology, Christian-Albrechts-Universität zu Kiel; Department of Geography, Physical Geography, Christian-Albrechts-Universität zu Kiel)

Abstract format: Oral

At the beginning of the Bronze Age and in contrast to the Final Neolithic the landscapes of major entries to the Alps and the big alpine valleys became hot spots of human settlement activities. The reasons for that profound change in the settlement landscape are yet rather speculative but seem to be connected with the maintenance and establishment of intensified trade and the access to alpine resources such as metals, pasture or wood. However, the alpine foreland was not abandoned as the scarce record of Bronze Age pile dwellings might suggest. Interesting spatio-temporal dynamics can be witnessed in the overall settlement system in the Northwestern alpine region. Over the course of the Bronze Age there are reoccurring shifts for several kilometers of core areas of

settlement activities. Those shifts seem to emerge especially during times when changes also took place in the social, economic or ideological realm of the Bronze Age communities, but socioecological reasons are also quite likely.

Methods of archaeological population reconstruction such as 14-C SPD (summed probability densities), site counts/densities and the use of palaeoenvironmental proxies show ongoing human activities during the Bronze Age and do not indicate any severe population decline in the course of the witnessed spatial shifts of settlement activities. The social transformations that can be inferred from changing material culture and burial rites or the relocation of settlement core areas seemingly only had minor effects on the demographic development of the northwestern alpine region.

Based on those findings we like to discuss possible social, economic or environmental drivers for the documented dynamics and present an interpretation of those developments in the local and over-regional context of the European Bronze Age.

6 CONTINUITY AND/OR INNOVATION AT THE END OF THE LATE BRONZE AGE AT THE FRINGES OF SE ALPS

Abstract author(s): Cresnar, Matija (University of Ljubljana; Institute for the Protection of Cultural Heritage of Slovenia)

Abstract format: Oral

Numerous and extensive construction projects carried out in Slovenia in the last 25 years have brought to light a large number of new mainly lowland archaeological sites dating from Bronze Age. After numerous reports, but also integral monographs have been published, we are for the first time able to deal with settlements excavated on a scale where we can truly speak about their layout, internal development, etc., but also about settlement patterns on (micro-)regional levels.

Although the number of sites dated to different subphases of the Bronze Age has increased, most of them can (still) be dated to the Late Bronze Age. On the one hand, this gives us the opportunity to study the relationships between the individual settlements, but also to combine these new findings with the knowledge about the (accompanying) cemeteries, most of which were excavated some time ago.

Modern excavation techniques should also be taken into account, as the recently excavated shallow cremation graves have also shed new light on grave preparation, cemetery layout and burial rites in general.

Important new data have also been obtained from research projects concerned with the origins and development of Early Iron Age centres, including the application of remote sensing techniques and geophysics, as well as series of radiocarbon dates to help understand their settlement dynamics.

When combining these rather large datasets, it becomes also obvious that what appeared to be an abrupt change is much less clear on closer inspection. In a sense, the more we (seem to) know, the more complex the questions we can pose and which, for the time being, remain unanswered... But then again, that is what keeps us going...

7 SCALING DYNAMICS ON THE SOUTHEAST BALKANS IN THE LATE BRONZE AGE

Abstract author(s): Burkhardt, Laura (German Archaeological Institute - DAI)

Abstract format: Oral

In the Late Bronze Age on the Southeast Balkan, regional communication zones that connected groups in different resource areas can be traced. This can be seen in the use of pottery concepts (vessel types and decoration systems) across the ore-rich regions (Rhodopes) as well as the large agricultural zones (Northern Greece, Thracian Plain). This speaks for an interweaving of everyday practices and exchange networks within and between these regions. But beside connecting pottery concepts unifying settlement patterns or burial practices can hardly be found. While on the one hand, this diverse picture allows discussing dynamics on different spatio-temporal scales, on the other hand, it contributed to the fact that previous approaches defining cultural groups spatially and chronologically were difficult. Moreover, such narratives were largely made using unsystematically researched sites and settlements that were short-lived. The latter may point to specific modes of subsistence and a certain degree of mobility. Therefore, more complex models, e.g. a polyetic model of culture and the hypothesis of trans-locality are being discussed based on new systematic research from the Eastern Rhodopes. An attempt to update and eventually revise old and partly inflexible narratives about the Late Bronze Age on the Southeast Balkans.

8 TRACING CONNECTIONS: THE BRONZE AGE SITE OF TORRE CASTELLUCCIA IN THE REGIONAL AND INTERREGIONAL NETWORKS OF THE GULF OF TARANTO

Abstract author(s): Pizzuti, Elisa - Palazzini, Flavia (Sapienza - Università di Roma)

Abstract format: Oral

Starting from the South Italian Middle Bronze Age (1700 - 1300 BC), we can observe a complex landscape of fortified coastal settlements around the Gulf of Taranto (Apulia, Basilicata, Calabria). These long-lasting sites, often occupied until Greek colonization (ca. 700 BC), were located at a short distance from each other and mostly stood on headlands flanked by natural bays and inlets. This location made the settlements highly accessible and thus privileged landing places, further allowing defense from external threats. While in the Mediterranean basin trade, mobility, and social connectivity were ever-expanding in complexity, the Gulf communities participated in both local and interregional networks, hence developing social and economic relationships (e.g. LBA Mycenaean contacts). In this setting, the renewed studies on the site of Torre Castelluccia (18 km south-east of Taranto) offer a fresh perspective, increasing the current state of awareness on the social and cultural dynamics in the focus area. Excavated around the middle of

the XX century, Torre Castelluccia belongs to the quoted group of long-lasting sites. Both settlement - placed on the hilltop - and funerary areas are known, with a clear spatial relationship of contiguity. Furthermore, the Late Bronze age cremation cemetery is in part coeval with the use of one chamber "grotticella"-type tomb, revealing a complexity of coexisting rituals. We present the results of our research based on a solid typo-chronological frame, using a multi-layered spatial approach (local, regional, supra-regional). The analysis of legacy data combined with the renewed study of artefacts sheds new light on Torre Castelluccia, offering both a valid testimony of the settlement dynamics in the Gulf of Taranto and relevant information on the communication networks established in the broader Mediterranean scenario.

9 SARDINIA AND THE LATE BRONZE AGE SEA-BORNE METAL TRADE BETWEEN SCANDINAVIA, ATLANTIC EUROPE AND THE MEDITERRANEAN

Abstract author(s): Sabatini, Serena (University of Gothenburg)

Abstract format: Oral

This paper aims to discuss the role of Sardinia in the metal trade between Scandinavia, Atlantic Europe and the Mediterranean during the Late Bronze Age or the second half of the second Millennium BCE. Recent analyses on bronze finds from Northern Europe provided a relevant idea of the complexity of the European Bronze Age metal trade. The discovery -by means of lead isotope and trace element analyses- of copper of likely Sardinian origin in a number of local artefacts was a highly unexpected result, imposing rethinking the role of the island as a metal producing region for a wide variety of 'customers'. The issue is open and complex and far from being fully investigated.

The purpose of this paper is to present a preliminary work suggesting that metal trade and exchanges unfolded between Atlantic Europe and the Mediterranean, also thanks to the contribution of strategically positioned Sardinian communities. A combination of evidence suggests that what we could call Sardinian 'maritime enterprises' might have played a significant role in the sea-borne metal trade between copper-rich Mediterranean and tin-rich Atlantic Europe.

10 EXPECTATIONS OF CONSUMERS – HOW TO PROMOTE COPPER IN A GLOBALIZED BRONZE AGE EUROPE

Abstract author(s): Nessel, Bianka (Institute for Pre- and Protohistory, Johannes-Gutenberg University Mainz) - Uhnér, Claes (University of Oslo, Museum of Cultural History)

Abstract format: Oral

Copper ingots appear in different shapes during the European Bronze Age. Some are widely distributed; others only circulated in regional networks. It is often assumed that similar forms indicate that ingots are made of similar raw materials. However, scientific material analysis shows that the shape or form of an ingot type is often not, or at least not directly affected by changes in the exploitation of ore sources. A reason for this might be that certain regions, or particular consumer groups, had developed a general acceptance or preference for specific ingot types. Consumers might have associated trusted suppliers with certain types and/or visual appearances of raw copper. But they also had to deal with disruptions when an ingot type was not obtainable and had to be substituted. This paper discusses the distribution of plano-convex casting cakes during the Late Bronze Age and their relevance for socio-economic interpretations of copper exchange in order to better understand Bronze Age exchange networks and communication zones.

11 MYTH, MESSAGES AND MATERIALIZED CONNECTIONS IN NORDIC BRONZE AGE ICONOGRAPHY: MULTISCALAR INVESTIGATIONS

Abstract author(s): Ahlqvist, Laura (Aarhus University)

Abstract format: Oral

The Late Nordic Bronze Age (c. 1100-600 BC) brought about marked socio-cultural shifts and disruptions in, for example, exchange networks, burial rites and hoarding, affecting the daily lives of the people inhabiting the area. In addition, the period is particularly famous for its elaborate iconography on metal objects. The style is geographically very distinct, yet referencing and incorporating 'international' elements. Especially one-edged razor blades and large belt ornaments (hængekar) are adorned with zoomorphic imagery, suns and ships, which have been interpreted as direct representations of Bronze Age mythology. Importantly, this art also underwent various transformations during this time, seemingly intertwining with the aforementioned changes in social practices, a complex process that has, as of yet, not been investigated fully. This paper seeks to explore the intangible large-scale societal developments through a lens of ornamentation analysis.

Using a novel quantitative approach, the paper explores the spatio-temporal trends in iconography on key object types of the Late Nordic Bronze Age. The individual elements of the ornamentation form the point of departure for multiscalar investigations into the cultural transmission creating these trends, thus considering the agency and communication of the people behind the art. Simultaneously, a persistent view to the wider geographical distribution of iconographic developments may hint at modes of contact and exchange as well as political and ideological implications. Thus, the paper aims to elucidate wider societal developments in the Nordic region and beyond - from the viewpoint of the individual to entire societies.

12 OF TRADERS AND CUTTERS - DYNAMICS OF AMBER DISTRIBUTION IN THE EUROPEAN BRONZE AGE

Abstract author(s): Serbe, Benjamin (Institut fuer Ur- und Fruehgeschichte Kiel)

Abstract format: Oral

The Bronze Age can be viewed as kick-off in European trade. Although it already started beforehand it is a time in need for exchange. With the spread of the bronze technology the respective resources copper and tin are in constant flow throughout the continent. In this era of intensified connectivity amber steps up into the European exchange systems.

This study aims to investigate the exchange networks of the Bronze Age through the spread of amber in Europe. As this work is still in progress a first glimpse of this matter can be caught in the research history and the use of different classification systems displaying the regional varieties of amber artefacts in the time of 2200 to 800 BC. They give insight in the exchange of raw material (the trader's work) and finished amber products (the cutter's work) throughout Europe and the underlying dynamics of interaction.

Further Network Analyses will help to discuss this matter of exchange and test the overall narrative of the so called Amber Route.

13 SCALING INFRASTRUCTURE AND SOCIAL TRANSFORMATION IN THE BRONZE AGE

Abstract author(s): Quinn, Colin (Hamilton College)

Abstract format: Oral

The European Bronze Age was a time of expanding interregional connectivity and rising social inequality. Archaeologists have suggested that trade routes played a central role in structuring Bronze Age societies, and the control of these economic networks and associated technologies were important pathways to power. Despite the perceived importance of trade and exchange to explain social organization and development in the Bronze Age, the nature of these networks remain undertheorized. The concept of infrastructure, adapted to archaeological contexts, can provide a way to unpack trade, exchange, and distribution as analytical concepts. Infrastructure is the dynamic multi-scalar cultural system that emerges out of human interaction to facilitate the movement of people, goods, and ideas. Using this approach, I trace the development of infrastructure in Bronze Age Europe, with particular attention given to the metal-rich region of southwest Transylvania. Transylvania is home to and played a critical role in supplying raw materials, especially gold, copper, and salt, that fueled the development of inequality in the Bronze Age. In this paper, I examine how infrastructure was organized at the local scale, how Transylvanian communities articulated to increasingly large-scale infrastructural networks, and how these small and large scale systems changed throughout the Bronze Age (2700-1200 cal. BC).

A. EARLY BRONZE AGE AEGEAN GENOMES FROM PERACHORA CAVE, CORINTH, GREECE

Abstract author(s): Psonis, Nikolaos - Vassou, Despoina - Tabakaki, Eugenia (1 Ancient DNA Lab, Institute of Molecular Biology and Biotechnology, Foundation for Research and Technology – Hellas, Heraklion, Crete) - Stravopodi, Eleni (Ephorate of Palaeo-anthropology and Speleology, Ministry of Culture and Sports, Athens) - Kafetzopoulos, Dimitris (1 Ancient DNA Lab, Institute of Molecular Biology and Biotechnology, Foundation for Research and Technology – Hellas, Heraklion, Crete)

Abstract format: Poster

Research involving ancient DNA (aDNA) has experienced a true technological revolution in recent years, mainly through the advance of high-throughput sequencing. Archaeogenomic research on present-day Greek/Aegean sites has been focused either on Neolithic (covering the period from ~ 8.000 to 4.000 BCE) or on Middle to Late Bronze Age specimens (covering the period from ~2.400 to 1.200 BCE). Hence, there is a sampling gap concerning the period from the Final Neolithic to Early Bronze Age, an important transitional phase during of which noticeable changes have been documented on archaeological basis that may indicate broader cultural changes. Previous analyses of ancient genomes have concluded that Middle/Late Bronze Age Peloponnesian populations (attributed as Mycenaean) and Middle Bronze Age Cretan populations (attributed as Minoan) could be modelled as a mixture of the Anatolia Neolithic-related substratum with additional 'eastern' (Caucasus/Iran-related) ancestry and could be considered as distinct from Neolithic Aegean populations who had only Anatolian farmer ancestry. In this study we provide archaeogenomic evidence from an Early Bronze Age (Early Helladic) population located in central present-day Greek mainland (Perachora cave, close to the Early Helladic settlement of Perachora in the Gulf of Corinth), in order to examine if the Bronze Age 'eastern' ancestry was present in the mainland Aegean area from the early onset of the Bronze Age. Our preliminary results suggest that the Early Bronze Age Perachora population is clustering together with Early/Middle Neolithic farmers from Europe, Aegean, and Anatolia, an indication of distinctiveness from Middle/Late Bronze Age Peloponnesian and Cretan populations. Hence, southern mainland Early Bronze Age Aegean people may not have been genetically admixed yet, with populations carrying the additional 'eastern' ancestry, an event that possibly occurred immediately after, during the Middle Bronze Age and the advent of the intensified Minoan mobility and interchange network.

505 ON THE MOVE: INTERDISCIPLINARY APPROACHES IN STUDYING HUMAN MOBILITY

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Fernée, Christianne - Trimmis, Konstantinos (University of Bristol) - Drnić, Ivan (Archaeological Museum in Zagreb)

Format: Regular session

Mobility and movement are central to human evolution. Human history has been marked by mobility and migration events, from early humans to the modern migration crisis. The nature of this mobility ranges from micro-mobilities, mobilities of everyday life, to sea-

sonal mobilities, such as in transhumance, and occasional large-scale movements. The broad social, economic and political underpinnings of mobility are diverse and not always known. However, human mobility has always had a great influence on the spreading of cultural, social and technological ideas. Consequently, within archaeology this has typically be studied using artefactual evidence and material culture.

Bones and teeth present a multifaceted array of data from which mobility can be reconstructed. The dynamic nature of bone means that it provides a record of life conditions, health and lifestyle. This can be studied on a range of different scales, from the individual, to the community and regional levels. Human remains, therefore, provide a great tool to understand human experience and the impact of transitions such as mobility.

This session aims to discuss methodological advances in the study of human mobility, particular its interplay with the human body. This session welcomes papers that focus on but are not limited to biomechanical, biogeochemical and biomolecular studies (e.g., functional morphology, stable isotopes and ancient DNA). We also welcome papers that integrates bioarchaeological data with other methodological approaches, including but not limited to computational and climatic modelling, material culture, textual, and social anthropology studies.

ABSTRACTS:

1 PEOPLE'S STORIES: AN INTEGRATIVE BIOARCHAEOLOGICAL STUDY OF SHORT-TERM MOBILITY

Abstract author(s): Fernée, Christianne - Trimmis, Konstantinos (University of Bristol) - Drnić, Ivan (Archaeological Museum in Zagreb)

Abstract format: Oral

Tangible places and objects are often used as evidence of mobility. However, this evidence removes the individual from the discussion of mobility. Bioarchaeology enables the individual to be brought back into focus. Bones and teeth present a multifaceted array of data from which mobility can be reconstructed. The human skeleton is malleable, or plastic, responding and adapting throughout the life of an individual to external environmental and social pressures. The dynamic nature of bone means that they provide a bio-narrative for individuals, providing a record of life conditions, health and lifestyle from infancy to adulthood. Two aspects of mobility, although not mutually exclusive, can be studied: mobility itself and its impact.

Recent scientific advances have enabled the creation of a detailed timeline for single individuals, in terms of mobility and its effects. This can help bring to light the rhythms and social relations of mobility directly from human remains. This paper will present an integrative methodological approach to studying mobility and its impact. It will bring together traditional approaches with recent advances in the field of bioarchaeology into a single methodological framework. There will be a particular focus on the study of short-term mobility as identifying short-term and sub-group mobility using the archaeological record has been particularly challenging.

2 HOW TO APPROACH MOBILITY IN THE LA TÈNE PERIOD? ADVANTAGES AND DISADVANTAGES OF THE COMBINED BIO-MOLECULAR ANALYSES AND MATERIAL EVIDENCE

Abstract author(s): Danielisova, Alzbeta - Bursák, Daniel (Institution of Archaeology of the CAS, Prague)

Abstract format: Oral

The standard way to detect movement, in the case of individuals, is through strontium isotope analysis. The isotopic data on mobility indicate changes of residence, although evidence of long-distance movement is problematic for methodological reasons. Analysis of skeletal material from La Tène cemeteries across Europe shows that bio-archaeometric evidence makes no case for large migrations in the 4th century BCE or later. According to the findings so far, migrations represent smaller groups of people or individuals who changed their place of residence at least once in their lives. There is no evidence that certain groups within the population were more mobile. Therefore, the usual image of 'Celtic migrations' as conveyed in historical sources does not seem to be supported by interdisciplinary analysis. It is amid such fragmentary evidence that provenance analysis of material culture may be useful in addressing questions of mobility by detecting various origins for what seem to be typologically identical everyday objects. As the long-distance trade with common clothing accessories as well as the raw materials in this period is improbable, it is likely that everyday objects, like jewellery, could have been subjects of mobility as well as their owners. This contribution aims to demonstrate that geochemical data from everyday objects such as items of personal jewellery can be a useful proxy source when used in combination with bio-molecular analysis and in a context of socio-economic complexity.

3 BABY STEPS: A STUDY OF THE SHAPE OF CHILDHOOD MOBILITY

Abstract author(s): Stark, Sarah (UCL)

Abstract format: Oral

Growth and early mobility are a heavily studied field in juvenile bioarchaeological studies. The question of shape or developmental trajectories, however, has only recently been investigated as methodological advances such as geometric morphometrics methods (GMM) have become more available.

The application of GMM allows for a novel analysis of developmental trajectories as whole bone morphology is analysed and visualised in a three-dimensional space. To determine if long bone plasticity and movement is influenced by population variation, juveniles

of Anglo-Saxon to Post-Medieval foetal to 12-year-old long bones were examined; they formed a comprehensive dataset to integrate auto3dgm with traditional bioarchaeological methodologies of growth and development. This study seeks to identify how biological processes affect bone shape during ontogeny to answer, 'what is bone shape and what do shape trajectories tell us?'

The principal findings were that long bone shape is statistically significant by site and period from foetal to 5 years old and that shape is not a linear progression but rather fluctuates during the life course. It was also found that the developmental trajectories had different potential in the extent of shape that could be achieved for each age group, and that trajectories could change as a result of developmental pathways such as nutritional or environmental stress that occurred during growth.

4 **ADNA AND THE ESTABLISHMENT OF DISCRIMINANT FUNCTIONS IN COMMINGLED REMAINS. PUNTA AZUL'S CASE (EL HIERRO, CANARY ISLANDS)**

Abstract author(s): Ordóñez, Alejandra (Departamento de Bioquímica, Microbiología, Biología Celular y Genética. Universidad de La Laguna; Departamento de Geografía e Historia. Universidad de La Laguna) - Cockerill, Samuel (Departamento de Geografía e Historia. Universidad de La Laguna) - Serrano, Javier - Fregel, Rosa (Departamento de Bioquímica, Microbiología, Biología Celular y Genética. Universidad de La Laguna) - Arnay de la Rosa, Matilde (Departamento de Geografía e Historia. Universidad de La Laguna) - González Reimers, Emilio (Facultad de Medicina. Universidad de La Laguna)

Abstract format: Oral

One critical subject in any bioanthropological study of a population is the sex determination of the individuals. It becomes even more crucial when analyzing daily and seasonal mobilities in a specific society, especially those related to gender roles. In cases where the archaeological remains are comingled, discriminant functions become a fundamental tool to achieve this goal. Nevertheless, they should have been made with populations as close as possible to those being studied. Punta Azul's burial site is one of the island's most important funerary sites. It has remains of more than a hundred individuals. However, as in most of the burial sites in the archipelago, the remains were highly comingled.

Considering previous anthropological studies, we chose the astragalus and calcaneus establish discriminant functions. Prior results suggested that the distinction of males and females in these specific bones could give us insights into this population's activities. The appearance of certain traits led us to think there could be genetic, gender, or movement patterns that were conditioning its presence. Indigenous populations adapted their behavior to take advantage of the limited available resources with seasonal mobility, like going to higher lands in the summer and everyday mobility related to pastoral activities. These movements were probably different for men and women. Therefore, the analysis of activity patterns in these bones by sex is fundamental to address these questions.

As a preliminary approach, we analyzed 31 samples and established the genetic sex of 25. Although it is still a small number, we could design a discriminant function for the calcaneus and the astragalus with an overall accuracy of 88% and 100%, respectively. These promising results lead us to analyze a higher number of bones, using aDNA, to increase our functions' reliability and assure the gender assignation to see our bioanthropological results' social implications.

5 **BIOMUSE: THE GENOMIC HERITAGE OF ANCIENT GREECE, BRINGING DIGITALISED BIOHISTORY IN MUSEUMS**

Abstract author(s): Theodoroudi, Eleftheria (Laboratory of Physical Anthropology, Department of History and Ethnology, Democritus University of Thrace) - Winkelbach, Laura (Palaeogenetics Group, Institute of Organismic and Molecular Evolution - iomE, Johannes Gutenberg University Mainz) - Ganiatsou, Elissavet (Laboratory of Physical Anthropology, Department of History and Ethnology, Democritus University of Thrace) - Pukaj, Albert (Palaeogenetics Group, Institute of Organismic and Molecular Evolution - iomE, Johannes Gutenberg University Mainz) - Souleles, Angelos (Laboratory of Physical Anthropology, Department of History and Ethnology, Democritus University of Thrace) - Brami, Maxime - Blöcher, Jens - Diekmann, Yoan - Burger, Joachim (Palaeogenetics Group, Institute of Organismic and Molecular Evolution - iomE, Johannes Gutenberg University Mainz) - Papageorgopoulou, Christina (Laboratory of Physical Anthropology, Department of History and Ethnology, Democritus University of Thrace)

Abstract format: Oral

For some years now, genetic studies have complemented the portfolio of archaeometric techniques to accurately reconstruct the ancestry, life history and phenotype of prehistoric people. Museums and cultural centres are keen to attract and inform their visitors with exhibits based on these cutting-edge research techniques. Yet the potential that the combination of different research methods, including palaeogenomics, offered to museums has not yet been fully exploited.

BIOMUSE is a project that brings together bio-molecular and anthropological expertise with heritage professionals to present individual biographies of ancient Greek (pre-)history to the public.

The idea is to use a holistic set of analytical techniques to help document, digitise and share a hitherto underutilised source of information on human cultural and biological heritage. To this end, we analysed more than 50 prehistoric humans, including their complete genomes, in diachronic time periods ranging from the Mesolithic to the Byzantine period. We then combined the genomic information with data from different scientific fields, i.e. archaeology, history, isotope chemistry, physical anthropology, to give a snapshot of the lives of these people and present them to the public using state-of-the-art museological communication and visualisation tools. By collaborating with museums and heritage organisations, we aim to raise awareness of the potential of biohistorical approaches to

document the lives of anonymous people from the deep past. We hope that this will not only increase the existing knowledge about the genomic history of Greece, but also increase the attractiveness of the biological heritage to the public.

6 **METHODOLOGICAL DEVELOPMENT OF DECONTAMINATING OSTEOLOGICAL MATERIALS COATED IN ANIMAL GLUES FOR STRONTIUM ISOTOPIC ANALYSIS**

Abstract author(s): Wathen, Crista - Isaksson, Sven - Lidén, Kerstin (Stockholms Universitet)

Abstract format: Oral

The effects of diagenesis on the strontium isotopic values of osteological materials have been well documented, however, the effects of preservatives and adhesives have not. These are generally added in a museum-setting or during an archaeological excavation for stabilization. Thus allowing the material to either travel or be saved for future analysis. However, there is evidence that these practices may affect isotopic or DNA analysis, and whether or not they affect strontium isotopes has not been widely studied. Unfortunately, the exact adhesive and the methodology to create it was seldom documented, making it difficult to determine the appropriate method to remove it. This means that if the glue is not fully removed then the biogenic values of the bones may not be the portion analyzed but the glue itself! Additionally, depending on the isotopic values of the glue it might cross-link with the material, thus changing the biogenic values. Thus creating issues when trying to determine any mobility patterns in a population. For this reason, a multi-step study has been created to determine the effects of glues with known strontium values and if they can be removed with the decontamination methods set by the Stockholm University Laboratory.

7 **THE MYSTERY OF THE CENTURY. WHO WERE THE PEOPLE BURIED IN THE GRAVES WITH STONE SETTINGS IN MEDIEVAL POLAND?**

Abstract author(s): Błaszczuk, Dariusz (Faculty of Archaeology, University of Warsaw)

Abstract format: Oral

About a hundred years ago, archaeologists became interested in and began to study specific cemeteries present in central and eastern Poland. They were characterized by a characteristic structure of graves with stone settings and very rich equipment, including made of silver ornaments, weapons, clay, wooden and bronze vessels as well as everyday objects. These cemeteries were established and used in the Middle Ages between the beginning of the 11th and the beginning of the 13th century. Their occurrence was limited mainly to two regions of Mazovia and Podlachia, and they were usually recorded near the strongholds.

The specific form of these cemeteries from the very beginning of research on them raised questions about the origins of the people who created and used them. Some researchers believed that these are the graves of the local Slavic people. However, among a large group of archaeologists, the view was also adopted that in these cemeteries were buried the newcomers from Scandinavia, who were settled in these places by the Piast rulers. In turn, another group of researchers proposed that in this type of cemeteries were buried people of Baltic origin.

As part of the Populus Masoviae Madii Aevi project, an attempt was made to answer the question of who were and where came from the people buried in medieval cemeteries with stone settings in Poland. It was decided to try to answer this question, on the one hand, by re-examining the funeral rite and funerary equipment, and on the other hand, by using the results of analyses of stable strontium and oxygen isotopes. The results of these studies and analyzes will be presented during the presentation.

8 **EMORPHPROJECT: EXAMINING MOBILITY DEGREE OF PALAEOOLITHIC REINDEER THROUGH AN OSTEOMETRIC ANALYSIS OF METAPODIAL BONES AND PHALANGES IN COMBINATION WITH ML ALGORITHMS**

Abstract author(s): Galán López, Ana Belén - Costamagno, Sandrine (TRACES - UMR 5608 CNRS) - Burke, Ariane (Université de Montréal)

Abstract format: Oral

Mobility patterns of reindeer will have affected the hunting strategies and the mobility of hunter-gatherer groups that depend upon them. The question of the season occupation of human territories and the seasonal behaviour of reindeer remains open. Due to the important role that reindeer (*Rangifer tarandus*) played for human populations in Western and Central Europe during much of the Palaeolithic period, many studies have focused on it particularly during the Magdalenian. However, and despite the numerous attempts to reconstruct the migratory behaviour of Palaeolithic reindeer, there has yet to be a definitive model that can explain their movement patterns.

Modern ethological data indicates that reindeer herds adopt different mobility strategies that correlate with habitat type and topography. Furthermore, it has been demonstrated that an animal's habitat and mobility patterns hypothetically affect bone density and limb bone morphometry as has been proven in several species.

Therefore, the main goal of our project is to quantify the link between mobility and morphology using metacarpals, metatarsals and phalanges (because they occur more often in our archaeological records) from modern caribou populations (migratory and sedentary settings) and to apply these results to twenty-three faunal assemblages from Upper Palaeolithic archaeological sites in South-western France to reconstruct reindeer mobility.

Thus, metapodial bones and phalanges from modern and archaeological samples have been studied taking linear measurements from them in combination with Machine Learning (ML) algorithms. As a result, ML analyses showed how it is possible to distinguish reindeer mobility patterns with more than 90% of accuracy depending on the skeletal part and bone type. These results will allow us to reconstruct how migratory patterns of Paleolithic reindeer affected human hunting strategies and the mobility of hunter-gatherer groups that depended upon them during Magdalenian period.

A. INVESTIGATING PALEOMOBILITY PATTERNS AT THE SITE OF AMBOINA, BONAIRE (DUTCH CARIBBEAN), THROUGH ISOTOPIC ANALYSIS

Abstract author(s): Seferidou, Eleni (Faculty of Archaeology, Leiden University, Netherlands.) - Laffoon, Jason (Faculty of Archaeology, Leiden University, Netherlands.)

Abstract format: Poster

Due to its geographical diversity, the Caribbean region promotes interaction between the different groups of people inhabiting its islands and the neighboring mainland. Each of these regions has specific resources that are either unavailable or less available at other locations, requiring the movement of goods and people across space. The heterogeneity of resource availability activates people to engage with each other and move through the islandscape, creating extensive communications networks, especially during pre-colonial times. This paper takes an isotopic approach to investigate patterns of paleomobility amongst the pre-colonial population from the site of Amboina in Bonaire, Dutch Caribbean. Samples of tooth enamel from eight individuals were analyzed for strontium isotope compositions. The results are evaluated based on existing strontium baseline, to determine whether the individuals were of local or nonlocal origin. A macro-regional database of bioavailable strontium isotopes is used to assess places of origin for the nonlocals to the island. In addition, associations between biological sex and age-at-death of the individuals will be attempted based on their place of origin. The burial practices encountered at the site were complex. This paper will explore possible associations between these practices and the origins of the individuals. Lastly, comparisons with other contemporary populations in the circum-Caribbean region will be presented, to establish commonalities in migration patterns and burial rituals.

508 PRESERVING THE “LIVING HERITAGE” OF ABANDONED LANDS. ARCHAEOLOGY AND SUSTAINABLE PRACTICES TO PROTECT AND CONSERVE UPLAND LANDSCAPES

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Panetta, Alessandro (University of Genoa) - Martín Civantos, José María (University of Granada) - Dalglish, Chris (INHERIT - Institute for Heritage & Sustainable Human Development) - Stagno, Anna (University of Genoa)

Format: Regular session

Europe's upland rural heritage is the complex result of an interaction of nature and culture over millennia. In these areas, both archaeological research and local communities can play an active role in the conservation and protection of landscape and rural heritage. However, current conservation measures and land-use decisions often fail to consider relevant aspects, such as the historical dimension of upland landscapes, perceiving and managing them as “natural” places, or the contribution of local practitioners in sustaining their environment.

This session aims to discuss and define a “living heritage” approach to landscape conservation, through the historical-archaeological reconstruction of local stakeholders' cultural values, expertise, and practices.

Archaeological research can highlight the process of marginalization that has affected upland areas and their heritage. The progressive abandonment of historic practices, such as agro-forestry-pastoral ones, is leading to the loss of the intangible heritage those practices represent and of their wider social and environmental benefits.

Moreover, archaeological analysis can help preservation policies such as, for example, historic building ones, that often seek to preserve the physical form of rural buildings without regard to their broader cultural values and historical uses. Yet every rural building was created through relationships of environmental resource management, production and trade. Reconstructing these networks can lead to better conservation, protection and use of these assets, through a better understanding of their character and function.

The session aims to explore other aspects of this issue and the possibility of:

- Identify stakeholders' cultural values and local expertise, useful in conservation practices.
- Define best practices of conservation measures, such as 'protection through use'
- Promote collaboration among local institutions and communities and realise effective participation in the conservation, protection and sustainable development and use of upland landscapes
- Suggest new tools to policy-makers, that will allow taking into account the historical dimension of rural places.

ABSTRACTS:

1 WHATEVER IT TAKES TO PRESERVE THE EUROPEAN RURAL HERITAGE. SUSTAINABLE PRACTICES TO PROTECT AND CONSERVE UPLAND LANDSCAPES AND MEMORIES

Abstract author(s): Panetta, Alessandro (University of Genoa) - Martín Civantos, José María (University of Granada) - Dalglish, Chris (INHERIT - York Archaeological Trust) - Domínguez, Pablo (CNRS - University of Toulouse Jean Jaurès) - Gerrard, Chris (Durham University) - Py-Saragaglia, Vanessa (CNRS - University of Toulouse Jean Jaurès) - Stagno, Anna Maria - Salvidio, Sebastiano (University of Genoa)

Abstract format: Oral

This contribution will give an overview of the project “IRIS - Inspiring Rural Heritage: Sustainable Practices to Protect & Conserve Upland Landscapes & Memories”, developed under the European “Joint Programming Initiative on Cultural Heritage and Global Change” (“Conservation, Protection and Use” call).

IRIS involves different researchers and stakeholders from Italy, UK, Spain, France and Montenegro, and is focused on conservation and enhancement of rural heritage, especially of upland areas. These areas need a new perspective to overcome the nature/culture divide which currently characterizes their study, management and conservation. Indeed, the dualistic policies of cultural heritage conservation and naturalistic area protection seem to fail when facing the fragile heritage of rural areas, denying, for example, the historical dimension of biodiversity process, or the relationship of historical settlements with environmental resources management. As historical land use practices have shaped landscapes and habitats through time, this historical characterisation can inform current management and conservation of rural areas. IRIS aims to highlight how the multifaceted concept of “living heritage” (intended such as the intangible heritage of practices, knowledge and representations, as a currently relevant cultural heritage in local communities, and as the biological component of historical landscapes) can be assumed at the basis of effective policies of protection.

Focusing on upland areas highlights the loss of social, economic and environmental benefits linked to the progressive abandonment of historical practices, and the need for a shift in decision-making, actively involving the whole network of local communities, stakeholders, researchers and policy-makers which act in rural areas.

2 THE CHEVIOT HILLS (UK) – HISTORIC LAND USE PRACTICES, CONSERVATION & SUSTAINABLE USE OF UPLAND LANDSCAPES FOR COMMUNITY BENEFIT

Abstract author(s): Dalglish, Chris (INHERIT - York Archaeological Trust) - Gerrard, Chris (Durham University) - Walker, Skye (York Archaeological Trust)

Abstract format: Oral

In this paper, we will present ongoing research into the upland landscapes of the Cheviot Hills (UK). This research is being undertaken as part of the project ‘Inspiring Rural Heritage: Sustainable Practices to Protect & Conserve Upland Landscapes & Memories’. The project has case studies in Italy, Spain, France, Montenegro and the UK. It began in late 2020 and will continue until 2023.

The Cheviot Hills lie on the border between England and Scotland, and partly within the Northumberland National Park. Through our research, we are exploring how land use practices have shaped these moorland, forest and farming landscapes over time.

We are also investigating how knowledge of land use history might inform conservation both of the historic environment and of nature. And we are exploring how this knowledge might inform the development and use of these landscapes, for the benefit of local people. Conservation and development issues include: the economics of farming; depopulation; the loss of traditional skills; climate change impacts on land use and habitats, and; predicted increases in tourism, recreation and forestry.

In the paper, we will introduce the Cheviot Hills, their landscapes and land use histories. We will discuss the methods we are using in the research and the emerging results. The methods include:

- a) historic land use analysis (with a range of archaeological, landscape and historical data, and GIS);
- b) participatory mapping and interviews, to explore the cultural values and knowledge of local residents and organisations;
- c) stakeholder engagement, to identify risks to the historic environment, to the sustainability of local communities and to the continuation of their ‘living heritage’, and to develop proposed policies and actions to address these risks;
- d) narrative development, working with local people and stakeholders to communicate the values of land use heritage.

3 LEARNING FROM THE PAST: HISTORICAL WATER MANAGEMENT AND AGRARIAN PRACTICES IN NORTHERN SIERRA NEVADA MOUNTAIN (GRANADA, SPAIN)

Abstract author(s): Martín Civantos, José María - Abellan Santisteban, José - Ramos Rodríguez, Blas - Roman Punzon, Julio (Universidad de Granada)

Abstract format: Oral

Water has been a connecting element between man and his environment. As an indispensable resource, its management has marked the settlement in areas with water scarcity. The Sierra Nevada is one of these areas in which water management is an example of adaptation to the environment. Numerous irrigation systems from medieval times are identified on its slopes. Irrigation is still managed today by rural communities, ensuring a constant source of water for agriculture and pastures and maintaining a living

and sustainable rural legacy. A historical legacy that is maintained in response to the intensive industrial exploitation of natural resources. This paper focuses on the Northern slope of Sierra Nevada because of its archaeological and historical legacy. The village of Jerez del Marquesado has five irrigated zones from medieval times with their own irrigation channels and water distribution rights. The maintenance of these systems depends on cooperation between local farmers, being an example of a sustainable and Nature-based Solution to preserve the living heritage of rural zones. A historical, sustainable and resilient system that has been maintained to the present.

4 **RURAL HERITAGE AND LANDSCAPES OF SIERRA NEVADA: HISTORICAL IRRIGATION SYSTEMS AND PASTORAL LANDSCAPES FROM AN ARCHAEOLOGICAL PERSPECTIVE (18TH-21ST C.)**

Abstract author(s): Sánchez García, Agustín - Stagno, Anna Maria (Università di Genova) - Martín Civantos, José María (Universidad de Granada)

Abstract format: Oral

In this paper, we aim to address some aspects related to historical practices of environmental resource management in the Sierra Nevada (Granada-Almería, Spain), today Parque Natural/Nacional. The focus of the investigation is the changes in the environmental resources management practices documented from the 18th century to the present day.

The research is being carried out, thanks to a collaboration between LASA (University of Genova) and MEMOLab (University of Granada), through archival research, historical photography analysis, as well as landscape archaeological investigations. The focus on the last three centuries will make it possible to link the reconstruction of the changes in the environmental resources management with the changes in the access rights to lands, to understand the role of those changes in the process of abandonment of the territory and social and political marginalisation of these areas and of their local societies.

The topographical and microanalytical approach adopted will allow to cross at the topographical level different sources and to fill the gap in the knowledge about these processes, focussing on irrigation systems and pastoral areas.

The final aim is to discuss the methodological aspects of the interdisciplinary investigation and to discuss in which way the archaeological and historical perspective could also contribute to a deep reflection around the meaning of the mountain heritage, the intersection between natural values, the current risks and threats.

As well known, the Sierra Nevada irrigation system is of Islamic origin and still used for agricultural and livestock purposes. We will reflect on historical practices and benefits associated with, as well as on the possibilities open by their historical investigation to address the risk of abandonment of some of these practices, with negative consequences for the whole systems in terms of desertification level, which risks to be increased also by the climate change.

5 **HOW LESSONS FROM HISTORICAL ECOLOGY CAN CONTRIBUTE TO UPLAND MANAGEMENT AND CONSERVATION**

Abstract author(s): Costello, Eugene (University College Cork; Stockholm University)

Abstract format: Oral

This paper asks how lessons and data from the past can contribute to sustainable habitat conservation in Europe's uplands, particularly in areas protected under Natura 2000 legislation. It is based partly on an article I published in 2020 in Landscape Research, and partly on research and stakeholder engagement undertaken since.

The paper focuses on a mountainous peninsula in Kerry, Ireland. It begins by highlighting the difficulties that conservation of upland bog, heath and grassland habitats is facing due to rural depopulation and over-grazing. It then uses landscape history and archaeology to assess the long-term feasibility of conserving or restoring these habitats under current EU and National Park policy. Pointing to the surprisingly recent disappearance of woodland due to grazing, charcoal production and logging, I show that pre-1950s land use was not as 'traditional' or static as conservation discourse holds it to be. Historical management of uplands by farmers could vary greatly over space and time depending on socio-political factors and economic trends.

This historical ecology of change is crucial to understanding the relative failure of habitat conservation in many parts of Ireland and other parts of the EU today. I outline how 'lessons from the past' can help to make upland management more realistic, if all stakeholders accept that society and landscape have been constantly co-evolving. The paper finishes by providing concrete examples of how archaeologists and historians might act on what they have discovered about past land management. I suggest that engagement with local land-use partnerships and ecologists is a crucial first step, before ever we attempt to influence legislation at a national or supra-national level.

6 **RECOGNISING CONTEMPORARY USER VALUES AND SIGNIFICANCE IN THE CONSERVATION OF UPLAND PEATLANDS**

Abstract author(s): Jennings, Benjamin - Flint, Abbi (University of Bradford)

Abstract format: Oral

Upland landscapes of the UK include large areas of peatland. While not 'abandoned' landscapes, these are almost 'shunned' environments depicted on maps as open spaces, with a perception of being dangerous and inhospitable. In reality, upland peatlands are palimpsest landscapes of use and occupation. In the present day this often focusses on conservation and preservation of the natural

landscape for biodiversity and global climate benefits, and recreational use. Less prevalent in the conservation agenda are considerations of cultural heritage, both tangible archaeological remains and past, contemporary and emerging intangible cultural heritage.

Through literature review (Flint and Jennings, 2020), analysis of online User Generated Reviews (Flint and Jennings, In Prep), surveys and targeted interviews with people who use Ilkley Moor, an upland moorland in West Yorkshire, UK, the 'Wetland Futures in Contested Environments' project explored aspects of heritage which are identified and valued by members of the public. Ilkley moor is a mixed landscape combining prehistoric and historic use for agriculture and quarrying, with more recent use as common land, wellbeing and leisure environment. We explore the role cultural heritage plays in shaping how people perceive, value and use the landscape, and the impact various forms of land use may have on this heritage. This research offers insights for landscape managers, and contributes to alternative interpretations of peatland heritage.

There is a tendency to observe landscapes as static features, enduring and unchanging. The emerging and continuing living heritage of peatlands must be recognised in narratives of the landscape rather than allowing heritage interpretation to fall into static and backward looking perceptions.

- Flint & Jennings (2020) 'Saturated with meaning: peatlands, heritage and folklore', Time and Mind, <https://doi.org/10.1080/1751696X.2020.1815293>
- Flint & Jennings (In Prep) 'The role of cultural heritage in visitor narratives of peatlands: analysis of user-generated reviews from three peatland sites in England'.

7 **LIFE OF AN IMPRESSIVE LANDSCAPE: FROM MUNICIPIUM TO TOURISTIC ATTRACTION**

Abstract author(s): Hoxha, Zana (Institute of Albanology) - Rama, Zana (Archaeological Institute of Kosovo) - Luci, Kemajl (Museum of Kosovo)

Abstract format: Oral

This paper documents the phases of life of the city of Ulpiana from the roman period until today. As an urban centre Ulpiana was founded by the emperor Marcus Ulpius Traianus (98-117) and named after him. Due to economical changes because of wars and illnesses the boundaries of the city changed several times. It was until the 7th century when the last traces of the population were found. As a powerful city it was mentioned by several ancient writers it remained a trace in time. It remained as a beautiful rural landscape, of the town of Gracanica for many centuries, until in 1926 it was identified as an archaeological site. The land was used for agriculture purposes for centuries and it is still used. Parallel to this function, it is a subject of research of local and international archaeologist. As several structures are unearthed, this rural landscape is being transformed into one of the main tourist attractions in Kosovo. Although an archaeological park, the rural landscape surrounding the site is still being utilised by the local community as agriculture land. As you visit the site, you can enjoy the structures but also the countryside feeling. This multiuse of this impressive landscape and the cohabitation of the local community with the archaeological works is worth documenting. Thus, the objective of this paper is to present the transformations of this landscape and the economical and social effects of this transformation in the life of the local community.

509 **HORSEMAN-HORSE COUPLE THROUGH TIME AND SPACE. PART 1**

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Binde, Marion (Université de Bordeaux; UMR 5199 PACEA) - Bede, Ilona (Université Paris 1 Panthéon-Sorbonne; UMR 8167 Orient et Méditerranée - Monde byzantin) - Csiky, Gergely (Archaeological Institute of the Research Center for Humanities, Budapest)

Format: Regular session

Horse riding greatly impacted past societies by increasing mobility and revolutionizing warfare. Horses were also frequently used for sports and hunting. These various practices implied close interactions between riders and their mounts, considered as precious companions. This couple is also strongly linked to wealth and power, therefore social representations. This relationship contributed to raising a figure of the horseman, between myth and reality, often in a positive/negative duality.

A variety of sources provide precious evidence including human and equids bones, harness, archaeological contexts, written sources and pictorial depictions, nowadays ethnographical observations and method of ethology on this special couple across time and space. Their analysis can provide information on equestrian practices, physical interactions and performances of the rider with his mount and methods of training and grooming of these animals. It can also give us an idea of cultural perceptions of horsemen on their horses, of the society on the horsemen.

This session aims to explore the strong horseman-horse relationship by highlighting the multidisciplinary and interdisciplinary approaches. We hope to illustrate the need to share knowledge from different disciplines for a better understanding of this strong link. We expect papers focusing on - or even crossing - different realms as archaeological context analysis, studies on human and equid bones, equestrian material, iconography, social and cultural anthropology, etc. which can document this topic. Works interested in European as well as non-European contexts and on diverse periods are welcome.

ABSTRACTS:

1 OSTEOBIOGRAPHY OF A 19TH CENTURY BELGIAN INFANTRY CAPTAIN AND ITS CONTRIBUTION TO THE KNOWLEDGE OF SKELETAL MARKERS OF HORSE RIDING

Abstract author(s): Polet, Caroline (Royal Belgian Institute of Natural Sciences) - Villotte, Sébastien (PACEA, Université de Bordeaux)

Abstract format: Oral

Within the framework of the constitution of an identified collection of human skeletons, the royal Belgian Institute of the Natural Sciences exhumed in Châtelet (Province of Hainaut) the remains of an infantry captain died in 1883 at the age of 48. Historical data and his military file give evidence that he was riding a horse since at least 1859 (year in which he turned 24 years).

His skeleton presents the sequelae of diverse pathologies and joint alterations which could result from the equestrian practice. Some of these pathologies have an acute traumatic origin as the right acromio-clavicular dislocation, the fractures of four ribs, four transverse processes of lumbar vertebrae and the antero-inferior margin of the body of T12 and L5. They could result from fall(s) off a horse. Other pathologies are rather in connection with the daily practice of horse riding (repeated micro-traumas). These lesions consist of a myositis ossificans of the adductor muscles on both femurs and enthesopathies on the femur and the coxal bone. Degenerative osteoarthritis can be observed on the vertebral column (especially between C7 and T1). The joint alterations found on this skeleton are iliac impressions (extension of the articular cartilage in the direction of the femoral neck) and an ovalization of the acetabulum.

Given that the studied individual died young (before 50 years), his enthesopathies are likely in part the consequence of microtraumas, rather than only from degenerative processes linked to ageing. It is thus an ideal candidate to study the markers of horse-riding practice. This study also confirms the contribution of the collections of identified skeletons in reconstruction of the activities of past populations.

2 THE RIDER SIZE – HORSE SIZE RELATIONSHIP THROUGH TIME AND SPACE

Abstract author(s): Niskanen, Markku (University of Oulu)

Abstract format: Oral

Absolute and relative sizes of horses and riders affect riding performance. A rider can be too heavy for a horse, but a horse can also be too big for a rider (e.g. legs too short to reach well enough around a horse's sides). This study examines the rider size – horse size relationship in past and present in light of osteoarchaeological, historical and ethnographical data. Heights and weights of past people and horses are estimated from skeletal dimensions, but known body sizes are used in more recent cases (e.g. cavalry troopers and horses, competitive riders and their sport horses). Conformation (e.g. metapodial proportions) affects horses' ability to carry weight and is taken into account. Results demonstrate temporal and geographic variation in absolute and relative sizes of humans and horses likely reflecting in horses' usability for riding as well as the overall riding performance. For example, early domestic horses were generally big enough for adult male riders; horses from the sites of the La Tène culture of Central Europe were generally too small for adult male riders for "proper" riding being much smaller than earlier and later domestic horses from Central Europe, but some horses from the same sites were bigger than many contemporary steppe horses. It is acknowledged that it is not always known if archaeological horses (e.g. the early domestic horses) were used for riding.

3 BECOMING EQUESTRIAN: PEOPLE AND HORSES IN BRONZE AGE HUNGARY

Abstract author(s): Kanne, Katherine (Northwestern University)

Abstract format: Oral

The Bronze Age was a transformative period in European prehistory and human-horse relationships. The changing relationships between people and horses correspond to the origins of complex tell societies of Middle Bronze Age of Hungary (2000/1900–1500/1450 BC). For this paper, I present the results of my research of the human-horse relationships in this period, where I used an integrated methodology combining zooarchaeology, bioarchaeology, stable isotope analysis, bit study, and GIS mapping to analyze data from five tell settlements and ten cemeteries I compared to existing assemblages.

I illustrate that when the tell societies were formed, horses and the first bridle bits were widely distributed and horses gained a cultural significance different from other livestock. Mortality profiles and strontium isotopes show that horse breeding was generally localized to the tell communities, but people were importing in a few horses from other regions. Wither's heights, bit-wear, and post-cranial pathologies suggest that horses were likely ridden, which is further supported by the evidence for riding from human remains. Riding was probable, relatively widespread, and not restricted by class or sex. Though equestrianism is often linked to wealth and power, horses and riding were not obviously aligned with elites at this time. Horses were probably ridden by regular women and men to herd livestock, travel, and trade.

In contrast to earlier expectations which assumed chariot driving warrior aristocracies ruling the tells and controlling the bronze trade, I argue horses gave people individual power and autonomy which enabled them to variously resist the development of centralized authority and hierarchical social differentiation previously thought to characterize this period, a sentiment supported by a growing body of research of the Hungarian Bronze Age.

4 HORSES IN THE EARLY AND MIDDLE BRONZE AGE IN CENTRAL EUROPE

Abstract author(s): Wittmann, Sarah-Julie (Albert-Ludwigs-Universität Freiburg; LWL-Museum für Archäologie Herne)

Abstract format: Oral

The complex relationship between horses and humans is unique and fascinating even today and had a great impact on past societies. But when and how did it start? Horse domestication had been practiced in Central Europe in the early Bronze age at the latest. However, the earliest evidence is particularly scanty. Only the application of a holistic approach towards the integration of various disparate sources and methods permits to unveil a fuller picture of early domesticated horses in Bronze Age societies.

This paper introduces diverse strands of archaeological evidence concerning early domestic horses between the Carpathian Basin and the river Rhine, the Po Valley and Southern Scandinavia: Zooarchaeological remains, artifacts (such as bridle-equipment) and imagery (for example on rock art or bronze figurines).

On the basis of this data, the different forms of husbandry and exploitation of early domesticated horses as well as their role in Bronze Age imagination will be discussed. Can we tell how equids were kept and bred? What do we know about their part in Bronze Age nutrition? To when can we trace the first evidence of riding and were horses used as draught animals? Did early domesticated horses really have such a crucial impact on Bronze Age conflicts? Finally, the emphasis is put on the role of horses in Bronze Age societies and imagination, and on the relationship between equids and humans. In this process, widespread narratives in Bronze Age archaeology ("warrior horsemen", "warrior aristocracy") are challenged under close examination of the archaeological material. Moreover, the long history of research is being taken into consideration to grasp the present-day understanding of Bronze Age horses.

5 THE EARLIEST SPUR IN EUROPE? ABOUT HORSES AND MEN IN THE LATE HALLSTATT NECROPOLIS FROM VALEA STÂNII (ROMANIA)

Abstract author(s): Mandescu, Dragos (Arges County Museum)

Abstract format: Oral

The paper focuses on the graves of mounted warriors in the archeological group Ferigile (south of the Carpathians, the 7th-5th centuries BC) and offers a detailed look at this kind of spectacular tombs from the necropolis at Valea Stâinii (Argeş County). I will try to follow first of all quantitatively the spread of the tombs of horsemen in the whole Ferigile group and the way of funeral expression of the presence of the horse in the grave of the rider warrior (usually a symbolic presence). Then I will insist on the situation illustrated by the incineration necropolis from Valea Stâinii. They are presented the clues that allow the attribution of some of the graves to the elite group of mounted warriors: not only the horse-harness parts deposited as a grave goods, along with weapons, but also some pits with ashes and animal cremated bones placed at the fringes of graves. The result of archaeozoological analysis confirmed the presence of horse bones (among other animals). This could be an indication of the slaughter of the horse, along with other animals, at the funeral banquet (perhaps to be eaten?), and could indicate eventually a much closer connection between man and animal. The analysis of the horse-harness elements attests to large-scale supraregional contacts, at the interference between the Thracian, Scythian and Illyrian cultural milieux. A very recent discovery at Valea Stâinii (2020 archaeological season), made in the last explored funeral feature (the barrow no. 22, radiocarbon dated to 8th-6th centuries BC), seems to reveal one of the earliest spurs, if not the earliest, from Europe. A comparative discussion upon the earliest known spur specimens from the Iron Age Illyrian, Celtic and Thracian worlds brings arguments in this regard.

6 THE HUMAN-HORSE INTERACTION IN THE PREHISTORY OF ROMANIA

Abstract author(s): Balasescu, Adrian (Institute of Archaeology, Romanian Academy)

Abstract format: Oral

The horse became a constant presence in the archaeozoological studies in Romania since the Chalcolithic period (approximately 4500-3900 BC). The increased number of horse bone remains from various sites during this period (over 5%) led some romanians authors to consider that this species had already begun to be domesticated, but this fact has not been confirmed. It is considered that the first domestic horses in Romania come from the Bronze Age (after 3000 BC). The skeletal remains of this species have been discovered in various domestic contexts, which attest to horse consumption (hypophagy). However, in some archaeological contexts, ritual deposits of horses have been discovered, which illustrate the special relationship that existed between these animals and humans. Ritual deposits of complete horses were discovered in various prehistoric settlements (Negrileşti, Ripiceni) from the Noua culture (1800-1100 BC). A review of the archaeological contexts, the archaeozoological, taphonomic and biometric study of these horses from Noua culture will be made in this presentation.

This work was supported by a research grant developed with the financial support of the Recurring Donors Fund at the disposal of the Romanian Academy and managed by the "PATRIMONIUM" Foundation GAR-UM-2019-II-2.1-1 (project no. GAR-UM-2019-II-2.1-1/15.10.2019).

- 7 **VICTORIOUS HORSES, HORSEMEN AND CHARIOTEERS IN ANCIENT GREEK GAMES**
Abstract author(s): Liveri, Angeliki (Greek Ministry of Education and Religious Affairs)
Abstract format: Oral
This paper presents images of horses, horsemen, chariots and charioteers who were victorious in ancient Greek Games, Panhellenic or local. Horses and related competitions were very popular in Ancient Greece. Owning a horse was a status symbol. Motifs of equestrian or chariot races contests and their winners are represented in various artistic works (e.g. sculpture, vase-paintings, jewelry and coins). Victory processions of winning horses or chariots are particularly interesting. Such works (monumental or in small dimensions) were dedicated to sanctuaries. Tyrants and kings were frequently represented in the obverse or reverse of their coins as horsemen or winner in chariot race. Horses and chariot races are linked with deities or heroes. This paper aims to categorize the representations according to the competition and the celebration's phase of the prizes' awarding. Therefore, it would be possible, combining archaeological evidence and written sources, to reconstruct the customs related to the victory celebrations (proclamation and prizes awarding), the relationship between horses and horsemen or charioteers and the winner's status.
- 8 **“A HORSE IS WORTH MORE THAN RICHES” – EXPLORING HUMAN AND EQUINE RELATIONSHIPS IN MIDDLE TO LATE IRON AGE BRITAIN**
Abstract author(s): Barker, Jane (The University of Manchester)
Abstract format: Oral
“A horse is worth more than riches” is an old Spanish proverb, and this simple phrase encapsulates the complex relationship between humans and horses, which is far more than economic value. The occurrence of equine remains, and elaborately decorated horse gear and chariot components, is widespread in archaeological contexts from Middle to Late Iron Age Britain (circa 500 BCE to 100 AD). It appears, therefore, that ponies were important to Iron Age people. Previous equine related research has focused mainly on typological approaches to horse gear, researching different component parts, such as bridle-bits or terrets, or on art and decoration, whilst research into faunal remains has relegated the pony to either economic or symbolic meaning purely for the benefit of humans. Recent zooarchaeological advances in the study of skeletal morphology have illuminated some fascinating changes connected to the different effects of harnessing, chariotry and equitation on equine remains. My research takes a novel and holistic approach to the human and equine relationship, combining these advances in zooarchaeology, with equine ethology, material culture studies, osteoarchaeology, iconography and classical and ancient texts. This paper will explore some of these themes through a specific case study. The overarching aim is to gain a more nuanced understanding of the complexities of the relationship between people and ponies during the Middle to Late Iron Age period of British prehistory.
- 9 **THE MEANING OF FUNERARY HORSE RACES IN POMERANIAN CULTURE**
Abstract author(s): Wojtecki, Jakub (Nicolaus Copernicus University in Toruń)
Abstract format: Oral
The archaeological iconographic evidence, supported by an awareness of similar customs in a wide variety of Indo-European cultures, suggests that funerary horse races were indeed performed by inhabitants of the Baltic sea's south coast region in the early Iron Age. The aim of my presentation is an attempt to clarify of the meaning of those rituals and of the horse itself for the society forming what is largely referred to as the Pomeranian Culture, in the context of the people's religious and mythological systems. The need for a proper funeral, as a condition for living in the afterworld, indicates the significance of its elements. According to van Gennep's theory of the rites of passage, funerary equestrian races, often connected with a competition for the deceased's property, were performed in the middle phase of the ritual, when both the dead and the mourners stood between the world of the living and those inhabiting the afterworld. In the Indo-European cosmology, the horse was an animal which appeared to be able to cross the borders between the worlds of humans and gods. It can be observed in the mythology, as well as in the archaeological iconography or the written sources describing pagan religions. It may further suggest that the horsemen taking part in the above-mentioned rituals, precisely owing to their steeds, entered the outworld inhibited by sacral powers. As I will attempt to demonstrate, using horses for such important rituals that shows their „supernatural” abilities, the animal's significance and value in culture.
- 10 **HORSEMAN AND HORSE IN LITHUANIA DURING THE 2ND–14TH C. AD: SIZE, AGE AND ORIGIN OF THE HORSES**
Abstract author(s): Piliciauskiene, Giedre - Kurila, Lurynas - Simčėnka, Edvardas - Zagurskytė, Aurelija (Vilnius University, Department of Archaeology) - Lidén, Kerstin (Stockholm University, Department of Archaeology and Classical Studies)
Abstract format: Oral
In Lithuania, the first graves of horsemen buried together with the horse appeared in the Early Roman Period. Through the ages, riders and horses were buried in many ways, e.g. warrior together with the whole horse or only with the head and legs of a horse, etc. During the Viking period, horse burials in barrows and huge horse cemeteries with up to 300 horse graves appeared as well. Close relationship between rider and horse can be observed up to the early 15th c. – horses were still buried in the same cemeteries with humans until the Christianization of Lithuania in the late 14th c. Moreover, historical sources report that in the 14th c. Grand Dukes of Lithuania were cremated together with dozens of horses and also dogs and birds of prey.

In our presentation, we will demonstrate dynamics of horseman-horse relationship during the millennium and we will try to answer the questions – when, how and why did the size and age of the buried horses change. The first results of 87Sr/86Sr and 180/160 stable isotopes analysis of horses and riders from wealthy elite graves dated to the Migration Period will be presented as well. The analysis provided us new data about the migration processes in Europe during the 4th –6th c. and answered the question about the origin of exceptionally large horses of the Migration Period in the territory of the present day Lithuania.

- 11 **HORSE BURIALS FROM RÓWNINA DOLNA, SITE III, NORTH-EASTERN POLAND**
Abstract author(s): Szubska, Magdalena - Wysocki, Jacek (Cardinal Stefan Wyszyński University in Warsaw)
Abstract format: Oral
The cemetery of the West Baltic cultural circle in Równina Dolna, site III, is exceptionally valuable due to a high number of cremated human burials (over 300) and skeletal horse burials (over 70) from the Roman period and the Migration Period. Horse burials included riding equipment. The finds excavated from the horse pits included, among others, snaffle bits (over 60), bridle buckles, large iron buckles, leather strap ferrules, nosebands and iron scissors. Moreover, in two horse graves parade bridles and a highly rare find of a curb bit were found. The cemetery in Równina Dolna is located in the borderland between the Bogaczewo culture, the Dollkeim-Kovrovo culture and the Olsztyn Group. This allowed us to identify all these influences on the culture of peoples in this area. The long time horizon (from I BC to V AD) and the large number of burials give us the opportunity to learn more about the tangible and spiritual culture (rituals and beliefs of this group of people and the role horses played in its rituals).
- 12 **THE MEROVINGIAN RIDER AND HIS HORSE : IMPACT OF EQUESTRIAN EQUIPMENT ON THE RIDER'S POSTURE AND SKELETON**
Abstract author(s): Baillif-Ducros, Christèle (INRAP - National Institute for Preventive Archaeological Research)
Abstract format: Oral
The Merovingian period offers an ideal archaeological context to address the question of equestrian practice by populations of the past. Within the funeral complexes, the archaeological and archaeozoological data testify to the presence of mounted equine subjects but also those of their riders. There are distinguished from the population buried mainly by the single wearing of a spur on their left heel and sometimes by the presence of parts dedicated to the equestrian equipment of the horse such as the bit, the stirrup and / or the saddle. This one is the link between the rider and his mount. The rider interacts directly with the animal through his equipment (the spur) and that of his equine partner (the saddle and the stirrup (s)). This interaction results in a visible lesional impact on the rider's skeleton called "Horseback-riding syndrome". The results of a doctoral research carried out on the methodological revision of the "syndrome", from osteological collections of the northeastern Gaul dated from the 6th-7th centuries, made it possible to emphasize the influence of the equestrian furniture used on the rider's posture. This interdisciplinary study (horse archaeology, biological anthropology and equestrian sport medicine data) on the rider's posture is a new methodological key for a good understanding and better identification of "Equestrian stress markers" on the skeleton. From statistical analyzes, three criteria could be validated to distinguish rider individuals within Merovingian necropolises : presence of the Poirier's facet at the femoral head-neck junction, ovalization of the acetabulum and joint changes of the hip during a repeated sitting position on the saddle; presence of osteoarthritis on the upper outline of patellar surface in case of use of stirrups.
- 13 **MOUNTED OR NOT MOUNTED? IDENTIFICATION OF RIDING BY USING ENTHESEAL CHANGES IN HORSES ASSOCIATED WITH THE BURIAL OF CHILDERIC I**
Abstract author(s): Binde, Marion - Cochard, David - Knüsel, Christopher J. (UMR 5199 PACEA, "De la Préhistoire à l'Actuel: Culture, Environnement et Anthropologie", Université de Bordeaux)
Abstract format: Oral
Childeric I, father of Clovis and first king of the Franks, was buried in 481-482 in the present Saint-Brice district of Tournai (Belgium). Between 1983 and 1986, excavations of a Merovingian necropolis there, directed by Raymond Brulet, revealed three pits containing a total of 20-21 horses. The context of the discovery, their position on the periphery of a large tumulus containing resplendent grave inclusions and the 14C dating suggest that these valuable animals were selected from Childeric's cavalry, sacrificed, and deposited as part of the obsequies to mark the death of this Merovingian paramount. But were they really used as mounts? Zooarchaeologists currently have few reliable equine bone markers to identify riding activity. To determine if these horses were used as saddle animals, this presentation aims to fill this gap in knowledge by providing a new approach based on enthesal changes. They correspond to bone modifications of the interface where tendons and ligaments meet bone (i.e. entheses), and they are widely used in biological anthropology for reconstructing socio-economic activities, division of labor and the health status of past human groups. However, altered tendinous or ligamentous attachments are not as much employed in studies of faunal remains, even if interest in them has been increasing over the past decade. Twenty-three entheses of the appendicular skeleton were macroscopically recorded on the horses to permit comparison with 53 modern unworked and worked (mounts, draft equids) specimens. Results show that prevalence of altered attachments in these horses is clearly distinct from those of draught equids and closest to those of recent saddle specimens. Combined with archaeo-

logical data and palaeopathological investigation, the analysis of enthesal modifications demonstrates that the horses deposited around the tumulus were probably used as mounts and confirms a hypothesis first proposed by archaeologists.

510 HORSEMAN-HORSE COUPLE THROUGH TIME AND SPACE. PART 2

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Binde, Marion (Université de Bordeaux; UMR 5199 PACEA) - Bede, Ilona (Université Paris 1 Panthéon-Sorbonne; UMR 8167 Orient et Méditerranée - Monde byzantin) - Csiky, Gergely (Archaeological Institute of the Research Center for Humanities, Budapest)

Format: Regular session

Horse riding greatly impacted past societies by increasing mobility and revolutionizing warfare. Horses were also frequently used for sports and hunting. These various practices implied close interactions between riders and their mounts, considered as precious companions. This couple is also strongly linked to wealth and power, therefore social representations. This relationship contributed to raising a figure of the horseman, between myth and reality, often in a positive/negative duality.

A variety of sources provide precious evidence including human and equids bones, harness, archaeological contexts, written sources and pictorial depictions, nowadays ethnographical observations and method of ethology on this special couple across time and space. Their analysis can provide information on equestrian practices, physical interactions and performances of the rider with his mount and methods of training and grooming of these animals. It can also give us an idea of cultural perceptions of horsemen on their horses, of the society on the horsemen.

This session aims to explore the strong horseman-horse relationship by highlighting the multidisciplinary and interdisciplinary approaches. We hope to illustrate the need to share knowledge from different disciplines for a better understanding of this strong link. We expect papers focusing on - or even crossing - different realms as archaeological context analysis, studies on human and equid bones, equestrian material, iconography, social and cultural anthropology, etc. which can document this topic. Works interested in European as well as non-European contexts and on diverse periods are welcome.

ABSTRACTS:

1 BUCKLE UP! A COMPARISON OF LOCAL DECORATION STYLES ON PAZYRYK RIDING GEAR REGARDING SUPRA-REGIONAL EXCHANGE DURING THE 3RD CENTURY BC

Abstract author(s): Stümpel, Anna-Elisa (University of Groningen)

Abstract format: Oral

It is widely acknowledged that the horse had a key-role in the nomadic life-style of the Scythians situated in the Central Asian and Eurasian steppes. As the archaeological record shows, being able to control the horse through bridle, saddle and hobbles was an important element in Scythian culture, and a vast variety of different kinds of bridle styles indicate that their design was continuously optimised.

Particularly the riding gear of the archaeological group of the Pazyryk Scythians is characterized by various types with a local choice of (animal) motifs and designs for the ornaments on it. Some horses were equipped with ostentatious headdresses as well that were similarly decorated as the other equipment. An example of local differences in the ornamental design of the riding gear and horse headdresses can be found at the necropolis situated in Pazyryk Valley. There, four of the five elite burials are alike while the ornamental style found in Pazyryk-1 is similar to the contemporaneous kurgan Berel'11.

In this paper, the design of bridle, saddle and headdress ornaments found in the elite burials of Pazyryk-1, Berel'11 and Ak-Alakha-3 kurgan 1 burial 2 is examined via a comparative approach. Based on the premise of intensive human-horse-relations, it is argued that the animal motifs shown on the riding gear and horse headdresses found in these burials are linked to a territorial organisation. They were chosen individually for each clan and functioned thus as their "coat of arms", which were displayed especially via the headdresses. By additionally considering the different designs of the ornaments on the riding gear and headdresses and their spatial distribution, it might be possible to gain further insight into the Pazyryk Scythian (cultural) relations and exchange at a later phase of their culture in the 3rd century BC.

2 THE INTERPLAY OF MATERIAL, SHAPE AND FUNCTION IN THE SPREAD OF STIRRUPS IN LATE ANTIQUE EURASIA

Abstract author(s): Csiky, Gergely (Archaeological Institute of the Research Center for Humanities)

Abstract format: Oral

Stirrups considerably influenced horse riding and cavalry warfare during Eurasian Late Antiquity. They not only transformed the way of mounting but also provided greater stability during the ride which facilitated various movements, including mounted archery and the change of weapons on the saddle. In spite of the notion of the second cavalry revolution, this change did not happen at once. The present paper aims to present the long and multi-stage process of the spread of stirrups.

The material, shape, function and geographical distribution of the early stirrups significantly changed from the 4th to 7th century in Eurasia. The first wooden stirrups with metal frame were buried in elite burials in North China and Korea dated to the 4th-5th centuries. Two types of suspension are distinguished: a single stirrup on the left side or pairwise suggesting different functionality. The first to mount the horse and the second to support the rider's feet. Their geographical distribution overlaps the nomadic - sedentary borderland in an era when dynasties of nomadic origin ruled Northern China.

Iron stirrups became dominant only by the end of the 5th and early 6th century. Their shape changed considerably: stirrups with eyelet-shaped loops and flat stirrups with elongated loops are equally known, the foot of both of these types are narrow and T-shaped in their cross-section. The spread of such artefacts shifted towards the steppes, most of such stirrups occurred in Inner Asia.

The next step in the evolution of stirrups was the broadening of the feet providing better support for the rider. The earliest Avar stirrups represent this final stage of this process which means that they appeared in Europe in a developed form.

3 DID CHIEFS WHO BURIED IN A KOFUN BURIAL MOUND ACTUALLY RIDE HORSES?

Abstract author(s): Hashimoto, Hiroko (The Congenital Anomaly Research Center, Kyoto University) - Shimizu, Daisuke (Chubu Gakuin University)

Abstract format: Oral

As Japan is an islands country, cultures, domestic animals and cultivated plants which were introduced from the Eurasian Continent have always given a great impact to Japanese culture. Japanese horses also originated Mongolian Plateau. Horses were brought to Japan in the fifth century through Korean Peninsula by immigrants during the Kofun Period (third to seventh century). Afterwards horses were bred in Japan, as several pasture remains, and many horse tacks were found mainly inside of Kofun burial mounds. Moreover, number of horse shaped Haniwa clay dolls were ritual artifacts and were arranged around a Kofun burial mound. During Kofun Period, horses were symbols of authority. Central government granted horses to local clans exchanging with fidelity. Naturally, horses were symbol of authority for chiefs of local clans, as well. Some individuals who were buried in a Kofun burial mound had femurs with extraordinary developed linea aspera. The linea aspera is a major insertion of adductor muscles of the thigh. Development of osteo parts usually lead by muscle development of where the muscles originated or inserted. Therefore, several morphologists pointed this character was likely to relate with horse-riding. The purpose of this study was to evaluate which muscles were mainly used during horse-riding with Kofun style harness. Subjects for experimentation were six people who had a good horse-riding experience at least 45 years' career. The subjects rode a horse with Kofun style horse tacks for two hours. After horse-riding the subjects have been palpated their thigh, and interviewed. All of the subjects always felt muscle pain only on the adductors. They said they needed to hold tighter horse body between their knees when they used Kofun style harness than present harness. Extraordinary developed linea aspera of femur was not common for individuals who buried in a Kofun burial mound. Although the chiefs mounted horses to display the authority, most of them were not riders.

4 LIFE ON HORSEBACK? A STUDY OF THE "HORSE RIDING SYNDROME" IN AN AVAR POPULATION OF THE 7TH-8TH CENTURY

Abstract author(s): Bühler, Birgit (Vienna Institute for Archaeological Science - VIAS, University of Vienna; Department of Evolutionary Anthropology, University of Vienna) - Kirchengast, Sylvia (Department of Evolutionary Anthropology, University of Vienna)

Abstract format: Oral

The "horse riding syndrome" comprises a number of changes on the human skeleton which, if found in association, could indicate that the individual in question practiced horse riding as a habitual activity during his or her lifetime. In the bioarchaeological literature, "Poiriers' Facet" (Reiterfacette) has been referred to as one characteristic trait of the "horse riding syndrome". Therefore, in archaeological contexts, individuals where "Poiriers' Facet" (Reiterfacette) is present on one or both femurs could be expected to exhibit a higher prevalence of other characteristics of the "horse riding syndrome". Firstly, the aim of this paper is to contribute to methodological research on the "horse riding syndrome", by testing possible associations between different characteristics within the adult population of an Avar cemetery of the 7th-8th century AD from Eastern Austria (Wien-Csokorgasse). Avar populations are ideally suited for methodological research on the "horse riding syndrome", because - according to historical sources - the Avars were accomplished mounted warriors. Indeed, the results demonstrate a clear association between the presence of "Poiriers' Facet" on the proximal femur of an individual and the prevalence of other characteristics of the "horse riding syndrome" on the bony pelvis and leg bones of the same individual. Secondly, the aim of this paper is to identify possible differences in activity patterns between different groups within the adult population of Wien-Csokorgasse. This research is expected to contribute to existing knowledge regarding the "way of life" and habitual activities of Avar populations in Eastern Austria. The results suggest differences in habitual activity patterns within the Avar population in question, especially between the sexes, as well as chronological differences.

5 "TELL ME HOW YOU BURY YOUR HORSE, I'LL TELL YOU WHO YOU ARE"

Abstract author(s): Bede, Ilona (University Paris 1 Panthéon Sorbonne; UMR 8167 East and Mediterranean, Byzantine World)

Abstract format: Oral

Funeral practice and social identity in the Avar period.

Horse burial practice has been much extended in the early Middle Ages and especially in Avar period cemeteries. Though it didn't concern the whole society but a very limited part of it, which has been therefore considered as part of the elite. Killing a horse is actually an important economic sacrifice and not everyone could afford it. Several works has shown already the link between horse burial and men buried with a mounted belt or weapons. Nevertheless deceased buried with a horse (or part of it) aren't systematically fitted with abundant or wealthy material. On the other side, the overwhelming part of the horses in Avar period cemeteries are harnessed and fitted, but it's not always the case neither.

The purpose of this communication is to qualify the meaning of both horses' and human deceased' burials and their relationship inside the funeral practices, regarding archaeological finds. The bones assemblage, the material, and the positions of the deposits give some criteria to characterise the burials. Funeral practices are highly concerned by normalisation of ritual and differentiation inside the society. The demonstration played in this ceremony is significant for the people involved in it. We should therefore recognise "standard" or "exceptional" elements, which distinguish the individuals buried, the role(s) of the horse's deposit, as an animal and/or as reified object, it's meaning in the ritual, for the society in general and for the deceased in particular.

6 NOT EVEN "DEATH WILL DO US PART:" MEDIEVAL CASPIAN NOMADS AND THEIR HORSES IN LIFE AND AFTERLIFE

Abstract author(s): Shingiray, Irina (University of Oxford)

Abstract format: Oral

The importance of horses in life of Eurasian pastoral nomads cannot be overstated. Horses were raised, praised, ridden, eaten, traded, raided, gifted, exchanged, exerted, exhausted, and exalted—representing the soul of its owner or its transporter to the afterlife. In the Middle Ages, horses were buried with male and female deceased; they were sacrificed at ritual sites, and depicted on personal and ritual objects. In my contribution to this session, I will address the role of the horse in life and death of medieval Caspian, mainly Turkic and Mongol, nomads by looking at the archaeological evidence from individual burials, ritual deposits, and a variety of nomadic items of personal and ritual use which depicted horses or were used as parts of a horse tack. I will also explore some medieval nomadic beliefs, mythology, and symbology in relation to horses based on (meager) textual sources that we possess from that time period, but also based on textualized oral histories that have come down to us from the resilient medieval steppe tradition. I will also consider elements of continuity and change in the nomadic religious and ritual practices in relation to the role of the horse when the Caspian nomads began embracing Islamic faith and changing their conceptions of personhood after life.

7 OF HORSES AND MEN: ARCHAEOLOGICAL AND ARCHAEOZOOLOGICAL EVIDENCE FROM ROMAN AND EARLY MEDIEVAL SITES IN SLOVENIA

Abstract author(s): Karo, Špela (Institute for the Protection of Cultural Heritage of Slovenia, Centre for Preventive Archaeology) - Toškan, Borut (Research Centre SAZU Institute of Archaeology)

Abstract format: Oral

For millennia, horses and humans coexisted and interacted. Horses played important role in transportation, labour, diet, religion, and military services. They represented social status and wealth and often received considerable attention from their owners to make them appear elegant and attractive. In the archaeological record, this is most evident in the exquisite equestrian equipment, as well as ritual and burial practices.

Slovenian sites from the Roman period and the Early Middle Ages yielded a fairly large number of equestrian equipment and skeletal remains of horses from different archaeological contexts. However, the evidences of human-horse interaction from the two periods differ considerably. Pieces of equestrian equipment from the Roman period are not very numerous, regardless of the fact that cavalry was an essential part of the Roman army. Individual pieces are usually found in settlement layers, as parts of hoards or as stray finds. The remains of horse bones discovered in settlements, waste pits, cemeteries and wells, on the other hand, provide information about Roman dietary and ritual practices.

The situation in the Early Middle Ages is even more intriguing. Numerous items of equestrian equipment such as bits, stirrups, strap dividers, saddle parts and spurs come mainly from the hilltop sites and some hoards, but horse remains from these contexts are limited to single bones in the settlement layers. The objects, forged from high-quality metals and elaborately decorated, undoubtedly belonged to the riders of the upper class, but where are their horses?

8 WERE THEY RIDERS? IDENTIFICATION OF RELIABLE HORSE RIDING-RELATED SKELETAL CHANGES FROM THE BIOARCHAEOLOGICAL ANALYSIS OF A HUNGARIAN CONQUEST PERIOD POPULATION

Abstract author(s): Berthon, William (Chair of Biological Anthropology Paul Broca, EPHE, PSL University; Department of Biological Anthropology, University of Szeged; UMR 5199 PACEA, CNRS/University of Bordeaux) - Tihanyi, Balázs (Department of Biological Anthropology, University of Szeged; Department of Archaeology, University of Szeged) - Révész, László (Department of Archaeology, University of Szeged) - Coqueugnot, Hélène (Chair of Biological Anthropology Paul Broca, EPHE, PSL University; UMR 5199 PACEA, CNRS/University of Bordeaux; Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Leipzig) - Dutour, Olivier (Chair of Biological Anthropology Paul Broca, EPHE, PSL University; UMR 5199 PACEA, CNRS/University of Bordeaux; Department of Anthropology, University of Western Ontario) - Pálfi, György (Department of Biological Anthropology, University of Szeged)

Abstract format: Oral

Although some equine skeletal changes are promising for identifying the riding practice, the existence of a direct link between specific human bone changes and this activity has not yet been unarguably demonstrated. This is notably due to various limiting factors, such as the lack of specificity of the markers and the absence of direct contextual evidence.

Archaeological and historical sources attest that armies of mounted archers conquered the Carpathian Basin at the turn of the 9th and 10th centuries. Deposits of riding equipment and horse bones are often found in association with the individuals in graves from Hungarian Conquest period cemeteries. Those populations are, thus, among the most pertinent to perform methodological investigations on horse riding-related skeletal changes.

We selected 67 individuals from the 10th-century Hungarian cemetery of Sárrétudvari-Hízófold and analyzed them according to the presence or absence of riding deposit in their grave. They were also compared with 47 presumed non-rider individuals from the documented collection of Lisbon.

We performed a broad macromorphological and osteometric analysis and observed significant differences between the Hungarian groups, with or without deposit, and the comparison group. They concerned especially some lower limb enthesal changes, morphological adaptations of the hip region, and intervertebral disc herniations at the thoracolumbar junction. These traits can be explained by the horse riding practice and are promising indicators to evaluate, statistically, the presence of riders in a population of interest.

Besides, comparisons showed that Hungarian individuals without riding deposit in their grave were very likely riders as well. This funerary practice may, therefore, be related to symbolic or social aspects. Our research contributes to shedding light on the role of horse riding and riders in past populations.

This research was supported by the "Árpád-ház Program" of the Ministry of Human Capacities, Hungary, and the Hungarian NKFIH K125561 Grant.

9 HORSE-MAN COUPLE IN WEST SLAVONIC TRIBES OF THE EARLY MEDIEVAL (POLAND)

Abstract author(s): Makowiecki, Daniel - Chudziak, Wojciech (Institute of Archaeology, Nicolaus Copernicus University in Torun) - Krajcarz, Maciej (Institute of Geological Sciences, Polish Academy of Sciences, Warsaw) - Janeczek, Maciej (Department of Animal Physiology and Biostructure, Wrocław University of Environmental and Life Sciences) - Wiejacka, Martyna (Institute of Archaeology, Nicolaus Copernicus University in Torun) - Popovic, Danijela (Laboratory of Paleogenetics and Conservation Genetics Centre of New Technologies, University of Warsaw)

Abstract format: Oral

There is a Polish proverb saying that: "everybody can see how a horse looks like". Written by Benedykt Chmielowski the author in the 17th century encyclopaedia, it indicates commonness of the animal in the Polish Kingdom. At the same time, it confirms a long tradition of the horse-human relationship among the West Slavic tribes occupying the lands of Vistula and Odra basins from the 6th-7th centuries. According to the historical records there is no doubt that horse was significant in the warfare and religion. It was so precious that only the highest elites were its owners. On the other hand, this special character of horse-Slavs relationship is reported by very limited historical records. On the contrary, zooarchaeology permanently collecting horse remains, produces biological and, at the same time, independent data in archaeological and social contexts. Thus, this creates an obvious chance to verify the current historical picture on significance of the animal in the crucial historical stage of Poland during transition from tribal community to Christian European state (6th-13th century). Osteological, biometric, pathological, isotopic and genetic data are just being analysed for this purpose under the project titled 'Horse in Poland in the Early Piasts and Internal Fragmentation. An interdisciplinary Study*'. In the paper, the authors will report on chosen issues which are possible to be discussed thanks to the project. Among them are verification and complementation of the historical knowledge, and in particular the significance of horse in beliefs, rituals and social structure, its external features, biological conditions, sex ratio and size in height at the withers.

*) The project (2017/25/B/HS3/01248) is financed by the National Science Centre, Poland.

WARHORSE – A MEDIEVAL REVOLUTION?

Abstract author(s): Benkert, Helene - Creighton, Oliver - Outram, Alan - Ameen, Carly (University of Exeter)

Abstract format: Oral

The warhorse was the most iconic animal of the Middle Ages. As distinctive symbols of status, horses were central to the aristocratic image and closely bound up with concepts of knighthood and chivalry. As weapons of war, bred for strength and stamina, warhorses changed the face of battle. But our established understanding of warhorses is based almost entirely on historical scholarship. In contrast, archaeological evidence, which has immense potential to challenge received wisdom and transform knowledge about an animal so critical to medieval life, has remained neglected and untapped.

The AHRC-funded project 'Warhorse: A Medieval Revolution?' aims to address this gap in knowledge and, for the first time, brings together several lines of enquiry to explore the medieval horse in all its aspects. Through a multi-disciplinary approach, combining traditional zooarchaeology, geometric morphometrics, and genetic analysis with equine material culture, landscapes, and documents, this research strives to understand the development of this crucial species and how it came to define an entire era.

Presenting preliminary results, this paper examines the zooarchaeology of medieval horses from the 8th through to the mid-16th centuries. Biometrical analyses enable us to study changes in size, shape, and robusticity of the animals resulting from human selection. Through these changes, zooarchaeology has the ability to inform about advances in warfare and to illuminate the place of equine culture in the medieval society.

HORSE HARNESS DECORATIONS FROM BOHEMIA AND TRACES OF ITS PRODUCTION IN THE 8TH CENTURY

Abstract author(s): Profantová, Nadezda (Institute of Archaeology of the Czech Academy of Sciences in Prague)

Abstract format: Oral

The horse harness decorations in the 8th-9th century in Bohemia are mostly connected with the Carpathian Basin. These decorations are often gilded or silvered and represent prestige subjects/goods probably status symbols together with local spurs with hooks. It is important because there are no horseman's burials (with 3 unrevised exceptions) and also inhumation graves are known from the half of the 9th century. In this time, Carolingian status symbols (e.g. spurs and swords) predominated in male's graves. New prospections with metal detectors as well as archaeological excavation bring evidence about local production (press-model, unfinished phalerae, ingots) and local innovation of some types of it (pieces without exact analogies). Some luxurious pieces are very rare in Middle Europe, they have parallels only in west Slovakia and Balaton region in Hungary, some of them belong to the so-called italo-byzantine group. Others are distributed also in southern regions of the Carpathian Basin in Croatia. The finds of harness decoration are concentrated on some hillforts and hilltop sites in Bohemia, the most important are Tismice and Hostim in the Middle Bohemia, both with the area more than 15 ha.

DECORATED HARNESS LIKE A CULTURAL AND SOCIAL WITNESSES OF SCANDINAVIANS AT THE 9TH - 11TH CENTURIES OF ANCIENT RUS

Abstract author(s): Novikov, Vasily (The Russian Academy of Sciences Institute of Ethnology and Anthropology - IEA; LCC "Ergotransproekt")

Abstract format: Oral

The Viking Age fortified settlements in ancient Rus' are mostly associated with the early medieval trade routes from Scandinavia to Constantinople, from Scandinavia to Caliphate and from Volga to the Sea of Azov. These monuments largely date back to the 9th - 11th centuries AD. It is Scandinavian colonization of new trade routes that is key to appearance finds of horse and rider equipments. Excavations of these settlements and burials have yielded an extensive collection of various elements of bits, bridles, saddles, stirrups, whips, icenails etc. Most of the harness elements are in metal and often were decorated, either with oriental-style or with a Scandinavian one (Borre, Jelling and Oseberg styles).

Osteological data of the horse and the human buried with harness pieces and the distinctive features of the burials allow us to get a foretaste of horse riding's culture in warrior corps of Viking Age in ancient Rus'.

Horse played a role of high social standing of their keeper, reflected the personal aesthetic and took an important part of the burial practice. Decorated harnesses could be a pattern of ethnic affiliation and religion.

HOW FAST WAS THE TRAIN, NEEDED BY THE HEROIC MOUNTED WARRIOR?

Abstract author(s): Bauer, Anna (Independent Researcher)

Abstract format: Oral

What are the physiological basiscs question of size draught over long distances? Is the draught and ability to carry heavy burden only a question of size or is race and physique also important? The draught – and the output of the pack animal depend on different factors like the weather, the way, the package and the physical condition of the animals. Mange, glanders, pleuropneumonia, exhaustion, shortage of forage and water as well as wounds due to harness decimated many of animals of the baggage and in some cases also men, if they didn't run away in time. Using examples up from the Roman Empire till the First World War, it will be explained with

which problems every horseman has to struggle when he was going to war. War is not a lot of warriors in a shine armour and his well groomed horse and chivalry. War means dirt and death. In my presentation I will give you the answers to this questions and show you how cruel war was, for animals and humans and how men tried to help their horses and to reduce their suffering. Let me show you how horseman-horse relationship was during warfare.

A CROSSROADS BETWEEN THE CONTINENTS – INTERDISCIPLINARY APPROACHES TO INTERCONNECTEDNESS IN THE ANCIENT MEDITERRANEAN

Theme: 4. Globalisation and archaeology

Organisers: Mittnik, Alissa (Department of Human Evolutionary Biology, Harvard University; Harvard Medical School) - Eisenmann, Stefanie (Max Planck Institute for the Science of Human History, Department of Archaeogenetics, Jena) - More, Alexander (Climate Change Institute, UMaine; Initiative for the Science of the Human Past, Harvard University)

Format: Regular session

Since the first transition of hominins out of Africa, the Mediterranean – with its unique landscape and central position – has served as a pathway between Africa, Asia and Europe. It saw the rise and collapse of vast interaction networks, and has been (and still is) mediating the movement of people, and along with them the exchange of objects, technology and cultural practices. These human interactions took place at different temporal and spatial scales that can be traced by an ever-growing array of methods that in turn require increased integration and communication between disciplines.

The inquiry into Mediterranean interconnectedness is not answered with the mere description of interactions, but encompasses questions about both their catalysts and effects, such as the roles of health – especially technological innovations, social organization, the spread of diseases and pandemics, and climate.

We welcome contributions that use inter- and cross-disciplinary approaches to study connectivity between the regions surrounding the Mediterranean during the main periods of what could be termed “ancient globalization” in the 2nd millennium BC to the 1st millennium AD: from the emergence of regional kingdoms and first territorial entities with their “international relations” in the Middle and Late Bronze Age, until the intensified mobility and cultural entanglement associated with the trade networks, colonies and imperialist expansions of the Greek, Phoenician and Roman cultures. Such approaches may include, but are not limited to: stable isotope analysis, aDNA of humans, animals and pathogens, proteomics, material source analysis, network analysis, and statistical modelling. In this session, we aim to gather a broad scope of methodological approaches and research questions into the individual and large-scale movements seen in the ancient Mediterranean, their causes and demographic effects, and what this can potentially reveal about the response of societies to demographic, political and environmental changes, as well as to catastrophes and crises.

ABSTRACTS:

RETHINKING MEDITERRANEAN CONNECTEDNESS

Abstract author(s): Stockhammer, Philipp (LMU Munich; MPI Jena)

Abstract format: Oral

For many decades, the Mediterranean has been understood as a world of utmost connectedness through the ages with the sea, landscape and food linking societies. In the last decade, scientific approaches have not only underlined the extent of this connectedness, but also added complexity to our image of the past Mediterranean. Dimensions of human mobility and trade over large distances have become obvious as well as their inherent transformative dynamics. Now, Globalization Studies are forcing us to rethink connectedness and emphasize the duality of dis:connection which means that connection and disconnection always condition each other and that thinking about connection needs to take into account corresponding disconnections.

In my presentation, I will first provide an overview of recently published scientific datasets which have brought to light novel insights into the scales and diversity of mobility of humans and goods in the Bronze Age Eastern Mediterranean. I will then take this as a basis to conceptualize dis:connection and appropriate the related field of debate in Globalization Studies for archaeological thinking. Finally, I will rethink current interpretations of scientific dataset within a framework of dis:connectedness.

THE HONEY BEE, HER LIQUID GOLD, AND HER SIGNIFICANCE IN THE MEDITERRANEAN

Abstract author(s): Zak, Claire (Texas A&M University)

Abstract format: Oral

Honey, as the primary sweetening agent of the ancient Mediterranean world before the introduction of cane sugar, was recognized as a vital commodity among the Egyptians, Greeks, and Romans alike. Some scholars even claim that honey was as important and prevalent in trade as wheat, oil, and wine. The ancient sources, especially the Roman authors Virgil, Pliny the Elder, Columella, and Cato expend many pages to record the characteristics of bees, the craft of beekeeping, and the myriad of uses for honey and beeswax. Beekeeping was enough of a common practice to afford this attention and yet there is little current scholarship regarding the actual trade and distribution of bee products between regions and kingdoms in a cross-Mediterranean exchange. Both the literary and archaeological evidence help to map a vast network of honey and wax exchange, including the insatiable demands of Middle

Kingdom Egypt, Bronze Age Israel, classical Greece, and the Roman Empire's. Evidenced by honey's status as a medicinal remedy, votive offering with divine connections, and a display of wealth, it is readily apparent why this liquid gold and beeswax were in such high demand throughout the Mediterranean.

This research combines several lines of evidence: literary sources, archaeological sites, reverse engineering techniques, biological characteristics of honey bees, in addition to ceramic and lipid analyses to determine how lucrative the ancient honey and beeswax industry could be. In considering sites that preserved beehives in a fire, it is possible to determine a hive's productivity and total yields of beeswax and honey for trade.

This project considers questions regarding the uses of honey bee products, their social and economic significance, potential shipping containers, how much wax is needed for lost-wax casting of certain bronze objects, and product trade estimates across the Mediterranean.

3 INSIGHTS INTO ADMIXTURE HISTORY AND SOCIAL PRACTICES IN THE PREHISTORIC AEGEAN FROM ANCIENT DNA

Abstract author(s): Skourtanioti, Eirini - Gnechi Ruscone, Guido Alberto (Department of Archaeogenetics, Max Planck Institute for Evolutionary Anthropology) - Ringbauer, Harald (Department of Archaeogenetics, Max Planck Institute for Evolutionary Anthropology; Department of Genetics, Harvard Medical School) - Krause, Johannes (Department of Archaeogenetics, Max Planck Institute for Evolutionary Anthropology) - Jeong, Choongwon (School of Biological Sciences, Seoul National University) - Stockhammer, Philipp W. (Department of Archaeogenetics, Max Planck Institute for Evolutionary Anthropology; Institute for Pre- and Protohistoric Archaeology and Archaeology of the Roman Provinces, Ludwig Maximilian University)

Abstract format: Oral

European genetic history went through major transformations during the Neolithic and Bronze Age. Despite the significance of the Aegean for European prehistory, preservation challenges have hindered a comprehensive understanding of human mobility and population dynamics in this region through time. In this paper, we present insights from ancient DNA (genome-wide) analyses on Early Neolithic and Bronze Age individuals from Mainland Greece, Crete and the Aegean islands. Our results indicate multi-phased genetic shifts in the Aegean populations since the early Neolithic that can be traced to populations related to Anatolia and then, during the Late Bronze Age, to Central-Eastern Europe. Besides the long-lasting biological connections with these adjacent regions, we also found that Bronze Age Aegeans exhibited endogamy in high frequencies so far unobserved in the rest of the ancient West Eurasia. These close-kin marital practices, likely equivalent to first-cousins unions, were substantially higher in Crete and other Aegean islands than in Mainland Greece. Our study highlights the potential of novel biomolecular methods to unravel the interplay of genetic admixture and cultural entanglements in the Aegean and beyond.

4 MOBILITY AND MIGRATION AT THE END OF THE BRONZE AGE IN THE SOUTHERN LEVANT

Abstract author(s): Knapp, A. Bernard (University of Glasgow)

Abstract format: Oral

Living in 'an age of migration' has significantly affected how archaeologists, scientists and social scientists view this very complex phenomenon. Most archaeologists who study prehistoric migrations still believe that the main stimulus behind such movements was human agency, not climatic or environmental change. In fact, human migrations have multiple, complex and often historically specific causes, but archaeological explanations tend to be monothetic. This paper looks critically at migration scenarios proposed for the end of the Bronze Age in the southern Levant. After presenting a brief but critical examination of current archaeological views on the so-called Philistine migration around 1200 BC, I consider the current state of evidence from palaeogenetics (aDNA) and strontium isotope analyses related to this phenomenon. Although such analyses have enabled us to ask — but all too seldom to answer — questions that would never even have been raised a decade ago, in the case of the 'Philistine migration' most studies published to date have been inconclusive and are inadequately invested in the wider archaeological, social science and palaeogenetic literature. The conclusion attempts to look anew at this enigmatic period of mobility and connectivity, of transformation and social change, alongside the hybridised practices of social actors old and new.

5 INVESTIGATING DIETARY PATTERNS IN MEDITERRANEAN LATE ANTIQUITY THROUGH A BAYESIAN META-ANALYSIS OF HUMAN ISOTOPIC DATA

Abstract author(s): Coccozza, Carlo (Ludwig-Maximilians-Universität München, Fakultät für Kulturwissenschaften; Max Planck Institute for the Science of Human History, Department of Archaeology, Jena) - Cirelli, Enrico (Alma Mater Studiorum Università degli Studi di Bologna, Dipartimento di Storia Culture Civiltà) - Teegen, Wolf-Rüdiger (Ludwig-Maximilians-Universität München, Fakultät für Kulturwissenschaften) - Fernandes, Ricardo (Max Planck Institute for the Science of Human History, Department of Archaeology, Jena; University of Oxford, School of Archaeology; Masaryk University, Arne Faculty of Arts)

Abstract format: Oral

The main subject of our research was the interplay between subsistence practices, cultural traditions and population movements within the Mediterranean region of the Roman Empire during Late Antiquity. We employed a meta-analysis of a large collection of bioarchaeological data to determine the extent to which migrating populations impacted local food traditions and subsistence practices.

Our main data sources were the IsoArch and CIMA stable isotope databases that assembled human isotopic data from the Roman and Medieval periods, respectively. Both IsoArch and CIMA are part of the IsoMemo initiative that brings together a network of isotopic databases. This initiative, based at the Max Planck Institute - Science of Human History includes also access to modelling tools to model spatio-temporal archaeological and historical phenomena. We employed the modelling of human isotopic data to visualise spatio-temporal shifts in the diet of late Roman populations and to determine the relationship between dietary shifts, population movements and political crisis. We adopted a transdisciplinary approach in which the modelling of isotopic data was combined with archaeological data to better characterize dietary shifts and their causes.

Results revealed significant changes in dietary habits of populations residing within locations associated with the Western Roman Empire (e.g. Portugal, Spain, Italy, Tunisia), whereas these were mostly absent in the Eastern Roman Empire (e.g. southern Balkans, Greece, Palestina). However, there was an overall decrease in marine protein consumption in Mediterranean areas. Results also reveal that Longobards migrating from Pannonia into northern Italy maintained dietary traditions that were based on the consumption of large amounts of millet and/or sorghum.

Our results show clear links between dietary traditions in Mediterranean populations and major changes in political systems and broad migratory movements.

6 THE PUNIC MEDITERRANEAN - A NEW ANCIENT DNA PERSPECTIVE

Abstract author(s): Ringbauer, Harald (MPI-EVA Leipzig) - Olalde, Iñigo (University Pompeu Fabra) - Mittnik, Alissa (Harvard University) - Lalueza-Fox, Carles (Institute of Evolutionary Biology - CSIC-UPF) - Reich, David (Harvard University)

Abstract format: Oral

Towards the end of the 6th century BCE, the former colony Carthage in present-day Tunisia emerged as a hegemonial power in the Western Mediterranean. While keeping the Phoenician language as well as many aspects of cultural practices, a new set of "Punic" customs spread rapidly from the Northwest African coast throughout the Western Mediterranean, including coastal sites in Iberia, Ibiza, Sicily and Sardinia. In this study we produced novel ancient DNA evidence from human remains buried in Western Mediterranean Punic necropoli. So far, ancient DNA data from Punic sites has been sporadic, and here we generated genome-wide ancient DNA as well as new Radio Carbon dates to fill this gap. Together, this new data allowed us to probe whether cultural links to North Africa are also accompanied by North African genetic ancestry. Moreover, we studied putative genetic connections to the Levant and Aegan. Finally, we investigated the complex interaction with local populations.

7 EXPLORING THE GENETIC DIVERSITY OF MAGNA GRAECIA – THE CASE OF CAMPANIA

Abstract author(s): Mittnik, Alissa (Department of Human Evolutionary Biology, Harvard University; Max Planck-Harvard Research Center for the Archaeoscience of the Ancient Mediterranean) - Coppa, Alfredo (Department of Environmental Biology, Sapienza University of Rome; Department of Genetics, Harvard Medical School; Department of Evolutionary Anthropology, University of Vienna) - Sperduti, Alessandra (Bioarchaeology Service, Museum of Civilization, Rome; Department of Asia, Africa e Mediterraneo, University of Naples "L'Orientale") - Bondioli, Luca (Bioarchaeology Service, Museum of Civilization, Rome; Department of Cultural Heritage, University of Padua) - Gigante, Melania (Department of Cultural Heritage, University of Padua) - Cavazzuti, Claudio (Department of History Cultures Civilizations, Alma Mater Studiorum - University of Bologna; Durham University – Department of Archaeology) - Modi, Alessandra - Caramelli, David (Department of Biology, University of Florence) - Pinhasi, Ron (Department of Anthropology, University of Vienna) - Reich, David (Department of Human Evolutionary Biology, Harvard University; Max Planck-Harvard Research Center for the Archaeoscience of the Ancient Mediterranean; Howard Hughes Medical Institute, Harvard Medical School; Broad Institute of Harvard and MIT)

Abstract format: Oral

Starting in the 8th century BCE, coastal Campania in Southern Italy became a melting pot of various cultures and peoples when Etruscan and Greek colonizers joined local Italic tribes. By establishing cities and trade posts, the contact networks of Campania were further expanded across the Mediterranean and inland.

We generated ancient genomes from Campania, spanning the 8th to 3rd century BCE, i.e. the Orientalizing, Archaic and Hellenistic-Roman period in this region. While most individuals can be attributed to a genetic ancestry that arose on the Italian mainland, we also discover descendants of migrants from the Aegean and Eastern Mediterranean. Most notably, an individual dated to the 8th century at the first Greek settlement, Pithekoussai, a site that also yielded the earliest example of writing in the Euboean alphabet, was genetically of Aegean origin, and we find that this type of ancestry persisted at the site for several centuries. We compare the genetic composition of these descendants of Greek settlers to the local Campanians represented by individuals from the site San Marzano and Etruscan immigrants from Pontecagnano.

We integrate a thorough analysis of the associated material culture and, where available, strontium isotopes to establish temporal and cultural patterns of mobility, ancestry and admixture that shaped the genetic landscape of Campanian Magna Graecia.

8 GLOBALIZING SCENTS AND SPICES. EXCHANGE OF AROMATIC PLANTS ALONG THE INCENSE TRADE ROUTE

Abstract author(s): Huber, Barbara - Larsen, Thomas - Boivin, Nicole (Max Planck Institute for the Science of Human History)

Abstract format: Oral

Some of the most highly desired natural products that moved along ancient trade routes were not substantive, calorie-laden foods, but aromatics, powders and extracts that nonetheless packed substantial flavor and aroma. Not only did these substances possess the ability to transform cuisines or to perfume people and their environment, they also played significant roles in economic, cultural, and ritual contexts. Control over and access to these trade goods became the source of great wealth and political power.

Thus, to understand the dispersal of goods and early forms of globalizations, it is key to identify the origins and use of these aromatic substances. Traditionally, it has been difficult to study them in the archaeological record due to their ephemeral nature. Moreover, macroremains of spices or plant exudates are scarce in archaeobotanical assemblages in contrast to more tangible remains such as seeds and fruits. However, recent advances in biomolecular analyses of organic residues in artefacts make it possible to also trace the “invisible” commodities of trade.

Here, we present the study of organic remains from objects associated with the use of aromatic substances, such as incense burners, perfume flasks and unguent containers, alongside the Arabian incense road and at destinations in ancient Egypt in the 1st millennium BCE using biomolecular fingerprinting of plant secondary metabolites, lipids and proteins. Our study provides a unique insight into the sensual world of the past by shedding light on the consumption practices of aromatics.

9 INSIGHTS INTO ANCIENT EGYPTIAN GENOMES IN THE FIRST MILLENNIUM BC

Abstract author(s): Salem, Nada (Department of Archaeogenetic, Max Planck Institute for the Science of Human History, Jena; Department of Archaeogenetics, Max Planck Institute for Evolutionary Anthropology, Leipzig) - Gneccchi Ruscone, Guido Alberto (Department of Archaeogenetics, Max Planck Institute for Evolutionary Anthropology, Leipzig) - Mötsch, Angela (Department of Archaeogenetic, Max Planck Institute for the Science of Human History, Jena) - Teßmann, Barbara (Museum for Prehistory and Early History, SMPK Berlin; Berlin Society of Anthropology, Ethnology and Prehistory) - Frenzel, Hannah (Institute of Anatomy, Leipzig University) - Spyrou, Maria (Institute for Archaeological Sciences - INA, University of Tübingen) - Francken, Michael (Cultural Heritage Management, Government office of Stuttgart) - Harvati, Katerina (Institute for Archaeological Sciences - INA, University of Tübingen; Senckenberg Centre for Human Evolution and Palaeoenvironment, University of Tübingen) - Stockhammer, Philipp (Department of Archaeogenetic, Max Planck Institute for the Science of Human History, Jena; Institute for Pre- and Protohistoric Archaeology and Archaeology of the Roman Provinces, LMU Munich) - Krause, Johannes (Department of Archaeogenetic, Max Planck Institute for the Science of Human History, Jena; Department of Archaeogenetics, Max Planck Institute for Evolutionary Anthropology, Leipzig)

Abstract format: Oral

Egypt provides a privileged location to study historical population dynamics as it is at the crossroads between the ancient civilizations in Africa, Asia, and Europe. In the first millennium BC, ancient Egypt witnessed foreign domination by the neighboring populations including Libyans, Nubians, Assyrians, Greeks, Romans, and others, whose roles vary from trade exchange to invasion and rule. Despite being potential to addressing questions on the population's demographic, retrieval of ancient DNA from the Egyptian mummies has greatly been challenged by the presence of contamination. Here we report a preliminary, rigorously tested genome-wide dataset from mummies using high-throughput DNA sequencing and targeted capture techniques. The individuals in our study are recovered from Upper and Lower Egypt sites and spanning around 900 years of ancient Egyptian history, from the Third Intermediate to the Roman period. Our study aims to characterize the major ancestry components for ancient Egyptians and to explore the genetic continuation and admixture through times and regions.

10 CONNECTING PLACES: THE MATERIAL QUALITY AND PROVENANCE OF ANCIENT PIGMENTS

Abstract author(s): Rodler, Alexandra (Austrian Academy of Sciences) - Baragona, Anthony (University of Applied Arts) - Verbeemen, Eliah - Goderis, Steven (Vrije Universiteit Brussel) - Sørensen, Lasse (The National Museum of Denmark)

Abstract format: Oral

Cinnabar (α -HgS, mercury sulfide) forms a bright red pigment when powdered, was expensive and likely widely traded within the Roman Empire. The provenance of raw materials and the use of pigments can reveal how ancient societies were interconnected. Through a combination of pigment surface- and cross section analysis, as well as trace element analysis, we evaluate pigment preparation, raw material quality and provenance of 29 wall painting fragments from Roman Ephesus (western Turkey). Samples were collected from several rooms and living units of Terrace House 2 and Terrace House 1. They were analyzed using optical microscopy and SEM-EDS on cross sections; additionally, surface topography was studied by SEM-EDS. Elemental analyses (by portable XRF and ICP-MS) hint at a preference for combining cinnabar with Fe-rich pigments (earth pigments) rather than with Pb-rich pigments (minium, red lead), which was also confirmed by SEM-EDS analysis. While ochre was often used as an underpainting layer, EDS measurements exclude the prevalence of pigments other than cinnabar on the top layers. Likewise, EDS was unable to determine statistically relevant variation in the stoichiometry of the cinnabar pigment grains. Optical and scanning electron microscopy revealed that there is significant variation in both pigment morphology and surface distribution. These observations suggest that chromatic variation of

the final paint layer is likely due to differences in production and application of the cinnabar paint from a single mineral source. Lead isotope analysis of these samples also hints at the use of cinnabar from a similar source (age, location) and/or consistent mixing of cinnabar from similar sources. This work on the use, quality and provenance of archaeological pigments contributes to reconstructing economic networks that existed between Roman provinces.

11 ANCESTRAL ORIGINS AT THE ROMAN DANUBIAN LIMES

Abstract author(s): Carrion, Pablo - Olalde, Iñigo (Institut de Biología Evolutiva-CSIC) - Rohland, Nadin (Department of Genetics, Harvard Medical School) - Grbić, Miodrag (University of Western Ontario) - Miladinović-Radmilović, Nataša (Institute of Archaeology, Belgrade) - Tomanović, Željko - Keckarević, Dušan (University of Belgrade) - Mikić, Ilija (Institute of Archaeology, Belgrade) - Lalueza-Fox, Carles (Institut de Biología Evolutiva-CSIC) - Reich, David (Department of Genetics, Harvard Medical School; Department of Human Evolutionary Biology, Harvard University)

Abstract format: Oral

At its peak, the Roman Empire united all Mediterranean shores under the same rule and law. This, together with great improvements in long-distance communications, brought human mobility across the Mediterranean to an unprecedented scale. From all the areas which were under Roman control, the Balkans is a particularly interesting region as it was the midpoint connecting the Western and the Eastern parts of the Empire; and several peoples groups moved through the region during the Great Migration Period, such as Goths, Huns or Slavs. In this project, we have extracted and analyzed aDNA from ancient Roman and post-Roman individuals (n=69) from 3 settlements located in present-day Serbia: most importantly the capital of Moesia Superior Roman province, Viminacium. Genetic and Radiocarbon dating analyses results point to a high degree of cosmopolitanism in Viminacium during the early imperial period. We observe two major groups of individuals: one with a local ancestral signature likely deriving from Balkan Bronze and Iron Age populations, and other with Near Eastern ancestral origin, suggesting strong population movements from the Eastern parts of Empire impacting not only Rome, but also other major cities like Viminacium. Moreover, we detect remarkable cases of human mobility across the Saharan and the Mediterranean, such as a young male, whose ancestral origins lie in Eastern Africa. These results highlight how dense samplings at specific sites can provide a detailed view on both individual and large-scale human mobility patterns.

12 FIRST-MILLENNIUM CE PLANT AND ANIMAL EXCHANGE VIA ARCHAEOBOTANY IN COLLABORATION WITH OTHER DISCIPLINES: A MULTI-SCALAR VIEW FROM THE NEGEV HIGHLANDS

Abstract author(s): Fuks, Daniel (McDonald Institute for Archaeological Research, University of Cambridge)

Abstract format: Oral

This paper presents three test-cases in which archaeobotanical data deriving from trash middens of 1st-millennium CE Negev Highland sites were integrated with other sources of evidence to track individual and large-scale movement of plants and animals. Although based on the same archaeological contexts, these studies span different temporal and geographic ranges, from millennial-scale Eurasian crop diffusion to micro-regional grazing patterns of individual sheep and goats. First, qualitative changes in crop baskets attest to long-term diffusion, pushing back to Umayyad times introduction of aubergine (an east Asian domesticate) in the Levant, and supporting the Islamic Green Revolution thesis. Yet the plant remains suggest an even greater role for Roman agricultural diffusion, which appears to be a peak period of post-Neolithic, pre-modern crop diffusion in southwest Asia. Second, quantitative changes in key crops attest to the rise and fall of commercial viticulture in the Negev Highlands, centered on the mid-6th century CE, in tandem with ceramic evidence for changing involvement in Mediterranean trade. These results exemplify a globalizing ancient economy's vulnerability to external shocks like plague and climate change. Finally, a multi-proxy archaeobotanical study analyzed seed/fruit remains, phytoliths and pollen within individual sheep/goat dung pellets to identify grazing season and range. This has potentially profound implications for future research on agropastoral regimes, including aspects of seasonality and mobility. Methodologically, these studies exemplify integration of archaeobotanical evidence with textual, ceramic, and geoarchaeological data, respectively. Together, they offer a more holistic, multi-dimensional view of human-plant interaction from the vantage point of a particular microregion, with relevance to much broader scale movements of plants and animals across the Mediterranean and beyond.

13 THE FUTURE OF MEDITERRANEAN CONNECTEDNESS STUDIES

Abstract author(s): Hodos, Tamar (University of Bristol)

Abstract format: Oral

This presentation outlines future dialogues and future questions pertaining to ancient Mediterranean connectedness as inspired by the papers presented in this panel. Following Stockhammer's conceptualization of dis:connection, it begins with an assessment of emerging evidence for the balance between connection and dis:connection as highlighted in the panel's featured case studies.

These focus on two primary areas of evidence: biological data and commodities. Thus, this paper compares emerging biological data for various migrations around the ancient world, extending from the Neolithic and Bronze Age Aegean to the Bronze and Iron Age Levant and Egypt, as well as first millennium BCE Campania and among western Mediterranean Punic communities, and finally Roman Moesia Superior. It also assesses the mobility of specific organic commodities, such as incense, honey, and the pigment cinnabar, and considers the role commodities and diet play in our understanding of migration and socio-cultural and political developments, particularly in the Roman and post-Roman worlds.

Using these case studies, this paper then reflects upon our past interpretations of complex connectivity in these eras. Finally, it considers future avenues of cross-discipline analysis to more fully identify and understand the complex connections between people in the ancient Mediterranean.

513 PRODUCING POWER: EXPLORING THE RELATIONSHIP BETWEEN PRODUCTION AND SOCIO-ECONOMIC CHANGE IN THE MEDITERRANEAN FROM THE CHALCOLITHIC TO THE IRON AGE

Theme: 6. Material culture studies and societies

Organisers: Valenzuela-Lamas, Silvia (Consejo Superior de Investigaciones Científicas - IMF-CSIC) - Trentacoste, Angela (School of Archaeology, University of Oxford) - Nieto-Espinet, Ariadna (Consejo Superior de Investigaciones Científicas - IMF-CSIC) - Guimarães-Chiarelli, Silvia (CIBIO/InBIO - Centro de Investigação em Biodiversidade e Recursos Genéticos; Consejo Superior de Investigaciones Científicas - IMF-CSIC)

Format: Regular session

The rise of social complexity in the Mediterranean during late prehistory has been the object of many regional studies. The emergence of increasingly complex social hierarchies took place at different paces in different areas around the Mediterranean – e.g. in the Near East, Cyprus, Egypt, Greece, Italy, Iberia, north Africa – but also different tempos within these sub-regions. What were the socio-economic and political strategies through which these processes were articulated? Did they lead to similar production strategies across the Mediterranean? Are they identifiable in the archaeological record through indicators that are comparable between areas?

This session aims to gather specialists working on settlement patterns, material culture, architecture, and bioarchaeology from the Chalcolithic to the Iron Age from the Near East to the Atlantic façade of Iberia to explore the relationship between production and broader indicators of socio-economic change. Areas of production can include:

- Agricultural strategies, e.g. cereal production, processing, and storage;
- Zooarchaeological evidence for husbandry strategies and animal size;
- Pottery production, e.g. the development and diffusion of standardised forms (cooking vessels, transport vessels, fine tableware);

These will be considered in relation to other indicators of socio-economic organisation, for instance:

- Settlement patterns, e.g. concentrated versus diffuse urbanism, site hierarchies;
- Early evidence for and characteristics of architectural complexity and the internal organisation of sites.

The session aims to facilitate scientific discussion on (1) the effect of socio-economic systems (analysed here through settlement pattern and architectural characteristics) on production, (2) crop and animal husbandry adaptations in different cultural and environmental contexts. We invite papers of any applicable methods that represent farming practices and land management in the region throughout this period (Chalcolithic to Iron Age). Integrative papers drawing evidence from materials studies, bioarchaeological approaches, survey and field excavations are especially welcome.

ABSTRACTS:

1 SOCIAL COMPLEXITY AND COMPLEX SYSTEMS

Abstract author(s): Nakoinz, Oliver (Johanna Mestorf Academy)

Abstract format: Oral

Social complexity is a frequently used term in social archaeology. According to the concepts of social evolution, increasing social complexity is assumed which eventually leads to state formation. This process is not driven by continuous optimization of social structures but by an adaptation to new conditions, in particular increasing population sizes. But if we understand society as a complex system, what does this mean for social complexity? In complex systems also, complexity is increasing with the population. This seems to fit. But let us look into the details. The complexity in societies understood as complex systems depend on the number of effective contacts of each individual. Due to cognitive capacities, we cannot manage more contacts than a certain threshold (e.g. Dunbar's number). If the population exceeds this threshold we fail to remember agreements and to judge people and society becomes unstable. In this case, we need a social organisation that reduces the number of effective contacts. Approaches that limit these effective contacts to specific groups or establish hierarchies are reducing the number of effective contacts and hence reduce complexity. Remembering that social hierarchies are called social complexity we have to admit, that system complexity is not agreeing with social complexity. On the contrary, social complexity is referring to mechanisms to reduce complexity in social systems. These observations lead to an understanding of structures (hierarchies etc.) which enable some people to acquire power much easier as a kind of side effect of the tools used for reducing complexity. Or vice versa ...

2 COMPLEX BUT EGALITARIAN? ASSESSING SOCIAL EVOLUTION AT THE ORIGINS OF THE NEOLITHIC IN THE NEAR EAST

Abstract author(s): Ibáñez, Juan (Spanish National Research Council - CSIC)

Abstract format: Oral

The study of the transition from hunter-gathering to farming societies in the Near East testimonies important social changes that are observed, though not exclusively, in architectural shifts. Small hamlets gathering some dozens of individuals become villages where many hundreds (even few thousands) of people lived. Temporary huts evolved into houses with stone walls, internal compartmentation and solid built floors. Distant exchange of exotic objects manifest the display of complex networks of interaction between villages. The Early Neolithic in the Near East can be considered as a complex socio-economic context in which economic inequality and interpersonal violence is poorly documented. Are we facing a utopic small world of successful cooperation? Was social coercion so effective that living in extended communities was possible without economic dependence? In any case, this model of social organization, as the extended Neolithic villages, seems to decline at the beginning of the 7th millennium cal BC, coinciding with the beginning of the Neolithic diaspora out of the Near East.

3 VARIATION IN ETRUSCAN POWER PRODUCTION: A SETTLEMENT PERSPECTIVE

Abstract author(s): Zeviani, Camilla (University of Cambridge) - Palmisano, Alessio (LMU Munich) - Stoddart, Simon (University of Cambridge)

Abstract format: Oral

This paper analyses the variation in the distribution of power in Archaic Etruria, by examining the distribution of settlement sizes and territories across the region between the Arno and Tiber, using open source data. The settlement organisation of Etruria has generally a strongly hierarchical structure, but this generalisation conceals considerable variation. This variation has recently been outlined in several contributions by Stoddart and Palmisano which draw on both the powerful places at the head of the hierarchy and the sustaining rural settlement. More detailed and ongoing work by Zeviani is ground truthing the underlying evidence both to guard against the pitfalls of "statistical theatre" and to reveal more subtle details of power management from the best studied areas. Particular attention will be made to Poggio Civitate and Cerveteri, two contrasting centres, to illustrate both the contrasts in management of landscapes of power and the Quellenkritik which is vital even when dealing with relatively large data sets.

4 SOCIAL DYNAMICS, URBANIZATION PROCESS AND AGRICULTURAL INTENSIFICATION IN EASTERN IBERIA IRON AGE

Abstract author(s): Grau, Ignacio (Institute of Archaeology and Historical Heritage. University of Alicante)

Abstract format: Oral

The Iron Age in Eastern Iberia, between the 6th and the 3rd cents. BC was a period of major socioeconomic changes related to the emergence of urbanism and complex political systems. The political landscape was articulated around a series of urban centres that controlled the exclusive territories in which depending farming sites were placed.

The economic basis of this social dynamics was the agricultural intensification attested by paleobiological data, landscape signatures and settlement patterns. We present archaeological data to propose that farming practices in this region is based in intensive agriculture in which arboriculture had a special role in land management. This specific model of intensive production had as a result, the region presents a social model based in corporate peasant societies with clear signs of social ranking, but less hierarchical than the social models observed in other regions of Iberia during the Iron Age. Data from urban and rural sites in the region will be used to present the socio-economic model.

5 TRACES OF POWER. ARCHAEOLOGICAL AND BIOARCHAEOLOGICAL EVIDENCE FROM WESTERN CATALUNYA BETWEEN THE BRONZE AND IRON AGES (2ND-1ST MILLENNIUM BCE)

Abstract author(s): Nieto-Espinet, Ariadna (CSIC- Institució Milà i Fontanals) - Prats, Georgina - Moya, Andreu - Castellano, Alba - Alonso, Natàlia (University of Lleida)

Abstract format: Oral

Between the Late Bronze Age and the First Iron Age (1250-775 cal. BC), important changes in urban planning and architecture are documented in the inland valleys from Western Catalonia. During the Late Bronze Age, the first enclosed settlements appeared, and in the First Iron Age the first fortifications, with a complex urban structure were documented. These changes occurred very prematurely with respect to the rest of the neighboring territories. These first manifestations of power became generalized and consolidated throughout the territory of NE Iberia during the Middle Iron Age (6th-5th c. BC) characterized by a hierarchical system of occupation was implemented and the emergence of what has been called Iberian Culture.

A first hypothesis suggests that it was an incipient and progressive demographic increase and the possibility of accumulating surplus that produced a growing pressure on resources, which increased the competitiveness between communities and the emergence of the first local elites. At this point, coercion would be used as a means of control in a strongly territorialized context. What was the impact of socio-political changes on local economies (livestock, agriculture and exchanges)? How are social changes, and

the emergence of social inequalities, reflected in the archaeological record? Which are the most significant, indicative and/or reliable?

In order to evaluate the complexity of the factors that triggered/stimulated these processes, a meta-analysis integrating the different archaeological data available (architecture, archaeozoology, archaeobotany, material culture and storage capacity analysis) will be carried out. The aim of this work is (1) explore the social and economic implications that generated this premature emergence of complex societies in this area; (2) evaluate what evidence (indicators in the archaeological record), the emergence of inequalities and the first complex societies have left us; (3) and how changes in urbanism and architecture are related to changes in production models.

6 INTEGRATING THE POTTER'S WHEEL IN NARRATIVES OF LONG-TERM SOCIO-ECONOMIC CHANGE IN THE WESTERN MEDITERRANEAN

Abstract author(s): de Groot, Beatrijs (The University of Edinburgh)

Abstract format: Oral

The early Iron Age in the western Mediterranean saw the intensification of long-distance trade stimulated by Phoenician commerce. The potter's wheel is a technological innovation that is tightly bound to such processes of intensification of production and exchange. Pottery workshops were part of a new landscape of production in which agricultural products, oil, salt and garum were produced alongside the wheel-made containers in which they were transported. Wheel-made pottery is therefore an important class of artifacts that reflects socio-economic change and the context in which this technology was first employed marks a radical shift in how pottery production was organised. Despite the significant transformation the spread of wheel-made pottery might reflect, the impact of this technology on the working lives of people across this region remains rarely addressed.

This presentation will discuss different socio-economic motivations underpinning the adoption and spread of the potter's wheel in the western Mediterranean and consider its impact on the organisation of ceramic production and social divisions of labour. It will consider how the prevalence of wheel-made pottery reflects regional variation in the response of different groups to the economic opportunities presented by long-distance trade and consider how such responses correspond to social hierarchies.

7 DIVERSITY AND CHANGES IN THE ANIMAL EXPLOITATION DURING THE NEOLITHIC OF THE LEVANT

Abstract author(s): Gourichon, Lionel (Université Côte d'Azur, CNRS, CEPAM - UMR 7264)

Abstract format: Oral

The transformation from a (semi-)mobile hunter-forager way of life into a highly productive and successful system of crop-livestock farming have been a lengthy and complex process. Although the earliest evidence of breeding of goat, sheep, cattle and goat were found in the Early and Middle Pre-Pottery Neolithic B, the role of hunting in the Neolithic societies only decrease progressively and even remains important in some regions until the Chalcolithic period. Nonetheless, because livestock husbandry not only ensures food autonomy all year-round but also allows the creation of surpluses, wealth and prestige from meat-on-the-hoof and the various products that animals can provide during their lifetime (milk, wool, traction, dung), this new human-animal relationship may have contributed, along with the agriculture, to the emergence of new forms of economic, social and symbolic capital.

From this point of view, studying changes in herd management strategies and production goals is a path to trace the evolution of the systems of organization of Neolithic societies. The methodological approaches developed in recent decades to reconstruct and interpret animal mortality profiles, despite their disparity and the need for improvement, offer interesting avenues to address this question.

In this paper, based on the data available for the Levant region between the 10th and 5th millennia BCE, we will particularly present the great diversity of small and large livestock management strategies according to chronology and locations, highlighting the specialised practices and attempting to understand their dynamics in a general perspective.

8 CROPS AND LIVESTOCK AS A FORM OF EMPOWERMENT IN THE VALENCIAN COUNTRY BETWEEN THE 3RD AND 1ST MILLENNIUM BC

Abstract author(s): Iborra Eres, Maria Pilar (independent researcher) - Pérez Jordà, Guillem (Contractat CIDEGENT Dept. de Pre-història, Arqueologia i Història Antiga Universitat de València)

Abstract format: Oral

The social and economic structures are diverse in the Valencian Country between the end of the third millennium and the first millennium cal BC. here are alternating periods in which processes of population aggregation associated with apparent social complexity develop, and others in which the population structure is dispersed and in principle more Land ownership together with agricultural and livestock production are interpreted as the inhabitant's sustenance and also as the elements to explain the emergence of complex hierarchical societies.

The preliminary theme of this paper is to analyse the agricultural and livestock management developed during this time, pointing out the agrarian goods accumulated or controlled by the dominant social groups. Evidence of this control also comes from different elements linked to agricultural production, such as storage structures and agrarian tools.

A significant undertaking in this regard is the presence of storage structures as silos, barns and domestic equipment located in some centres as signs of agrarian production or control also noteworthy a differential distribution of labour tools at the end of the third millennium and in established way during the first millennium cal BC.

On the other hand, during most of the 2nd millennium, an essentially domestic production structure was consolidated, with the exception of the areas located to the south of this territory during the last third of the millennium.

9 ON THE INTERFACE BETWEEN PLANT INTENSIFICATION AND SOCIAL COMPLEXITY IN SOUTHWEST ASIA

Abstract author(s): Arranz Otaegui, Amaia (University of Copenhagen)

Abstract format: Oral

This paper provides a long-term perspective of the environmental, social and cultural context in which plant resource intensification developed in southwest Asia (23-5.0 ka cal. BP). It highlights that increased social complexity, manifested in the development of sedentism, stone-made architecture, specialised material culture, and symbolism is attested long before the development of Neolithic farming systems. With the onset of the Pre-Pottery Neolithic period (c. 11.5 ka cal. BP), the earliest forms of intensified plant resource exploitation activities are documented, comprising the cultivation of morphologically wild plant species. The social background behind this major change in subsistence shows a complex society in which social differences are manifested in the burial customs, monumental and communal food-storage buildings are for the first time constructed, and the exchange networks intensify, culminating with the spread of ideas and developments across the region. Once fully-fledged agricultural societies evolved c. 10 ka cal. BP, plant exploitation activities intensified, as evidenced by the use of manure, crop irrigation, and the cultivation of new plant food species. These changes in subsistence are linked to various socio-economic processes such as the expansion of animal domestication and herding practices, and the development of the so-called "mega-sites". During the Chalcolithic and Bronze Age periods, the first urban settlements bring together new forms of social, political and economic organization, where land-ownership and extensive agricultural production will play a central role.

10 CHANGES IN AGRICULTURAL PRACTICES AND SUBSISTENCE STRATEGIES THROUGH THE METAL AGES IN NORTHWESTERN ITALY: A MULTI-PROXY AND MULTI-ISOTOPIC APPROACH

Abstract author(s): Varalli, Alessandra (CaSEs Research Group, Department of Humanities, Universitat Pompeu Fabra. Barcelona, Spain.; Department of Archaeology, Durham University) - Gröcke, Darren (Department of Earth Sciences, Durham University) - Church, Mike (Department of Archaeology, Durham University) - Sparacello, Vitale (Dipartimento di Scienze della Vita e dell'Ambiente, Università degli Studi di Cagliari Cittadella Universitaria di Monserrato) - Arobba, Daniele (Museo Archeologico del Finale, Finale Ligure) - Nisbet, Renato (Università Ca' Foscari, Dipartimento di Studi sull'Asia e sull'Africa Mediterranea) - Starnini, Elisabetta (Soprintendenza Archeologia, Belle Arti e Paesaggio per la città metropolitana di Genova e la provincia di La Spezia; Dipartimento di Civiltà e Forme del Sapere, Università di Pisa) - Dori, Irene (Soprintendenza Archeologia, Belle Arti e Paesaggio per le province di Verona, Rovigo e Vicenza) - Maggi, Roberto (Laboratorio di Archeologia e Storia Ambientale - LASA, Università di Genova) - Skeates, Robin (Department of Archaeology, Durham University)

Abstract format: Oral

Liguria (northwestern Italy) is a region rich in archaeological sites spanning the Metal Ages and beyond. However, comparatively few open-air sites are preserved, and most archaeo-anthropological evidence derives from collective burials in cave deposits, where human remains are generally commingled. Large-scale, multi-proxy isotopic analysis of directly-dated bioarchaeological remains has helped overcome these limitations and allowed for a direct assessment of changes in agricultural intensification, mobility, social inequalities and power relations.

CNS stable isotope analysis was conducted on 86 animals, 124 humans, and 175 botanical samples, from 14 sites spanning the Copper to Iron Ages (3600-400 cal.BCE). Results highlighted an increase over time in nitrogen isotopes in plants, suggesting an overall trend of increased manuring, likely linked to agricultural intensification. However, within the same period, different nearby sites privileged manuring of wheat or barley, hinting at the specialization of farming systems, possibly based on micro-environmental and/or economic factors.

Human diet was mainly based on C3 terrestrial foodstuffs. However, a significant increase in $\delta^{15}N$ is detected in the Iron Age, suggesting increased animal protein consumption. Beginning in the late Bronze Age, an increase in $\delta^{13}C$ is also apparent due to the introduction of C4 plants (millet). These changes are not shared uniformly among individuals, suggesting differential access to certain food resources, possibly due to the entrenching of social inequalities. Sulphur analysis indicates that these differences are not due to the provenience of the individuals. Indeed, it was possible to clearly distinguish sites and related human groups at a micro-regional level based on $\delta^{34}S$ ranges in animals and humans.

Thanks to a stable isotope, micro-regional approach, we have gained insights into the nature and timing of some socio-economic processes that would otherwise have been difficult to discern archaeologically in Liguria, while also adding to broader understanding of subsistence strategies within the Mediterranean region.

RESILIENCE AND LIVESTOCK ADAPTATIONS TO DEMOGRAPHIC GROWTH AND TECHNOLOGICAL CHANGE: A DIACHRONIC PERSPECTIVE FROM THE FIRST MILLENNIUM IN NE IBERIA

Abstract author(s): Valenzuela-Lamas, Silvia - Nieto-Espinet, Ariadna (Consejo Superior de Investigaciones Científicas - IMF) - Huet, Thomas (independent) - Trentacoste, Angela (University of Oxford - School of Archaeology) - Guimarães, Silvia (Consejo Superior de Investigaciones Científicas - IMF) - Orengo, Hector (Institut Català d'Arqueologia Clàssica - ICAC)

Abstract format: Oral

Economic systems are closely related to their ecological context, and livestock has been an integral part of human economies since the Neolithic, significantly contributing to the creation and maintenance of agricultural anthropized landscapes.

In the frame of the ERC-StG project 'ZooMWest' we collected and analysed thousands of zooarchaeological data from NE Iberia (>90,000 NISP). By considering these data in comparison with ecological indicators and archaeological evidence (settlement characteristics and their distribution) we will present changes in animal production and the relationship between people, livestock, and their environment during the first millennium BC.

Results show a shifting relationship with the territory from the Bronze Age to the Iron Age, when the expansion of iron technology and the Mediterranean trade led to significant changes in production and society. The zooarchaeological results demonstrate a significant impact of socio-economic system over animal husbandry, shaping the frequencies of species and the size of the animals, and a smaller influence of the local environment as the technological capacity of humans increased.

SANCTUARIES, HUSBANDRY AND ECONOMY: THE ZOOARCHAEOLOGICAL RECORD FROM THE TARTESSIAN REGION

Abstract author(s): Ramos Soldado, José Luis (Independent researcher) - García Viñas, Esteban - Bernáldez Sánchez, Eloísa (Laboratorio de Paleobiología, Instituto Andaluz de Patrimonio Histórico) - Ferrer Albelda, Eduardo (Departamento de Prehistoria y Arqueología, Universidad de Sevilla)

Abstract format: Oral

Since the beginning of the Phoenician colonisation in the southwest of the Iberian Peninsula (towards the end of 9th century B.C.), settler activity was partially aimed at exploiting the natural resources of the surrounding territory (agricultural, mineral, etc.), in an attempt of reproducing customs and traditions from the Ancient Near East – including cooking practices –. The establishment of sanctuaries all over the Mediterranean was a common and successful strategy among these activities, often carried out in relevant locations concerning sailing, trade and resources (Huelva, El Carambolo). Indeed, these sanctuaries constituted a model for further singular buildings and complexes built in indigenous sites all over the next century (Caura, Carmona, Montemolín). In addition, the introduction of a colonial economy entailed not only the exploitation of the colonised territories, but also an increasing demand of products related to exchange and consumption.

In this context, sanctuaries of Phoenician traits identified at the southwest of the Iberian Peninsula during the Iron Age probably constituted both religious and politico-economic centres where settlers and indigenous communities may have carried out agreements of different nature, at least until the beginning of 6th century B.C., when this system seems to have collapsed. Zooarchaeological evidence gathered from both domestic and cultic contexts led us to consider these spaces as engagement centres for the communities, where meat resources were managed and redistributed following a well-defined and structured ritual system. Nevertheless, these sanctuaries also worked as trading centres and strategic sites for the control and management of the territory and its resources, as well as slaughterhouses for the surrounding populations.

PRODUCING NAVAL POWER: SAILS AND ECONOMIC STRATEGIES IN THE AEGEAN, 6TH – 4TH CENTURY BC

Abstract author(s): Dimova, Bela (British School at Athens)

Abstract format: Oral

Sails and textile technology played a key role in enabling mobility and thus shaping historical phenomena such as migration, trade, the acquisition and maintenance of imperial power in the ancient Mediterranean. This paper examines the demand for sailcloth and different strategies through which it was produced or supplied. A focus on sail manufacture helps to understand the relationship between textile production and broader socio-economic change. Combining insights from weaving experiments, reconstructions of ancient ships, and historical records, we can estimate the labour and material requirements for equipping ancient ships with sails. A consideration of the Athenian navy at Salamis demonstrates that making sails involved significant amounts of labour and resources. As commercial fleets grew during the 5th and 4th centuries BC, they placed significant demands on textile production. In addition to production, managing supplies and reserves of sailcloth constituted another significant challenge. This challenge could be addressed through trade, taxation, and more intensive exploitation of textile workers.

TEXTILES, TABLET WEAVING, ELITES, AND URBAN DEVELOPMENT IN FIRST MILLENNIUM BCE CENTRAL ITALY

Abstract author(s): Samuels, Jeffrey (Phillips Exeter Academy)

Abstract format: Oral

Textiles are a culmination of agricultural, zoological, ceramic, and craft production processes. Each productive choice made during a textile's chaîne opératoire – e.g. the weaving technique (loom-based or tablet), fiber (flax or wool), and decoration (dyeing and finishing) used, – is socially and contextually embedded. Furthermore, the longevity and spread of certain textile technologies is tied to their utility as a functional and communicative tool as well as the sustainability of their embedded production networks. Elite textiles, used to reify status and power at the local and regional level, provide one visible materialization of these relationships. Too often, however, these productive choices – and the resulting textiles – are divorced from their settlement context due to particularities in the archaeological record.

In this paper, I contextualize the role of particular elite textile technologies within Italian urbanizing communities and model what the spread of these technologies means for the diffusion of dispersed urbanism amongst Italian elites.

In particular, I use artefactual, excavation, and survey data from the Latin site of Gabii to situate one elite textile technology – tablet weaving – as an important element for maintaining the dispersed urban system present at Gabii. Tablet weaving was a particularly effective economic and symbolic tool at the site, the culmination of diffuse productive networks tying elite and non-elites together.

Moving to a regional level, I examine tablet-weaving's spread from central Europe down the Italian peninsula during the final Bronze Age and early Iron Age, concurrent with the first wave of Italian urbanism that saw the rise of numerous urban entities similar formally similar to Gabii. This analysis underscores both a central European impetus for the elite systems that drove the first wave of Italian urbanism and the reciprocal relationship between craft production and the establishment of stable urban communities.

SMALL BUT SIGNIFICANT: EXPLORING NEO-ENEOLITHIC MINIATURE REPRESENTATIONS AS MATERIAL OBJECTS

Theme: 6. Material culture studies and societies

Organisers: Shatilo, Liudmyla (Kiel University, Institute of Pre- and Protohistoric Archaeology) - Marangou, Christina (Independent researcher) - Naumov, Goce (Goce Delcev University of Štip, Institute of History and Archaeology) - Terna, Stanislav[†] (Kiel University, Institute of Pre- and Protohistoric Archaeology)

Format: Regular session

A striking category of finds from Neolithic and Copper Age sites in Mediterranean, South-East and East Europe are the miniature items that embody certain aspects of prehistoric life in non-perishable materials. Depictions of humans, animals and means of transportation, architectural entities such as houses or stoves, adornments, clothing or tools, all of them are a valuable source of information for studying non-literate societies.

Miniatures have been traditionally considered as art and religious objects. This approach gave birth to durable paradigms and narratives. On the other hand, miniatures are, above all, artifacts which come from archaeological contexts. Consequently, they could be and should be quantified, contextualized and investigated as material objects.

Our session seeks to address empirical approaches to the Neolithic and Copper Age miniatures from the 7-4 millennia BC in the Mediterranean, South-East and Eastern Europe and focus on the following research questions:

- What are the theoretical aspects of the concept of miniaturism? How can it be used in better understanding of technical, functional and symbolic features of small objects and 'replicas'?
- How do miniatures occur in the archaeological record? What are the circumstances of their discovery in various archaeological contexts of the Neo-Eneolithic?
- What is the relation between miniatures and other archaeological finds? Are they 'special' finds? If so, how 'special' are they compared to the 'usual' mass finds?
- How and what modern interdisciplinary methods can be applied to study these prehistoric objects? What is their potential for understanding the taphonomy, function and meaning of miniatures?
- What are the social implications of the above-mentioned research questions? If there is a 'society of miniatures', to which extent can it mirror a 'society of people'?

Presentations on various approaches of Neo-Eneolithic miniatures as material things are welcome.

- 1 A MATTER OF LIFE AND DEATH. ANTHROPOMORPHIC FIGURINES IN EARLY NEOLITHIC EUROPE – TRANSREGIONAL AND TRANSCULTURAL CONNECTIONS**
Abstract author(s): Becker, Valeska (Westfälische Wilhelms-Universität Münster)
Abstract format: Oral
- Anthropomorphic and zoomorphic figurines occur in almost all early Neolithic cultures of Europe, from the Karanovo I culture of Bulgaria in the east to the Linear Pottery culture in the west. The presentation will give a brief overview of early Neolithic anthropomorphic figurines from southeastern, southern and central Europe in terms of the number of their occurrence, their shape, decoration and deposition, and will then highlight some common features on a transregional and also transcultural level such as body shapes, breakage patterns, and means of disposal, but also differences which concern, e.g., decoration and the overall number of figurines. It is striking that some characteristics span hundreds of kilometres and occur in similar fashions, forging far-reaching connections and conservative traditions, whereas other features seem to have been employed to create differences and set boundaries between different regions. Briefly, also other anthropomorphic representations such as anthropomorphic vessels, applications, painted and incised human figures will be regarded as well. The aim is to shed light on the networks of communication between early Neolithic cultures and their respective handling of traditions and innovations regarding the making and use of figurines.
- 2 ANTHROPOMORPHIC FIGURINES DISCOVERED IN THE SETTLEMENT OF CUCUTENI - DÂMBUL MORII (CUCUTENI, IAȘI COUNTY, ROMANIA)**
Abstract author(s): Balaur, Radu (Alexandru Ioan Cuza University of Iasi, Interdisciplinary Research Institute - Science Department, Arheoinvest Center)
Abstract format: Oral
- The archeological site from Cucuteni – Dâmbul Morii has benefited from an increased degree of attention from researchers, since the beginning of the last century. Although not as titrated and published as his older and more intensely investigated sibling Cucuteni–Cetățuie, the settlement of Dâmbul Morii (first mentioned by H. Schmidt under the name Talsiedlung–“the settlement in the valley”) still stands as a milestone of the Romanian archaeological research.
- The results of the excavations at Dâmbul Morii are less known in the archaeological literature. Over the years, they limited themselves to presenting a series of objects discovered in this settlement, but without specifying the context of the discoveries. The research is still far from complete.
- The present study considers the detailed analysis of the anthropomorphic plastics discovered in this settlement. We consider the analysis of the pieces following the manufacturing canons (raw material, techniques), as well as the decoration. A specific feature of the Cucuteni A-B phase is the elongation of the body and legs. For the purpose of this study, a number of about 150 pieces were considered. Following the decoration, we want to establish the ratio between the number of female statuettes and the number of male statuettes, in a specific context.
- 3 CRAFT AND MINIATURES: FIGURINES FROM EXCAVATIONS OF POTTERY-MAKING WORKSHOP AT NEBELIVKA MEGA-SITE**
Abstract author(s): Burdo, Nataliia (Institute of Archaeology NAS of Ukraine) - Videiko, Mykhailo (Kyiv Borys Grinchenko University)
Abstract format: Oral
- In 2014 at Nebelivka mega-site was excavated part of pottery workshop, which included pottery kilns and a pit. In the explored part were discovered 30 miniatures, 2 from them related to remains of kiln, the other to filling of the pit. Part of female figurine was inside the kiln, the other outside. At the pit were found 29 fragments from 28 figurines.
- One figurine divided on top and bottom parts. Fragmented objects presented by 6 top and 23 bottom parts. Fractures allow us to make assumptions how the figurines were molded: from a single lump of clay, from two vertical mirror halves, from the front and back vertical halves. Figurines had different sizes: small, from 5 to 7 cm; middle, from 10 to 12 cm; large, from 15 cm. Different kinds of clay were used to create miniatures. Part of them produced from caolinite clay, the same that used for pottery making. Other figurines are from red clay with organic admixture. Two realistic type figurines produced from brown clay. The most of items are female, one – male, put part without gender markers. Schematic figurines prevail, 3 figurines are realistic. Most of the figurines are standing, on a spindle-shaped or columnar stem. Figurines with naturalistic details are presented: images of pregnancy, hair, hands.
- The discovery of miniatures suggests that rituals are periodically carried out in the workshop. This set of miniatures is distinguished by the technological, stylistic and typological diversity typical to sculpture of the Nebelivka mega-site. The variety suggests that the miniatures were made by different people. The highest quality items can be associated with the workshop. Such a collection of miniatures of different origins suggests participation in the rituals of not only the owners of the workshop but also the neighbors.

- 4 THE LIFE HISTORIES OF FLAT BONE FIGURINES**
Abstract author(s): Müller, Michael (Free University Berlin) - Savu, Mihaela (Christian-Albrechts-Universität Kiel)
Abstract format: Oral
- The archaeological researches carried since 2002 at the Chalcolithic tell and surrounding flat settlement Măgura Gorgana at Pietrele (Romania) have revealed numerous miniatures of all kinds throughout the years. Models of buildings, ovens, furniture, vessels and tools were found along with zoomorphic and anthropomorphic figurines. The latter category, with around 600 complete and fragmentary representations, includes items made of diverse materials, such as ceramic, lithic or of animal origin as well as of different shapes and sizes. In our paper we will explore the biographies of flat bone figurines, a class of miniatures well represented at the site, with specimens in different stages of production, usage, reshaping and conservation. Our research is focused on reconstructing the manufacturing process of flat bone figurines by identifying the operational sequence involved in the transformation of the raw material into the finished objects. In addition, we will evaluate the reshaped specimens, the possible usage traces on flat bone figurines and their integrity status at the time of retrieval. Their discovery contexts as well as the relations to other artefacts from Pietrele, particularly figurines of other types and materials, will also be discussed.
- 5 ENGAGED TO BE BURIED: WHAT CAN MATERIAL ENGAGEMENT THEORY TELL US ABOUT ANIMAL FIGURINES?**
Abstract author(s): Gilb, Hannah (Deutsches Archäologisches Institut)
Abstract format: Oral
- Miniatures are a fascinating and adorable phenomenon of Neolithic-Eneolithic material culture in Southeastern Europe. Their existence and typological diversity betray valuable insight into their manufacturer's unique perception of their environment, and the finished product serves as a thumbprint embodying this perception. Miniature animal figurines have meanwhile been discovered as a frequent constituent of the material libraries of Copper Age cultures, though the make of these figurines differs enough to render the creation of a working typology useless. There are nevertheless enough morphological similarities to identify recurring types, though the function played by these figurines during their use-lifetime is still undetermined.
- Archaeologists have been making pointed efforts to move away from catch-all designations like “cult/sacrificial object” and have instead begun to apply other, more informative rubrics of investigation. Cognitive archaeology, a sub-discipline that has gained traction over the past few decades, has already significantly contributed to material research. In studying the animal figurines, I have found a place for “Material Engagement Theory” (MET), which highlights above all the roles of enactivism, external activism and material signs. In order to help answer the question of whether and to what extent the application of MET on the evaluation of miniatures and figurines can help us decode their manufacturer's cognitive participation in their environment, I discuss a case study in which MET is applied to the categorization process of animal figurines from the Neolithic-Eneolithic settlement mound of Măgura Gorgana, located near the modern-day village of Pietrele (jud. Giurgiu) in Romania. Here, MET offers evaluative tools to extrapolate the phenomenological contours of the life of the manufacturer, as well as justification for categorization as “special” finds, but still offers limited conclusions about the active function of the animal figurine.
- 6 MINIATURE REPRESENTATIONS OR SMALL VESSELS? SMALL SCALE VESSELS FROM THE CHALCOLITHIC TELL SETTLEMENT MĂGURA GORGANA AT PIETRELE**
Abstract author(s): Martin, Janine (DAI - German Archaeological Institute, Eurasia department)
Abstract format: Oral
- Often considered as religious objects, the functional scope of miniature representations is somewhat limited to the use in ritual activities. Given the small dimensions of these objects, there seems to be a decrease in functionality compared to their actual-sized counterparts.
- Unlike representations of the animate world, such as anthropomorphic and zoomorphic figurines, miniature vessels are modeled after objects with a clear functional purpose. Depending on the actual size and volume, the functional character as a container is still preserved in most of the miniature variants. To which degree a reduction in size is accompanied by a reduction of function, therefore, is a matter of various factors such as vessel shape, surface treatment, and finishing.
- Based on the collected miniature vessels from Pietrele, Măgura Gorgana (jud. Giurgiu, Romania) this group of objects is examined regarding their usability as containers. Stating that miniaturism goes along with an at least partly performed loss of the original functional purpose, characteristic attributes of small scale vessels on the one hand, and miniature representations on the other hand, are defined in order to determine whether they should be seen as objects of a sacred or rather secular purpose.
- These considerations are complemented by an exploration of the distribution of miniature vessels within the settlement and the associated house contexts to get a better understanding of the relation between the artifacts and the actual archaeological features. Taking into account both the stylistic features and the spatial distribution of the miniature vessels from Pietrele, Măgura Gorgana, this paper aims to contribute to the interpretation of miniature vessels, their classification, and their possible use in Chalcolithic societies.

7 MINIATURES AND MNEMONIC DEVICES – A CASE STUDY FROM THE BLACK SEA AREA IN THE 4TH MILLENNIUM BC

Abstract author(s): Uhl, Regina Anna (University Leipzig; DAI, Eurasia Department)

Abstract format: Oral

In the course of the last 10 years, research in Petreni, a chalcolithic site in Moldova, brought to light a wide range of miniatures: schematic animal figurines, clay images of furniture and further, small geometric and naturalistic clay tokens were found in deep features with ashy layers as well as in architectural features. In research history, many of these objects were conventionally treated as magically charged objects or rather apodictically received a mere religious connotation. But due to their find contexts, whereupon clay tokens can be associated with tally sticks, clay breads (pâini/ хлібці), large quantities of bones and broken zoomorphic miniatures, these assemblages necessitate a re-contextualization and demand to be re-evaluated differently. Especially the association of “miniatures” and tokens with imprinted notches on the fragmented or complete tally sticks imply that those objects shall be contextualized in a sphere of counting or registering and be regarded as mnemonic devices.

In larger quantities, such objects are as well-known from other Cucuteni-Tripolye settlements, but for the first time, these objects were registered together with tally sticks in Petreni and shall be presented here.

8 WHEEL MODEL OR SPINDLE WHORL? STATISTICAL ANALYSES AS A METHOD OF DISTINGUISHING THE TWO TYPES OF FINDS

Abstract author(s): Chub, Nataliia (RGK - Romano-Germanic Commission DAI)

Abstract format: Oral

Wheel models are an object category that evidences the knowledge of the function of the wheel within a particular prehistoric community. This makes them a valuable source for the investigation of the innovation of the wagon. However, it is not always possible to distinguish wheel models from other categories of finds. While wheel models with a more or less obvious wheel hub evidence the knowledge of real prototypes relatively clearly, the interpretation of the objects with other shapes as wheel models is very often not sure, as they might represent other object categories as well. Especially the spindle whorls are most likely to be misinterpreted as wheel models.

Objects which can be interpreted as wheel models are known from the area of the Copper Age Cucuteni-Trypillia culture. However, very few of these objects have a definite wheel hub. Observations of the context of the finds, which could support this interpretation, are rare as well. Are there any other possibilities to distinguish these two categories of finds?

In my investigations on the innovation of the wagon in the Trypillia culture, I have applied statistical analysis with this objective. In my paper I will present the results of this analysis and discuss the potentials and the limitations of this method. On the basis of this investigation I will draw a conclusion whether the wheel-shaped objects of the Trypillia culture really indicate the innovation of the wagon in the area of this culture.

9 DOES COLOR OF THE NEOLITHIC MATERIAL OBJECTS MATTER?

Abstract author(s): Balaban, Radmila (Faculty of Philosophy, Department of Archaeology, University of Belgrade)

Abstract format: Oral

The aim of this paper is to provide a possible new interpretation of the role of small objects made of nephrite and/or jadeite, which originated from 14 Neolithic sites (6200/6000-4600/4500 cal BC) on the territory of contemporary Serbia. There are about 100 items of different shapes (axes, chisels, rings, pendants), of small dimensions (between 3-8 cm), made of green stone.

In Serbian archaeology, small green objects had for a long time been considered beautiful and therefore necessary to be found in museums exhibits, while more serious analyzes remained almost on the margins of scientific discussions. Changes in the interpretations of these objects in the Serbian archaeological literature have occurred since the 1980s. Determining the raw materials for making objects and detecting the natural source opened new questions concerning the acquisition of small items. However, the question of symbolism and meaning of this archaeological material in the context of the role that they could have had in the societies that procured, made and used them, remained open. Also, can the color of an object, along with its dimensions, be considered as one of the most important factors of their value and importance?

Why is the emphasis on green important? As Michel Pastoureau (2015) states, production of green paint or pigment was almost impossible in the past (especially in prehistory), and attempts of its production began in ancient Egypt, but it only succeeded from the period of the ancient Rome. In that period, they came up with the solution to soak copper plates in wine to create a green pigment. Thus, during the Neolithic, the only possibility to possess a green object was restricted to the natural resources.

10 MINIATURIZING THE BODIES IN THE NEOLITHIC BALKANS

Abstract author(s): Naumov, Goce (Center for Prehistoric Research / Goce Delčev University)

Abstract format: Oral

The Neolithic Balkans are well studied in terms of the Neolithization process and the material remains of the first farming societies. A number of fieldwork and material studies provided an abundance of anthropomorphic, zoomorphic and architectural representations

that demonstrate the symbolic realm of the communities inhabiting this region. A variety of figurines, vessels, models or stamps with human and animal features indicate the complexity of symbolic potency these societies had along with the intramural burials and deposition of animal bones that evidence its involvement in the rituals. Having in mind this spectrum of images and rituals the imagery and performative aspects of its components should be considered. In this regard the small dimensions of these representations should be emphasized as they have significant role in how these items were used and perceived in a variety of actions in which they were involved. Therefore the concept of miniaturism is inevitable to be explored in relationship to the exceptionally small and stylized figural images in the Neolithic. The deliberate reduction of features and preference of minute objects, as well as the actions performed with them will be highlighted in this presentation in order to elaborate the perspectives of symbolic embodiment of the first farming societies in this region.

11 TINY WORLD AND NEOLITHIC SOCIETY: NEW INSIGHT FROM THE HOUSE MODEL OF PLATIA MAGOULA ZARKOU/WESTERN THESSALY, GREECE

Abstract author(s): Alram, Eva (Mykenische Kommission, Osterr. Akademie D Wissenschaft) - Cveček, Sabina (Austrian Archaeological Institute)

Abstract format: Oral

In the course of the Platia Magoula Zarkou publication project, the well-known house model and its contents have been re-studied, using a 3D scanner. Furthermore, the restudy of the stratigraphy of the site gives new insight into its date at about 5600 calBC and its deposition.

As a result, the most homogeneously produced figurines and the house model belong to a special set produced for a special kind of arrangement and deposition. So, the size, decoration and position of each object in the house model had a certain meaning, from the very beginning of their production, and for sure at the moment of their placement in the container and its deposition.

Furthermore, this house model and the figurines give a most detailed picture of a social group living in a Middle to early Late Neolithic household in the area of the Southern Balkans. The spatial formation and the differences in shape and size most likely relate to the different ages and/or the horizontal social position of the individuals represented by the figurines. So, their containment within the same house model shows them as members of the same household, consisting of an extended family as well as people connected to them by their activities, not necessarily only through kinship.

The house model also points to the important role of women in the household. It has been suggested that this demonstrates that the role of women in society was more active than the one of men. However, this is opposed to the representation of well-decorated men sitting on stools who may have had their major task outside the house. Therefore, from this effigy, we should not conclude a matriarchal society, but we should also think of women playing an important role in household societies with a patrilinear social background.

12 TRIPOLYE & VINCA: HISTORICAL CONTEXT OF REALISTIC CLAY MINIATURES

Abstract author(s): Shatilo, Liudmyla (Institut fuer Ur- und Fruehgeschichte Kiel; Institute of Archaeology NASU) - Hofmann, Robert (Kiel University)

Abstract format: Oral

Our presentation deals with the emergence and disappearance of representations with realistic characteristics and aims to reconstruct their historical context. We are focusing on prehistoric periods and two different case studies - more precisely on objects from Copper Age Tripolye settlements of the forest-steppe zone east of the Carpathians and from the Late Neolithic tell Vinča-Belo Brdo on the middle reaches of the Danube. We analyse various objects with 'realistic' images, associated mainly with clay miniatures. For Tripolye, we focus on house models, sledge models, images of equipment for animal use on the zoomorphic objects (figurines, vessels etc.), 'realistic modelled' faces of anthropomorphic figures, and images on anthropomorphic figurines (hairstyles and accessories for them, necklaces, footwear and clothes). Based on the latest findings on chronology, we are attempting to trace the mentioned realistic features in time and space by means of quantifications and mapping. Additionally, we investigate the size development of anthropomorphic figurines. In the case study of Vinča, the frequency of realistic plastic features in the different depths of the tell stratigraphy are put in relation to the total number of figurines and the historical dynamics of the late Neolithic societies. The consideration of different material categories showed that objects with 'realistic' characteristics mainly occur in certain periods and geographical regions that are characterized by specific historical developments. These include high population densities in large agglomerated settlements, increased innovativeness, intensive interaction in densified far-reaching communication and exchange networks.

13 MINIATURE IMAGERY OF ÇATALHÖYÜK WEST MOUND

Abstract author(s): Biehl, Peter F (University at Buffalo, SUNY) - Naumov, Goce (Goce Delcev University of Štip)

Abstract format: Oral

Çatalhöyük is one of the most well-known and important Neolithic and Chalcolithic sites in Western Eurasia and the Middle East. Settlement at the site encompasses two separate tell mounds known Çatalhöyük East and Çatalhöyük West, with a potentially significant overlap between the occupation of the two mounds, starting in the late seventh millennium BC. This paper discusses

the anthropomorphic and zoomorphic imagery from the Early Chalcolithic (6,000-5,500 cal BC) West Mound in Çatalhöyük in Central Anatolia, and scrutinizes the concept of miniaturization in general, and the difference it embodies in two- and three-dimensional representations in the form of figurines, potstands and painted pottery. Furthermore, the paper will explore how we might be able to connect singular images with representations of multiple images on painted pottery, and how this might help us to come to a closer understanding of the meaning and function of this miniature imagery in early farming societies.

14 „THE MICRO-UNIVERSE” OF THE HUMAN COMMUNITIES BELONGING TO THE PRECUCUTENI-CUCUTENI-TRIPOLYE CULTURAL COMPLEX. BRIEF ANALYSIS

Abstract author(s): Preoteasa, Constantin - Nicola, Ciprian-Dorin (Neamț National Museum Complex)

Abstract format: Oral

Remarkable for the quantity, quality and diversity of the vestiges within its settlements, the Precucuteni-Cucuteni-Tripolye cultural complex (ca. 5000-3500 BC) presents in its inventory also miniatures (with a rather low frequency) that reflect material and spiritual life of the human communities during the Chalcolithic.

Often considered as objects of prestige, with cultic or artistic value, made by specialized craftsmen, the miniatures were also included in the hoards or cult complexes, thus emphasizing their special importance. The artefacts for daily use are not missing, also.

Some categories of miniatures are present throughout the evolution of this civilization (vessels, zoomorphic figurines, anthropomorphic statuettes, sanctuary-models), while others are found only in certain chronological sequences: Precucuteni / Tripolye A – Cucuteni A / Tripolye BI (votive axes, pintaderas, cones, discs, rondels, tablets, thrones, monoxyls, ornaments, en violon idols, rhyta) or Cucuteni A-B / Tripolye BII – Cucuteni B / Tripolye CI (sleighs).

The variety of raw materials from which the miniatures were made (clay, bone, different rocks, copper, gold, shells, seeds) allows a wide range of analyses, which can provide important data from techno-typological and functional points of view.

15 ANIMATING AN INANIMATE WORLD: FROM IMAGES AS PHYSICAL ENTITIES TO TANGIBLE OR INTANGIBLE REFERENTS AND NARRATIVES

Abstract author(s): Marangou, Christina (Independent researcher)

Abstract format: Oral

The Neolithic and Eneolithic (Chalcolithic) material world has been represented physically in miniature in various concrete ways. Imitated originals, comprising living beings -human, non-human and otherwise-, as well as artefacts and structures, may co-exist in an ensemble of similar or different represented subjects. However, all copies, even if in the same material, would not always have been used together, while isolated examples also occur. Therefore, all themes and specific contexts were neither necessarily interconnected, nor inevitably forming and comprising miniaturized sets. Moreover, it could be implied either that a missing theme/missing prototype was actually absent, or that presumed originals had not purposely been incarnated in miniature. In fact, not only presence would be important, possibly reflecting the referents' real or imagined occurrence, but also absence of miniaturized themes might be significant.

Conversely, it cannot be excluded that present physical entities were not imitations of reality, but rather materializations of fictional beings, things or associations. Therefore it has to be explored which themes and/or depictions were selected, which of them were correlated, under which circumstances and in what associations or interactions with other images and concrete surroundings, but also with the world(s) of their originals. Obviously, images have their own existence, presumably distinct from their prototypes' apparent or alleged ways of life.

As expected, in the Neolithic and Chalcolithic periods substantial connotations and inferences that would have offered indubitably meaningful readings of miniature representations are lacking. Surviving material and contextual evidence from Greece and neighbouring regions, as well as anthropological and social considerations may suggest conceivable working hypotheses and research perspectives. Among other possible approaches, potential interpretative directions of miniature images might imply alleged fictional or real referents, but also an assumed reality, with possible allusions to metaphorical performances or narratives conceived by the humans behind.

515 NEW REALITIES? A CRITICAL APPROACH TO RECREATING OBJECTS FOR EXAMINING AND PRESENTING THE PAST

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Miller Bonney, Emily (California State University Fullerton) - Adams, Sophia (SUERC, University of Glasgow)

Format: Session with presentation of 6 slides in 6 minutes

The advent of 3-D printers, experimental archaeology, cultural heritage parks, community archaeology and even Virtual Reality and archaeological computer games have created new ways of exploring and thinking about the past. These processes of replicating, reproducing and recreating provide unique ways for archaeologists and students to investigate how people engaged with materials and artefacts across time. While we can make multiple copies of an artefact with a 3-D printer to take the past into the schoolroom we can also attempt to revive the techniques of the past as a way of replicating not just the object but the practice. Reproduction

is no longer just about filling museum shops but about extending the life of the object. At the same time all these activities risk separating the object from its cultural context. If we turn the bust of Nefertiti into a t-shirt design or a piece of street art, what are the consequences for the original? How does that prototype now fit into our present? At the same time can such replicas provide ways to remedy colonial appropriations retaining the replica in the museum where the plunder was housed and returning the original to the descendants of that first crafter? From resources for teaching to tools for analysis this session encourages presenters to take a critical approach to different types of recreated objects in presenting and discussing the past. In papers of no more than six minutes in length and using only six slides participants are invited to reflect on the issues raised by the reproduction of the past and to consider doing so by focusing on a single object.

ABSTRACTS:

1 REPRODUCING THE PAST IN MULTIPLES: SHAPING PAST AND PRESENT NARRATIVES

Abstract author(s): Miller Bonney, Emily (California State University Fullerton)

Abstract format: Oral

In this session we reflect on reproduction as ways for thinking about how people have engaged with materials and artefacts across time, yet in many respects this not a new issue. In 1901 Arthur Evans excavating the site of the palace at Knossos on Crete found fragments of a faience figurine for which only the torso and the upper hips were preserved. The raised right hand appeared to hold a bit of cord. Twenty-five years later in the wake of significant restorations the fragment emerged as the snake-wielding votary of Evans's Snake Goddess from the Temple repositories. Though only designated as a votary the figure has quickly superseded the Goddess in power and prevalence and has become one of a half dozen iconic images for the Bronze Age culture of Crete, the so-called Minoans. Replicated in a broad array of media including Barbie dolls and earrings the figure even made an appearance at the opening ceremonies of the Olympic games in Athens and is a foundational icon for various iterations of the goddess movement such as the Ariadne Institute. She has become the Snake Goddess in the popular imagination. The journey of this fragment calls us to reflect on the power of recreations to recast the past in both trivial and politically significant ways. The figurine was deployed not only to comment on a particular narrative of Minoan religion but was a device in tying Crete through Athens as the foundation of western civilization.

2 THE LINDHOLME TRACKWAY

Abstract author(s): Griffiths, Mark (Independent researcher)

Abstract format: Oral

In the winter of 2018 myself and Dr Henry Chapman were approached by Natural England to remake the Neolithic Lindholme trackway on their site on the Thorne Moors close to the location of the original find. Henry had worked on excavating the original after its discovery in 2004. One of the oldest trackways found in the UK it measured 50 metres long by 3 meters at its widest point. We would be working with members of Natural England and a team of around ten volunteers.

As we would be working with volunteers, and the wetland site was open to members of the public strict health and safety practices would need to be observed at all times. Henry and I wondered how we could create an authentic recreation of a two and a half thousand-year-old structure using flint axes yet make the process safe, inclusive and fun?

As the month's past, working on the bleak but beautiful moor, and the work on the trackway progressed, both Henry and I came to the conclusion that our preconceived ideas on the importance of the structure itself were starting to be challenged. The unforeseen importance working, sharing and forming bonds could be the true story behind the original Lindholme trackway.

3 FIT FOR A PRINCESS: RECREATING THE DOMESTIC SPACE OF KATARINA JAGELLONICA IN TURKU CASTLE, 1562

Abstract author(s): Gonzalez, Joseph (California State University, Fullerton)

Abstract format: Oral

Turku Castle was an important Swedish royal residence and the seat of the Duke of Finland, Prince Johan, 1556-1563. Considerable scholarship has been devoted to the reconstruction of the architectural layout of the castle during Johan's time and, to a certain extent, the appearance of his apartments. However, far less attention has been paid to the chambers of his wife, Princess Katarina Jagellonica. The inventory of the princess's dowry provides the opportunity to reconstruct the appearance of her apartments and to examine the ways in which the décor served to define a feminine space. Similarly, in an age when clothing, architecture, and interior design were all fields of carefully constructed rhetorical power, the interiors of a princess offer a glimpse into the construction of feminine royal power and offer insight into the ways that the apartments functioned as a ritual space where the princess and her ladies would have engaged in actions that contributed to the representation and exercise of that power.

- 4 **DINNER IS SERVED BUT WE ARE 250 YEARS LATE**
Abstract author(s): Reppo, Monika (University of Tartu)
Abstract format: Oral
 In 2020, a number of pottery and glass vessel fragments were found from a cellar on Toompea hill, Tallinn. Whilst processing the finds, it was discovered that a large number of the vessels can be reconstructed partially or fully. Perhaps these plates, bowls, bottles and drinking glasses once formed a high dinner set? What did dinnertime look like in this upper-class household? Wouldn't it be wonderful to know how it was all laid out? Reconstructing vessels from fragments and using editing software to rebuild the missing parts, a potential dinner scene from the second half of the 18th century is recreated. From discarded fragments to ornamented manganese delft plates, bowls and platters, British creamware plates, glazed redware bowls, delicate porcelain cups and saucers to glass bottles, tumblers and stemware, the table is set. Zooarchaeological remains allow us to show what meats are on offer. Some storage vessels hint at other food options. But what is missing? What are the obstacles? How much is fantasy and how much can we plausibly recreate? This paper reflects on the challenges of recreating a Czarist Russian high society dinner scene.
- 5 **VR GAME SIMULATION OF A 'GULAG CAMP' AS AN EFFECTIVE EDUCATIONAL TOOL: REFLECTION ON THE CRITICAL STAGES OF DEVELOPMENT**
Abstract author(s): Holata, Lukáš (University of South Bohemia; Gulag.cz) - Brošta, Josef - Černoušek, Štěpán (Gulag.cz) - Novik, Andrej (Scio)
Abstract format: Oral
 The paper will provide a critical reflection on developing an educational tool using the 3D visualization of the Gulag camp. Specifically, game simulations in Virtual Reality are a highly effective way to provide contemporaries (and young generations especially) with an authentic 'insight into the past' and thus offer them an (almost) real impression and experience with the restrictions of totalitarian regimes. Such an effort responds to a long-standing critique of the teaching 20th-century history, which is reflected in the young generation's knowledge and attitudes. At the same time, the curtailment of democracy is re-emerging issue in Central and Eastern Europe. However, creating a truly effective learning model widely used in schools is an extremely challenging task. Its developing process consists of three critical stages. 1) Gulag camp reconstruction: it is based on the archaeological survey and documentation of the correctional labour camp's remnants – unique archaeological sites that are in few cases remarkably well-preserved in Siberian taiga and tundra. 2) Recreation of the camp's everyday life: especially prisoner's memoirs are exploited to add all living aspects and original dynamics into the camp scenery. Nevertheless, both stages have considerable implications in archaeological theory and methodology, such as structural vs. eventful approach, theoretical modelling, transformation processes, or de-facto refuse. 3) Integration with the pedagogy, didactics, and ethics state-of-the-art to validate the game simulation content and ensure its relevance to education.
- 6 **GOING ROUND IN CIRCLES: DIGITALLY RECREATING EARLY BRONZE AGE AEGEAN ROLLER SEALS**
Abstract author(s): Finlayson, Sarah (Universität Heidelberg)
Abstract format: Oral
 Roller seals made of clay or wood were used relatively widely in Early Bronze Age Greece to decorate hearths and pithoi; they were a part of the aesthetic enrichment of everyday objects, their patterns of use across mainland Greece giving us an insight into the movements of travelling potters and the choices of their customers.
 Only two fragments of a terracotta roller have survived, but we can derive its likely original dimensions, as well as get some idea of the clearly handmade, rather wobbly nature of these objects.
 The Corpus of Minoan and Mycenaean Seals, University of Heidelberg, holds casts of one of these fragments, as well as a range of casts of roller seal impressions; as part of our ongoing research into Aegean sealing practices in the Erkon3D project, we have scanned a selection of these impression casts, in order to digitally recreate the size and shape of the roller seals used to make them.
 These digital objects have been 3D-printed, and we are now using the modern replicas to explore how to handle a roller seal, making impressions that can be compared to the originals' casts.
 From both digital and experimental archaeology perspectives, this kind of 'closing the loop', from impression to object and back again, is innovative and exciting; it enables us to recreate the long-gone artefacts from the material traces they left behind, as well as providing to-scale and accurately replicated objects for experimental use.
- 7 **EXPLORING TECHNOLOGICAL VARIABILITY OF LONG-HANDLED COMBS AND THE IMPACT ON ANALYTICAL METHODOLOGIES**
Abstract author(s): Beamer, Jennifer (University of Leicester)
Abstract format: Oral
 Experimental archaeology affords the opportunity to use replicas of archaeological objects without risking damage to the original artefacts. In recent experiments examining the role of textile tools in the operational sequence of Iron Age cloth production, three long-handled combs made of antler were commissioned. One nearly complete comb from Danebury hillfort, Hampshire, UK, was

selected to serve as the model. Though the craftsperson was instructed to make a comb with specific parameters, the use of two thicknesses of saws for cutting the tines resulted in one comb appearing visually different. The following presentation discusses the impact of this decision at the time of crafting the comb in terms of functionality. Such a decision may influence the suitability of combs for the intended function, which can impact the nature of use-wear. The propagation of this effect is problematic for the analytical methods designed to investigate functional features of archaeological examples. Furthermore, assessing technological variation with a larger comb assemblage may produce misleading results.

- 8 **"OH... BUT IT LOOKS SO MODERN AND COLOURFUL?" – CLOTHING AND EXPECTATIONS OF ATTENDEES AT PREHISTORIC LIVING HISTORY EVENTS**
Abstract author(s): Girotto, Chiara (Ludwig-Maximilians-University Munich)
Abstract format: Oral
 Creating functional prehistoric attires for museum events is always a challenging task. Whilst complete ensembles have survived from the Nordic Bronze Age, the same cannot be said for the Central European Urnfield Culture. Whilst textile's survivability is generally limited due to their organic nature, the predominant burial custom of the time – cremation – complicates the matter. Drawing inspiration from analogies and the most contemporaneous evidence the goal is to create clothing that is functional with the personal adornments recovered from graves whilst embracing the little textile evidence that has survived.
 Certainly not helped by depictions of the Bronze Age, or Prehistory in general on film many visitors at such events presume these reconstructions to be all natural colours, saggy and generally unflattering. In my short presentation I want to talk about the impact of clothing as a background for reconstructed artefacts and people's perception of the past. I wish to focus my presentation on a dress based on a reconstructional drawing by Bartel & Voss 2005. This rare inhumation grave in the Urnfield Culture Cemetery of Grunfeld (Germany) offered new insights as the burial attire left an impression in the sandy soil. As most remaining textiles of this culture were dyed it was reconstructed in woad blue and tends to spark a lot of debate due to its perceived „modernity“. Whilst the original colour is not known and even the style is a debate this one example of a new reality highlights the importance of clothing and associated replicas to educate the public in an easily accessible and direct way.
- 9 **REPLICATION, REIMAGING AND THE REAL: THE CHANGING NARRATIVES OF A PREHISTORIC GODDESS'**
Abstract author(s): Gearey, Benjamin (Prehistoric Society) - Power, Orla-Peach (UCC)
Abstract format: Oral
 The Pallasboy Project was conceived of as an experimental project that engaged with the practical and physical aspects of the archaeological process but also incorporated digital methodologies and artistic approaches to augment these traditional modes of engagement. Drawing from an experienced multidisciplinary team of photographers, artists, crafters, archaeological and digital heritage specialists, The Pallasboy Project explored the process involved in the crafting of prehistoric wooden artefacts from a range of contexts across Europe. In this paper we present on the second phase of this project which focused on the recrafting of an Iron Age wooden figure known as 'The Ballachulish Goddess', sometimes known as the 'Goddess of the Straits', a wooden anthropomorphic figure unearthed in a peat bog at North Ballachulish in 1880. We consider the changing narratives and perspectives that surrounded this evocative figure in the digital and physical record, and consider the ephemeral passing values that each record can manifest.
- 10 **A DESIGN APPROACH TO IRON AGE TEXTILES: RECONSTRUCTING A WOVEN CLOAK FROM BURTON FLEMING, EAST YORKSHIRE**
Abstract author(s): Farley, Julia (British Museum)
Abstract format: Oral
 One of the most complex textile constructions from Iron Age Britain is represented by small fragments preserved in corrosion products on an iron brooch found in the grave of a young man (25–35) buried at Burton Fleming, East Yorkshire (c. 350 BC). The brooch was clasped behind his neck, and the textile fragments were likely part of a rectangular cloak which had been used to wrap the body and, perhaps, worn in life.
 This paper explores the design and construction of the cloak, including the spin direction of individual yarns, potential use of colour, and the creation of a complex weave structure incorporating a diamond twill centre and decorative border. The border was further embellished by the addition of embroidered inserts, one of the earliest known examples of embroidery in Britain. As part of this project, a large-scale version of the border pattern was re-created on a modern loom with commercial yarns. In addition, handspun yarn was used to create 1:1 scale samples of the diamond twill and border patterns, investigating the effect of twist direction on the visual and tactile properties of the finished textile.
 Approaching this exceptional textile from an overarching design perspective reveals the creative and carefully planned use of a wide range of materials and techniques, undoubtedly executed by an accomplished weaver (or weavers).

THE TANGY SMELL OF BRONZE: IGNITING THE SENSES TO LEARN WITH THE PAST

Abstract author(s): Adams, Sophia (University of Glasgow)

Abstract format: Oral

Thirty children sitting in a circle sniffing a Bronze Age bronze axe. They are learning about prehistory. At the same time I am encouraging the children to understand the world through all their senses. In this time of virtual classrooms and online learning we are becoming ever more reliant on the visual, often to the detriment of other senses. Feel the weight of an object, be careful of the sharpness of an edge, hear the rattle of components, smell the honey flavour of warm beeswax, hear the resonance of sonorous hollow bronze. This paper exalts in the value of connecting with the past through original objects and recreation work.

Increasingly archaeologists are engaging with the sensory aspects of past material culture from experimenting with recreating objects to incorporating the knowledge of makers, re-enactors and others who experience ancient artefacts in a physical way. We may provoke our senses in different ways dependent on experience, physical abilities, our environment and cultural conditioning. Our experience is not identical to those of people in past but neither is an illustration of axe-typology representative of how prehistoric people interacted with the world around them. Here I share with you how and why I think an approach that engages a range of senses improves our knowledge of and learning about the past.

FROM CRITIQUE TO SYNTHESIS: TRANSCENDING THE GENOMIC DIVIDE WITHIN ARCHAEOLOGY

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Makarewicz, Cheryl (Kiel University) - Nativ, Assaf (Zinman Institute of Archaeology, University of Haifa) - Furholt, Martin (Dept. of Archaeology, Conservation and History University of Oslo; Institute of Prehistoric and Protohistoric Archaeology, Kiel University)

Format: Discussion session

It is difficult to exaggerate the impact of 'ancient genomics' on our understanding of human prehistory. Offering a host of sweeping narratives on migration, conflict, ethnicity, and kinship, aDNA provides us with accounts that are easy to identify and empathize with. For many, it is a dream come true: prehistory reconfigured to a human scale.

However, these benefits of ancient DNA also resulted in the reproduction of old and often troubling narratives, burdened with heavy Eurocentric, racial, and biological flavors. They also tend to reduce human cultural dynamics to a handful of explanatory mechanisms, including mobility and population turnovers. Moreover, rather than producing durable and mutually-beneficial relations, the division of labor between the participating disciplines tends to create a hierarchical relationship, where archaeology is systematically relegated to a position of servitude: it provides the means, the conditions, and the conceptual framework, but the narrative is generated by the geneticists.

This session asks to initiate a mutually constructive dialogue between archaeologists and practitioners of ancient genomic, proteomic, and related sciences. This dialogue will earnestly address the deep-seated problems at hand and seek to build new explanatory frameworks to overcome them, fusing anthropologically-informed models with archaeological, archaeological science, and genomic data sets. In doing so, the aim is to refocus efforts on tracing mechanisms that underscore the formation, diversification, crystallization, and transformation of human behaviors. Among others, these may include experimentations with plant and animal management, translocation and uptake of domesticates, generation of new forms of socio-political organization, and the formation of urban communities. Ultimately, this session seeks to move beyond recent debates about the incommensurability of anthropological, archaeological, and genomic modes of knowledge in order to actively develop new venues that transcend these divides.

ABSTRACTS:

1 DOES THE ADNA - ARCHAEOLOGY DIALOGUE INVOLVE DIALOGUE AMONGST ARCHAEOLOGISTS FIRST?

Abstract author(s): Vander Linden, Marc (Bournemouth University)

Abstract format: Oral

The advent and ongoing generalisation of ancient DNA analyses in archaeology has triggered extensive discussions in the discipline, addressing both old and recent topics (examples include migration, demography, identity, kinship). In this sense, it is worth restating that, from a formal point of view, aDNA analyses inform us about biological evolution, defined here as change in frequency of DNA sequences in a population across several generations. Various processes either generate (e.g. mutation, migration) or sort this variation (e.g. natural selection, genetic drift) and archaeology has a potentially key role to play in elucidating the factors shaping these processes. However, this ambition will only be fulfilled if archaeologists rise above their - arguably important - personal research interests and rather invest into concerted efforts to integrate aDNA and archaeology in theoretical, methodological and ethical terms. These questions will be discussed through evaluation of recent examples drawn from the literature on Later European Prehistory.

BETWEEN TWO PREMISES OF HISTORY

Abstract author(s): Nativ, Assaf (University of Haifa)

Abstract format: Oral

Two premises seem to underly historical research. One asserts that the present provides access to the past; the other insists that the past constitutes the present. Both premises are equally valid, and most scholars are likely to hold both to be true. However, these premises articulate positions that are incommensurable and mutually exclusive. For one, time and temporality are properties that emerge out of an otherwise atemporal present. For the other, time is a pre-existing causal force with explanatory power. Moreover, while the former is geared towards the formulation of truthful propositions, the latter seeks to produce historical representations (à la Frank Ankersmith). For our discussion, I would like to suggest that we use the two premises as an analytical device to engage the question of archaeogenetics. For instance and in order to start the discussion going, we may begin with the hypothesis that many of archaeogenetics' struggles emerge from the effort to marry the two premises, consequently divulging dubious effects.

TRANSDISCIPLINARITY IN THE ARCHAEOGENETIC DISCOURSE

Abstract author(s): Furholt, Martin (University of Oslo)

Abstract format: Oral

From the perspective of a European archaeologist, the 'archaeogenetic revolution' has had a strong impact on our overall understanding of prehistory. It has created a lot of tensions, often along old science war demarcation lines, but has at the same time also sparked several initiatives for more transdisciplinary efforts. In the early days, the identification of migration processes on a continental scale was the most prominent as well as the most contentious topic. Misunderstandings about concepts, such as populations, cultures, and human migration caused heated exchanges, but also laid bare conceptual weaknesses which had troubled much of prehistoric research since the early days of Prehistoric Archaeology in the late 19th century. This led to a (partial) re-direction of the overall debate towards more regional and local reconstructions of social group composition, and forms of mobility between communities and thus a more differentiated debate about the concrete forms the summary term migration actually can take. At the same time, a broader spectrum of topics which include an integration of bioarchaeological and archaeological information is now being discussed, focusing on, among others, human biological relatedness and kinship systems, biological sex, gender and related social norms as well as human engagement with plants and animals. Key to these advancements is the willingness to engage in a transdisciplinary approach, which takes a more explicit and critical approach to the biological and social perspectives on past lived worlds and is willing to integrate the rich corpus of anthropological theory. This should be the model for the further advancement of the field of archaeogenetics.

CONSTRUCTING ANCIENT IDENTITIES WITH GENETICS AND ARCHAEOLOGY

Abstract author(s): Frieman, Catherine (Australian National University)

Abstract format: Oral

As a social archaeologist who frequently works closely with scientists, I am interested in the process through which scientific data is created, given meaning and used to interpret human practices or describe human society. A key critique of archaeogenetics (and one I've made myself) is that the credibility accorded to scientific data as an objective and higher form of truth mean that biologizing models of society drawn from naive interpretations of genomes and molecules—rather than people and relations—are taken to be indicative of a higher truth. Neither archaeologists nor geneticists, I believe, find this entirely satisfying. Moving forward, I think it will benefit both of our entwined disciplines to reconceive of archaeogenetic data as itself a product of social action (in this case the practice of science). All archaeological data is fragmented and biased – through taphonomy but also through our collection methods, the techniques of analysis and interpretation we apply and our own contemporary filter through which we are forced to interpret them. As we build up our sense of past people's identities, social networks, and relations, we are lucky to have genomic profiles to incorporate in our model building, but we can be more flexible in our use of these datasets in we accept they are just as fragmented and biased as the rest of the archaeological record.

FROM CRITIQUE TO SYNTHESIS VIA THEORY

Abstract author(s): Crellin, Rachel (University of Leicester)

Abstract format: Oral

Recent years we have seen a boom in both aDNA research in archaeology and (relatedly) critical papers highlighting problems that archaeologists have identified with the historical narratives that have emerged from aDNA research. There has been critique of the scale and scope of the narratives and of their political and ethical consequences in the present.

One of the key steps in developing more nuanced and sustainable narratives is to consider the theoretical foundations that underpin this research. All narratives about the past contain theoretical assumptions and frameworks – in the case of aDNA research these are rarely explicitly addressed. One of the key theoretical issues to address is the binary opposition between genetic and archaeological data in many of these papers: how do we write more complex and nuanced narratives where both sets of data can be given equal weight? How can we better entangle the two kinds of data together in our narratives whilst still being able to appreciate that

they may be revealing very different things? To move forward archaeologists and geneticists need to develop more collaborative relationships: ones where we make time to dialogue and to listen to each other.

6 ANCIENT LIVESTOCK GENOMICS AND HUMAN AGENCY

Abstract author(s): Bradley, Daniel - Daly, Kevin (Trinity College Dublin)

Abstract format: Oral

Genomic analysis of ancient domesticates provides a case of how genetics can be informed by and in turn inform archaeological hypotheses. For ancient livestock estimates of kinship, recent population size, and uniparental markers can help reveal the breeding patterns of ancient herds, and the relative fecundity of male and female animals. As control of breeding is a key element of domestication and herd management, genomics can thus help indicate how and when human societies in the past interacted with their partner species, and possible traits which they valued. One question is: can human agency be inferred with the help of genomic information? Along with human genomics the inference of migration requires detailed dialogue between archaeologists and geneticists. This term has a value-laden usage and particular history of interpretation in archaeology, with an entirely different tradition in genetics. One main issue in interdisciplinary study is the communication of which aspects of inference from new evidence are secure and which are speculative.

7 KINMAKING AS SOCIAL PRACTICE

Abstract author(s): Bruck, Joanna (University College Dublin)

Abstract format: Oral

This contribution picks apart the assumptions that underpin recent archaeogenetic studies of kinship and marriage in the past. Bio-genetic formulations of kinship are not only reductive, but are the legacy of our own colonial histories, and run the danger of imposing androcentric and heteronormative models of relating onto the past. In contrast, anthropological approaches argue not only that concepts of kinship are highly variable, but that kinmaking is a social process: practices such as exchange, ritual and the sharing of food are what create and maintain relationships between people who consider each other to be kin. So too Indigenous theorists describe the act of being in relation – which can encompass both human and non-human kin. The significance of these insights is that they call into question the relegation of archaeological data to a subsidiary position relative to genetic science. Archaeologists are, in fact, in a particularly good position to understand how kin were made in the past, for we can examine kinmaking as a technology that leaves material residues of a sort that are particularly amenable to archaeological analysis.

8 ANCIENT DNA AND ZOOARCHAEOLOGICAL APPROACHES TO ANIMAL DOMESTICATION

Abstract author(s): Brunson, Katherine (Wesleyan University)

Abstract format: Oral

Ancient DNA research on non-human animals is expanding rapidly. Ancient DNA provides access to genomic data covering hundreds of thousands of years, allowing for the investigation of evolutionary, ecological, social, and environmental questions in deep time, especially regarding the ways that humans have interacted with other species and modified past ecosystems and environments. In particular, the insights gained from paleogenomic studies have great potential to contribute to ongoing archaeological debates about the origins of domesticated species. As the discipline continues to develop, it will be critical to integrate ancient DNA data with other sources of information from zooarchaeology, stable isotope studies of diet, and archaeological context in order to address remaining methodological, ethical, and interpretive challenges. I will discuss possibilities for the future of ancient DNA studies of domesticated animals, focusing on the importance of zooarchaeological perspectives. Zooarchaeological collections harbor abundant sources of ancient DNA for studying past human-animal interactions, but must be sampled and analyzed critically and ethically.

9 USES AND ABUSES OF ANCIENT GENOMICS? TOWARDS A FULL INTEGRATION OF ADNA AND ARCHAEOLOGY

Abstract author(s): Fernandez, Eva (Durham University)

Abstract format: Oral

Thanks to recent advances in sequencing techniques, “ancient genomics” has become a mainstream tool to study the past of human populations and address long-standing debates in Archaeology. However, despite the obvious mutual benefits for both disciplines, they are far from being fully integrated. In a survey taken in 2018 about the role of ancient DNA in Archaeology among archaeologists at different stages of their career, the main issues arising were 1) Genomics papers being too technical and difficult to understand non-specialist audiences, 2) lack of engagement of geneticists with the archaeological background of samples and 3) destructive sampling and samples used as commodities in genetic studies. Among the actions highlighted to lessen the divide between both disciplines, were 1) Educate archaeologists in the uses and interpretations of ancient DNA, 2) Educate geneticists in the importance of the archaeological context for the interpretation of results, 3) Foster dialogue between experts in both disciplines through the organisation of courses and discussion forums, 4) Regulate the destructive nature of material and 5) Disclose all the material tested for DNA analysis, including negative results.

During this session I will use this survey as a starting point to identify areas of concern and think of actions to be taken to work towards a fully integration of ancient DNA and Archaeology.

10 ONTOLOGIES, ETHICS AND PERSPECTIVISM: CAN WE MAKE ARCHAEOGENETIC NARRATIVES MORE ANTHROPOLOGICAL?

Abstract author(s): Arbuckle, Benjamin (University of North Carolina)

Abstract format: Oral

This timely session addresses the uneasy and evolving relationship between archaeology and ancient genomics. I begin from the position that archaeology and ancient genomics are actually working rather well together but that both suffer from similar weaknesses linked to positivism, gender bias and Eurocentrism which have been explored in the archaeological literature since the 1980s. I focus on three related critiques which can be applied to both disciplines especially in the process of narrative construction. The first focuses on the ontological diversity (or lack thereof) deployed in building narratives about prehistory and the resulting categories we use to organize our temporally and spatially diverse data. What are the consequences of linking genomes to specific economic strategies (forager vs farmer) and geographic places when we know these variables are ever-changing? What do we miss by labeling nonhuman animals as either domestic or wild, hunted or herded? Second, what are the political implications of current trajectories of archaeogenetic explorations of prehistory? Whose narratives are being lifted up and celebrated as ‘human history’ and whose narratives remain untold on this platform? Moreover, who is involved in the collection, curation, and destructive analysis of the remains of human and nonhuman persons? Finally, what does acknowledgement of perspective do to the presentation of narratives which often seek to present the past as a series of ‘facts’. How can we situate genomic narratives, often perceived as the ‘real’ answers to human history, within understandings of the past which emphasize the importance of themes of multi-species co-creation, meaning-making, inequalities, social networks, etc?

11 ARCHAEOLOGY AND GENETICS – A NOTORIOUS TROUBLEMAKER OR A MATCH MADE IN HEAVEN?

Abstract author(s): Haak, Wolfgang (Max-Planck Institute for the Science of Human History; Max-Planck Institute for Evolutionary Anthropology)

Abstract format: Oral

In this discussion session I will provide an archaeogeneticist’s view on the developments revolving around the “genetics-infused narratives” over the last couple of years, in particular the ‘genomic’ era. Engaging with many colleagues and stakeholders in archaeology and anthropology, and genetics, I have naturally become aware of the multitude of different views, attitudes and approaches to science and the accumulation of knowledge in general. More often than not, an apparent rift between humanities and natural sciences has been brought forward as obvious reason to explain the discordance over archaeogenetic data, whereas I do agree with the session’s title that the genomic divide might lie elsewhere, and in fact might not be an insurmountable obstacle for future research. Critical engagement from all sides will be needed to build frameworks for a fully informed, holistic archaeology, that should not be afraid to touch on highly complex or sensitive topics, including the field’s own troubled past.

12 EXPLORING PRESTIGE, ENTITLEMENT AND HUMILITY WITHIN AND BETWEEN ACADEMIC DISCIPLINES

Abstract author(s): Larson, Greger (University of Oxford)

Abstract format: Oral

Conversations and controversies surrounding the relationships between archaeologists and geneticists tend to take as read a presumed hierarchy between the two fields. A common refrain holds that ancient geneticists vacuum up archaeological remains, apply fancy methods, arrive at the same conclusions, and then publish those results as if they are novel in higher profile journals than archaeologists tend to aspire to.

Power differentials, where one field is assumed to take precedence over another is a common phenomenon in academia writ large. Fighting against the perceived bias that favours animal studies over plants, Rieseberg coined the “zoological retardation index” which compared publication dates of major biological discoveries in plants and animals. In a review article he stated: “Major botanical advances often suffer the worst of fates - the scientific community ignores them until they are independently ‘discovered’ or confirmed by zoologists.” In the case of archaeology and genetics, it has been argued that at times, archaeologists have been complicit in their own subjugation by providing material to ancient genetics labs and in so doing, relinquishing claims to credit or contribution.

I am curious about how these dichotomies emerge, and more importantly, how the biases can become baked into, and internalised by practitioners on both sides of these divides. By explicitly considering this phenomenon, the hope is that we can identify and eliminate these emergent biases which will ultimately lead to better collaborations, deeper insights, and superior science.

'WHERE DO WE COME FROM? WHAT ARE WE? WHERE ARE WE GOING?': ARCHAEOLOGY, ARCHAEOGENETICS, AND ARCHAEOLOGICAL SCIENCE FUTURES

Abstract author(s): Makarewicz, Cheryl (Kiel University)

Abstract format: Oral

A tension exists between genomic narratives, constructed from datasets generated independently of theoretically-informed model building and hypothesis testing, and archaeological discourses that variably participate in often divergent anthropological theoretical currents while simultaneously attempting, with varying degrees of success, to draw together a wealth of multi-scalar datasets derived from the stratigraphic, material cultural, faunal, botanical, and biomolecular records. This unease is further exacerbated by real or perceived differences in how archaeogenetics and archaeology incorporate local communities and cultural heritage issues into their research programmes, realize the potential of new practitioners from countries where laboratory and funding opportunities may be limited, and address concerns about the commodification of human skeletal resources.

These debates between archaeology and archaeogenetics have been stridently vocalized on both sides, garnering much attention within the academy and in the public sphere, but they mirror more silent currents that churn deep within the archaeological sciences as whole. The archaeological sciences collectively achieves new methodological advancements at an increasingly quickened pace which increases the analytical resolution of dietary, mobility, and technological histories to dizzying heights, but appear to abet picayune particularism that stymies broader discourses on human evolution and cultural dynamics.

This discussion hopes to help decipher the disquiet between archaeology, archaeogenomics, and other archaeological sciences by tracing 'where we come from' in terms of our theoretical foundations, remembering 'what are we' - anthropologists interested in understanding 'how' and 'why' novel human behavioural strategies emerge, intensify or disappear, and figuring out 'where are we going' - what pathways can we take that will build a more integrated Archaeology and ensure our collective archaeological, archaeogenetic, and archaeological science futures?

CONSIDER THE COLLECTIONS: RETHINKING APPROACHES TO COLONIAL MUSEUMS FOR THE 21ST CENTURY

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Boza Cuadros, María Fernanda (Museum am Rotherbaum - Kulturen und Künste der Welt; Centro Peruano de Arqueología Marítima y Subacuática) - Lans, Aja (Syracuse University)

Format: Regular session

Museums across Europe and other parts of the world house archaeological and ethnographic collections that are embedded in decades-long reifications of the colonial world order and racist human hierarchies. More recently, debates have raised questions regarding the positionality of museums, the authority of curators, and the legitimacy of retaining certain collections in detriment of descendant communities calling for their repatriation. Within a context of widespread political unrest, global pandemics, and a looming climate catastrophe, visions of reparative justice must include deep reflections on the future of museums and their collections and the questions that researchers ask of them, as well as the role that restitutions of cultural goods play in these scenarios. At this juncture, museums should stop being mere reflections of their context, and instead embrace an active role in shaping anti-colonial, anti-racist and sustainable future agendas. The papers in this session take these ideas to task, and critically re-consider museum collections, their origins and their legacies. Importantly, the future of museum-based research is portrayed for its potential to aid in the disarticulation of colonialism in the years to come. We raise here new questions, including who gets to conduct research, and who grants permission to conduct it? Who decides what artifacts are to be repatriated, reburied, and displayed? How do research methodologies incorporate decolonial objectives? And, how do partners interact equitably in the context of a museum?

ABSTRACTS:

1 THE NATIONAL MUSEUM OF ARCHAEOLOGY (MUNA) IN PERU: A WAY FORWARD FOR OVERCOMING COLONIALIST AND NATIONALIST ENTANGLEMENTS?

Abstract author(s): Uribe Chinen, Claudia (University of Tsukuba)

Abstract format: Oral

This paper discusses a possible paradigm shift potentially represented by the project of the National Museum of Archaeology (MUNA) amid the celebrations of the Bicentennial of the Peruvian Independence. The history of National Museums in Peru demonstrates a close relationship with nation-building processes and State-run initiatives to glorify the nation through the make-up and display of a past of grandeur. Since the beginning of the Republican era in Peru in the early 19th century, National Museums officially functioned as the temples of the national identity and the public gates to encounter the origins of the modern nation-state in the prehispanic past as revealed by archaeology. Prehispanic objects represented the symbolic capital of the national being, which systematically justified the symbiotic relationship of museums and archaeology, and their entangled dimensions of colonialism and nationalism, within national agendas. However, nowadays the cultural agenda calls for awareness on cultural diversity, anti-racism and sustainability. Therefore, a reflexive position towards the praxis and roles of museums, and archaeology, is more than a priority.

I argue that the ongoing project of the MUNA holds a particular momentum to overcome past injustices in terms of culture, heritage and history, where the centralism of the 'othered', stereotyped and exoticized cultures of the prehispanic past legitimized invisibility, racism and marginalization. A National Museum of Archaeology in a reality like Peru may ultimately provide the means to raise awareness and a sensitive lens to understand cultural diversity and reconcile a pluricultural society.

DECOLONIZING THE AFRICAN COLLECTIONS AT MOA: FROM PROJECT TO PROCESS

Abstract author(s): Porto, Nuno (Museum of Anthropology - University of British Columbia)

Abstract format: Oral

Decolonizing the African Collections and Displays at the University of British Columbia Museum of Anthropology is a two-year project designed to re-write catalogue entries for the museum's African Collections, while training undergraduate students in object based, museum-oriented scholar research. Along 4 terms, working with 34 UBC undergraduate students, the project has consistently refined decolonial gestures, epistemologies and ethics, drafting new understandings and new horizons of museum practice and curatorship, while promoting an experimental academic practice based in forms symmetrical authority and empowerment of indigenous knowledge producers.

On this paper I will focus on the transformative nature of this project as a practice that has called for a reconceptualization three key concepts of museum culture. One: that collections are forms of social relations materialized in things and must be addressed as such. Two: that cataloguing is by definition an open-ended process, because catalogue entries refer to dynamic and in-the-making social and historical entities. Three: that museums should act less as sites and more as hubs, experimenting and distributing forms of knowledge and practice structured by principles of social justice.

DECOLONIZING HUMAN REMAINS HOUSED IN MUSEUMS: APPLYING BLACK FEMINIST PERSPECTIVES TO THE HUNTINGTON COLLECTION

Abstract author(s): Lans, Aja (Syracuse University)

Abstract format: Oral

Human skeletal remains housed in museums have long been a cause of controversy. Many remains were sourced from marginalized populations, acquired through dubious means, and illustrate the slippage between dualisms such as subject/object. In addition to pathways for repatriation and reconciliation, I argue that to decolonize such collections, curators and anthropologists must engage with scholarly contributions from people of color, especially Black women. Work must also be done to actively diversify the academy and encourage the perspectives of individuals with multiple-consciousnesses. To illustrate this, I reflect upon my work with the National Museum of Natural History's Huntington Collection, which originally consisted of the skeletal remains of some 3600 individuals who died and were dissected in New York City between 1892 and 1920. More specifically, I consider the history of the collection and its namesake, Dr. George Sumner Huntington (1861-1927), the Smithsonian Institution and its benefactor, James Smithson (1765-1829), and the life and death of a Black British woman named Eleanor, whose remains are now curated in said collection. Using a black feminist framework, I explore their life histories and postmortem careers in an effort to decolonize this collection and to offer new perspectives on human remains curated in museums.

PATHS TOWARDS WIDENING APPROACHES: SELK'NAM ANCESTORS, REPRESENTATIVES AND RESEARCHERS

Abstract author(s): Schattke, Constanze (University of Vienna; Natural History Museum Vienna) - Olivares, Fernanda - Molina, Nancy (Fundación Hach Saye) - Berner, Margit - Eggers, Sabine (Natural History Museum Vienna)

Abstract format: Oral

When provenance research is initiated in a museum, worlds sometimes collide. This happens especially if there is little will to integrate new world views. Herein we present an example of a proactive provenance research, where persons with different backgrounds, expertise and experience are finding a way to face and share distinct worldviews. Inspired by a summer course in the Department of Anthropology of the Natural History Museum, Vienna (DA-NHMW), the student among us (CS) decided to widen her biologically based studies to an interdisciplinary provenance approach that is now culminating in her master's studies. In a joint process with the museum researchers (SE and MB), a focus on the human remains from the Natives of Tierra del Fuego was chosen. Besides the details of the ancestors bones themselves, the provenance research is a centerpiece of her work. The researchers started to seek contact to representatives of Native groups. The descendants of the Selk'nam (NM and FO) and their group have yet to fight to have the genocide of their ancestors recognized by the Chilean government. They are struggling to preserve and protect the dignity of her ancestors. Now, researchers and representatives are cooperating while working through the history of the ancestors remains located in the DA-NHMW. How can all parties successfully work together? What are the difficulties to overcome - and where can we learn the most from each other? All of this will be addressed here from different perspectives. Can the widening of worldviews lead to successful joint endeavors?

5 FORMACIÓN DE COLECCIONES ARQUEOLÓGICAS Y ETNOGRÁFICAS: NOTAS SOBRE LAS TRAYECTORIAS DE OBJETOS LATINO-AMERICANOS

Abstract author(s): Bernal, Vanessa (Ecole du Louvre)

Abstract format: Oral

Los objetos arqueológicos y etnográficos procedentes de América Latina que encontramos actualmente en las salas de los museos europeos despiertan en el público una serie de preguntas, muchas de las cuales están relacionadas sólo al valor y a la función que estos artefactos desempeñaron en la vida de las culturas y sociedades ancestrales. Sin embargo, ¿imaginan estos visitantes en algún momento que dichos objetos han experimentado varias “vidas”? Cada una de estas “vidas” comienza en el momento de su fabricación y continúa incluso después de su (re)descubrimiento. Estas historias de vida, los diferentes viajes realizados hasta llegar a Europa, los lazos establecidos con diferentes personajes que intervinieron en sus desplazamientos y, especialmente, el momento en el cual ingresan a las instituciones museales europeas, son elementos importantes en el análisis y el estudio de la formación de colecciones extra-occidentales. En este contexto, esta investigación se enfoca en las trayectorias que han seguido cinco objetos precolombinos, procedentes de Perú y de México, que forman parte actualmente de las colecciones públicas de museos de Francia.

6 DISPLAY OR RETURN? A RAJA AMPAT ALTAR AND A MAORI WAKA

Abstract author(s): Veys, Fanny (National Museum of World Cultures)

Abstract format: Oral

A group of ten 19th-century figures from Mayalibit Bay on Waigeo, the largest of the Raja Ampat Islands in West Papua, Indonesia, featured prominently in the exhibition ‘A Sea of Islands’ at the Museum Volkenkunde, part of the National Museum of World Cultures (the Netherlands) that opened on 20 February 2020. It was the latest halt in the travels of the group after stopovers in Manokwari, Amsterdam, New York, London and Paris. One female member of the group even spent more than 80 years in Spain. That same year, the museum was celebrating its tenth anniversary of having custodianship over a Maori canoe, a waka. This long-term loan and active exchange resulted from the return of a tattooed head to the National Museum of New Zealand.

The paper will trace the politics behind displaying and returning, demonstrating that these two case studies are actually two sides of the same coin. A different answer to the question whether ancestral remains should be on display or should be returned can be equally enriching experiences for all parties involved. I will advocate for respect as the guiding principle when museums are making decisions around these contested objects.

7 THE SKULL IN THE ATTIC: PRACTICAL CONCERNS FOR UNEXPECTED FINDS IN MUSEUM COLLECTIONS

Abstract author(s): Boza Cuadros, Maria Fernanda (Museum am Rothenbaum - Kulturen und Künste der Welt; Centro Peruano de Arqueología Marítima y Subacuática) - Dau, Jamie (Museum am Rothenbaum - Kulturen und Künste der Welt)

Abstract format: Oral

Since 2017, the Museum am Rothenbaum – Kulturen und Künste der Welt (MARKK, Hamburg) has been undergoing a comprehensive repositioning process under new management. This includes, among other things, the critical examination of the museum’s own history and the reappraisal of its colonial entanglements and legacies. Quotidian tasks such as the inventory of previously neglected collections result on occasion in unexpected circumstances that raise new and critical questions. Here, we discuss one such scenario. On January 12, 2021, the partially mummified skull of a human being was discovered in one of the museum’s storage facilities during inventory procedures. At the time of its discovery, nothing was known about the provenance of these human remains other than limited information that it originally stems from Peru. In this paper, we present the current state of research based on the visual inspection and non-invasive examinations performed on the cranium, as well as the associated historical contextualization. We further elucidate on the potential ramifications of this case, including devising procedures consistent with the museum’s new ethical stances.

518 WORTH THE EFFORT: EVIDENCE OF PREHISTORIC CROSS-CRAFT INTERACTIONS

Theme: 6. Material culture studies and societies

Organisers: Dzhafezova, Tanya (University of Oxford) - Grębska-Kulow, Małgorzata (Regional Historical Museum - Blagoevgrad)

Format: Regular session

This session aims to stimulate a discussion on the theoretical and methodological premises for identification of cross-craft interactions. The latter will be considered in the context of various technical, technological and social developments in the Neolithic communities.

Finding evidence of the links between various prehistoric technologies is not always straightforward. However, it is probable that the highly-skilled and practical artisans would have saved their time and efforts in all possible ways, and at each stage of the production chain.

This may have referred to: (a) the coincidental use of the same raw-materials to make various categories of artefacts and decorations, (b) the specific techniques applied at different stages of the chaîne opératoire based on transferred knowledge and skills, (c) the successful approaches borrowed from other productions’ technological cycles, (d) the

handling of synchronous and common (firing) events for various objects production, amongst others. Yet, in so many cases, there is still a question to be resolved: how genuine cross-craft interactions could be detected?

The transfer of materials between different production cycles in prehistoric times is a well-known practice worldwide – e.g. figurines made of stone tools debitage, small finds made by application of specific architectural techniques; puncture approaches adopted from older technologies and adapted to new materials, etc. However, how we interpret these – as evidence of practicality, as results from technology transfer or as direct indicators of cross-technologies needs further debate.

We welcome papers and posters concerned with the detection of the interplay between different prehistoric techniques and technologies based on various raw-materials (e.g. clay, bone, flint, marble, organic materials, etc.), that explore cross-craft interactions in prehistoric context.

ABSTRACTS:

1 EVIDENCE OF TECHNOLOGICAL BORROWING IN THE NEOLITHIC OF THE VOLGA REGION

Abstract author(s): Doga, Natalia (-) - Vybornov, Alexander (-) - Gilyazov, Filat (-)

Abstract format: Oral

Complex technological borrowing in making ceramics and stone artifacts could only occur as a result of direct interaction between craftsmen from different cultures. The most ancient ceramics from the North Caspian Sea region are without ornament and made of silt with impurities. Crockery with different technology of production, shape and ornamentation, which are typical for potters of Surskaya culture, were found in these complexes. Borrowing of these techniques contributed to the development of the ceramic tradition of this area. The earliest ceramics in the Lower Volga region were made according to the North Caspian Sea formulas and the geometric microliths are similar in shape and processing to the complexes of the Northern Caspian region. Orlovskaya formula reached the forest-steppe Volga region and became a basis for technology formation of the Middle Volga culture ceramic tradition, i.e. ceramics made of silt with complex geometrical ornaments. Syncretic ceramics with a southern technology of production and northern typological features were discovered in the Orlovskaya culture. With the emergence of the Caspian culture, the technique of forced pressing, borrowed from the craftsmen of the Lower Don, became current in the steppe Volga region. The forward movement of the bearers of the Caspian culture to the south of the forest-steppe led to technological borrowing by the local population and the formation of the Samara culture. Technologies of jewelry making from wild boar’s tusk become common for the cultures of the Mariupol region. The local societies of the Kama culture borrowed from the newcomers of making a special design of the upper parts of the vessels, i.e. collar crockery and the technique of forced pressing. Arrowheads of Keltiminar-type appeared among bearers of culture with collar ceramics. Thus, the signs of technological borrowing indicate the active interaction of craftsmen in the Neolithic era.

2 THE LATE BRONZE AGE POTTERY MAKING IN THE SOUTHERN URALS: SRUBNAYA-ALAKUL CONTACTS AND CROSS-TECHNOLOGY INTERACTIONS

Abstract author(s): Mukhametdinov, Vadim (Bashkir state university)

Abstract format: Oral

In the Late Bronze Age, the Southern Urals is the area where Srubnaya and Alakul cultures meet. Having close origins (the Poltavka and the Abashevo cultures), subsistence patterns and systems of communication, they also share significantly similar material culture. This results in a very complicated cultural characterization of ceramics in the sites that belong to the zones of interaction. Respectively, it makes it difficult to explore the directionality and the dynamics of the interrelations.

Detailed analysis of pottery technology can still help solve some of the issues. On the basis of technological examination, the two groups bearing the typical characteristics of the Srubnaya and the Alakul culture were established. Then the ceramics from the ‘syncretic’ sites were analyzed, allowing us to deduce the changes that have occurred as a result of intercultural contacts.

The characteristic pottery traditions of the Srubnaya culture in the Middle Volga region were studied by N. Salugina, and those of Alakul in Central and Northern Kazakhstan – by V. Loman. Whereas the former associate with shell or grog added to the clay, the coiling technique and the bottom-and-wall approach; the latter reveals the addition of talc or grit, and the patch construction using convex-molds. Moreover, some common features were still less presented (shell temper used by the Alakul potters or the patch technique applied by the Srubnaya craftsmen).

The analysis showed that it is sometimes difficult to determine the Srubnaya or Alakul origin of pottery traditions at the ‘mixed’ sites and the data should be considered in the broader context, taking into account all materials from an archaeological complex.

3 CO-OPERATIVE LABOUR AND THE POOLING OF DIVIDUAL SKILLS

Abstract author(s): Chapman, John (Independent scholar) - Gaydarska, Bissierka (Durham University)

Abstract format: Oral

There is a sense that specialists in technological studies of Neolithic craft practices are more at home with the ‘chaîne opératoire’ itself than with the persons operationalizing those practices. In the 25 years since Igor Kopytoff’s ground-breaking chapter on the

biography of things, prehistorians have been more likely to work on object biographies than on the biographies of the persons making the things. In this paper, we look at the ways that Neolithic craftspersons worked through and materialised some key cognitive processes and explore the impact of 'Team Neolithic' on various crafts and their inter-relations with other crafts.

We assert that most of the significant innovations in the Neolithic, including mixed farming, building, weaving and metallurgy, required co-operative labour from groups of different genders and ages, thus combining the personal skills learnt by those individuals into a productive and effective practice. The integration of any team's variety of skills and knowledge would have led to the higher probability of cross-craft applications in the household context of maintenance activities.

These ideas are discussed in the context of the interplay of two sets of practices – rectangular practices (house-building and weaving) and rotary motion (spinning, bow-drill perforation, wheeled transport and even the lap-wheel). Husserl's characterization of building as a 'geometric praxis' is equally true of weaving, with successively more complex mathematical patterns required to make decorated cloth. To what extent did builders and weavers interact? The high level of labour required from all members of the family each day to create enough yarn for clothing made spinning the quintessential co-operative labour. Why did it take so long for spinners to transfer their understanding of rotary spindle-motion to stone-making and transport?

4 DISC BEADS OF THE EARLY NEOLITHIC: RAW MATERIALS AND MANUFACTURING TECHNOLOGIES

Abstract author(s): Boroneant, Adina (Vasile Pârvan Institute of Archaeology, Romanian Academy) - Mărgărit, Monica (Valahia University, Târgoviște)

Abstract format: Oral

Disc beads spread with the first farming communities in Europe but they seem to be quite rare in the archaeological record (perhaps related to excavation techniques) and details of their contexts have rarely been published. The present paper reviews the known finds from Romania and integrates them within the broader context of the Starčevo culture in particular, and the Early Neolithic in general. Various types of raw material were used for manufacturing such beads: shell, bone, stone and ceramic. Several Early Neolithic sites in Romania attributed to the Starčevo culture have yielded such beads. Similar finds occurred in other geographical regions covered by the Starcev culture. The number of such occurrences is small compared to the number of identified sites. Most likely this does not reflect the true archaeological situation but merely the state of publication. It is thus difficult to assess the significance of disc beads within a community, and their link to a particular social, age or gender group. Their use seems to have been connected with the everyday life of Early Neolithic communities in the Balkan and Carpathian regions, but also to funerary practices in Central Europe.

5 NEOLITHIC BEAD MANUFACTURING: CONTEXT, EXPERIMENT AND TECHNICAL INSIGHTS

Abstract author(s): Gurova, Maria (National Institute of Archaeology with Museum, Bulgarian Academy of Sciences) - Bonsall, Clive (School of History, Classics and Archaeology, University of Edinburgh)

Abstract format: Oral

Bulgarian prehistoric culture and the incomparable finds from the Varna cemetery (V mill. BC), in particular, offer some remarkable examples of craft specialization, including beads and necklaces made of various minerals. Their sophisticated manufacture and use of very hard materials such as carnelian and nephrite remain enigmatic from the technical point of view.

The Varna finds were part of a tradition of bead manufacturing that appeared in the Balkans more than a millennium earlier – at the beginning of the Neolithic. Archaeologically, two categories of objects are recognized as having been involved in prehistoric drilling activities as an element of craft specialization of various prestigious items production.

The first comprises toolkits of micropiercers found in the flint assemblages of several sites among which Kovachevo and Ilindentsi in southwest Bulgaria represent particularly interesting case studies. The morphological characteristics of the micropiercers and the contexts in which they occur suggest they were used for making perforations. Use-wear analysis of the large series of micropiercers from the above mentioned sites reveals used examples (with variable development of microtraces), pieces that were broken (possibly through utilisation), as well as unused examples.

The second category is represented by beads and other decorative and prestigious objects made of bone, shell, pottery and various rocks and minerals such as marble, serpentinite, malachite, nephrite and jadeitite.

This paper revisits the results of an experimental programme aimed at clarifying the various practical and technical aspects of disc bead production as represented in Southeast European Early Neolithic sites. These results shed light on various aspects of prehistoric technological skills, craft specialization and interaction, high level expertise vs common household activity, etc.

6 LITHIC AND OSSEOUS INDUSTRIES IN THE LATE NEOLITHIC: MUTUAL RELATIONS AND INTERCONNECTIONS

Abstract author(s): Vitezovic, Selena - Antonovic, Dragana - Dimic, Vidan (Institute of Archaeology, Belgrade)

Abstract format: Oral

Lithic and osseous industries represent very important technologies among Neolithic communities; they were principal raw materials for production of everyday tools, used also for decorative and other non-utilitarian objects. However, current archaeological practice in majority of projects is to sort portable finds according to their raw material and to study them separately, and this is why

wider studies of technological systems are very rare. In this paper, we will explore mutual relations and connections of the ground and abrasive stone and osseous technologies within the Late Neolithic Vinča culture in the central Balkan area (with particular focus on the assemblages from the sites of Vinča-Belo Brdo and Pločnik). Ground and abrasive stone tools were used for production of osseous artefacts; in fact, the abundance of abrasive stone tools is closely linked with the osseous technology, since abrasion was widely used technique for manufacturing and especially for repair of osseous tools. Osseous raw materials were, in turn, used for production of handles and hafts for stone axes, adzes, chisels, etc. There are multiple other aspects of mutual connection and inter-dependence: tool kits for certain activities and craft include both lithic and bone tools for diverse stages of production (for example, woodworking); there are cases of skeuomorphism – morphologically identical or similar artefacts produced from both lithic and osseous tools, such as small chisels, axes, etc. Tight connections between these two technologies show that traditions and innovations in one technology cannot be understood without the studies of the other, and that studies of technological systems are very much needed for comprehensive studies of prehistoric economy and craft production.

7 BONES, BRONZES AND OTHER STUFF. CROSS-CRAFT INTERACTIONS AT THE BRONZE/IRON AGE SETTLEMENT IN GRZYBIANY (POLAND)

Abstract author(s): Baron, Justyna (University of Wrocław)

Abstract format: Oral

The archaeological evidence produced by a small community living in a lake settlement in Grzybiany in SW Poland at the turn of the Bronze and Iron Age (8-6th c. BC) thrillingly illustrates interactions between various traditions and innovations. Due to wet environment, the site provided rich data on many everyday activities. We consider some of them to have been innovative (metallurgy) while the other to have represented stable, long-lasting, domestic traditions (pottery manufacturing, bone and antler processing) or even vanishing crafts (flint knapping). My theoretical model of cross-craft interactions assumed that dynamic development in one of the activities (such as the high-temperature technologies in metallurgy) must have influenced the other (such as the temperature in pottery firing).

The final interaction pattern was, however, far from the initial model. It showed that, even in a single settlement, we can observe differing dynamics of technological development depending on the type of worked raw material.

8 PECULIAR WHETSTONES FROM THE PREHISTORIC SITE OF KAIMENSKA CHUKA, BULGARIA

Abstract author(s): Hristov, Pavel (Regional Museum of History - Blagoevgrad)

Abstract format: Oral

The production and maintenance of everyday tools in prehistoric times often required gear specifically designed for the task. The multi surfaced elongated whetstones found during the excavations at Kaimenska Chuka, in the southwestern region of Bulgaria, are an example of a single piece of tool-making gear used for the production and maintenance of different tools employed during the daily routine of the prehistoric craftsman.

As stated above, each of the whetstones has at least a few working surfaces (usually between three and five), a feature which appears to be a testament to their regular use and importance for the inhabitants of the prehistoric village. With the exception of a few very large examples, most of the stones have a similar elongated shape. However, while some of them possess flat working surfaces used for the maintenance of tools with cutting edges, others have fullered sides most probably needed for production of bone awls and needles. Interestingly enough, a few of the whetstones have both flat and fullered sides, most certainly used for the working of different types of tools, and perhaps even tools made from different types of materials. Furthermore, the widest sections of the tapering fullers vary from thin (less than 1cm) to quite wide (about 3cm). These differences are undoubtedly related to different stages of bone tool production, and perhaps to the production of different types of bone tools designed for different purposes.

The research into these still insufficiently studied stone tools brings to light the prehistoric person's ingenuity of simplification and easing of everyday crafting activities.

9 STRANGE INHABITANTS OF PREHISTORIC HOUSES IN THE MIDDLE STRUMA VALLEY, SOUTHWEST BULGARIA

Abstract author(s): Kulow, Malgorzata (Regional Museum of History-Blagoevgrad)

Abstract format: Oral

In the traditional technique of building prehistoric houses on the Balkan Peninsula, clay mixed with organic substances (mainly chaff) is used for the construction of walls which gave them elasticity, greater stability, and at the same time lightness. It seems that this specific technology was not limited to house building but was also used to make certain items related to the interior of a house. These are specific human heads made of similar clay dough mixed with chaff. They were stationary, attached to an inner stake or beam, and only the front was intended for viewing. These figurines are larger than usual, with clearly defined eyes, lips and nose, apparently in order to be seen from afar. The faces of most of them are additionally decorated. These types of figurines have been found in several early Neolithic settlements in the Middle Struma valley, Southwestern Bulgaria: Kovachevo, Ilindentsi and Balgarchevo. A figurine of this type is also known from the site of Madzhari in Northern Macedonia. Through these specific items we touch

a hitherto unknown ritual and the intertwining of the intangible and tangible worlds by adapting similar technology in the manufacture of quite distinct objects but unified by the idea of the protection of the house and its inhabitants.

10 RED FROM BELOW: LATE NEOLITHIC HAEMATITE PIGMENT PRODUCTION AND RED PAINTED POTTERY IN WESTERN SYRMIA (NE CROATIA)

Abstract author(s): Botic, Katarina (Institute of Archaeology, Zagreb) - Buric, Marcel (Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb)

Abstract format: Oral

Dark and red pigment based decorations applied on ceramic vessels and other objects appeared very early in the Neolithic of the Balkans. Mostly manganese and iron based decorations, rarely cinnabar based, appear from the early stages of the Vinča culture as well. Over a century old theory of the production of cinnabar based colouring pigment in specially shaped ovens/kilns at the Vinča – Belo Brdo site is still debated today. Some recently published research indicates use of iron based ore in these ovens/kilns resulting in hematite colouring pigment as a final product, mostly used on vessels, while cinnabar pigment was confirmed mostly on ceramic figurines at the turn of the sixth to the fifth millennium BC.

New excavations at Bapska tell site (Western Syrmia, late Vinča and Sopot phases) in 2013 and subsequent years uncovered one of the similar ovens/kilns and the preliminary results show hematite traces in its interior as well. It was also suggested in the preliminary report that the bog iron could have been used as a source for this particular production. In this paper, we present a discussion about ore origin, production of pigment and techniques of its application on vessels and other ceramic objects at two sites (Bapska and Bršadin – Pašnjak pod selom) in the Western Syrmia region adding new data to the ongoing discussion.

11 INVESTIGATING TECHNOLOGICAL PROPERTIES OF BONE-TEMPERED CERAMICS IN PREHISTORIC EUROPE

Abstract author(s): Palacios, Olga (Laboratory of Quantitative Archaeology, Universitat Autònoma de Barcelona) - Hein, Anno (Institute of Nanosciences and Nanotechnology, National Center of Scientific Research 'Demokritos')

Abstract format: Oral

This study investigates the role of bone temper for the manufacture of ceramic vessels in the Neolithic period from a technological point of view. There is currently a vibrant debate in research surrounding the potential benefits and advantages of using particular tempers over others as Neolithic ceramics in Europe were tempered with both organic and inorganic materials. This variability and observed preferences are investigated from three different perspectives: the temper material's benefits during the manufacturing process (e.g. availability, easy to prepare), the technological properties that can provide to the ceramics (e.g. higher thermal shock, lower porosity) or the meaning and significance of using this material from a social perspective (e.g. social differentiation). The present study focuses on the second hypothesis and explores the potential mechanical and physical properties of bone temper as it is found across European prehistoric ceramics.

The principal objectives of this research are to define the technological properties of bone-tempered ceramics when different temperatures are applied and various tempering percentage is added. The ultimate goal is to explore whether a specific reason for adding this singular material to the clay can be identified and gain new insights into the role of temper on ceramics. To accomplish this, specimens mixed with bone material were prepared and standard material tests were performed for characterising thermo-mechanical properties of bone-tempered ceramics, such as strength, toughness and thermal conductivity. This study answers some questions regarding the thermo-mechanical properties of Neolithic tempering options and aims to contribute towards a further debate concerning the use of specific technologies and their potential cross-craft significance.

12 SEARCHING FOR THE RAW MATERIALS: THE EARLY NEOLITHIC QUARRYING FOR OCHRE AND OBSIDIAN

Abstract author(s): Kosciuk-Zalupka, Julia (Jagiellonian University)

Abstract format: Oral

The issue of mapping of the raw material quarries, together with their further juxtaposition to the prehistoric sites seems to create new challenges and paths of development in archaeology. Beside the general recognition of the geology of a terrain, the main issues would be: (1) assigning the quarry with the archaeological material and (2) assuming the frequency of utilizing such spots. It should also be kept in mind, that the raw materials could have been acquired due to an exchange action, if their spot of origin lies far from the site. Moreover, there could also be considered the role of the information flow on the best quarries in the vicinity.

In that context, the material from Aşıklı Höyük and Musular, in Turkey, were analyzed. Under consideration there were taken both: obsidian and ochre pieces. The main aim was to check, if those societies, living close by, were using the same quarries. Another aim was to ascertain, if the same group of people was capable of bringing both obsidian and ochre during a single quarrying event — that would be possible, if the outcrops were lying nearby. The final results showed, that the spatial proximity of those societies did not imply choosing of the same quarries, at least in the case of the pigments. On the contrary, the obsidian quarries were the same, localized in Nenezi Dağ and Göllüdağ.

13 THE COMPLEXITY OF SIMPLICITY: DECODING CROSS-CRAFT INTERACTIONS FROM EARLY NEOLITHIC BALKAN POTTERY

Abstract author(s): Dzhafzova, Tanya (University of Oxford)

Abstract format: Oral

Exploring why a pot was made the way it was, and the processes and people behind this, involves a detailed multi-layer and cross-disciplinary examination of preserved material remains. Considered within cultural, social, technological and environmental context, these allow for a better understanding of plain practicalities or more complex aspects such as: transfer of knowledge; level of experience and flexibility; oftentimes belonging and, possibly, personal/specific background, amongst the rest.

Understanding cross-craft interactions is thus essential for interpretation of Neolithic pottery production. Exemplifying the simple assumption that time and efforts would have been saved in all possible ways, however, may sometimes be more complicated. Here, the question of how to detect genuine cross-craft interactions is tackled by archaeometric analysis at macro- and micro-scale, using examples from Neolithic pottery production.

Going beyond the linear perspective, the analysis reveals not only a spectrum of choices (decision-making at different stages of the productive chain), but also the interplay between different prehistoric techniques, technologies, everyday and craft activities. Understanding 'transferable' knowledge and skills in such context thus broadens in a new way our research horizons.

*This project has received funding from the European Union's Horizon 2020 research and Innovation Programme under the Marie Skłodowska-Curie Grant Agreement No 798143.

520 INTEGRATING ALL DIMENSIONS: 3D-APPLICATIONS FROM EXCAVATION TO RESEARCH TO DISSEMINATION

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Hostettler, Marco (University of Bern, Institute of Archaeological Sciences, Prehistoric Archaeology; University of Bern, Walter Benjamin Kolleg, Graduate School of the Arts and Humanities) - Drummer, Clara (Orthodrone GmbH, Kiel) - Emmenegger, Lea (Freelancer) - Reich, Johannes - Stäheli, Corinne (University of Bern, Institute of Archaeological Sciences, Prehistoric Archaeology)

Format: Regular session

3D-technologies are increasingly shaping the way archaeologists work and think. The fact that 3D recording techniques are becoming part of the standard toolkit in archaeological fieldwork opens up enormous opportunities for research and public outreach. As archaeological excavations are seen to be destructive, conventional documentation techniques have been shaped over decades if not centuries to mitigate as much information loss as possible. This includes the development of fitting tools and workflows as well as best practices in archaeological data collection, long-term archiving, research and dissemination.

As new tools, 3D-Technologies need to be implemented into these existing best practices and workflows. In order to take full advantage of the new possibilities, we consider an integrated approach from the beginning of a project to be essential. This enables the successful implementation of 3D-technologies in all stages: it is not only important during fieldwork, but also later during research or public outreach. There, for instance, challenges concerning interoperability or quality may arise and have to be coped with. Also, the irreversibility of archaeological excavations has to be met with the functioning of long-term archiving of mostly large and complex datasets.

Despite the increasing implementation of 3D-technologies in everyday archaeological practice, the overall experience of knowing what decisions to make and how they will affect the later possibilities and limitations is still developing. Nevertheless, there are ever more successful projects showing how 3D-techniques can be fully integrated into archaeological practice.

This session aims to bring these examples of integrated research projects to a broader archaeological audience. As these potent documentation techniques have found their way into everyday practice, a broad dissemination and discussion of their possibilities and arising challenges is urgently needed.

ABSTRACTS:

1 CERAMICS 3D: DIGITAL DOCUMENTATION AND DISSEMINATION OF CERAMIC FINDS FROM GUADALUPE, HONDURAS

Abstract author(s): Fecher, Franziska (University of Zurich) - Lyons, Mike (University of Bonn; German Archaeological Institute) - Reindel, Markus (German Archaeological Institute) - Fux, Peter (Museum Rietberg Zurich; University of Zurich) - Mara, Hubert (Mainz University of Applied Sciences) - Bayer, Paul (University of Graz) - Gubler, Brigitte (Lucerne University of Applied Sciences and Arts)

Abstract format: Oral

In our project we use a digital approach for the 3D-documentation of ceramic finds from Guadalupe, Honduras, including low-cost structured light scanning and automated generation of profile drawings with the 3D software GigaMesh. By linking the 3D and con-

textual data to the open access Arachne object database of iDAI.world, the models are made accessible online in the iDAI 3D viewer. This results in an interactive ceramic catalog that can be used as a basis for future studies in the little explored region of northeast Honduras. Here, the documentation and illustration of finds in publications and their accessibility are particularly important, as there are hardly any representative and descriptive publications on the material culture to date. The investigations focus on the Cocal period (AD 1000-1525) coastal settlement of Guadalupe. Numerous well-preserved finds, especially pottery, were found during excavations. In order to document these on-site as efficiently as possible and to ensure usability for later off-site investigations, a workflow was developed that combines 3D technologies with traditional drawing techniques to achieve an optimal result in terms of quality and quantity.

2 ACCURACY AND MECHANICAL STRENGTH OF LATE PREHISTORY BALANCES: A 3D-MODELLING-BASED APPROACH

Abstract author(s): Poigt, Thibaud (UMR 5607 Aousonius - Univ. Bordeaux Montaigne; UMR 5608 TRACES - Univ. Toulouse Jean Jaurès) - Comte, Florent (Independent researcher)

Abstract format: Oral

This contribution aims to present the results of new 3D applications in the field of ancient metrologies. They bring insights about weighing precision and balances mechanical properties during the Late Bronze Age (LBA) in Western Europe. Northern France and Southern England share the particularity of providing tiny balance beams and weights dedicated to weigh small quantities. It is traditionally accepted that most of the Bronze Age weights found in Western Europe correspond roughly to a same practice built around one metrological system. Nevertheless, the deviations observed between several weights which should correspond to the same values in the metrological system raise questions about the accuracy of the Bronze Age balances.

This paper will present new mathematical and digital protocols – sensitivity analysis, 3D modelling, simulation, and finite element analysis – which highlight the main mechanical features of the LBA balances, the accuracy expected with them and their mechanical strength to use. Our purpose will be to question, through 3D applications, the ancient balances accuracy and solidity. This method is based on the modelling of balances from drawings of the best preserved bone or antler beams (~ 10 artefacts). The models obtained are considered as idealised objects aiming to understand the main characteristics of LBA balances. They provide the basis for two types of analysis. The first one uses the calculation of the centre of gravity of the beam and forces mechanics to estimate the balances sensibility and accuracy, based on a scale visualization of the beam defection according to its different loads. The second one relies on original uses of finite element analysis to approach the strength and rupture points of the beams. Our results allow to understand better the properties and limitations of ancient weighing instruments and their consequences on metrological practices.

3 DEER ANTLER STORIES – COMBINING 3D-TECHNOLOGIES, ARTISTIC RESEARCH AND ARCHAEOLOGY TO BRING MESOLITHIC STORYTELLING PRACTICES BACK TO LIFE

Abstract author(s): Ahola, Marja (Helsinki University) - Lassila, Katri (Aalto University) - Davidow, Elviira (Independent artist)

Abstract format: Oral

Throughout history, humans have been telling stories. While historical societies have used the written word or moving pictures to share their stories, prehistoric communities relied largely to oral tradition. Although these stories have largely gone missing during the course of time, they have nonetheless left material remains e.g., in the form of rock art. However, rock art might not be the only materialization of past storytelling practices. On the contrary, if made mobile again, prehistoric artefacts might also bring past storytelling practices back to life.

In this presentation, we introduce a novel, multidisciplinary project that relies on 3D-technology, artistic research and archaeology to 1) explore further materializations of prehistoric storytelling, and 2) to bring them back to life. As a case study, we present a single artefact – an 8000-years-old ornamented deer antler object from Finland. Even though the artefact has not been modified intensively, the form of the item resembles an animal or a combination of several animals. Remarkably, these animal forms seem to be especially well present in the shadows the artefact casts, suggesting that this item might have been used as a storytelling device. Indeed, when the antler artefact is rotated against light source, it is capable of casting shadowy forms of different animals that appear, disappear and merge along with the movement.

To study the phenomenon further, we have 3D modeled and printed the artefact. This digital approach has allowed us to approach storytelling by experimenting with the art of shadow play while safeguarding the actual item. In this presentation, we will tell where this multidisciplinary experimental archaeology has led us.

4 LOOKING BACK GOING FORWARD: LEARNING FROM 100 YEARS OF PROCESS IN THE DIGITAL TURN

Abstract author(s): Pantos, Alexis (Freelance) - Murray, Owen (The Epigraphic Survey - Oriental Institute of the University of Chicago)

Abstract format: Oral

The Epigraphic Survey began documenting inscriptions of temples and tombs in Luxor in 1924. At the time, most documentation was highly selective and hand illustrated – with the standards and quality of documentation varying greatly between researchers. The promise that photography would level the playing field and speed up the process loomed in the air, and yet the Survey chose to

adopt a system of facsimile documentation that paired large format photography with traditional pen and ink illustration. Developing an integrated workflow from capture through to publication, and a truly multidisciplinary approach relying on skilled photographers, artists and Egyptologists, this distinctive recording methodology came to be known as the “Chicago House Method”.

Since 2014 this workflow has become increasingly digital, substituting photogrammetric 3D capture in place of large format B&W photography, and iPads, Wacoms, and styluses for paper, pencils and rapidographs. With exciting new possibilities for presentation, analysis and delivery of data on the horizon the project finds itself at a virtual crossroads. This talk presents some of the questions that have arisen from considering the transformation to the next form of integrated workflow: how the opportunities map to the aims of the project, and what lessons are to be gleaned about integrated workflows from the previous 100 years of a tried and true multidisciplinary approach.

5 DEVELOPMENT AND INTEGRATION OF 3D-APPLICATIONS IN JAPANESE ARCHAEOLOGY

Abstract author(s): Loftus, James (Kyushu University; Japan Society for the Promotion of Science) - Noguchi, Atsushi (Nara National Research Institute for Cultural Properties; JCSACH)

Abstract format: Oral

Despite the gradual adoption of 3D technologies in other fields, applications within archaeology in Japan have been much slower in comparison. However, it seems that Japanese archaeology is now experiencing a gold rush of adoption of these technologies; and within this recent wave of government and public interest has come many difficulties as well. Lack of resources and training at local governmental institutions, gaps in the dissemination of data, and certain fundamental issues related to open access and security policies has begun to create a dead-stock of available data at research centers and museums across the country. Despite these challenges, and due to the still relatively underdeveloped nature of 3D data in archaeology, the time to rectify these situations is now. Several labs and individuals across the country are working feverishly to create an environment of openness, incorporating established scholars, local institutes and students in the adoption of 3D technologies. This paper seeks to summarize the nature of Japanese archaeology, the problems related to applications of 3D data within Japan, and the current attempts by scholars to rectify the situation. The authors hope to open the field of Japanese archaeology to an international stage, and in doing so, other scholars both domestically and abroad may come to encourage a more open and holistic approach to 3D data.

6 IMPLEMENTING A 3D DOCUMENTATION WORKFLOW FOR CONTEXT-BASED EXCAVATIONS: THE CHALCOLITHIC SETTLEMENT AT TELL YUNATSITE, BULGARIA

Abstract author(s): Whitford, Brent (University at Buffalo)

Abstract format: Oral

At the chalcolithic settlement of Tell Yunatsite, Bulgaria, a from motion photogrammetry 3D documentation methodology has been implemented since 2013. Our explicit aim was to utilize photogrammetry as a means of documenting complex stratigraphic relationships between archaeological contexts and to ultimately surpass the methodological limitations of the Wheeler-Kenyon box grid system. In this paper, we first discuss the practical and theoretical challenges that we faced when integrating our methodology into the existing context-based excavation practice. Second, we elaborate on some technological issues that arose in terms of cost, storage, upkeep, and data-quality as is relevant to long-term projects. And third, we provide concrete examples of the scientific benefits that have been derived from our method—benefits that go beyond mere visualization techniques—from analysis to public dissemination. To date, our efforts have been met with great success. Over eighty individual five by five meters excavation sector models have been produced at less than 1 cm³ resolution within which nearly 700 individual contexts are represented in full alongside their 3D stratigraphic boundaries, allowing the production of stratigraphic cross-sections at any location over the entire excavated surface of the site—integrating all dimensions, from practice, to analysis, to dissemination. In conclusion, our 3D documentation method, we believe, allows for a more accurate and detailed estimation of the elusive 4th dimension—time.

7 3D DOCUMENTATION AS BUILDING BLOCKS FOR RESEARCH ON PREHISTORIC SITES IN THE BALKANS – VISUALIZING SVINJARIČKA ČUKA AND BIJELJINA

Abstract author(s): Petschko, Irene - Gavranović, Mario - Horejs, Barbara (Austrian Archaeological Institute, Austrian Academy of Sciences) - Klein, Michael (7reasons)

Abstract format: Oral

The focus of the project “Visualizing the Unknown Balkans” is on the survey, excavation and visual presentation of prehistoric archaeological sites in Bosnia-Herzegovina and Serbia in cooperation with local partners. By application of modern methodologies, the main aim is to provide comprehensible reconstruction of sites and ancient landscapes and to create a starting point for future investigations.

In this paper we will present documentation and results of two case studies, the sites Svinjarička Čuka (Serbia) and Bijeljina (Bosnia-Herzegovina). Svinjarička Čuka is a multi-phase settlement in the South of Serbia in the hinterland of the South Morava valley. The settlement started with the first Neolithic settlers, while younger occupation involves Bronze and Iron Ages. In Bijeljina (in North-east Bosnia, near the river Drina) the tumulus Novo Selo was excavated and revealed traces of human activity in the Copper Age, Middle Bronze Age and the Middle Ages, with inhumation and cremation burials. Both case studies cover about 5000 years of human history in the Western-Central Balkans.

The workflow for the 3D photogrammetric documentation in the field was developed before the excavations with its requirements (quality standards, documentation resolution and further utilization of the data) in mind. It was fully integrated in the excavation process and replaced the occasionally highly time-consuming traditional analogue field drawings, offering a higher level of detail and the third dimension.

In combination with tacheometric surveying, the 3D models and derived orthophotos were georeferenced and the basis for drawing maps in GIS, analysis, and the subsequent visualization of research results. Depending on the state of preservation of the structure, the models were used as foundation of the reconstruction of the sites by serving as reference or guides. Moreover, the photogrammetric documentation provided also an excellent basis for the accomplishment of illustrations for publications.

8 3D TECHNOLOGIES FOR ARCHAEOLOGICAL RESEARCH AND PUBLIC OUTREACH IN THE TROPICAL FOREST OF THE MAYA AREA

Abstract author(s): Munoz Cosme, Gaspar (Universitat Politècnica de València; C.I. PEGASO) - Vidal Lorenzo, Cristina - Aliperta, Andrea (Universitat de València; Departamento de Historia del Arte)

Abstract format: Oral

Laser scanning and photogrammetry, applied in combination with traditional systems, are powerful tools that are opening new horizons in the analysis and interpretation of archaeological excavations. Since 2012 we have introduced this technology, for the first time in the Maya area, in all stages of the archaeological research in La Blanca and Chilonché, two important ancient Maya urban centres in the rainforest of Petén, Guatemala. The 3D models produced after field data collection and data processing at both sites have therefore contributed to archaeological interpretations since they have increased our knowledge of the entities scanned and helped to establish the spatial connections between the archaeological finds. We have also developed an innovative method consisting in the day-to-day digital documentation of the digging operations. Data collected in the field and processed on the same day, acquiring plans, sections and elevations to help us in the interpretation of the remains as they came to light, represent a profoundly effective support tool to generate discussions among the excavators, establish or modify the excavation strategies according to the results obtained every day and avoid unnecessary earthworks. The advantages and improvements of this new method, one of the most successful approaches of our project, is described in this contribution, as well as the difficulties we faced in such an extreme environment. Our project has also integrated 3D technology in public dissemination through digital media and educational programs, bringing the results of this research to a much wider audience. Finally, it should also be taken into account the wide range of options that this technology offers for future actions, especially for the conservation of Cultural Heritage, making it possible to virtually revisit previous stages of the excavation and the whole archaeological process. The next challenge to face is the preservation of these amount of data.

9 SETTLEMENT, FORTIFICATION AND FLUVIAL CHANNEL. INTEGRATION OF 3D PHOTOGRAMMETRY AT POHANSKO NEAR BŘECLAV

Abstract author(s): Prištáková, Michaela - Dresler, Petr (Masaryk University)

Abstract format: Oral

Application of the 3D documentation is a relatively common procedure employed at particular archeological excavations. In praxis we sometimes encounter various challenges that make us think about the practicality of its use. From one perspective, there are possibilities to amend the fieldwork methodics in order to collect the necessary 3D data, from another perspective we contend with a time-consuming post-processing of the data collected and its further use, be it for scientific or representational purposes.

We started to gather the data used in 3D photogrammetry at Pohansko, near Břeclav, in 2012. Over the years this became an inseparable part of documentation of various scientific projects employed at the site. With the development of 3D visualization tools the output of the data became also a way to better understand and observe the investigated objects. In the paper we will provide examples of application of the 3D documentation in investigation of a settlement, a fortification and a river basin. We will focus on situations in which the use of 3D photogrammetric data proved useful and the specific ways how to implement and visualize the data in GIS programme.

10 3D DOCUMENTATION IN SAARI MANOR EXCAVATION 2020

Abstract author(s): Paukkonen, Nikolai (Muuritutkimus Oy) - Uotila, Kari (Muuritutkimus Oy; University of Turku; University of Helsinki)

Abstract format: Oral

During the year 2020 Muuritutkimus Company conducted an excavation inside Saari mansion in Mynämäki in Southwestern Finland. The layers between the vaulted cellars and the 1st storey floor were excavated archaeologically, revealing the remains of wooden floor beams and other structural features from the 17th century. The project was initiated by the need of renovating the building, which is still in active use. As such, everyday workings required active communication with affiliated parties, such as conservators and engineers.

The conditions were ideal for using several different 3D-documentation technologies. A Riegl VZ-400i laser scanning system was used to document different phases of the excavation process on almost a daily basis. Additionally a Faro Freestyle 2 handheld scan-

ner was used for some smaller features, supporting and supplementing the data gathered with the larger Riegl scanner. The third 3D documentation tool used during the project was a Matterport Pro2 3D camera, which allowed us to present up-to-date visualization to the other members of the project. An Oculus Quest 2 VR headset was tested as an optional way of inspecting and interacting with the material.

This paper examines the results and differences of these various methods. The results are promising, although there are still some unresolved questions. Comparisons between accuracy, resolution and ease of use between the technologies are presented. Furthermore, we provide details of the workflow used, including some applications of VR technology for planning.

A. THREE-DIMENSIONAL SEEDS. IMPLEMENTING 3D TECHNOLOGIES IN ARCHAEOBOTANY

Abstract author(s): Aquaro, Antonella (DAI - Deutsches Archäologisches Institut; Freie Universität Berlin)

Abstract format: Poster

In this poster I discuss the application of 3D rendering to the field of Archaeobotany. I will show how we can create 3D models of archaeobotanical material and why it is needed. There are different approaches to document samples in 3D. Idealised models only need drafting skills and a suitable software, such as Adobe Photoshop. Things are different when it comes to real samples. The procedure I apply starts with a new generation digital microscope. Thanks to an accurate Z axis scanning, one side of the sample is directly modelled in 3D. More views are needed to obtain a complete model. Remasking and alignment can be achieved with a 3D mesh processing software system, such as MeshLab. The possibilities offered by 3D technologies in the botanical field are multiple and coherent with archaeological purposes.

Firstly, the photographic documentation of samples is enhanced by the third dimension: 3D allows to record data of difficult cases and better share them with other scholars. In addition, 3D images provide a more complete dataset for samples later to be destroyed, e.g. for dating purposes.

Similarly, a 3D model can substantially enrich the experience of consulting identification atlases. This is particularly relevant for those researchers who do not have access, temporarily or permanently, to a physical reference collection.

Finally, 3D simplified models show standard characteristics of taxa and render shapes and volumes, thus complementing drawings in the task of training students in the identification practice.

For these reasons and more, the integration of the third dimension is a wished improvement of the archaeobotanical praxis for scholars, students and wider public.

521 SHAPING A DISCIPLINE: KNOWLEDGE TRANSMISSION AND EXCHANGE IN THE HISTORY OF ARCHAEOLOGY. PART 1

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Coltofean-Arizancu, Laura (University of Barcelona) - Martins, Ana Cristina (IHC-FCSH NOVA - Pólo Universidade de Évora and Uniarq-UL) - Arnold, Bettina (University of Wisconsin-Milwaukee)

Format: Regular session

The circulation of concepts, ideas, theories and methods was essential to the development of archaeology since its early days. Evolutionism, the three-age system, diffusionism, culture history, processual archaeology, radiocarbon dating, behavioural archaeology, the Harris matrix, post-processual archaeology and new materialism, among many other, have all shaped archaeological theory and practice as we know it today. However, their impact on and absorption in the discipline was geographically and chronologically uneven. This session explores knowledge transmission and exchange throughout the history of archaeology in Europe and elsewhere, from the nineteenth to the twentieth century. We welcome papers that examine any of the following topics: the trajectories followed by concepts, ideas, theories and methods during their dispersal within the archaeology of different regions; the dissemination channels (e.g. correspondence, congresses, publications) through which these were transmitted and the role of social and academic networks in this process; and their use as devices for propaganda purposes, attaining personal prestige (including through appropriation) and establishing power relationships and hierarchies. We would also like to encourage discussions on the reception or rejection of various intellectual frameworks in the archaeology of different countries, and the political, economic, social and cultural contexts in which these attitudes occurred; the ways in which conceptual and methodological schemes influenced the practice of archaeological actors and institutions, and fostered multidisciplinary and interdisciplinary encounters.

ABSTRACTS:

1 CELTIC AND VIKING: HOW KEY CONCEPTS IN 19TH CENTURY EUROPEAN ARCHAEOLOGY WERE DEVELOPED WITH REFERENCE TO THE SCOTTISH NATIONAL COLLECTION

Abstract author(s): Goldberg, Martin (National Museums Scotland)

Abstract format: Oral

The activities, knowledge and networks of antiquaries working with the Scottish national collection during the second half of the nineteenth century (formerly National Museum of Antiquities of Scotland, now National Museums Scotland) were pivotal in defining

key concepts for understanding prehistoric European archaeology and the earliest historical periods. This paper will explore how during the 1850's the chronological ordering of the Scottish national collection for display, using the Scandinavian inspired Three-Age system, resulted in the recognition of distinct classes of material and one of the earliest definitions of Celtic art(s) by Sir Daniel Wilson. Further Scandinavian connections, and the identification of international comparisons for Scottish material culture in the 1870's, resulted in precocious use of the concept of the Viking Age by the Keeper of the museum Joseph Anderson.

2 MISCONCEPTIONS OF THE CLOSED FIND APPROACH IN PRE-AND PROTOHISTORY IN SCANDINAVIA, GERMANY, ENGLAND, AND FRANCE 1808-1860

Abstract author(s): Sasse-Kunst, Barbara (Albert-Ludwig-Universität Freiburg, Institut für Archäologische Wissenschaften)

Abstract format: Oral

In central and western Europe, the first half of the nineteenth century is considered a formative period during which enduring differences in methodologies, research directions and concepts emerged. The analysis of selected archaeological works by German, Scandinavian, English and French investigators indicates that the invention and adoption of Thomsen's Three Age System was only possible in Scandinavia. At that time this was the only area of Europe in which controlled empirical excavation methods, precise documentation and stable long-time museological standards already existed, thanks to special royal sponsorship and an archaeological school with scientific traditions (medicine) since the early Enlightenment. In the decentralized German-speaking areas of Europe, the dominant paradigm in societies referred to as "Geschichts- und Altertumsvereine" was a non-teleological historical approach to antiquities. There archaeology emerged, but closed finds with precise documentation were not a primary concern, and the principle of Thomsen's system was not understood. In regions that had experienced an extensive Roman occupation and that also had a strong antiquarian tradition, such as France, parts of England and south-west Germany, a protohistoric, Roman and Early Medieval Three Age System was characterized by a historical chronology and some well-documented early medieval closed finds. However, this methodological approach had not been generally adopted and Thomsen's system was rejected not only for his problematic approach to protohistoric chronology using myths instead of history, but also because Thomsen had delegated the theoretical and graphic explanation of his method to future generations. This led to the misconception that "the method" consisted of typology and not the sequence dating of closed finds.

3 MEDIUMS OF ARCHAEOLOGICAL KNOWLEDGE. SOME REMARKS FROM THE GERMAN MARKET OF JOURNALS AND ENCYCLOPEDIAS

Abstract author(s): Grunwald, Susanne (RGK/JGUniversity Mainz)

Abstract format: Oral

The circulation of archaeological knowledge was never only a question of terminology and networks. From the very beginning it was always also an economic question – was a regional archaeological society able to collect enough membership fees to edit a journal, was a topic interesting enough to print expansive illustrations and maps, were enough buyers available to defray publishing costs? While the book market exploded in the 19th century archaeology became established as a new field in Europe and North America. The representatives of that new science learned to publish and to share knowledge from the most successful publishers of their time– from historians, encyclopedists, and novelists. So archaeological publications were always also products and their authors and editors acted and competed on the publishing market. That influenced publishing strategies, archaeological terminology, and topics as well as strategies to get money for the publishing process or to promote books. To illustrate the potential of that perspective, examples from the German Prehistoric Archaeology of the 19th and first half of the 20th century will be discussed.

4 HERODOTUS AND ARCHAEOLOGICAL APOLOGETICS IN AN AGE OF SECULARIZATION

Abstract author(s): Marchand, Suzanne (Louisiana State University)

Abstract format: Oral

In the early modern era, scholars frequently turned to Herodotus for secular confirmation of the historicity of the Old Testament. The presumption in histories of archaeology and oriental studies is that as decipherments proceeded and as archaeological work began in earnest in the 19th century, Herodotus lost his salience, and apologists their foundations. But if we look at many figures in the later nineteenth century, we can see that this tradition did not die out, and indeed was reinvigorated by Egyptological and Babylonian finds that seemed to confirm Herodotus' accuracy. This paper underscores the persistent use of Herodotus in archaeological work in Egypt and the Near East into the very late 19th century as a means to illuminate the heretofore understudied tradition I will call 'archaeological apologetics.' I hope to show that Herodotus' champions by no means disappeared, and were not necessarily 'unscientific' in their approaches. Many were themselves ardent Christians, eager to use Herodotus (as had early modern scholars) in combination with recent finds to shore up the historical and ethnographic reliability of the Old Testament. Figures to be discussed include Fulcran Vigoroux, Georg Ebers, Edouard Naville, and Charles and Francois Lenormant.

5 WHOSE DISCOVERY? RECOGNITION OF THE LEPENSKI VIR SITE AND CULTURE BETWEEN ARCHEOLOGY AND ART HISTORY

Abstract author(s): Cosic, Natalija (Department of Archaeology, Faculty of Philosophy, University of Belgrade)

Abstract format: Oral

Eureka! This is a word that is often associated with the moment of discovery and innovation in a scientific field. However, from a constructivist perspective, studying a scientific discovery is focused on the processes, not moments. The viewpoint emphasizes the importance of a series of invisible and visible events, encounters, and collaborations that eventually result in a change in a given scientific context. In this paper, I will explore the specific circumstances that led to the recognition of Lepenski Vir culture during initial archaeological research in the 1960s. Based on Bourdieu's field theory, I want to problematize the notion of archaeological discovery, through analysis of the academic and societal circumstances that influenced the announcement and naming of a new archaeological site and culture.

The past, like heritage, does not exist in itself but is the result of a combination of different mechanisms and practices of recognition, selection, and codification in contemporary settings. The re-examination of the historical and epistemological bases of archaeological interpretations contributes to a critical consideration of the way in which knowledge about the past is constructed. The interpreted past emerged from archaeological practices of excavation, discovery, and recording appears in various formal representations. The end result depends entirely on individuals and institutions that act as regulating authorities in shaping and naming processes. In a combination of different socio-political and academic circumstances, the site of Lepenski Vir was discovered and interpreted as a new culture in European prehistory for which the archaeologist Dragoslav Srejović is credited. The essential turning point in that process took place with the discovery of the famous sculptures from this renowned site.

6 PRESTIGE AND PROTOSTORIA: EXAMINING PROTO-ETRUSCOLOGY AS A "BOUNDARY SPACE" IN THE LATE 1800S

Abstract author(s): Gustavsson, Anna (Dep of historical studies, Gothenburg University)

Abstract format: Oral

In the mid- to late 19th century, Northern Italy became a hot spot for European archaeologists and geologists. Many new discoveries in the region provided excellent geographical –and intellectual– grounds for an emerging new discipline: Paletnologia, or Prehistoric archaeology. For the late Italic prehistoric faces, the additional term Protostoria was implemented. At the same time, the Etruscan culture sparked a great interest among the international scholarly community of prehistorians. The Etruscans became a key element in discussions about the origins of the Bronze Age. They were suggested as the transmitters of the Bronze Age from the South of Europe to the North, by Scandinavian archaeologists like Oscar Montelius (1843 –1921), Hans Hildebrand (1842–1913) and Ingvald Undset (1853–1893). This paper is promoting the idea of perceiving proto-history, or even "proto-Etruscoology" as an important academic space bridging the gap between prehistory, history and art history, and as a common ground and international platform for multidisciplinary debates, knowledge exchange, positioning, prestige and networking and among European scholars in the late 19th century. Drawing on theoretical and methodological inspiration from Science and Technology Studies (STS) and microhistory, these issues will be examined by zooming in on the correspondence between the Italian scholars Luigi Pigorini (1842–1925) and Edoardo Brizio (1846–1907), and their Scandinavian colleagues Oscar Montelius and Ingvald Undset, in the early 1880s. The archive material derives from archives in Italy and Sweden.

7 WETLANDS AS A LABORATORY. KNOWLEDGE EXCHANGES AND THE FOUNDATION OF PREHISTORIC ARCHAEOLOGY IN NORTHERN-ITALY (1854-1976)

Abstract author(s): Pizzato, Fedra Alessandra (University of Verona)

Abstract format: Oral

After discovering the existence of the lake-dwelling civilization in Switzerland (1854), the search for the lacustrine people across the Alps assumed particular importance for many European scientists and archaeologists. By the end of the 1860s, several Italian scholars, including eminent scientists such as Antonio Stoppani, started to visit Italian wetland sites to investigate the development of the lake-dwelling civilization. Scholars based in Verona, such as Pierpaolo Martinati and Stefano De Stefani, were particularly active in this research program. Incidentally, they were also in close contact with Luigi Pigorini, dominus of Italian archaeological research. Precisely by virtue of these contacts, Verona (and the nearby city of Vicenza) quickly became an informal center for Italian studies of lake-dwellings. Scholars, collectors from the local upper class, and amateurs based in the area were rapidly involved in a transnational network of relations with Swiss colleagues and Italian patriotic associations, such as the Italian Alpine Club (CAI). By reconstructing the scientific exploration of Northern-Italian wetlands as a case study, this paper aims to shed new light on the dynamics of knowledge circulation across national borders, scientific fields, different levels of expertise, and the center-periphery in the second half of 19th century Italy.

8 KNOWLEDGE TRANSFER AND EXCHANGE BETWEEN GERMAN AND HUNGARIAN ARCHAEOLOGISTS IN THE TWENTIETH AND TWENTY-FIRST CENTURIES

Abstract author(s): Coltofean-Arizancu, Laura (Römisch-Germanische Kommission des Deutschen Archäologischen Instituts)

Abstract format: Oral

This paper discusses the main elements of archaeological theory, method and interpretation that have been exchanged and transferred between Hungarian and German archaeologists in the twentieth and twenty-first centuries, and have made an impact on the overall development and evolution of the discipline in both countries. Using archival documents, scientific publications and oral history interviews, the paper examines the complex mechanisms underlying these interactions, as well as the various factors that have shaped them (i.e., political, ideological, socio-economic, personal). The paper derives from the hypothesis that these interactions were a complex process of bilateral knowledge transfer, in which not only did German archaeologists influence Hungarian archaeology, but Hungarian archaeologists also influenced German archaeology. The paper is built around the case study of one of the most important institutions in German archaeology, the Romano-Germanic Commission (Römisch-Germanische Kommission [RGK]; Frankfurt am Main) of the German Archaeological Institute (Deutsches Archäologisches Institut), and its collaboration with scholars and scientific bodies involved in Hungarian archaeology. Since its foundation in 1902, the RGK has been acting as hub for research and networking on the prehistory and early history of Europe, as well as on Roman provincial archaeology in Central Europe. Throughout the years, the institution has attracted numerous international scholars, it has conducted pivotal archaeological projects, and has established key collaborations with archaeologists and institutions across the globe.

9 TRANSFER OF ARCHAEOLOGICAL POWER/KNOWLEDGE DURING WORLD WAR II IN SERBIA

Abstract author(s): Bandovic, Aleksandar (National Museum in Belgrade)

Abstract format: Oral

With the beginning of WWII and the occupation of Serbia, the German military administration closed the University of Belgrade, recognizing it as a hotbed of communist and liberal elements, after which its reorganization began, in accordance with the ideological principles of Milan Nedić's collaborationist government. Prompted by these circumstances, devotees and graduates of archeology, art history, law, architecture and ethnology gathered at the Museum Course (Lehrgang für Museumsbeamte) which was organized at the National Museum in Belgrade. Between 1942 and 1944, the Museum Course became a place of informal education for future curators and museum youth, in which a significant number of relevant Serbian experts participated. Conceived and initiated under the protectorate of Johann Albrecht von Reisz, a major at the Military Administrative Headquarters in charge of cultural heritage protection, the course nurtured future experts and museum workers. Participating students of archeology acquired practical knowledge through the archeological excavations of Kalemegdan led by Wilhelm Unverzagt, and through the process of comprehensive cataloging of museum collections led by Ahnenerbe's associate SS-Obersturmführer Kurt Willvonseder both financed by the Ahnenerbe in the interest of German science. The transfer of theoretical, practical and "tacit" knowledge, and the process of systematic shaping of future collaborators, took place in the wake of the "New Europe" led by the Third Reich. Through a critical analysis of sources, personal testimonies and publications, we will look at the ways in which knowledge/power was transferred, but also the questions of whom and what it served.

10 BETWEEN WORDS AND IMAGES: (RE)SHAPING ARCHAEOLOGY IN PORTUGAL DURING THE 60S

Abstract author(s): Martins, Ana Cristina (IHC - Polo da Universidade de Évora; UNIARQ - Universidade de Lisboa)

Abstract format: Oral

The 1960s were of intensity in a Portugal that balanced between the still dominant politics of the 'Estado Novo' and a growing demand for freedom of thought and action by the challenging voices that were multiplying. A need for change was also reflected in the country's scientific activity, archaeology being no exception.

In fact, the 1960s seem to constitute, as far as archaeological activity is concerned, a moment of confluence between those who pursued culture-historical analyses; those who acknowledged its limitations but could not overcome them; and those who absorbed new ideas and brought to the national archaeological research epistemological novelties that were generated, discussed, accepted, and used abroad.

It was, no doubt, a transition period that ended in the middle of the democratic process. What were the new ideas arriving to Portugal? How did these theoretical and methodological novelties reach the country? Who introduced them? How were they introduced? How were they received? What projects and ways of looking at the past did they initiate? How and to what extent did they coexist (or not) with previous approaches and methods? How did they enhance exercises (conscious or not) of personal and collective, public, and private prestige in the country's archaeology?

These are a set of questions that we will try to answer in our presentation, taking as starting points the archaeological meetings organized in Portugal during the 1960s, as well as the inherent proceedings and temporary exhibitions prepared during some of them, as privileged spaces and vehicles of knowledge transmission and exchange, and of new power relations and hierarchies.

11 THE ARCHAEOLOGICAL PICNIC: GROUPS AND MOVEMENTS IN ARCHAEOLOGY

Abstract author(s): Zubrow, Ezra (University at Buffalo; University of Toronto)

Abstract format: Oral

This paper focuses on some of the informal mechanisms that have helped create contemporary archaeology. I use the term groups for an assortment of friends or colleagues who come together informally as in a picnic. They have little formal organization but cooperate in various ways and resemble in some respects a proto think tank. Most thrust their members toward intellectual, artistic, and scientific radicalism. They reject the status quo and normality. They accumulate followers and fans as well as critics. The principles that unite the group usually are not codified. But, they are distinguishable and eventually a manifesto is produced. Some connect themselves to larger changes in the society; some do not. The most successful become parts of movements in the sense that their ideas and actions influence policy. Frequently future oriented their legacies are controversial. In this presentation a few examples of these small groups are considered in detail, including the Cambridge Group, an anti-post-modernist group of the early 1990s that helped to establish cognitive science; the Bay Area group, which had a major impact on environmental and evolutionary studies; and the Pan Vernon group, with its impact on the New Archaeology, part of the new science movement.

12 ARCHAEOLOGY AND INTERDISCIPLINARITY BEYOND THE RHETORIC

Abstract author(s): Kristiansen, Kristian (University of Gothenburg)

Abstract format: Oral

Archaeology is a creative, borrowing discipline, which has throughout its history successfully applied many methods and theories from a variety of disciplines from social anthropology, history and philosophy to various branches of science from geology, zoology and physics to genetics. However, to practice interdisciplinarity beyond the rhetoric demands two things often missing. The first is knowledge about the other disciplinary field, especially its methodology. The second is theoretical reflection about the limits of interpretation of each participating discipline. In this contribution I shall exemplify and discuss how to effectively develop such interdisciplinary collaboration. The paper takes its point of departure in the observation that every discipline has its own methodological and interpretative demands, and that these need to be respected. To combine is therefore not always easy, and a first step may be to create a narrative, that is less rigorous, but can be used to formulate new research questions.

13 DEALING WITH THE DEAD: TRANS-ATLANTIC INTELLECTUAL EXCHANGE NETWORKS AND THE DEVELOPMENT OF 21ST CENTURY MORTUARY ARCHAEOLOGY

Abstract author(s): Arnold, Bettina (University of Wisconsin Milwaukee)

Abstract format: Oral

As one of the more ubiquitous and salient sources of information about past human cultures, mortuary archaeology has been the focus of theoretical and methodological innovations since the Three Age System was tested against burial contexts in Scandinavia by Christian Jürgensen Thomsen in the 1830s. This paper will compare and contrast approaches to the archaeology of death on both sides of the Atlantic between 1945 and the present in order to reveal areas of mutual influence as well as discordances in approaches to mortuary archaeology. In spite of the fundamentally different foundations of the disciplines -- grounded in the humanities in the case of European archaeology and in the social sciences in the case of North American archaeology -- as well as socio-political developments emerging out of the historical contexts within which these fields developed -- on the one hand the Civil Rights movement and NAGPRA, on the other attempts at Vergangenheitsbewältigung on the part of nationalist regimes -- mutual influences can be traced in the publications of a group of scholars with links to both intellectual traditions. The ease and speed with which research results can now be disseminated have facilitated information exchange and many fruitful collaborations have resulted. However, a magpie approach has also emerged, attracted to the new and shiny but without the foundational grasp to apply these innovative ideas in a systematic and critical fashion. Without a deeper understanding of the intellectual roots and rules of these theoretical frameworks an emerging trans-global mortuary archaeology cannot develop into a mature subfield.

14 MAKING THE ARCHAEOLOGY OF TEXTILE PRODUCTION VISIBLE AGAIN: EXPLORING ITS KNOWLEDGE TRANSMISSION AND METHODOLOGY IN THE IBERIAN PENINSULA (SPAIN)

Abstract author(s): Morgado-Roncal, Leyre (University of Granada)

Abstract format: Oral

Although the archaeology of textiles has clearly been influenced by archaeometric studies, the formation, transmission and dispersal of this rigorous methodology has not been homogeneous throughout Europe. Indeed, the study of textile fibers and dyes in Spain is relatively recent, especially with respect to archaeometric analyses of ancient textiles. This type of study should ideally include not only the physical remains of the textiles themselves but the chaîne opératoire, the tools used to produce the textiles, the raw materials procured and so on. As a result, this paper will explore the introduction of textiles studies in the Iberian Peninsula (Spain), the reason behind the relatively late arrival of this approach to textile studies and the current state of this field of research. By doing so, we hope to discuss the influence of knowledge exchange, the particular evolution of archaeology in Spain and how is reflected in the study of ancient textile production. Finally, this methodological case study will enable us to contribute to textile research more generally by showcasing the historical and archaeological importance of these perishable remains.

INTERPRETING THE CONSERVATIVE PURITY: IRISH ARCHAEOLOGY AND THE POST-PROCESSUAL CRITIQUE

Abstract author(s): Whitefield, Andrew (National University of Ireland, Galway)

Abstract format: Oral

This paper examines the limited impact of theoretical developments in the second half of the twentieth century on archaeological scholarship in Ireland. While the discipline embraced many of the scientific methods and techniques of the post-war era, engagement with theoretical advances was muted. This was not simply a matter of resources, as the extensive deployment of palaeoenvironmental techniques and the long-term funding of the Discovery Programme research institute demonstrate. Rather, it will be argued, a consistently conservative disciplinary elite has been reluctant to challenge the interpretive paradigm established at the time of the founding of the modern institutional discipline.

The newly independent Ireland of the 1920s and 1930s naturally sought to differentiate itself from colonial Britain. As in many European countries during the interwar years, institutional archaeology was established as a means of providing scientific credence for a distinct and immemorial national identity. In Ireland, the national myth centred on the survival of ethnically-pure Gaelic farming communities in the west of Ireland, whose folk-wisdom and traditional way of life had endured through centuries of colonial rule. Archaeologists traced the continuity of Irish rural traditions back through the mists of 'Celtic' prehistory to the settlement of Ireland by Neolithic farmers.

An opaque system of excavation licencing established in the 1930s helped shelter the discipline from external criticism by allied disciplines and international archaeology. The attendant control over excavation data has enabled the results of scientific analyses to be published according to their agreement with what the leading Irish prehistorian Peter Woodman described as the 'canon of Irish archaeology'. Post-processual interpretive approaches allowed for the possibility that the assumptions that underpinned the 'canon' might be wrong. My aim is to explain why such approaches were seen as heretical, and the pervasive insularity of archaeological thought that endured as a result.

THE PROTECTION OF INNOCENCE: THE MARGINALIZATION OF PROCESSUAL ARCHAEOLOGY IN TURKEY

Abstract author(s): Dikkaya, Fahri (TED University)

Abstract format: Oral

The methodological framework at the heart of archaeology is still the description of data in Turkish archaeology. In recent years, new theoretical frameworks and interdisciplinary perspectives are becoming more common in the studies of the young generation, but the core descriptive archaeology still plays a dominant role in the archaeological research carried out by the Turkish archaeologists. In the 1960s, the rigorous use of the scientific method claimed by the processual archaeologists was discussed and applied by some Turkish archaeologists, especially in prehistoric archaeology, but the anthropological goals of processual archaeology were completely rejected. In later years, scientific method known as archaeometry was perceived as an auxiliary area for the archaeologists in the different scientific disciplines such as physics, chemistry, or biology, but not in the archaeology. This paper aims to discuss the history of processual archaeology in Turkey and its marginalization as a scientific study on the margins of archaeological practise.

GEOGRAPHIES OF SCIENCE: THE CONTRIBUTION OF ANGLO-AMERICAN AND EUROPEAN SCHOLARS AND RESEARCH OUTPUTS IN THE DEVELOPMENT OF COGNITIVE ARCHAEOLOGY

Abstract author(s): Sinclair, Anthony (University of Liverpool)

Abstract format: Oral

Traditional approaches to an analysis of theoretical developments in archaeology or its history in general have been based upon the close reading and critical analysis of published documents in the form of theoretical, methodological and analytical studies and of unpublished materials revealing links between scholars and institutions. However, the quasi-exponential growth in archaeological literature has made it almost impossible for anyone to read but a small percentage of the current literature, let alone the corpus of literature produced within any field over the last 30 years. Histories are inevitably local studies even though they may be examinations of more general developments in a discipline. Bibliometric data, readily-accessible in abundant quantity through the online search engines of the major citation indexes (Web of Science, Scopus, Google Scholar, etc.) on the other hand, seems to provide way into examining the conceptual development and geographical history of archaeological ideas. Bibliometric data – the meta data of individual documents – can provide data for each document on its authors, their institutions and the conceptual nature of their work revealed through keywords in titles and abstracts. The literature cited in each allows the further network analysis of the impact through time of scholars, places and ideas. In this paper I shall explore the development of cognitive archaeology from 1980 to the present day and examine the potential for bibliometric data to help write a distant reading account that explores the relative contributions of scholars and institutions from within and without the Anglo-American world.

SHAPING A DISCIPLINE: KNOWLEDGE TRANSMISSION AND EXCHANGE IN THE HISTORY OF ARCHAEOLOGY. PART 2

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Coltofean-Arizancu, Laura (University of Barcelona) - Martins, Ana Cristina (IHC-FCSH NOVA – Pólo Universidade de Évora and Uniarq-UL) - Arnold, Bettina (University of Wisconsin-Milwaukee)

Format: Regular session

The circulation of concepts, ideas, theories and methods was essential to the development of archaeology since its early days. Evolutionism, the three-age system, diffusionism, culture history, processual archaeology, radiocarbon dating, behavioural archaeology, the Harris matrix, post-processual archaeology and new materialism, among many other, have all shaped archaeological theory and practice as we know it today. However, their impact on and absorption in the discipline was geographically and chronologically uneven. This session explores knowledge transmission and exchange throughout the history of archaeology in Europe and elsewhere, from the nineteenth to the twentieth century. We welcome papers that examine any of the following topics: the trajectories followed by concepts, ideas, theories and methods during their dispersal within the archaeology of different regions; the dissemination channels (e.g. correspondence, congresses, publications) through which these were transmitted and the role of social and academic networks in this process; and their use as devices for propaganda purposes, attaining personal prestige (including through appropriation) and establishing power relationships and hierarchies. We would also like to encourage discussions on the reception or rejection of various intellectual frameworks in the archaeology of different countries, and the political, economic, social and cultural contexts in which these attitudes occurred; the ways in which conceptual and methodological schemes influenced the practice of archaeological actors and institutions, and fostered multidisciplinary and interdisciplinary encounters.

ABSTRACTS:

1

BETWEEN EAST AND WEST: FRANCIS BALODIS AND THE FORMATION OF LATVIAN ARCHAEOLOGY IN THE 1920S AND 1930S

Abstract author(s): Sne, Andris (University of Latvia)

Abstract format: Oral

In the Baltic region, archaeological research was conducted by several literary societies and amateur archaeologists since the mid-19th century. The establishment of the national states Estonia, Latvia and Lithuania after the First World War led to rapid development of national culture and research including also archaeology. The development of Latvian archaeology throughout the 1920s and 1930s found its basis in Russian, German and Scandinavian archaeologies absorbing various trends and methodologies of archaeological research and reasoning from neighbouring regions. The achievements and contradictions of those intellectual and political processes were clearly reflected in the life and work of Francis Balodis (1882-1847) usually considered the 'founding father of Latvian archaeology'.

Clearly, Balodis was one of the most significant and influential Latvian archaeologists who had received good education (Universities of Tartu, Moscow and München) and extensive practical training. The first part of his life was connected with the Russian Empire, later with the early years of Soviet Russia, where he established prolific academic career in fields of the Oriental art and history and eventually was appointed professor at the Universities of Saratov and Moscow. In these years he conducted wide-scale research in the Volga Tatars archaeological sites that resulted in major publications about Old and New Sarai, capitals of the Golden Horde.

Following the invitation from the recently founded University of Latvia, Balodis returned to Latvia in 1924. Soon he became a Professor, obtained a doctoral degree in history and was appointed Head of the Department of Archaeology of the Faculty of Philology and Philosophy. Balodis put a lot of effort into the formation of Latvian archaeology, leading numerous survey and excavation expeditions and actively publishing about Latvian archaeology and prehistory. His studies were based on detailed artefactual analyses while interpretation of archaeological material mainly incorporated the concepts of invasion, diffusion and migration.

2

THE ARCHAEOLOGICAL SITE OF NOIN-ULA. ONE HUNDRED YEARS OF COOPERATION BETWEEN RUSSIA AND MONGOLIA

Abstract author(s): Sutiagina, Natalia (The State Hermitage Museum) - Medvedeva, Maria (The Institute for the History of Material Culture, Russian Academy of Sciences)

Abstract format: Oral

This study was funded by RFBR and MECSS as Project Number 20-59-44005.

About a hundred years ago, in the Noin-Ula in northern Mongolia, the elite barrows of the Xiongnu were excavated in a cooperative project carried out by Russian and Mongolian scientists. The excavations were conducted in 1924-1925 by the Mongolia-Tibetan Expedition led by P.K. Kozlov. Fantastic objects dating from the 1st century BC to the 1st century AD were found in the well-preserved graves of the leaders and representatives of the Xiongnu nobility: Chinese silks, lacquered items, jade plates, horse harness, Bactrian woollen embroidery, and nomadic household items. During the excavations, significant scientific material was obtained and at the end of field research, leading Russian scientists engaged in analytical processing of the unique finds and preparation of the

final publication, which unfortunately was never completed. The collections and documentary material were divided among several museum and archival depositories, a process during which some finds have lost their provenance. It was not until the 1990s that specialists began to actively talk again about the Mongol-Tibetan expedition. Historiographic publications and catalogues of the collection appeared and excavations at the site resumed. Currently, a new joint project is supported by the Russian Foundation for Basic Research and the Ministry of Education, Culture, Science and Sports of Mongolia. The year 2024 will mark the centennial of the inception of Noin-Ula's Russian-Mongolian exploration. Thanks to the research presented in this paper, it has been possible to systematize and introduce the whole complex of finds and documents into wider scientific circulation by preparing publications, exhibitions and presenting results on the Internet.

The collaboration of Russian and Mongolian scientists marks a new era in the exchange of scientific knowledge, which will provide new opportunities for understanding the cultural heritage of Mongolia and Central Asia.

3 ARCHAEOLOGICAL KNOWLEDGE TRANSMISSION AT THE AMERICAN COLLEGE FOR GIRLS AT CONSTANTINOPLE (1890-1927): CHANNELS, AIMS AND CHALLENGES

Abstract author(s): Garcia-Ventura, Agnes (Universitat Autònoma de Barcelona)

Abstract format: Oral

The American College for Girls at Constantinople (ACGC) was an educational institution originally linked to the American Board of Commissioners for Foreign Missions. In 1890 the institution began a new solo stage and after several years became a renowned centre in its milieu. This transformation took place under the direction of Mary Mills Patrick (director 1889-1924). Patrick worked side by side with Isabel Frances Dodd (teacher at the ACGC 1882-1945). Dodd travelled extensively throughout the Middle East to enhance her knowledge of art and archaeology, the specialties she taught at the ACGC. In the words of Patrick, "Dodd devoted her energies to archaeological study in the Near East. She gradually attained the position of an authority on the subject". An analysis of the channels, aims and challenges used and faced by Dodd allows us to reflect on archaeological knowledge transmission in contexts beyond academia and universities. It also makes possible a gender analysis given that Dodd's experience as a woman in a men's world influenced her strategies. Dodd made use of a variety of channels to disseminate the knowledge she had acquired, including her teaching in the ACGC as well as the founding of a museum cherished by staff and visitors alike. Moreover, she was in touch with many of the leading scholars of her time, such as Archibald H. Sayce and William M. Ramsay, and she suggested hypotheses that were discussed in first-rate academic publications. Despite all of these achievements, however, Dodd was gradually forgotten. Taking this last circumstance into account with this communication we also vindicate her, as people perceived as peripheral in certain historical narratives are key to gaining a better understanding of the bigger picture.

4 THE CONTRIBUTION OF SEMNI KAROUZOU TO THE STUDY OF CLASSICAL POTTERY

Abstract author(s): Pateraki, Kleanthi (Independent Researcher)

Abstract format: Oral

The aim of the oral presentation is to present the contribution to the study of classical pottery of the pioneering Greek archaeologist Semni Paspapyridi-Karouzou, curator of the ceramic collections of the National Archaeological Museum of Athens (1933-1964). Attention will be focused on her contributions as an archaeologist, from excavation techniques through the analysis and presentation of results at Greek and international conferences and their publication in conference proceedings, archaeological journals and monograph series. In addition, Karouzou's difficult but courageous struggle as a woman fighting against prejudices, stereotypes and limitations will be highlighted. The crucial role that scholarly networks played in spreading her ideas will be discussed, including her study of specific ancient painters, such as the Amasis Painter, about whom the archaeologist wrote a "scholarly and valuable study", according to R.M. Cook. Furthermore, it will be mentioned how Karouzou's presentations and publications introduced new ideas to Greek archaeology while allowing her to have an impact on Classical studies outside Greece. The result of all these efforts on the part of this pioneering Greek archaeologist was her international recognition as a scholar.

5 ENGENDERING NETWORKS DURING THE SPANISH TRANSITION (1975-1980S) AND THE RECEPTION OF GENDER ARCHAEOLOGY IN SPAIN

Abstract author(s): Zarzuela, Paloma (Universitat de Barcelona - UB) - Díaz-Andreu, Margarita (ICREA, Universitat de Barcelona - UB)

Abstract format: Oral

This paper aims to contribute to our understanding of the context in which women archaeologists worked in Spain from the 1970s to the 1990s, how this affected the reception of gender archaeology in Spain and of gender concepts, ideas and theories and their transmission to the new generations. This period was marked by the end of the fascist dictatorship and the configuration of a new democratic regime that came together with a series of social and cultural changes. During this period there was an unprecedented growth in the overall number of women working within the discipline. The need of lecturers to cope with increasing numbers of students in universities and the birth of commercial archaeology in Spain created many new jobs that facilitated the incorporation of women into the profession. Based on a literature review and interviews this research examines the formal and informal networks of female archaeologists in these unparalleled decades and the partnerships women developed to create a supportive environment in which to pursue their work. We will then consider whether these networks facilitated the reception of gender studies in Spain. The

influence of networks in women's contribution to archaeology in general, and of gender studies in particular, and how this shaped the discipline in the following years is also assessed. This research is part of the ArqueólogAs project (full title 'Retrieving Memory: Women's Pathways in the History of Spanish Archaeology', www.ub.edu/arqueologas). ArqueólogAs aims to critically assess the role of Spanish female archaeologists from the 19th century until today. Despite a burgeoning literature on gender studies, little attention has been paid to the contribution of women to the discipline in Spain and the impact of female networks on its development and reception of gender studies.

6 FROM PRODUCTION TO CONSUMPTION: A CRITICAL MAPPING OF THE ARCHAEOLOGICAL PRODUCT IN GREECE

Abstract author(s): Daravigka, Klea - Chourmouziadi, Anastasia - Stavridopoulos, Yiannis (Aegean University)

Abstract format: Oral

Although a lot has been written and discussed occasionally about several distinct aspects of the existing system of production and management of the "archaeological product" -as both the material and immaterial representations of the past- no systematic attempt has ever been made to compose it all in a broad, comprehensive frame.

We have currently embarked on such an attempt, forming a small group of two practicing archaeologists and a professor in Museum Studies with a shared interest in Public Archaeology. We choose to employ critical mapping as a practice of putting in context each one unit, motive, procedure, dominant concepts, dissemination channels and interrelations of this multidimensional process of archaeological production. By doing so, we hope to reveal a panoramic view, through a critical prism, that bears the potential of uncovering intellectual patterns that define participants' role and determine the image of archaeological discipline and historic culture of Greek society, but also the defining mechanisms of the actual product and its consumption.

Our autoethnographic view -being parts of the process ourselves- coupled with the general notion of archaeological ethnography and the critical angle of our standing point, offer us a wide, conducive range of investigation.

We regard the project as a trigger for substantial dialogue concerning Greek archaeological reality and not just as an accomplished research outcome that statically depicts a given production system.

7 THE 'WESTERN GAZE' AND ITS ROLE IN INTERPRETING LANDSCAPE – EXAMPLES FROM CROATIA

Abstract author(s): Igljic, Sara - Kulenovic, Igor (University of Zadar)

Abstract format: Oral

In recent decades, there has been a growing interest in the way 'gaze' impacts studies of landscape and heritage. 'The Western Gaze' puts emphasis on the active observing subject in whose mind all the knowledge and perception are located. It expresses a certain view of the world and the way it is perceived. Said 'gaze' positions itself in the authorized heritage discourse and presents a certain mentality and set of values that have vastly impacted archaeology as we know today. It assumes that certain characteristics are more worthy of preservation and presentation as heritage than others. Given the highly visual aspect of landscape, the 'Western Gaze' has become imbued in landscape studies that divide 'culture' and 'nature'. It is based on Cartesian principles and consequently, the 'Western Gaze' assumes scientific objectivity in its research methodology and aspires to retain as much distance from the embedded cultural values of every researcher as possible. It represents a series of dualisms, nature-culture, subject-object, mind-body and male-female. In recent years, theoretical approaches in archaeology have explored how various 'gazes' (male, Western, imperial...) have affected landscape studies and its development. This paper will present how said discourse and gaze have impacted landscape studies using as a proxy a part of Croatia that extends from the northern Dalmatian coast to the slopes of South Velebit.

8 THE TRANSMISSION OF WESTERN KNOWLEDGE AND THE CONFIGURATION OF MUSEOLOGY: THE CANARIAN EMBALMED BODIES AS A CASE STUDY

Abstract author(s): Farrujia de la Rosa, Jose (Universidad de La Laguna)

Abstract format: Oral

Since the 19th century, archaeological museums have contributed to the display of hierarchical representations of the world that reflect Western structures of power. Thus, museums have actively contributed to the cultural construction of human remains.

This paper explores how the circulation of concepts, ideas, theories and methods developed in French anthropology in the late 19th century, in particular the exhibition of Indigenous embalmed bodies, was essential to the development of Canarian museology.

In the case of the Canarian archipelago, Ethnographic sources from the 16th and 17th centuries as well as archaeology indicate that Canarian Indigenous people took great care over the burial of corpses, reflecting their belief in the continued existence of individuals after death and worship of the dead. Embalmed bodies in well-kept graves have been found in caves, wrapped in various types of skins and arrayed in abundant garments and goods. The corpses were placed on planks, and bead necklaces, canes, lithic punches, knives and pottery with food were deposited with them as funeral offerings.

The display of such anthropological and archaeological remains, including embalmed bodies and other human remains, has been a significant aspect of museographic discourse in the Canary Islands from the 19th century to the present. Nevertheless, the original role of Indigenous remains in religious rites, funerary practices or in ancestor cults no longer carries the same meaning nowadays.

In this sense, this communication also deals with the role of evolutionism, diffusionism, culture history and colonial thinking in Canarian museology, and explores how this Western knowledge has influenced the conception of the ancient, embalmed Canarian bodies, by presenting them as cultural symbols of great scientific value, while emphasizing a construction of “otherness”.

9 FATHER WILHELM SCHMIDT, THE VIENNA SCHOOL AND THE INFLUENCE OF INDIGENOUS BELIEFS IN THE VATICAN MUSEUM

Abstract author(s): Aigner, Katherine (The Australian National University)

Abstract format: Oral

In a biography of the history of Pacific archaeology, Father Wilhelm Schmidt (1868–1954) is a notable contributor with a wide sphere of influence, both within secular academia and missionary networks. He demonstrated the entwined nature of the roots of ethnographical, anthropological and archaeological research in the early stages where disciplines engaged with remote and largely unknown Indigenous peoples. In 1906 he wrote: ‘one can no longer write a world history without mentioning those groups who were till now thought to be without history because they had no writing or left no traces of themselves hammered in stone. History is interaction! In comparison how unimportant it is whether groups have writing or not’ (Schmidt 1906:600).

Schmidt desired to learn, not only from a written history, but from the living cultures—a call echoed by Indigenous peoples still today. His earliest ethnographic writings ushered in a new era of study of so-called ‘hunters and gatherers’; he stressed their similarity, ‘true humanity’ and ‘intelligence’. Initially interested in linguistics, he could speak at least 17 languages and coined the term ‘Austronesian’ (which is still used today) in 1899 to indicate a family of four related linguistic groups. While British anthropologists embraced the evolutionary idea of Darwin, the ‘dynamic and interactionist’ diffusion ideas of cultural growth promoted by Schmidt influenced German-speaking thinkers. His 12-volume monumental work *Der Ursprung der Gottesidee*, (The Origin of the Idea of God) challenged evolution and the popular view that monotheism came at the end of the religious development of humanity. This paper profiles his thinking and influence in what he tried to achieve at the time in relation to bringing awareness of Indigenous cultures to Europe, through the Great Exhibition of 1925 and objects from Oceania held in the Vatican Museums’ *Anima Mundi – Peoples, Arts and Cultures*.

523 SETTLEMENTS OUT OF NOWHERE – THEORY AND PRACTISE OF DETECTING SETTLEMENTS BY MEANS OF COMBINED AERIAL ARCHAEOLOGY, GEOPHYSICS, PREDICTIVE MODELLING

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Segschneider, Martin (NIHK Wilhelmshaven) - Mauritsen, Esben (Arkeologi Vestjylland; Ringkøbing-Skjern Museum)

Format: Regular session

Theoretically, the approximate number of settlements to be expected through time and space in a given region or local entity (e.g. islands) can be estimated by natural preconditions like area size, soil quality, topography, travel and transport links and other landscape information as well as archaeological indicators like graves, surface finds, place names etc. Anyhow, typically only a small fraction of these settlements is actually known. In order to detect the missing settlement remains effectively and to estimate their number, methods like aerial archaeology including LIDAR, geophysics like geomagnetism and soil radar, field surveys like fieldwalking and predictive modelling using landscape parameters and known information about archaeological features are applied all over Europe. These studies give insight of what and how much is actually there, when it comes to find and evaluate the “missing” settlements. We invite contributions, which approach this topic with a combined set of methods from both the theoretical and practical point of view.

ABSTRACTS:

1 SITE DENSITY AS A FUNCTION OF RESEARCH INTENSITY: THE CASE OF THE CONTRADA DAMALE – PORTIERI (CALABRIA, ITALY)

Abstract author(s): de Neef, Wieke (Ghent University) - van Leusen, Martijn (University of Groningen)

Abstract format: Oral

Meaningful spatiotemporal comparisons of site density, as the foundation for demographic analysis and interpretation, require confidence that we have obtained reasonably accurate measurements of those site densities. This can in theory be achieved through a spatially stratified sampling strategy if no significant geomorphological or visibility biases are present - conditions that probably apply only in a small minority of cases. In all other cases, the observed site density is a function of research intensity. We present the case of the circa 1.5 sq km Damale-Portieri study area (northern Calabria, Italy), where a combination of fieldwalking surveys, geomagnetic surveys, and geoarchaeological studies conducted by teams from the Groningen Institute of Archaeology between 2002 and 2013 resulted in a relatively secure estimate of LBA site density. We discuss how this estimate is affected by increasing research intensity over time, and quantify the remaining uncertainties. The results of this research have important implications for models on protohistoric settlement patterns in this part of Italy.

2 THE PERAIA OF SAMOTHRACE PROJECT: NEW ARCHAEOLOGICAL INVESTIGATION IN AEGEAN THRACE

Abstract author(s): Avramidou, Amalia (Democritus University of Thrace) - Donati, Jamieson (Laboratory of Geophysics – Satellite Remote Sensing & Archaeoenvironment - FORTH; Democritus University of Thrace) - Garyfalopoulos, Apostolos (Aristotle University of Thessaloniki; Democritus University of Thrace) - Karadima, Chrysa (Ephorate of Antiquities of Rhodope) - Pardalidou, Chrysafenia (Ephorate of Antiquities of Evros) - Sarris, Apostolos (Laboratory of Geophysics – Satellite Remote Sensing & Archaeoenvironment - FORTH; University of Cyprus) - Papadopoulos, Nikos (Laboratory of Geophysics – Satellite Remote Sensing & Archaeoenvironment - FORTH)

Abstract format: Oral

The Peraia of Samothrace Project (PSP) is a multi-disciplinary archaeological fieldwork project to investigate the diachronic settlement patterns of the coastal and inland landscape opposite the island of Samothrace in Aegean Thrace. The area has been only sporadically studied in the past, in part due to its relative isolation far from any major ancient settlements and archaeological attractions that might spur more scholarly interest. A well-protected rocky environment alternates with agricultural plains, forested hills, and small coves, composing a varied landscape rich in natural resources. Clusters of prehistoric activity and habitation are attested around the area, and ancient sources mention trading posts, cities, and forts in connection to Greek colonization, Persian military campaigns, and the Macedonians. Various Roman stations are named along via Egnatia, which crosses through this region, while byzantine and post-antique remnants have also been detected. Yet despite the rich layers of human occupation opposite Samothrace, there has never been a systematic study. The project adopts a range of methodological tools, including satellite and aerial remote sensing, large-scale geophysical prospection, and intensive pedestrian field survey. For this paper, we present the initial results of our investigations, in particular the remote sensing and spatial analysis in GIS, as well as field data from geophysics and the field survey. We highlight also our digital, paperless approach to collecting field data and the use of GNSS receivers for quickly establishing survey grids.

3 THE NORTH FRISIAN ISLANDS (GERMANY) IN THE 1ST MILLENNIUM CE: A MULTI-METHOD PROSPECTION APPROACH TO A CHANGING SETTLEMENT LANDSCAPE

Abstract author(s): Majchczack, Bente (Christian-Albrechts-Universität zu Kiel; ROOTS Cluster of Excellence) - Mauritsen, Esben (Arkeologi Vestjylland; Ringkøbing-Skjern Museum) - Segschneider, Martin (Niedersächsisches Institut für historische Küstenforschung) - Wilken, Dennis - Wunderlich, Tina (Christian-Albrechts-Universität zu Kiel)

Abstract format: Oral

The North Frisian Islands, located in the Northern Wadden Sea area of the German North Sea coast, consist of elevated, flood-safe moraine cores, surrounded by fertile marshlands. These favorable settlement conditions, together with an easy access to maritime traffic routes, provided for a dense settlement and a high archaeological record stretching as far back as the Neolithic. In past archaeological research, much attention has been given to the numerous grave sites and burial mounds of the Roman Iron Age, Migration Period and Early Medieval Period, whereas evidence for settlement sites was scarce. Since 2006, an integrated multi-method research approach was conducted to gain a new understanding of the settlement dynamics of the 1st millennium CE with a focus on the island of Föhr. Yearly aerial reconnaissance led to the discovery of settlement sites in large parts of the island, followed by in-depth prospections with geophysical methods. Magnetic gradiometry provided the large-scale mapping and was coupled with Ground-Penetrating Radar, geoelectric and seismic methods on selected settlement features to improve the archaeological interpretation. Archaeological field survey and systematic metal-detecting allowed a quick initial dating of the sites. Based on the prospection data, archaeological excavations in the Early Medieval settlement sites of Witsum, Goting and Nieblum aimed to sample representative parts of the settlement to gain an overview on the settlements’ structures, dynamics, dating and economic activities. In combination with geoarchaeological investigations of the surrounding landscape and agricultural traces (e.g., anthrosols), it was possible to trace the development of small villages and dispersed farmsteads through the 1st-5th century CE until a probable settlement hiatus through the 6th and early 7th centuries. Afterwards, the emergence of earliest settlements of the Frisian immigration quickly evolved into thriving, craft- and trade-based trading sites, well connected within the North-Sea communication networks.

4 FROM THE SKIES TO THE UNDERGROUND. ON AERIAL ARCHAEOLOGY AND NON-INVASIVE METHODS IN DENMARK

Abstract author(s): Mauritsen, Esben (Arkæologi Vestjylland / Ringkøbing-Skjern Museum; Fortiden set fra Himlen / Holstebro Museum)

Abstract format: Oral

From 2008-2018 the project An aerial view of the past – Aerial archaeology in Denmark was carried out. The aim was to test the potential of various airborne remote sensing methods, such as LiDAR, drone 3D survey, and especially aerial reconnaissance by air plane, in a Danish context. The aerial surveys were mainly made in the summer months. When vegetation is stressed by draught it can lead to the creation of cropmarks over buried archaeological features. Over the years this led to the discovery of almost 1300 archaeological sites, most of which were hitherto unknown. The finds comprise a wide variety of categories such as longhouses, pit houses, ditches, fences, wells, cemeteries, levelled burial mounds, celtic field systems, causewayed enclosures, sunken roads, castle mounds and other defensive earthworks. Many sites were subsequently investigated in cooperation with metal detectorists,

or through targeted test excavation. In cooperation with the Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology a handful settlement sites was further investigated through high-resolution geophysical survey using motorized ground-penetrating radar and magnetometer systems. This paper will present examples of what can be achieved through aerial prospection, especially when combined with other remote sensing methods.

5 HOW MUCH IS STILL OUT THERE? A SETTLEMENT MODEL COMBINING ARCHAEOLOGICAL FIELDWORK, METAL DETECTING AND HISTORICAL MAPS (WEST JUTLAND, DENMARK)

Abstract author(s): Søvsø, Morten (Museum of Southwest Jutland)

Abstract format: Oral

Just a few decades ago, Danish archaeologists searched for settlements from the past using place-names, pollen analysis, phosphate mapping and field walking.

The 2001-implementation of the Malta-convention in Danish heritage legislation brought about an enormous increase in archaeological fieldwork. No one anticipated the vast scale and number of hitherto unknown settlements appearing in the trial trenches all over Denmark.

During the same period metal detectors and their users grew in both number and efficiency. This led to year by year growing numbers of finds coming into the museums. Logically this curve must top at some point, but when?

The third revolution in settlement history is the use of GIS-systems with access to both historical maps, orthophotos and LIDAR scans. Most/all Danish museums have adopted this powerful tool. Thousands of unknown sites have been found by both museum professionals and amateur archaeologists. The otherwise lost pre-modern agrarian landscape can easily be reconstructed on the computer screen.

The paper presents results from the Ribe/Esbjerg area on the West coast of Jutland. It shows what happens when you combine the knowledge gained from large-scale excavation with landscape reconstruction based on historical maps, ortho-photos and LIDAR-scans. And why C14-dating and metal detecting add vital details to the emerging structures.

A pattern of continuity spanning the two latest millennia seems to reproduce itself in every village. Only exception being the extreme climate crisis caused by the events referred to as the Late Antique Little Ice Age.

6 DISCOVERING A HIDDEN SETTLEMENT LANDSCAPE IN CONTEXT OF A SACRED LANDSCAPE

Abstract author(s): Sjögren, Karl-Göran - Axelsson, Tony (Dep. of Historical Studies, Gothenburg University) - Rassmann, Knut (Deutsche Archäologische Institut, Frankfurt)

Abstract format: Oral

The Falbygden plain in southern Sweden is unique with a concentration of at least 255 passage graves on an area of approx. 980 km². In recent years, archaeological research has set new accents and is increasingly looking at the connection between graves, enclosure sites and settlements. In contrast to the graves, finding Neolithic enclosures and settlements is more difficult. In today's intensively agriculturally used plain, fields and meadows offer different possibilities for detection of Neolithic features.

In addition to the surface surveys successfully carried out in recent years, geophysical methods, remote sensing and drone images are employed in the "Hidden Landscapes" project, started 2020. The work is embedded in long-term research by the University of Gothenburg and supported by the German Archaeological Institute. The aim is primarily to search for Neolithic enclosure sites, but also to test the feasibility of these methods in a moraine geology containing large amounts of magnetic stones of various sizes.

The methods are used at different scales. Remote sensing data from satellites and airplane photos examine the landscape as a whole. Among others, WorldView and TerraSAR-X microwave radar images are used. Drones with conventional photosensors and multispectral imagery check smaller windows of 5-20 km². In 2020, ca 3.9 km² have been surveyed. Large-scale magnetic surveys are used to investigate windows in the landscape with a size of 1-5 km². So far 5.8 km² have been prospected. Based on magnetic prospection and predictive modeling, smaller suspected areas are checked with ground penetrating radar. The final stage of the prospection is the verification of structures by drilling and test excavations. The selection of areas is accompanied by predictive modelling.

In the talk, we will present the methods employed and some of the results from the first season of work.

7 JUST A DROP IN THE OCEAN? HOW ISLAND ARCHEOLOGY CHANGED THE VISION OF LATE IRON AGE SETTLEMENTS IN NORTHWEST FRANCE

Abstract author(s): Duval, Hervé (CReAAH) - Peres, Thibaut (LETG; CReAAH)

Abstract format: Oral

In the last decades, island archaeology made significant progress in the northwest part of France. Those spaces that used to be neglected and apart from considerations brought crucial information's about many late Iron Age occupations. For a long time though, researches were mostly focused on Cross-Channel connections and the potential of the Atlantic shore remained underestimate. Due to the progress of new technologies, it has been possible to set up methods in order to study this particular geographic area. Results not only brought to light settlements that remained unknown, but also maritime nodes that were unexpected.

This communication presents the methods (airborne LiDAR, photogrammetry, field surveys, etc.) used in northwest France in order to detect and study Late Iron Age settlements. Moreover, by putting them in context within the Atlantic-Channel area, it also aims to describe a new maritime landscape, by considering what was missing until now. A closer look on fortified settlements will also be given in order to support this view. Thus, it appears that the natural preconditions of islands brought several strategic locations for settlements used in the development of maritime routes and dated from the late Iron Age. Field surveys also indicate that islands were highly dependents from external influences as well as their relationship with the coastal environment.

524 MEDIEVAL GLOCALISATION: LOCAL MANIFESTATIONS OF GLOBAL CONNECTIONS

Theme: 4. Globalisation and archaeology

Organisers: Cartwright, Rachel (University of Minnesota, Department of Anthropology) - Górkiewicz Downer, Abigail (University of Chester, History and Archaeology)

Format: Regular session

'Glocalisation' is a combination of the terms 'globalisation' and 'localisation', which coalesce into a concept that refers to global impact on a local scale. In Eurasia, the interconnections established in prehistory continued to develop, with the first millennia seeing the rise and fall of vast empires, such as the Assyrian, Hunnic, Kushan, Macedonian, Parthian, and Roman. By the beginning of the Medieval Period (5th-15th centuries) globalisation had reached new heights, with large migrations, religious pilgrimages, and extensive trade networks weaving Eurasia together. Examples include, but are not limited to, the Viking Age trade networks, the spread of Christianity and Islam, and the establishment of emporia along the Silk Road. Apart from the large-scale exchange of goods, materials, people, and ideas occasionally traversing thousands of kilometres, global connections frequently manifested in particular ways at the local scale, resulting in 'glocalisation'. While research into glocalisation is growing within the humanities and social sciences, it has remained under examined in archaeology, with the Archaeological Review from Cambridge in April 2018 providing one of the first real discussions on the topic within the field. Within medieval archaeology it has remained rather ignored altogether. This session aims to explore the exemplification of the impact of globalisation on local communities in the Medieval Period. The examination of the glocal not only highlights the heterogeneity of societies across Eurasia, but also illustrates the ways in which communities adapted to outside influences, reflected in several ways such as in the appearance of local examples of hybridisation or creolisation.

We encourage the submission of papers that explore how globalisation manifests in medieval archaeological contexts, and how it was variously acquired and negotiated at a local level from sites throughout Eurasia. This includes papers exploring all medieval contexts ranging from settlement and living-spaces, to emporia, burial grounds, and sanctuaries.

ABSTRACTS:

1 GLOBALIZATION AND EARLY CHRISTIANITY: THE CASE OF KOSOVO EARLY CHRISTIAN ARCHITECTURE

Abstract author(s): Hoxha, Zana (Institute of Albanology)

Abstract format: Oral

The new religion, Christianity, through the work of the apostles spread in every corner of the Roman Empire and beyond. Considering the large scale of the empire, it is astonishing how Christianity became "global" in such a short period of time. Since 313 AD, with the Edict of Milan, Christianity was preached freely, thus the number of believers grew exponentially. Moreover, at the same pace, Christian art and architecture was developing globally. Through comparative analysis of the design method and construction techniques of Christian architecture, we can observe how these buildings were subject to globalization process of this period. All over the empire, churches were being built based on the same principals and were being decorated with similar programs. Considering the above, this paper focuses on Early Christian architecture in the territory of Kosovo in a global context. Kosovo lies on the southeastern part of Europe, precisely on the Balkan Peninsula, putting the country at a favorable geographic and geopolitical position. Consequently, the process of Christianization reached this region relatively early, although a suburb of the empire. The objective of this paper is to present concrete examples of Christian architecture in Kosovo under the lens of globalization. Concluding, through these examples we can acquire a greater understanding on the ways that the global trends of this period in architecture were adapted to local conditions in form of new shapes and styles in the beginning and how the ambitions of the emperor Justinian affected the architecture in quantity and quality centuries later.

2 AGRICULTURAL 'GLOCALISATION' AT NINCH, A CASE STUDY FROM EASTERN IRELAND

Abstract author(s): Crowley-Champoux, Erin (University of Minnesota; University of Southern Maine)

Abstract format: Oral

In the first millennium AD, communities in Ireland became increasingly enmeshed in widespread changes occurring in Britain and the European Continent. This was particularly true for eastern Ireland, whose ports and harbors connected the island to the rest of Europe. It was during this period that the coastal community at Ninch, Co. Meath developed and grew. At this site, there is evidence for a range of activities, including agriculture, metalwork production, habitation, and burial. Artifactual and isotopic evidence demonstrates that the community at Ninch engaged with broader European networks and that this engagement transformed the community. From a zooarchaeological perspective, evidence from this site indicates increased agricultural experimentation and changing

butchery practices. In this paper, I explore the ways in which participation in both local and long-distance trade networks impacted community development and agricultural production at Ninch, Co. Meath and how the developments at Ninch are representative of impacts felt across eastern Ireland.

3 FUNERARY GLOCALISATION: COWRIE-PROVISION IN ALSATIAN INHUMATION GRAVES

Abstract author(s): Górkiewicz Downer, Abigail (University of Chester)

Abstract format: Oral

Sixth- and seventh-century inhumation burial in Alsace incorporates objects originating well outside the region. Non-local objects deposited in Alsatian burials range from Baltic- and/or North-Sea amber to Burgundian-style ceramic vessels. Yet the most 'exotic' items are cowrie shells. Cowries belonging to the genus *Cypraea* are believed to dwell in far-off waters, including the Red Sea and the Indian Ocean; their presence in burials reflects long-distance trade likely via both the Byzantine Empire and Lombard Italy to the wider Frankish realm of which Alsace was one part.

Cowries are not common in Alsatian inhumation burials and appear at first glance to be uniformly deposited with female individuals in similar spatial positions. I apply my original 'CCA-approach', which explores spatial position and composition of object-clusters in inhumation burials and which was previously applied to amber-bead deposition in Alsace, Kent, and East Anglia, to show that cowrie use in graves was not completely uniform. I argue that their variable deployment in mortuary ritual may be tied to localised individualisation as well as expressions of communal identities forged through shared social networks.

4 VIKINGS GO EAST: GROBINA ARCHAEOLOGICAL COMPLEX AND THE BEGINNINGS OF THE SCANDINAVIAN EXPANSION EASTWARDS IN THE PRE-VIKING AGE

Abstract author(s): Sne, Andris (University of Latvia)

Abstract format: Oral

An archaeological complex situated in present-day town Grobina (Latvia) on the eastern shore of the Baltic Sea bears significant information about the earliest wave of the Scandinavian overseas activities in the Pre-Viking Age and cultural hybridisation of local and incoming communities and cultural elements. Grobina archaeological complex includes a hillfort with adjacent settlement and four cemeteries that were used throughout the Iron Age and Middle Ages. A number of studies carried out since 1920s into the topics of cultural contacts in the Baltic Sea region reveal the persistent activity of Scandinavians in the east and south Baltic Sea region reaching the highest point during the Viking and post-Viking Age. But in the history of Grobina the preeminent role is played by the pre-Viking Age Scandinavian settlers who came from various places in Scandinavia (Gotland and Lake Malar area) and established their colony in this sparsely inhabited area already in the 7th century.

Archaeological finds, as well as few existing fragmentary written sources describe Viking Age Scandinavian and Curonian communities as dynamic, expansion-focused societies that are open to innovation and networking. At the same time there are no signs of Scandinavian political dominance during these centuries in East Baltic region, although evidence of Scandinavian presence in the Eastern Baltic region in pre-Viking Age has been found on the Estonian Island of Saaremaa (Salme burial site), as well as on the Baltic coast of present-day Lithuania (in surroundings of Palanga and Klaipeda), reflecting short-term expansion activities.

In Grobina, the coexistence model between Scandinavians and local people, the Couronians, was developed since first half of the 7th century. It gradually ceased to exist in the middle of the 9th century, but probably the experience of this local interactions formed basis for the Scandinavians in their further ways of interactions along Austrvegr (Eastern way).

5 VIKING AGE GLOCALISATION: EXAMPLES FROM SCOTLAND AND ICELAND

Abstract author(s): Cartwright, Rachel (University of Minnesota)

Abstract format: Oral

Widespread mobility and communication networks were key aspects that defined the Viking Age. The connections formed during this period spanned not only the North Atlantic heartland of the Viking World, but also vast expanses of Eurasia and North Africa. These long-ranging connections illustrate the globalisation of the Early Medieval Period. In examining the impact of this globalisation on the local sphere, the resultant glocalisation can be evidenced in hybridized material culture and the use of goods obtained through long- and short-distance trade in locally characteristic items and practices. This paper examines the concept of glocalisation from a theoretical perspective and then uses case studies from Scotland and Iceland in order to examine the degree to which globalisation and its local impact were exhibited in Scandinavian communities. In particular I will focus on sites in the Scottish Isles, looking primarily at Orkney and the Outer Hebrides, and western Iceland. The primary sources of data will be derived from material culture found in both settlement and funerary contexts from archaeological sites that illustrate the glocalisation of Viking Age communities.

6 GLOBAL CONNECTIONS AND LOCAL MANIFESTATIONS IN THE GALLOWAY HOARD

Abstract author(s): Goldberg, Martin (National Museums Scotland)

Abstract format: Oral

The Galloway Hoard (discovered in 2014) juxtaposes the silver bullion familiar from many other Viking Age hoards with a surprising array of other materials and objects not normally found in such hoards - gold, rock crystal, minerals, glass, Anglo-Saxon jewellery, as well as the rare organic preservation of silk, linen, wool, leather and wood. As the research and conservation programme continues many of these objects and materials are proving to have exotic origins and connections stretching halfway around the world. Part of the collection contained separately in a wrapped and lidded vessel features heirlooms accumulated over generations, some of which pre-date the Viking Age. Even the silver bullion has an unusual local element to it with Anglo-Saxon runic characters carved into Hiberno-Scandinavian broad-band silver arm-rings. The multiple identities, and the temporal and geographic range represented by this collection present an unusually rich example of global connections, albeit with numerous idiosyncrasies.

7 HOT SPOTS AND HINTERLANDS: PREMODERN 'PROTO-INDUSTRY' AND ALTERNATIVE TRANSITIONS TO CAPITALISM

Abstract author(s): Thurston, T L (University at Buffalo, SUNY)

Abstract format: Oral

Historical economists of Europe have identified a process that they call proto-industry as a pre-modern phase of economic conditions in which the productive choices of peasants drive new forms of economic development. They further predict that the strongest proto-industrial effects occur where agricultural potential is low - an archaeological and historically observable phenomenon. Precarious environments emerge as landscapes bristling with producers who funnel their 'surplus from below' through the hinterlands to the 'hot spots' of premodern urban centers. This connection appears to be the unlikely conduit through which a charcoaler's hut and the engines of colonial-era mercantilism are connected across oceans and continents. Can archaeology shed further light on the connections between so-called marginal environments, the relationships of certain forms of subjecthood to particular forms of rulership, and the entry of smallholders into international markets? More broadly, can parallels be drawn between the far north and the far south of Europe?

525 OF THE WATER: FISH AND MOLLUSCS IN THE ANCIENT EASTERN MEDITERRANEAN

Theme: 6. Material culture studies and societies

Organisers: Tsouparopoulou, Christina (University of Cambridge) - Recht, Laerke (University of Graz)

Format: Regular session

This session will examine the role of fish and molluscs in everyday life as well as in terms of their impact on social structures, and as part of ideological and symbolic expression. Given the prevalence of and dependence on water in various forms in all regions of the eastern Mediterranean, it is no wonder that fish and other aquatic species made an impact on human lives, yet this topic remains rather understudied. With this session, we would like to explore questions related to fishing practices and technologies, social status, human-fish/mollusc relations (also any potential over-exploitation), and fish/molluscs in ritual practices (e.g. as temple offerings, festival consumption, burial offerings), and ideology and religion (e.g. associated with supernatural beings or sacred space, as hybrid creatures, and as represented in luxury goods). Another set of questions would revolve around aquatic species as a non-alimentary resource, for example for jewellery, inlays, dyeing and medicinal purposes. Material under investigation can include faunal remains (worked and unworked), fishing gear and related tools, iconography and, where available, written sources. We particularly encourage papers that integrate multiple lines of evidence. The geographical area included here is the eastern Mediterranean broadly defined: papers using material from the Aegean, Cyprus, Anatolia, Levant, Mesopotamia and Egypt of any time period are welcome.

ABSTRACTS:

1 ENDLESS ROWS OF FISH! AQUATIC LIFE IN URUK PERIOD MESOPOTAMIA

Abstract author(s): Sieckmeyer, Kristina (Heidelberg University, Heidelberg Center for Cultural Heritage)

Abstract format: Oral

The exploitation of fish and other aquatic wildlife played an important role in everyday life of Ancient Mesopotamia. Fish, fisheries and related commodities are mentioned as early as the first written documents appear - being featured in administrative documents as well as in a lexical list dedicated exclusively to fish.

4th millennium BC greater Mesopotamia saw the formation of previously unknown urban complexity, indicating extensive settlement and communication networks. The dispersion of material culture, technical and economic improvements, but also the transmission of knowledge and cultural practices created an extensively cross-linked cultural landscape. The key technologies of that period clearly are the implementation of writing and the introduction of the cylinder seal, the latter offering the potential for a broader narrative and thus a new platform for visual communication. In this formative period of writing, seal imagery transported messages

that could not yet be transmitted differently. Finally, by the end of the 4th millennium, writing itself pushed communication to a completely new level.

What kind of information on aquatic life can be traced through these early records and do these observations coincide with the actual archaeological findings? This question also applies to the information placed on the documents themselves – the seal imagery. What do the seals tell us? One of the most striking examples of early cylinder seal designs is the type “rows of fish”. How are these seals distributed geographically, in which contexts have they been found and can we tell what they were used for in administrative terms?

This paper aims to examine the role of aquatic life in Uruk Period Mesopotamia in a holistic approach by combining textual witnesses, pictorial evidence and the rather scarce zooarchaeological data, shedding light on this specific aspect of early human-environment relations.

2 THE USE OF INGREDIENTS FROM FISH BY THE MESOPOTAMIAN THERAPIST

Abstract author(s): Chalendar, Véréne (Collège de France)

Abstract format: Oral

Assyriologists have paid particular attention to therapeutic rituals that use aquatic animals as a medium for the disease. Notably because they highlight the capacity of these animals to evolve in spheres inaccessible to humans and thus, make it possible to reject the disease as far as possible from the patient. On the other hand, the most “trivial” uses of fish in therapy are, to date, less well studied. However, there are many therapeutic prescriptions that mention either the generic term fish (kuḅ/nūnu) or specific species, whether they are currently identified with certainty or not (e.g. arsuppu, purādu, kuppū, girītu, ziqqatū). These texts document the use by Mesopotamian health specialists of a varied pharmacopoeia from fish (eyes, entrails, scales, fat, fins, gall bladder, etc.) to produce remedies for multiple diseases. Our paper aims to explore the therapeutic uses of fish, focusing on the possible specificities of each species, but also to examine whether there is a more global, more federative therapeutic concept of “fish” for the Mesopotamian physician. This subject will enable us to illustrate the richness of the therapeutic approach in Mesopotamia, in particular the different mechanisms which can lead to the use of an ingredient. It can also bring, through the examination of this aquatic pharmacopoeia, reflections of a more general nature concerning daily life and the practical and material conditions of the therapist’s practice in the ancient Near East.

3 CORRELATION BETWEEN STONES AND ICONOGRAPHY: FISH-CLOAKED FIGURE ON NEO-ASSYRIAN AND NEO-BABYLONIAN SEALS

Abstract author(s): Ftaimi, Tiffany (Ruprecht-Karls-Universität Heidelberg)

Abstract format: Oral

During the Neo-Assyrian and the Neo-Babylonian periods protective and apotropaic creatures were commonly depicted on ritual and adoration scenes in Mesopotamia. These creatures played a big role in ritual practices, such as purifications scenes in front of stylized trees, adoration scenes in front of deities as well as in front of deities’ symbols. Genii, hybrid creatures and figures cloaked in animal skins could be identified as protective and apotropaic creatures. Numerous representations of these creatures were depicted on Neo-Assyrian and Neo-Babylonian cylinder and stamp seals. Seals were used not only as a mark of ownership or to protect what was so marked but also as amulets that had a protective value for a wearer of a seal. Precious stones had a valuable meaning in the ideology and religion of Mesopotamian people. They used specific stones as amulets and seals for particular functions such as cure and protective objects.

The methodology applied in this study focuses on fish-cloaked figure on the Neo-Assyrian and Neo-Babylonian seals and seal impressions. An examination of stones’ types on which fish-cloaked figure has been depicted will be presented in this study as well. Additionally, the research aims to clarify the correlation between selected stones for seals’ production and depicted fish-cloaked figure for cure and protection purposes. The research based on iconographic aspects and available written sources.

4 MEDITERRANEAN CLAMOUR! REVISED DATING AND PATTERNS OF DISTRIBUTION OF ENGRAVED TRIDACNA SQUAMOSA MOLLUSCS

Abstract author(s): Schlegel, Valery (University of Zurich)

Abstract format: Oral

In the first millennium BC, engraved *Tridacna squamosa* were used as ornamented containers for cosmetics as far west as Vulci and as far east as Susa. Rolf Stucky’s dissertation of 1974 is to date the most comprehensive collection of engraved *Tridacna* dedicated to sanctuaries as well as enclosed in burials. In the 50 years since then, new finds have been published in various articles and another compilation is long overdue. This contribution not only seeks to provide this compilation but also presents a never adequately published and almost complete specimen in Leiden. Furthermore, a *Tridacna* found in Tomb I of the Northwest-Palace at Nimrud has been recently published and is herein dated to 730-694 BC, pushing back the old dating of engraved *Tridacna* (650/30-600/580 BC) by several decades.

Previous research concluded the provenience of engraved *Tridacna* either via stylistic considerations or via cumulative finds of polished *Tridacna*, which contradict each other. The new finds and revised dating enable to reevaluate the provenience via a new

approach called Topographic Profiling: A short term for mapping the finds of now over 140 specimens across the Mediterranean via their revised dating and stylistic groups to draw conclusions on their provenience, distribution patterns as well as iconographic differences and symbolism.

5 SHELLS IN MIDDLE KINGDOM EGYPT JEWELLERY

Abstract author(s): Patrevita, Maria (University of Naples “L’Orientale”)

Abstract format: Oral

An interesting aspect of Egyptian maritime activities of 12th Dynasty in the Red Sea is the impact on craft and jewellery. During this period, shell-shape pendants made out of a sheet of gold or electrum became very common in goldsmithery, such as the cowri-shell girdles found in the tombs of the 12th Dynasty of royal ladies, at Lahun and Dashur.

Used as ornaments from Badarian times, cowri-shells were as fertility amulets with meanings linked to female sexuality and hathoric symbolism, but also a kind of insignia for members of maritime expeditions around the Red Sea. The metallurgical study of these reproductions of shells in precious metals is the instrument to research and know the techniques, the tools and the ancient world of metallurgy.

The experimental archeology can help us to research the metallurgical processes behind this precious and symbolic artistic expression, connected to human-environment relations. We will try to understand what kind of technology was used for the creation of shells’s reproduction through experimentation of lost wax technique or the use of stone burins and chisels.

6 ENDURING LOVE? SHELL ORNAMENTS AND LANDSCAPE INTERACTIONS DURING THE TRANSITION TO SETTLED LIFE

Abstract author(s): Baysal, Emma (Ankara University)

Abstract format: Oral

The human-shell ornament relationship began in the Palaeolithic when mobile hunter-gatherer groups visited the shore to gather mollusc shells to use as beads. Evidence from around the Mediterranean suggests that the choices these groups made were consistent and deliberate and that meaning was attributed to the shells and their use. In the eastern Mediterranean, the Epipalaeolithic – Neolithic transition was a slow process that saw human groups become increasingly tied to certain localities. This had the potential to disrupt existing patterns of procurement practice and landscape engagement. Even though many new settlements were located far from the shore, marine shells continued to be employed as personal ornaments. This suggests that the interactions of early Neolithic communities with the landscape underwent gradual adaptive transformation that allowed them to maintain their connection with these marine resources throughout this period of change, possibly through the development of new or modified procurement mechanisms.

Archaeological data from a wide range of sites in Turkey spanning the Epipalaeolithic – Neolithic transition period offers us an opportunity to examine how the human-shell ornament relationship adapted and changed with increasingly sedentary lifestyles, at localities both close to and far from the sea. This presentation uses the data to explore to what extent communities were engaged with shell use, and how their preferences in type, processing and ornament use changed through time. The possible implications for the construction of identity of this dependence on the use of marine resources in ornamentation practices in different periods of prehistory are considered in the light of this evidence.

7 EXPLORING PAST EXPLOITATION STRATEGIES OF GROUPERS IN THE LEVANT USING SIZE RECONSTRUCTIONS

Abstract author(s): Winter, Rachel - Çakırlar, Canan (University of Groningen)

Abstract format: Oral

Groupers are large, solitary, apex-predator fishes which inhabit tropical and subtropical rocky reef ecosystems. They have been highly valued cuisine in the eastern Mediterranean for millenia, and retain high commercial value today. Due to their preference of shallow waters and close proximity to shores, only rudimentary fishing technology is required for their exploitation. Alongside their potential to grow to large sizes (>1 metre in total length), this contributes to their abundance in archaeological finds throughout the Mediterranean. This talk utilizes size reconstruction of groupers from archaeological sites along the Levantine coast from the Early Bronze Age through to the Middle Ages to explore fishing strategies and assess the potential long term impacts of their exploitation. Preliminary analysis from Bronze and Iron Age Kinet Höyük in Turkey, and two Lebanese sites, Iron Age Tell-el Burak and Bronze Age Tell Fadous-Kfarbida, suggests geographic and cultural differences in exploitation strategies. At Kinet Höyük, the dominant size category is between 61 to 80 centimeters (standard length) from the Bronze Age until the Middle Ages whereas further down the Levantine at Bronze Age Tell Fadous-Kfarbida and Iron Age Tell-el Burak the fish were more evenly distributed between 21 to 70 centimeters. Interestingly, the only finds of groupers over 1 metre in standard length comes from Bronze and Iron Age Kinet Höyük with no groupers of such length during later occupational phases nor at Tell-el Burak or Tell Fadous-Kfarbida.

8 FRESH INSIGHTS INTO THE CONSUMPTION OF PRESERVED MOLLUSKS IN THE BYZANTINE AND EARLY ISLAMIC PERIODS OF THE SOUTHERN LEVANT

Abstract author(s): Ktalav, Inbar (Zinman Institute of Archaeology, University of Haifa) - Lehnig, Sina (Johannes Gutenberg Universität Mainz)

Abstract format: Oral

Mollusk shells originating from the Mediterranean, the Red Sea and the Nile River, were uncovered in Byzantine and Early Islamic sites in the southern Levant.

Two widely spread shellfish taxa are the small clam, *Donax trunculus*, commonly found in the exposed sandy wash zones of the Eastern Mediterranean coast; and the large freshwater mussel, *Chambardia rubens*, whose habitat stretches from the Nile River to western Africa. A third species is less common, the large conch, *Lambis truncata*, commonly found in the shallow waters of the Red Sea. The breakage and abrasion patterns of the shell fragments of these species suggest that they were collected as live specimens intended for consumption, and not as empty shells washed ashore. The shellfish were desired for their nutritional value and medicinal purposes. Their occurrence at inland sites in the southern Levant indicates that these species had been preserved to survive long distance transport. Some of the sites were central trade centers, like Jerusalem, but others were humble monasteries or farms, and do not fit the common conception of luxury food. The mollusks from the southern Levant offer a prime example of the transportation of food derived from seas and rivers to distant inland locations and provide important new insights on the nutritional importance of shellfish and its availability to a wide range of population during the Byzantine and Early Islamic periods.

9 EXPLORING THE MULTI-DIMENSIONAL SYNTHESIS OF FISHING ACTIVITY: THE CASE STUDY OF CYPRUS

Abstract author(s): Michael, Maria (University of Southampton; Honor Frost Scholar)

Abstract format: Oral

The current paper highlights fishing as an activity and life-style involving interdependent economic, cultural, technological and environmental aspects. It strives to present the tradition of fishing activity on the island of Cyprus from Neolithic to Early Christian periods. The research presented here is based on the results developed during my PhD research project, which is the first attempt to gather all the available evidence for fishing activity in Cyprus in a single body of evidence.

Thus, my research attempts to examine the main indicators of fishing activity, which are the archaeological finds of fishing technology (e.g. harpoons or spears, hooks, traps, stone, clay and lead weights for the net or line weirs, fish-tanks) and fishbone assemblages recovered in a variety of archaeological sites in Cyprus. The iconographic and written sources, the environmental and ethnographic data are a supporting class of evidence.

This examination does not lead only to the creation of diachronic catalogues or typological arrays of archaeological finds, but it also demonstrates how cultural and physical contexts of Cyprus determined the presence or absence of fishing activity in Cypriot maritime landscape. In addition, this examination contributes towards a more holistic understanding of the relationship between fishers and their maritime cultural landscape.

According to available evidence, Cypriots have been involved in fishing activities diachronically. The systematic mapping of the archaeological sites, where finds of fishing gear and fish remains have been recovered, demonstrates regional and chronological patterns. Neolithic, Late Bronze Age and Hellenistic-Roman periods yielded more prominent evidence. Consequently, the results of the examination of these chronological periods will be discussed further in this paper.

10 UNDERREPRESENTED RICHES FROM THE SEA

Abstract author(s): Yamasaki, Mari (GRK 1876 "Early Concepts of Man and Nature", Johannes Gutenberg-Universität Mainz)

Abstract format: Oral

In the Late Bronze Age, fish and molluscs have played an important role in the diet and in the economy of Eastern Mediterranean coastal societies. Fish-roe cakes and dried splits feature in the list of goods traded over long distances, whilst textiles coloured with the purple dye obtained from murex shells were considered among the most luxurious items of their time and would continue to be so for centuries to come. Accordingly, the ancient textual and iconographic sources deal with these final products as objects of value, in terms of international gift exchanges and temple donations. However, despite their undeniable importance, marine faunal resources, the raw materials from which these valued products were obtained, rarely surface in the discourse of those who profited from them. Surprisingly few ancient sources explicitly deal with either fish or molluscs, nor are the activities related to their procurement and processing described in much detail, if at all. This paper aims at investigating the ancient conceptualization of these resources by combining the analysis of the archaeological remains with the textual and iconographical evidence, and addresses the question as to why these riches from the sea were consistently underrepresented in the sources.

11 "PONTON ICHTHYOENTA". MARINE CREATURES ON AEGEAN AND CYPRIOT PICTORIAL POTTERY AT THE END OF LATE BRONZE AGE

Abstract author(s): Lekka, Anna (Greek Ministry of Culture)

Abstract format: Oral

The figurative motifs of Aegean and Cypriot Pictorial Pottery at the end of Late Bronze Age derived mainly from the animal kingdom and includes marine creatures such as fish, octopuses, seahorses.

Fish represents one of the most common themes of Mycenaean IIC pottery and Pictorial White Painted Wheelmade III ware. Fish and octopuses decorate a great number of vases from the Greek mainland and the Aegean, mostly of the Octopus Style. Eastern traditions, Mycenaean pictorial motifs, and local practices contributed to the establishment of a fish iconography in Cyprus. The motifs most usually appear isolated, while there is also an attempt for narration, as can be seen in examples of fishing scenes. Both in the Cypriot examples and in the Aegean ones the bodies of the animals are decorated in a similar manner with various types of linear motifs.

A symbol of life and rebirth, with chthonic, apotropaic, and purifying properties, the fish has a long tradition and it is associated with religious beliefs. Although, the interpretation of the images starts from the environment and its relation to human activity and the dietary habits, images visualize ideas. The study of a vast number of myths and traditions leads to interesting conclusions concerning the religious syncretism.

12 FISHING IN VERGINA. FISHING GEAR AND BURIAL RITUAL FISH REMAINS FROM THE MACEDONIAN HINTERLAND

Abstract author(s): Stamatopoulou, Vasiliki (The Greek Ministry of Culture /Ephorate of Antiquities of Thessaloniki City; Aristotle University of Thessaloniki Vergina Excavation Project; The Hellenic Open University)

Abstract format: Oral

This paper presents recent excavation finds that document fishing activity in the ancient city excavated in Vergina illuminating an unknown to date aspect of daily life, diet, and interaction with the natural environment. The closest fish habitat to Vergina is the lower reaches of Haliakmon River, located about 5 km north of the ancient city. The finds examined here are, on the one hand, fishing gear of the second half of the 2nd century BC. found next to the city-wall and on the acropolis of Vergina and on the other hand, fish fauna remains found among the other remains of animals and birds that were offered to the funeral pyre for the occupant of the main chamber of the famous tomb II of the Vergina Great Tumulus, a burial ensemble considered by many as royal. The fishing gear from the excavations of the fortification of Vergina comes from well-dated layers and is an archaeological testimony that fills a gap in our knowledge of fishing in inland sites of northern Greece located in the vicinity of rivers or lakes. This set of data is co-examined with information from written sources as well as fishing finds from the wider region of Northern Greece, so that in addition to revealing fishing practices and ritual, to investigate the social status of fishing and fishers as well as the human-environment relations. The importance of fishing in the economy and nutrition of the local inhabitants and the role of river and lake resources of Macedonia in everyday life are topics that this paper will also address.

528 SHIFTING THE FOCUS: MOUNTAINS AS CENTRAL PLACES IN (PRE-)HISTORY

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Brisset, Elodie (Institut Méditerranéen de Biodiversité et d'Ecologie; CNRS, University Aix-Marseille, Inuiversity Avignon, IRD) - Ricci, Andrea (Cluster of Excellence ROOTS, Kiel University) - Balatti, Silvia (Institut of Classical Studies, Kiel University) - Djamali, Morteza (Institut Méditerranéen de Biodiversité et d'Ecologie; CNRS, University Aix-Marseille, Inuiversity Avignon, IRD)

Format: Regular session

Mountainous regions, sometimes considered remote and marginal areas, have always hosted a variety of human activities. Indeed, the importance of altitudinal gradients, climatic conditions and repartition of the ecosystem resources create different constraints and opportunities. This session aims to bridge an interdisciplinary community (i.e. Archaeologists, Historians, Ethnographers, Palaeoecologists and Palaeoclimatologists) in order to discuss the diversity of Human-Environmental interactions and perceptions associated with mountain environments during prehistorical and historical periods. In particular, we will welcome highly interdisciplinary approaches, time-transgressive investigations, and comparisons of studies of different mountain areas that will look at:

- Perceptions and experiences amongst human groups (e.g. sedentary farmers, hunter-gatherers, mobile pastoralists, urban citizens);
- Mobility (e.g. vertical, horizontal, migrations, invasions);
- Cultural niche construction (impacts of human activities on landscapes and ecosystems);
- Socio-economic activities (e.g. agriculture, arboriculture, pastoralism, transhumance, mining, way of life, including ritual practices);
- Interaction with geomorphic and climate hazards (e.g. erosion, snow cover duration, drought, river flood).

ABSTRACTS:

1 WHOSE PASTURE IS IT? OVERLAPPING ETHNOLOGICAL AND ARCHAEOLOGICAL RECORDS FROM PREHISTORIC LANDSCAPE OF SOUTHERN VELEBIT MOUNTAIN, CROATIA

Abstract author(s): Grguric, Maja (University of Zadar)

Abstract format: Oral

Velebit mountain is a part of Dinaric Alps and the largest mountain range in Croatia. Stretching along the eastern Adriatic coast it forms a natural border between the Mediterranean and continental regions, as well as climates. A distinctive karst topography, harsh climate, sparse vegetation and water resources of the southern coastal area of Velebit make it a marginal landscape today, attractive only to hikers and tourists. But up until a few decades ago scattered highland summer pastures provided for transhumant pastoralists from surrounding coastal areas as well as for those from the inland. In this paper ethnographic records as well as archaeological field survey and limited data sets collected from rare archaeological excavations conducted in this area are combined in attempt to explain the presence and placement of prehistoric hillforts in southern Velebit region. This paper provides arguments that ethnographically recorded seasonal migratory routes might correlate with economically interdependent prehistoric communities in the coastal, highland and inland region of Velebit mountain.

2 PATHWAYS AND MOBILITY IN UPLAND LANDSCAPES. THE RELATIONSHIP BETWEEN TRANSHUMANT ROUTES AND SETTLEMENT POSITION IN MOUNTAIN AREAS OF WESTERN EUROPE

Abstract author(s): Garcia Casas, David (Institute of Heritage Sciences - Incipit-CSIC; Centre Camille Jullian, Aix Marseille University, CNRS) - Cesarini, Roxanne (Aix Marseille University, CNRS, LA3M) - Mocci, Florence (Hors-Classe CNRS - Centre Camille Jullian, Aix Marseille University, CNRS) - Walsh, Kevin (University of York)

Abstract format: Oral

This study aims to investigate the role of human mobility in the construction of pastoral landscapes in two areas in the French Alps, the Byaisse and Fournel valleys in the Parc National des Ecrins and the Ubaye Valley. The approach is informed by previous research in Parc Nacional d'Aigüestortes (Central Pyrenees, Spain). The new investigation is part of the PATHWAY project which investigated the emergence and development of long-distance transhumance in the Western Alps from the Iron Age to the Middle Ages.

In this context, we are conducting research on the ancient routes taken by shepherds and their flocks and herds. We employ several data types in the reconstruction of ancient pathways. Some of these clues are topographic, such as elevation, slope or insolation, the others are linked to the, social and economic contexts or to the physical conditions of humans and animals. Consequently, we collect different data in a multidisciplinary approach. We first collect ethnographic and historical data by studying ancient cadastres and review studies undertaken by ethnographers since the 20th century. These data facilitate the visualisation of ancient pathways. These pathways are integrated to a GIS. We then compare the location of archaeological sites with the layouts of pathways to verify possible connections. Thanks to this regressive approach, we try to select the most relevant elements which determine pathways according to the chronological period. The next step is the integration of environmental data like hydrography, and forest clearance. Finally, we test these elements using spatial analysis to postulate the networks of ancient pathways. In summary, we aim to determine ancient transhumant routes derived from topographical, historical, ethnographic and environmental data. The results of this study will be used to improve the knowledge about the long-term evolution of pastoral activities in mountain landscapes.

3 CENTRALITY, MARGINALISATION AND MOBILITIES IN EASTERN TIGRAY (ETHIOPIA): MODERN AND CONTEMPORARY PERIODS AS ANALOGUES TO HELP UNDERSTAND THE PAST

Abstract author(s): Blond, Ninon (Université Lumière Lyon 2, Archéorient - UMR 5133; École Normale Supérieure de Lyon - ENSL, EVS - UMR 5600) - Benoist, Anne (CNRS, Archéorient - UMR 5133) - Callot, Yann (Université Lumière Lyon 2, Archéorient - UMR 5133) - Gajda, Iwona (CNRS, Orient & Méditerranée - UMR 8167) - Jacob-Rousseau, Nicolas (Université Lumière Lyon 2, Archéorient - UMR 5133) - Schiettecatte, Jérémie (CNRS, Orient & Méditerranée - UMR 8167) - Barge, Olivier (CNRS, Archéorient - UMR 5133)

Abstract format: Oral

In northern Ethiopia, the villages of Sewne and Wolwalo form the centre of two areas surveyed by the French archaeological mission in the Eastern Tigray which revealed pre-Aksumite, Aksumite and post-Aksumite settlements. Around Wolwalo, the study zone is on the Tigray plateau, at an altitude of 2700 m. Around Sewne, the site of Wakarida and the surveyed area extend on a topographic spur at the altitude of 2400 m, forming a transition zone between the plateau and the valleys plunging towards the Danakil Depression. The relations maintained by the sites of the two regions with the central powers during pre-Aksumite, Aksumite and post-Aksumite periods are still unclear, as well as the relationship between the two spaces (spur/plateau), and ancient agricultural practices.

Geographically, it is a margin area with a shifting relationship to political centrality, which can be apprehended on various spatio-temporal scales, thanks to an interdisciplinary approach, combining archaeology, geoarchaeology, geohistory and ethnogeomorphology. Our geographical analysis relies on the concepts of centrality, marginalization and mobility and is part of a diachronic reflection, essentially based on the modern and contemporary periods.

During the modern period, this space is subject to erosion caused by anthropogenic activities from the 14th century onwards but is nevertheless absent from travellers' accounts and early cartographies. Marginalised at the regional scale and away from the main itineraries, the studied space remains locally active and continues developing. Today, the Sewne spur constitutes a central margin: its marginal location makes it a contact zone, an interface area, where the distance from the centre leads to the creation of a new centre. This area becomes a porous and dynamic borderland between sedentary agricultural practices and nomadic or semi-nomadic agro-pastoral practices of the neighbouring Afar populations. These contemporary data provide analogues allowing to question past periods through a regressive approach.

4 IMPACT OF PREHISTORIC PASTORALISM ON ALPINE ECOSYSTEMS AT DIFFERENT SPATIAL AND TEMPORAL SCALES: A CASE-STUDY FROM VAL DI SOLE (ITALY)

Abstract author(s): Carrer, Francesco (Newcastle University) - Angelucci, Diego (University of Trento)

Abstract format: Oral

Archaeological and palaeoecological research in mountain environments has long shown that the impact of pastoralism on alpine and subalpine ecosystems dates back to prehistoric times. Forest clearances have permanently changed the vegetational composition of the montane uplands. Thousands of years of intense animal grazing has changed the local soilscape and contributed to soil erosion. Different proxies enable these dynamics to be investigated at different spatial and temporal scales. Pollen data and the analysis of soil profiles reveal the slow transformation of vegetation and soil, associated to the growing human pressure on local environments. On the other hand, archaeological contexts at high altitude provide unique 'snapshots' of the impact of pastoral activities at local scale and within the lifetime of the investigated site. The analysis of archaeological contexts has the potential to unravel how and why pastoral strategies contributed to the long-term landscape transformations disclosed by palaeoecology and soil science.

In this paper we discuss the case of MZ051S, a Bronze Age (ca. 1900-1400 BC cal) pastoral site at 2250 m asl in Val di Sole (Italian Alps). Evidence of the activation of slope processes in the site following its first occupation might indicate an early human impact on alpine ecosystem in the area. In order to validate this hypothesis, the analysis of the archaeological context have been compared/contrasted with palaeoecological and geoarchaeological data from the area (and surrounding areas). A computer modelling framework has been used to integrate and examine data with different spatial and temporal resolutions. Preliminary results highlight the benefits (and challenges) of using multi-proxy approaches and working across scales to assess human impact on mountain environments.

5 ARCHAEOLOGY IN THE CANTABRIAN MOUNTAINS (NW IBERIA): AN INTERDISCIPLINARY EXPERIENCE TO DELVE INTO THE CULTURAL BIOGRAPHIES OF UPLAND LANDSCAPES

Abstract author(s): Gonzalez Alvarez, David (Institute of Heritage Sciences - Incipit, Spanish National Research Council - CSIC)

Abstract format: Oral

Mountainous landscapes constitute an exciting meeting point for archaeologists aiming to engage with other academic disciplines, such as Geography, Anthropology, Earth Sciences, History, or GIScience. Interdisciplinary research developed on the uplands has grown substantially within the last few decades, deconstructing traditional views on the mountains as barely anthropized and peripheral landscapes through history. Since 2017, we have conducted archaeological research in the upland region of Babia (León, Spain), in the Cantabrian Mountains (NW Iberia). Aiming to fill the voids in the archaeological knowledge about the diachronic occupation of these mountains, we have carried out extensive remote sensing surveys, field-walking and geophysics prospections, and archaeological excavations. The data gathered flagship the relevance of the anthropogenic impact in these considered 'remote' or 'marginal' areas, in addition to the complexity of the anthropization processes. In this paper, we will reflect on how interdisciplinary research on upland landscapes driven by archaeological questions can widen our horizons on relevant debates for Iberian history such as the earliest spread of agriculture and pastoralism in Late Prehistory, the Roman conquest, the economic basis for the Medieval and Modern expansion of the Spanish cities, the impact of globalized contemporary markets in the decline of rural Spanish areas, or the recent climate crisis.

6 LIVING AND DYING IN THE MOUNTAIN : INTERDISCIPLINARY APPROACH OF HUMAN-ENVIRONMENTAL INTERACTIONS IN THE FRENCH ALPS (SAINT-PIERRE 2, THORAME-BASSE)

Abstract author(s): Lattard, Alexia - Isoardi, Delphine - Mocci, Florence (Aix Marseille Univ, CNRS, CCJ) - Huguet, Céline (Direction Archéologie et Muséum de la Ville d'Aix-en-Provence) - Cençon-Salvayre, Carine (Independent Researcher) - Talon, Brigitte (Aix Marseille Univ, Avignon Université, CNRS, IRD, IMBE) - Ollivier, Vincent (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA) - Martin, Lucie (Laboratoire d'Archéologie préhistorique et anthropologie, Université de Genève, Suisse / Edytem UMR 5204) - Sirdeys, Nais (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA; Aix Marseille Univ, CNRS, IRD, INRAE, Coll France, CEREGE) - Veyron, Robin (Aix Marseille Univ, CNRS, CCJ)

Abstract format: Oral

In the Southern Alps, in the heart of the upper Verdon valley (Alpes-de-Haute-Provence, Thorame-Basse), an interdisciplinary research program has led to the discovery of an unpublished site located on the Saint-Pierre Plateau (alt. 1300 m). Since 2019, the archaeological operations have revealed protohistoric and ancient built structures, and a funerary space from the High Empire and a

second one dating from late Antiquity. During Antiquity, the site took place in the civitas of Etramina extended in the Issole Valley. Mentioned as the diocese's chief town in the year 442 AD., this locality nevertheless disappears from the texts although we know of the existence of an ephemeral bishopric that existed for a short time during the 5th century. No remains relating to this ancient city have been clearly identified in the valley, raising questions about the forms of the human occupation and the settlement dynamics over time in this sector.

This project aims to maximise our understanding of the site in mountain, through interdisciplinary research: paleoenvironmental approaches (anthracology, archéobotany, pedo-anthracology, geomorphology, geoarchaeology), as well as geophysical survey in order to discuss the diversity of Human-Environmental interactions and perceptions associated in alpine valley. Our approach will study the forms and evolution of human settlement and the natural environment's management. The geomorphological approach revealed the existence of a paleovallon and an interfluvium which conditioned the first settlement (774-480 cal. BC), in a dominant position and, then, developed toward the paleovallon which was gradually filled during Antiquity. The first paleoenvironmental results confirm landscape opening and offer the first markers for the reconstruction of the species, wild and cultivated, exploited locally by these communities.

The diachronic occupation suggests that this vast plateau may have been an essential settlement point for the valley due to its topographical configuration and dominant position during Protohistoric time and Antiquity.

7 AN INTERDISCIPLINARY INVESTIGATION OF THE LONG-TERM PROVENÇAL AND ALPINE LIVESTOCK MANAGEMENT: THE INTERSECTION OF BIOARCHAEOLOGY, PALAEOECOLOGY AND CULTURAL ARCHAEOLOGY

Abstract author(s): Knockaert, Juliette - Dulias, Katharina (Department of Archaeology, University of York) - Giguet-Covex, Charline (Laboratoire EDYTEM, CNRS, Université de Savoie) - Isoardi, Delphine (Centre Camille Jullian, Aix Marseille Univ, CNRS, CCJ) - Pike, Alistair W.G. (Department of Archaeology, University of Southampton) - Suméra, Franck (Aix Marseille Univ, CNRS, Minist Culture, CCJ) - Unsain, Dianne (Centre Camille Jullian, A*MIDEX, Aix Marseille Univ, CNRS, CCJ; LA3M, Aix Marseille Univ, CNRS) - Magniez, Pierre (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA) - Mocchi, Florence (Centre Camille Jullian, Aix Marseille Univ, CNRS, CCJ) - Walsh, Kevin (Department of Archaeology, University of York)

Abstract format: Oral

From ritual, commercial to pastoral activities, domestic animals have played a major role in the use and trajectories of mountain landscapes over the last seven millennia in the Alps. However, for two decades, alpine archaeological research has rarely moved beyond the simple identification of past human activities, rather than their characterisation and the concomitant assessment of practices and techniques. The reasons for this are many; perhaps most significant is the relative dearth of archaeological and zooarchaeological evidence in the high-altitude zones.

The European research project PATHWAY (A*MIDEX-France and ARHC-UK) focuses on studying the diversity of past livestock management strategies and their impacts on landscapes from the Iron Age to medieval times, from the Western Alps to the Provençal plains. In this interdisciplinary study, the intersection of bioarchaeological (studies of fauna, isotope analyses) and paleoenvironmental (sedDNA, palynology) methods, combined with cultural archaeology, aims to highlight: (1) the animal resources exploited, (2) the mobility patterns of domesticated species (3) the high altitude areas exploited as mountain pastures and the responses (e.g. degradation, resilience, resistance, adaptation) of the vegetation communities and erosion dynamics in these grazing areas and finally, (4) the farming techniques and practices of the agro-pastoral communities of transalpine Gaul to the societies of Medieval times. This communication will present our analytical and integrative frameworks and the first results obtained, with a view to contributing to the history of Alpine pastoralism; a productive strategy that is a significant keystone agricultural undertaking of central importance not only for the Alps but for abutting European regions.

8 HUMAN SETTLEMENT IN THE HIGHLANDS OF SOUTHERN CAUCASUS DURING CHALCOLITHIC AND BRONZE AGE THROUGH ARCHAEOZOOLOGY, STABLE ISOTOPES AND CEMENTOCHRONOLOGY

Abstract author(s): Vautrin, Adeline - Balasse, Marie - Berthon, Rémi - Fiorillo, Denis (AASPE UMR 7209, Muséum national d'Histoire naturelle, CNRS, Paris) - Gambashidze, Irina - Gogochuri, Giorgi (Georgian National Museum, Tbilisi) - Gourichon, Lionel (CE-PAM UMR 7264, Université Côte d'Azur, CNRS, Nice) - Lemoine, Michel (AASPE UMR 7209, Muséum national d'Histoire naturelle, CNRS, Paris) - Stöllner, Thomas (Ruhr-Universität, Bochum) - Mashkour, Marjan (AASPE UMR 7209, Muséum national d'Histoire naturelle, CNRS, Paris)

Abstract format: Oral

The exploitation of montane ecosystems by agro-pastoral communities has played an important role in the development of these societies in the Caucasus. Mountains can be constraining in winter as snow prevents access to pastures and constrains animal husbandry, but they also provide access to natural resources such as copper ores, obsidian and pastures. As human occupation in the Caucasus mountains is still very little studied, the archaeozoological approach makes it possible to test the hypothesis that zoot-echanical innovations have led to a more substantial implementation of human communities in the montane ecosystems. The study of faunal remains makes it possible to account for the species that has been exploited (domestic or wild). Cementochronological analyses of herbivores teeth will allow us to determine the seasons of occupation of the sites. Finally, it will be possible to investigate pastoral mobility (horizontal, vertical, etc.), herd feeding (use of fodder) and births seasonality with isotopic ratio analyses in

bioapatite (carbon, oxygen, strontium) and collagen (nitrogen, carbon). The first results from various Georgian Chalcolithic and Early Bronze Age archaeological sites will be discussed in this presentation.

9 PASTORAL LANDSCAPES OF THE NURATAU MOUNTAINS IN CENTRAL ASIA

Abstract author(s): Luneau, Elise (Deutsches Archäologisches Institut, Eurasien-Abteilung) - Avanesova, Nona Armaisovna (Samarkand State University)

Abstract format: Oral

Mountains, while accounting for a large proportion of the territory, have been neglected in Central Asian archaeological research for a long time. Growing research in the recent past decades in these areas showed that mountains have been however essential in the acquisition of resources and exchange networks. At the far western point of the Pamir-Alay system, the Nuratau Mountains, located in the Samarkand province of the present day Republic of Uzbekistan, has also been largely unexplored up to now. Mostly covered by mountain steppe, the Nuratau ridge does not reach very high altitudes and, thus, was particularly suitable for the occupation by pastoralists.

Recent investigations in the region, through a collaboration between the German Archaeological Institute, Eurasia Department and the Samarkand State University, aims at better defining population movements and cultural evolution in prehistory. The surveys have revealed a dense occupation through time and showed that the area is strategically placed for the study of the movements of people through Central Asia. Various archaeological features attest cultural links with remote areas and highlight the specificity of cultural and socioeconomic practices in the mountainous areas over a long period. Preliminary outputs drawn from patterns of distribution of the various sites and structures in the area participate in highlighting diverse cultural topographies and interactions with the environmental setting. The research contributes to define various aspects of the pastoral landscape, and ultimately, to reconsider these areas, previously viewed as peripheral or marginal areas, as fully integrated within complex societies with various communities over time.

10 THE ROLE OF GOATS IN THE DEVELOPMENT OF PREHISTORIC AND PROTOHISTORIC SOCIETIES IN THE ZAGROS. A VIEW FROM THE ARCHAEOZOOLOGY

Abstract author(s): Mashkour, Marjan (CNRS-UMR 7209 AASPE- MNHN- Paris)

Abstract format: Oral

This paper aims at presenting an overview of archaeozoological studies in the highlands of western Iran and the importance of goats, wild or domestic, in the past subsistence economies of the Zagros, a strategic region in South West Asia.

The development of archaeological studies from the 1960s in the Zagros region and the intensification of archaeological investigations during the last decades have highly contributed to shifting the role of the Zagros mountains in the narrative of plant and animal domestication, from a marginal area to one of the centers of Neolithisation. In this frame, goats have had a crucial role from the Paleolithic to the dawn of Neolithic and beyond within the mobile or sedentary communities that inhabited these highlands and adjacent regions.

We will present a selection of sites where goat hunting and herding were important in the subsistence and discuss morphological features and demographic structure of goat populations regarding their wild or domestic status. Finally, we will address the articulation of this archaeozoological information and the evidence for the integration of the goat figure into the symbolic sphere and human artistic production on the Iranian Plateau.

11 THE EARLY BRONZE AGE ZAGROS INTERACTION SPHERE (CA. 3100-2500 BCE): ORGANIZING ACCESS TO DISPERSED RESOURCES IN A FRAGMENTED LANDSCAPE

Abstract author(s): Renette, Steve (University of British Columbia)

Abstract format: Oral

Relying on a combination of ethnographic accounts and Mesopotamian cuneiform records, archaeologists have characterized prehistoric and early historical Zagros societies as pastoral nomadic tribes. Such mobile peoples are credited with facilitating the circulation of goods and long-distance exchange of resources through their annual migration between high-altitude valleys and low-land plains. However, archaeological data supporting such a reconstruction of ancient Zagros mountain peoples is largely lacking. Instead, absence of evidence attributed to methodological difficulties in identifying temporary, ephemeral habitation away from mounded sites is often used to support the existence of nomadic tribes. This is particularly the case for the Early Bronze Age, which archaeologists persistently failed to detect in surveys of Zagros valleys and plains.

In this paper, I will present new evidence from the Mahidasht Survey Project in Kermanshah Province (1975-78) and the site of Kani Shaie in Sulaymaniyah, excavated between 2013-16, that demonstrates continued settled occupation within the central Zagros during the Early Bronze Age. This forces a reconsideration of local strategies to obtain non-locally available resources in this mountainous landscape and the formation of shared cultural practices between dispersed communities. I will argue that following the degradation of Late Chalcolithic directional exchange networks, Early Bronze Age communities reorganized into cultural constellations based on ecological-latitude zones as a risk-buffering strategy. In order to obtain non-locally available resources, periodic gatherings structured through feasting events provided the opportunity for exchange and the fostering of social ties with distant

communities. I propose that this Zagros Interaction Sphere produced a gradual ethnogenesis, based on a close relationship between communal identity and the inhabited environment, that gave rise to the peoples and polities attested in Mesopotamian cuneiform records of the later third millennium BCE.

12 LIVING THE MOUNTAIN LIFE: THE PASTORAL SOCIETIES OF THE SOUTHERN ZAGROS AND THEIR ENVIRONMENT IN ANTIQUITY

Abstract author(s): Balatti, Silvia (Institute for Classical Studies, Kiel University) - Brisset, Elodie - Djamali, Morteza (Institut Méditerranéen de Biodiversité et d'Ecologie; CNRS, University Aix-Marseille, University Avignon, IRD) - Ricci, Andrea (Cluster of Excellence ROOTS, Kiel University)

Abstract format: Oral

Pastoral societies have inhabited the Southern Zagros Mountains since at least the early 1st millennium BCE. Their lifestyle and its transformation through time offer us a vivid example of the engagement of people with the surrounding mountainous environment in a semi-arid region of Southwest Asia.

Based on a synthesis of the ethno-historical knowledge that has been gathered over the last decades (Balatti, 2017) and how this evidence interrelates with the paleoecological and archaeological data, this presentation will:

1. characterize what were the traditional socio-political structures and ways of life of the mountain peoples of the Zagros (e.g. pastoralism, hunting, arboriculture, agriculture, craft production, religion) in antiquity, with a special focus on the 1st millennium BCE;
2. discuss the various resources of this specific mountainous environment (opportunity/risk) and people ecology-driven stereotypes amongst the different groups (e.g. lowland authorities versus autonomous mountain dwellers).

We will finally use the ethno-historical evidence to provide some insights into the on-going interdisciplinary research carried out in the Southern Zagros in the framework of the project "HighStepLands" (DFG-SPP "Iranian Highlands"), that aims to investigate how human occupation strategies and subsistence patterns have interacted with the surrounding environment at the different altitudes, and how it has interplayed with the lowland socio-cultural-political organizations.

Reference:

- Balatti, S. 2017. Mountain Peoples in the Ancient Near East: The Case of the Zagros in the First Millennium BCE (Cléo 18), Wiesbaden.

13 COMPLEXITY BEYOND NEO-EVOLUTIONISM: SOCIAL ORGANIZATION IN "MARGINAL" ENVIRONMENTS AS SEEN FROM THE RIM OF THE TIBETAN PLATEAU

Abstract author(s): Hein, Anke (University of Oxford)

Abstract format: Oral

In spite of decades of criticism on the teleological, and colonialist-western-centric nature of neo-evolutionist models, these ideas still loom large in archaeological debates of social organization. Such debates tend to concentrate on early centers of "civilizations" and "states" located in fertile low-elevation plains and river valleys lending themselves to agricultural modes of subsistence. When high-altitude and rugged terrains are discussed, they are usually referred to as "marginal" and explained in relation to so-called "centers" within center-periphery frameworks or more recently zomia, places of retreat for people escaping the reach of nation states. Within grand narratives of human societal development, these areas are usually described as hampered by their geographic locations, forced to remain in a "less-developed", non-complex state of development.

Being seemingly inaccessible and "marginal", the rim of the Tibetan Plateau is particularly suited as a case study and starting point to help shake these old narratives. The aim is not merely to deconstruct them but to place them on their head and argue that social organization in mountainous regions can be highly complex, albeit in a dispersed manner that does not fit with traditional lowland agrarian narratives of power built on centralization. Based on archaeological material combined with ethnographic and to a lesser extent textual evidence from the Hengduan Mountain range, this paper shows how social networks extending over long distances and seemingly inhospitable terrain can provide a framework and basis of power expressed on a local level. Instead of trying to control the behavior of everyone in the network directly through administration, laws, and sanctioned violence as a nation-state would, local communities and individuals tap into the framework of knowledge, material resources, and behavioral codes to establish and maintain their claim to power and control.

529 ADDING FLESH TO THE BONES: THE INTEGRATION OF BIOCHEMICAL AND BIOMOLECULAR TECHNIQUES IN THE STUDY OF HUMAN-ANIMAL RELATIONSHIPS

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Brusgaard, Nathalie (University of Groningen) - Mannermaa, Kristiina (University of Helsinki; University of Tartu) - Çakırlar, Canan - Raemaekers, Daan (University of Groningen)

Format: Regular session

Understanding past human-animal relationships has been advanced by the development of new methods and techniques in archaeology, the so-called third science revolution. In particular, the study of interactions between humans and animals in hunter-gatherer and early farming and pastoral communities has been revolutionized by the application of new biochemical and biomolecular analyses. The current challenge is to how bring together both theoretically and methodologically a widening array of complex data (e.g. aDNA, eDNA, isotopes, lipids on ceramics, material culture patterns) with models from cultural anthropology to refine our narratives and ask nuanced questions.

This session brings together case studies from various regions and periods to discuss the ways in which these broad ranges of sources and methods can be integrated to study human-animal relationships in hunter-gather and early and pastoral farming communities. The session welcomes papers on these narratives and the theoretical implications of new techniques, as well as papers on the methodological challenges of interdisciplinary research, such as questions of big data, data representation, and ethical sampling.

ABSTRACTS:

1 EXPLORING THE RELATIONSHIP BETWEEN HUMAN ANTIQUITY AND PLEISTOCENE MEGAFUNA EXTINCTIONS IN NORTHWESTERN SOUTH AMERICA

Abstract author(s): Ziegler, Michael - Roberts, Patrick (Max Planck Institute for the Science of Human History)

Abstract format: Oral

South America was the last continental landmass to be colonized by Homo sapiens during the Pleistocene and their spatio-temporal presence on the landscape overlaps with one of the largest regional megafaunal extinctions of the Quaternary. As the gateway between North and South America, the northwestern region of South America facilitated an intercontinental dispersal of early human settlers as well as fossil taxa and represents an important area for exploring initial human-animal interactions. Moreover, this region is composed of a diverse environmental gradient (i.e., coasts, savannahs and lowland, Sub Andean and Andean tropical forests) which provides an important proving ground for exploring the capacity of our species to adapt to varied environments and their impacts on resident large mammals. Although the palaeontological record at archaeological sites across South America is growing, direct evidence of human-animal interactions remains fairly limited. Nevertheless, as demonstrated elsewhere in the Late Pleistocene archaeological record, advances in stable isotope analysis and a developing chronology at select localities can help to identify changes in megafaunal diet from these shared environments as well as provide insights into ecological and anthropogenic pressures. Here, I introduce the multidisciplinary approach of the ERC-funded LASTJOURNEY project, to show how palaeontology, ecological modelling, and biomolecular processes can add 'flesh' to the bones of our current knowledge of human dispersals and megafauna population dynamics in the region.

2 RECONSTRUCTING HUNTER-GATHERER PREY-SPECIES BEHAVIOUR: IMPLICATIONS FOR HOMININ ECOLOGICAL PLASTICITY DURING THE CENTRAL EUROPEAN PALAEOOLITHIC

Abstract author(s): Heddell-Stevens, Phoebe (Max Planck Institute for the Science of Human History; Friedrich-Schiller-Universität) - Roberts, Patrick (Max Planck Institute for the Science of Human History; University of Queensland)

Abstract format: Oral

Comparisons between Homo sapiens and our nearest hominin relatives have largely focused on high impact presentations of fossil morphologies, material evidence for technological and social complexity, symbolism, and genetic data. However, taphonomic limitations, non-linear appearances of 'modern' cultural traits, and increasing evidence for genetic admixture continue to complicate interpretations of our species' evolutionary narrative. In other regions, a growing response to these challenges has been to focus on exploring the varying adaptive flexibility exhibited by different hominin populations as they entered new environments or faced climate stresses. However, hominin palaeoecological adaptations across the Middle-Upper Palaeolithic transition in mid-latitude Western-Central Europe have yet to be integrated in these discussions. This avenue of research presents an exciting opportunity to test hypotheses of Homo sapiens' unique ecological plasticity. This is becoming increasingly urgent given the growing evidence for variety and flexibility in Neanderthal subsistence behaviour. Increasingly, a developing suite of biochemical techniques are enabling in-depth investigations into the ecological niche of H. sapiens and Homo neanderthalensis. This paper provides a critical discussion of 'on-site' archaeological scientific methods alongside more traditional approaches utilised in determining hominin subsistence and behaviours ecological tolerances. Focus is placed on the application of these techniques to reconstructions of prey-species palaeoecology as a largely underutilised line of investigation. Establishing plasticity in dietary and ranging behaviours of these fauna in response to broader climate and environmental shifts is key to interpreting flexibility in hominin hunting adaptations. We provide

our own contribution, involving multiple isotope analysis of serially-sampled herbivore prey-species tooth enamel from Palaeolithic sites in Central Germany to investigate hominin ecological tolerances. We advocate greater use of these approaches in combination to enable higher resolution reconstructions of hominin palaeoecology, and emphasise the need for establishing local palaeoclimatic and environmental parameters in interpretations of evidence for animal-human behavioural adaptations.

3 TRACING ENVIRONMENTAL STABILITY AND FAUNAL RESOURCE USE AT VLAKNO CAVE (CROATIA)

Abstract author(s): Radovic, Sinisa (Institute for Quaternary Palaeontology and Geology, Croatian Academy of Sciences and Arts, Zagreb) - Pilaar Birch, Suzanne (Department of Anthropology, Department of Geography, University of Georgia) - Vujević, Dario (Department of Archaeology, University of Zadar)

Abstract format: Oral

Vlakno cave is located on Dugi Otok (Long Island) in northern Dalmatia (Croatia). Recent excavations have revealed rich stratigraphy indicating the use of the cave from at least the late Pleistocene to the Early Holocene. These deposits are divided into several chronological strata attributed to the Epigravettian and Mesolithic. In this paper we focused our attention to the Mesolithic sedimentary complex, divided into two phases (Strata 2 and 3). Stable isotope analysis of faunal remains (n=24) from Vlakno suggest a relatively consistent environment between the two strata. There was no significant difference in average $\delta^{13}\text{C}$ or $\delta^{15}\text{N}$ values among all taxa. Small carnivores such as fox and marten along with a wild boar had elevated $\delta^{15}\text{N}$ as expected for trophic position and slightly more positive $\delta^{13}\text{C}$ values than herbivores. Deer and hare had relatively lower $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ values, reflecting a diet of C3 vegetation, likely in a wooded environment. Three birds of indeterminate species fell within this range, suggesting they were also herbivorous. Recorded changes in the taxonomic composition of faunal assemblages between the two strata suggest that something other than environmental change may have triggered the evident change in the subsistence economy of Vlakno's inhabitants. It has previously been speculated that patterns in the faunal assemblage may be the result of a change in topography, i.e. the postglacial sea level rise that caused Dugi Otok to become. The new stable isotope data combined with faunal evidence seem to support this hypothesis.

4 HUMAN DIET DURING CA. 7000-500 CAL BC IN SOUTHEASTERN BALTIC ACCORDING TO CARBON AND NITROGEN STABLE ISOTOPE DATA: AN UPDATE

Abstract author(s): Simcenka, Edvardas (Archaeology Department, Lithuanian Institute of History) - Kozakaitė, Justina (Faculty of Medicine, Vilnius University) - Piličiauskienė, Giedrė (Faculty of History, Vilnius University) - Piličiauskas, Gytis (Archaeology Department, Lithuanian Institute of History) - Robson, Harry (Department of Archaeology, the University of York)

Abstract format: Oral

In 2009 and 2017, several studies have been undertaken which have discussed the diets of prehistoric populations in Lithuania according to $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ stable isotope data. These studies, based on the analyses of 32 human and 81 faunal samples, showed that inland hunter-gatherers (ca. 7000-3000 cal BC) had consumed a mixture of freshwater and terrestrially derived protein, whilst Subneolithic groups (ca. 3000 cal BC) residing on the coast had consumed aquatic derived protein from estuarine and lagoonal environments. With the arrival of animal husbandry during the Early Neolithic Corded Ware culture (ca. 2800-2400 cal BC) a change in diet was observed. Indeed, these early farmers had consumed terrestrial derived protein, whilst the consumption of millet was evidenced a thousand years later during the Late Bronze Age (ca. 1000 cal BC). In 2020, we analysed a further 14 human and 40 faunal remains, including 10 freshwater fish, for $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ stable isotope analysis, the latter of which have not been previously analysed before. Moreover, we have ^{14}C dated 16 humans of a presumed Stone or Bronze Age date. In light of these new data, we will verify or disprove previous interpretations concerning the diets of prehistoric populations in the southeastern Baltic region during the period from ca. 7000-500 cal BC.

5 THE EMERGENCE AND EVOLUTION OF NEOLITHIC CATTLE FARMING IN SOUTHEASTERN EUROPE: ZOOARCHAEOLOGICAL AND STABLE ISOTOPE DATA FROM DŽULJUNICA-SMĀRDEŠ, IN BULGARIA

Abstract author(s): Kamjan, Safoora (Groningen Institute of Archaeology, University of Groningen) - de Groene, Donna (University of Reading, Archaeology Department) - van den Hurk, Youri (Groningen Institute of Archaeology, University of Groningen) - Zidarov, Petar (Eberhard-Karls Universität Tübingen, Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters) - Elen-ski, Nedko (Regional Museum of History, Veliko Tarnovo) - Patterson, William (Saskatchewan Isotope Lab, University of Saskatchewan) - Çakırlar, Canan (Groningen Institute of Archaeology, University of Groningen)

Abstract format: Oral

Domestication of cattle (*Bos taurus*) and its subsequent spread into Europe led to unprecedented economic, biological and social transformations. Little is known about the early interactions of humans with this animal in Neolithic Bulgaria, a key region with connections to north-western Anatolia (via Thrace or the Black Sea coast), the Aegean world (via the Struma and Mesta valleys), and central Europe (via the Danubian corridor).

Integrated zooarchaeological and stable isotope analysis of faunal remains from Džuljunica, one of the earliest and most well-stratified Neolithic settlements in the southern Danube catchment, spanning the end of the 7th millennium BCE and the first half of the 6th millennium BCE provides us with ample opportunity to contribute to this discussion. In this paper we use biometry, age at death data, and stable isotope analysis ($\delta^{18}\text{O}$, $\delta^{13}\text{C}$, $\delta^{15}\text{N}$) of collagen and tooth enamel to obtain insights into the modalities of

cattle farming, cattle grazing environment, slaughtering patterns, and calving seasons in relation to the environmental and cultural settings of this initial Neolithic settlement. The results of this study contribute to understanding the Neolithisation itineraries of Europe, and modes of adaptation and experimentation in early cattle farming in the Balkans.

6 INVESTIGATING THE BEGINNING OF ANIMAL HUSBANDRY IN THE DUTCH WETLANDS THROUGH ZOOARCHAEOLOGY, PALAEOGENOMICS, STABLE ISOTOPE ANALYSIS, AND HIGH-PRECISION RADIOCARBON CHRONOLOGY

Abstract author(s): Dreshaj, Merita (Groningen Institute of Archaeology, University of Groningen; Centre for Isotope Research, University of Groningen) - Brusgaard, Nathalie - Erven, Jolijn - Çakırlar, Canan (Groningen Institute of Archaeology, University of Groningen) - Dee, Michael (Centre for Isotope Research, University of Groningen) - Peeters, Hans - Raemaekers, Daan (Groningen Institute of Archaeology, University of Groningen)

Abstract format: Oral

The beginning of animal husbandry is a pivotal development in human history. The pace and nature of this development in the Dutch wetlands is debated, with two competing models for the emergence of farming: (1) a slow integration model starting around 4700 cal BC, and (2) a rather abrupt introduction around 4000 cal BC. In both models, the appearance of small-sized cattle (*Bos sp.*) and pig (*Sus sp.*) bones and teeth in the archaeological record is traditionally considered to mark the beginning of animal husbandry. This univariate approach, coupled with the lack of direct dates on probable domestic specimens has hampered the investigation of the variety of ways in which humans and animals interacted during this transitional period.

Our project 'The Emergence of Domesticated Animals in the Netherlands' investigates this issue with a holistic approach. We analyze cattle and pig remains in their archaeological and palaeoenvironmental context using a combination of biomolecular and biochemical analyses.

In this paper, we present the first results of our study of the Swifterbant culture sites at Hardinxveld-Giessendam in the Rhine-Meuse delta of the western Netherlands. These sites, which were occupied during the 6th and 5th millennium BC, yielded evidence for the introduction of pottery production and domesticated animals. They, therefore, represent a unique case study for the investigation of what this evidence means in terms of the possibility, nature, and scale of animal husbandry in this region at this time. We present new data from a zooarchaeological, aDNA, stable isotopic, and high-resolution Bayesian chronology study of the Hardinxveld sites and discuss how these techniques can shed light on the biocultural and economic development of early animal husbandry in the Netherlands.

7 PATHS TO POWER? INVESTIGATING NEOLITHIC ANIMAL MANAGEMENT PRACTICES AND DIETARY BEHAVIOUR ACROSS PASSAGE TOMB REGIONS OF THE IRISH SEA ZONE

Abstract author(s): pigiere, fabienne (University College Dublin - School of Archaeology) - Olet, Lilly (University of Bristol - School of Chemistry) - Mainland, Ingrid - Downes, Jane (University of the Highlands and Islands) - Faillace, Katie (Cardiff University, Department of Archaeology and Conservation) - Madgwick, Richard (Cardiff University, School of History, Archaeology and Religion) - Evershed, Richard (University of Bristol - School of Chemistry) - Buckley, Michael (University of Manchester - Department of Earth and Environmental Sciences) - Smyth, Jessica (University College Dublin - School of Archaeology)

Abstract format: Oral

The Passage Tomb People project (PTP) aims to identify the social drivers of passage tomb construction along the northern Atlantic Façade, focussing on three key zones – Orkney, Ireland, and north Wales. The connectedness of passage tombs in these areas has long been recognised, but to date there has been no integrated research on the societies that built them. Erected several centuries after the arrival of farming in each region, these 'mega' tombs may be responses to economic stress or, equally, the result of surplus and increasing social competition.

The large-scale datasets that are being generated to investigate the topics include molecular and multi-isotope analyses on ~500 pottery sherds, and ~450 human and animal teeth/bone and reference vegetation from the archives of upwards of 20 sites across Ireland, Orkney and North Wales. Programmes of oxygen, carbon and nitrogen isotope analyses of animal tissues along with proteomic analyses of enamel for sex determination are designed to investigate animal management strategies: diet, foddering, seasonal herding, and manipulation of birth season. Further, molecular and isotopic analysis of lipid residues in pottery and human tissues as well as single-compound radiocarbon dating are carried out to explore changes in subsistence strategies and human diet. Sample collection and analysis is ongoing and the present paper focuses on observed husbandry practices and dietary behaviour in Ireland and several islands of the Orkney archipelago, synthesising published data from settlements and tomb sites. This review of evidence is used to frame the wider research questions of the PTP project.

8 **FIDO IN THE FIELD: NEW MORPHOMETRIC AND STABLE ISOTOPE EVIDENCE FOR HUMAN-DOG RELATIONSHIPS IN PREHISTORIC CROATIA**

Abstract author(s): Zavodny, Emily (University of Central Florida) - Welker, Martin (Arizona State Museum) - McClure, Sarah (University of California Santa Barbara)

Abstract format: Oral

The development of seasonal transhumance as an economic strategy in the coastal and mountainous areas of prehistoric Croatia was part of a larger cultural readjustment to changing demographic and environmental conditions; namely, growing populations and a more intensively managed landscape. While most archaeological studies of this phenomenon have focused on the scale, composition, and movement of livestock, other equally important practices or human-animal partnerships may have also formed during this time. New linear morphometric and stable carbon and nitrogen isotope analyses of prehistoric domestic dog remains from the regions of Dalmatia and Lika suggest increasing human manipulation of canine size, physical proportion, and diet from the Neolithic period (ca. 6000-4000 B.C.) onwards. The appearance of these more robust dogs in later prehistory could indicate the emergence of dogs that were adapted specifically for livestock management and worked closely with humans to move herds between valleys and mountain pastures throughout the year.

9 **LIVING ON THE EDGE: A SEQUENTIAL MULTI-ISOTOPIC APPROACH TO UNDERSTANDING NORSE CATTLE HUSBANDRY PRACTICES IN THE WESTERN ISLES OF SCOTLAND**

Abstract author(s): Griffith, Jacob (Vrije Universiteit Brussel - VUB) - Mulville, Jacqui (Cardiff University)

Abstract format: Oral

Domestic cattle held a prominent role within the Norse subsistence economy at Mounds 2 and 2a, Bornais; a multi-period site on the island of South Uist, Scotland. Inhabitation of this site was constrained by its liminal environment and as such, the determination of how the Norse managed and utilised their cattle is an important element of understanding how they subsisted and survived. This study performed sequential multi-isotopic analysis on the dentine and enamel of the first and second molars of five cattle individuals taken from the Norse phases of the site. The aim was to recreate an oxygen, carbon and nitrogen isotopic biography of the early life of these cattle; oxygen biography from in utero through the first twelve/thirteen months of life and a nitrogen and carbon biography of the first twenty-four to twenty-five months. The results patterned isotopic values against ascending age, revealing ratio changes intrinsic with human-mediated interactions and provided evidence for husbandry practices previously unobservable. Practices included; autumn birthing rhythms in the Middle Norse period, human-mediated early weaning, seasonal transhumance during the spring/summer to in-land pastures and the supplementation of fodder during the winter, which was collected off-site. It also provides evidence suggesting that domestic cattle of that time may have lactated for longer periods than first presumed. The study therefore concludes that the cattle husbandry practices of the Norse occupants centred on the environment in order to maximise yield from their herd.

10 **A DOG'S PURPOSE: INTEGRATING ZOOARCHAEOLOGICAL STUDIES AND ADNA ANALYSIS TO ESTABLISH POSSIBLE RELATIONS BETWEEN FUNCTIONS AND CHARACTERIZATION OF DOGS IN ANDALUSIA**

Abstract author(s): Lupiáñez Corpas, Natividad (Conservation and Evolutionary Genetics Group. Estación Biológica de Doñana - EBD-CSIC) - García Viñas, Esteban (Laboratorio de Paleontología y Paleobiología. Instituto Andaluz del Patrimonio Histórico - IAPH) - Villalón Torres, David (Sistemas de Información. Instituto Andaluz del Patrimonio Histórico - IAPH) - Cornellas, Anna (Conservation and Evolutionary Genetics Group. Estación Biológica de Doñana - EBD-CSIC) - Bernáldez Sánchez, Eloísa (Laboratorio de Paleontología y Paleobiología. Instituto Andaluz del Patrimonio Histórico - IAPH) - Leonard, Jennifer (Conservation and Evolutionary Genetics Group. Estación Biológica de Doñana - EBD-CSIC)

Abstract format: Oral

Since their domestication, dogs have been used for diverse purposes as reflected in the different contexts their remains have been found in archaeological sites.

In order to understand the place of dogs in early human communities, we review Andalusian sites with published zooarchaeological studies from Paleolithic to Bronze Age. In spite of the existence of more than 15,000 archaeological sites in this region of the Iberian Peninsula, barely 100 of them have fauna studies published. Despite the lack of published data from this area and the difficulty of finding these studies, we see dogs in foundation rituals, funerary offerings, and even for human consumption.

By integrating these archaeological records with biomolecular data (aDNA analysis), we aim to establish the possible relation between the different purposes of dogs and their characterization from a genetic approach. To do so, we will select nuclear genes related to traits that could have been associated with some of the uses of dogs in these communities. These genes are related to morphological (coat color, hairlessness, size...), metabolism (starch digestion), sensory (olfactory receptors) and behavioral traits. Through mitochondrial DNA analysis, we will firstly verify if the studied remains actually belong to dogs or to another wild canid species. Then, we will attempt to determine if dogs used for certain purposes were local or imported from other regions.

11 **BURROWING INTO THE BIO-CULTURAL HISTORY OF RABBITS**

Abstract author(s): Doherty, Sean - Ameen, Carly (University of Exeter) - Alves, Joel - Granja Martins, Sofia - Larson, Greger (University of Oxford) - Sykes, Naomi (University of Exeter)

Abstract format: Oral

Rabbits (*Oryctolagus cuniculus*) are one of the most recently domesticated animals, yet remarkably little is known about the timing or location of their domestication. Native to the Iberian peninsula and southwest France, they have been transported by humans to all corners of the globe to live in diverse relationships with people: as pets, pests, sources of food and laboratory animals. The AHRC-funded project 'Exploring the Easter E.g.' is integrating historical and linguistic techniques with traditional zooarchaeological and biomolecular methods (including full-suite osteometric, geometric morphometric, isotope and genetic analysis) to examine the dynamics of varying human-rabbit relationships. In this paper we present our results of the integration of zooarchaeological, isotopic and geometric morphometric data for deciphering the management strategies of British rabbits after their reintroduction in the Middle Ages. We demonstrate how the combination of these complementary approaches is necessary to decipher the complex processes surrounding both rabbit domestication and subsequent husbandry practices, and unpick this animal's unique bio-cultural history.

12 **ANIMAL LIFE HISTORIES: BIOCHEMICAL ANALYSES AS PROXIES FOR DIET AND MOBILITY AMONG DOGS AND CAMELIDS IN NORTHERN ARID PERU**

Abstract author(s): Alaica, Aleksa (University of Toronto) - Gonzalez La Rosa, Luis Manuel (Archaeology Centre, University of Toronto) - Knudson, Kelly (Arizona State University)

Abstract format: Oral

Animal life histories serve as proxies for human daily and long-term strategies. As a particularly powerful set of analyses, biochemical methodologies provide effective datasets to quantify the types of resources on which animals fodder and graze, but also their mobility patterns. Stable and radiogenic isotopes are compared among dog and camelids from the 1st millennium CE site of Huaca Colorada on the northern coast of Peru. Examining the variable dietary and mobility trends among these species allows for the elucidation of their role in trade labour, as pastoral tools and as companions. This paper examines the variation in carbon, nitrogen and strontium isotopes among dogs and camelids ensuring spatial control for each specimen. Most dog and camelid remains that are analyzed by isotope analyses are from dental samples that have associated age details. By considering the age of each animal, their spatial context and their chronological association, this paper determines that dogs were locally raised and interred at Huaca Colorada, while camelids were traveling from distant regions to bring valued trade goods from highland and other coastal locations. The variable evidence of dogs and camelids in herding strategies in arid northern Peru attests to the integral role of dogs as pastoral companions and herding tools and camelids as key labour capital.

13 **AN OSTEOBIOGRAPHY OF CHOPPERS THE 'PG TIPS CHIMP'**

Abstract author(s): Davis, Olivia (Department of Archaeology, University of Exeter) - Capponi, Giovanna (Department of Department of Life Sciences, University of Roehampton) - Chidimuro, Blessing (Department of Archaeology, University of Reading) - Cooper, David (National Museums Scotland) - Thomas, Virginia (Department of Sociology, Philosophy and Anthropology, University of Exeter) - Dobbs, Phillipa (Twycross Zoo) - Doherty, Sean (Department of Archaeology, University of Exeter)

Abstract format: Oral

There is expansive literature about the history of zoological gardens, and what these institutions represent in terms of human-animal relationships. However, with the exception of a few celebrity individuals, the animals' stories have never been told. Many zoos donated specimens of deceased zoo animals to natural history museums (e.g. those of Paris, London and Edinburgh) and these skeletons have the potential to reveal the lived experiences of zoo animals. The creation of osteobiographies is a well-established method for reconstructing life/death histories from human remains, but the approach is seldom applied to animals. Using detailed skeletal (osteology, pathology) and biomolecular analyses (stable isotope analysis, elemental analysis), combined with archives that include her medical and social histories, we will narrate the life of one particular zoo animal, 'Choppers', a chimpanzee who featured in advertisements for the British brand of tea, PG Tips. This first osteobiographical analysis of a zoo animal provides a first step in the wider analysis of how chimpanzees have adapted to a life in captivity, including the impact of feeding on their development and health in comparison with wild chimpanzees. We conclude that zooarchaeological techniques can be deployed to benefit modern zoo-animal management.

530 BREAKING POINTS. MEDIEVAL AND MODERN SOCIETIES IN TRANSITION THROUGH MATERIAL CULTURE

Theme: 6. Material culture studies and societies

Organisers: García-Porras, Alberto - Busto-Zapico, Miguel (Universidad de Granada) - Cirelli, Enrico (Università di Bologna) - Zavagno, Luca (Bilkent University) - Teixeira, André (Universidade NOVA de Lisboa)

Format: Regular session

This session focuses on different events and stages of the Medieval and Modern era as by-product of transitional processes. For instance, technological and technical changes stem from dynamics of impulse, progress, advance, and extraction or resistance to other cultural forms; these will be examined mainly through the lenses of archaeology and material culture.

Indeed, material culture could shed light on different issues in the longue durée spanning from the end of the Classical world to the beginning of the Modern era. These included: the rise of the State, the birth of a global economy and the cross-cultural transactions between the Latin Christian, Byzantine and Islamic world.

One can notice the occurrence of changes in the different uses and forms of material culture as well as opposition or resistance. They allow us to grasp the ability of social groups to accept, assimilate or even reject external influences. In this light, one should admit that historiography has slanted towards single key-studies rather than approaching the general tendencies and trends characterizing the material culture of the periods under scrutiny here.

As a result, the proposed session includes papers which analyse different transition processes through the study of material culture. It will aim to provide an opportunity to compare and discuss these developments and lay the foundation for further theorization in the studies of material culture as approached from different epistemological perspectives. Lastly, this session stems from the idea that an interdisciplinary approach could dwell on specific trends to be debated and discussed across the historiographical board.

ABSTRACTS:

1 TRANSFER OF CRAFTSMANSHIP KNOWLEDGE IN LATE ANCIENT-EARLY MEDIEVAL MEDITERRANEAN SOCIETIES: PRODUCTION OF GLAZED CERAMICS AND DEVELOPMENT OF NEW TECHNOLOGIES

Abstract author(s): Cirelli, Enrico (Università di Bologna)

Abstract format: Oral

Between the fifth and the eighth centuries an extraordinary development of new forms start to be produced in various regions of the Mediterranean Sea within Western and Eastern artisans' workshops, first standing on Late Roman tradition, inherited by Byzantine and Muslim societies. Glazed vessels appear to be produced in northern Adriatic ateliers with a restricted formal repertoire and in a certain moment at the end of the 7th cent. Start to be produced with same characteristics, such as mortars, but adding also new forms, most of them imitating Sasanian dishes and other vessels, but also inventing a synthesis of eastern and western form that will become a marker for the Byzantine early medieval community. In this paper I will try to follow the movement of different techniques and vessel repertoires from Ravenna to Constantinople and from Syria to the New Rome, to better define this new revolutionary craftsman tradition based on ancient methods but developing new models.

2 BYZANTINE ISLANDS IN TRANSITION (CA.600-CA.900): AN ARCHAEOLOGICAL PERSPECTIVE

Abstract author(s): Zavagno, Luca (Bilkent University)

Abstract format: Oral

This paper examines the economic and political role played by some large islands of the Byzantine Mediterranean in the passage from Late Antiquity to the early middle ages (ca. 600-ca. 900 CE). Although literary sources (both Byzantine and Arab and western) dismiss islands of the western and eastern Mediterranean simply as places of exile or distant military outposts along maritime frontiers, archaeology and material culture have recently shed light on the role they played as "spaces of connectivity". This is due not only to their strategic locations along the commercial shipping routes crisscrossing the Mediterranean, but also because islands often presented unique opportunities for cultural encounters.

Indeed, this paper tries to briefly document how some Mediterranean islands such as Sardinia, the Balearics, Malta, and Cyprus were not simply caught in the crossfire of a "Pirennian" faultline between two (or more) polities; they rather consistently acted as places where local elites adjusted the tone of their daily socio-economic, cultural, and even religious interaction.

Coins (Arab-Byzantine, Byzantine, and Islamic), lead-seals (both Byzantine and Arab), inscriptions (boasting Greek, Latin, and Kufic characters), as well as the results of the analysis of production and circulation of ceramics chime with the literary sources to present a comparative picture of the relationships between the Byzantines and the Muslims. This in order to oppose to the idea of the so-called Dark Ages as a chronological breaking point but rather to analyze the construction of a Mediterranean maritime "frontier" as not simply pierced by cycles of raiding and warfare.

3 "EVERYTHING MUST TO CHANGE SO THAT NOTHING CHANGES": THE TRANSITIONAL CONTINUITY OF THE TÜR 'ABDİN REGION

Abstract author(s): Sommella, Virginia (Bilkent University)

Abstract format: Oral

This paper focuses on the history of the frontier along the river Tigris- and in particular on the region of the Tūr 'Abdīn located in south-eastern corner of modern Turkey, in the longue durée spanning the Medieval and early Modern Era. Indeed, in the Late Roman, Byzantine, and early Umayyad period, the Tūr 'Abdīn preserved the area's genius loci, resulting in what scholars described as the "Pompeii premise" (the chance to remain in touch with both the present and the historical past). So, by its very nature one should regard the Tūr 'Abdīn as a frontier outpost, constantly peripheral to its centers, and at the same time far away from the border itself. In this light, the Tūr 'Abdīn constitutes a privileged viewpoint in consideration of both its relationship with the frontier as a macro-transition zone, and its peculiar micro-ecology.

Therefore, this paper will aim at shedding some light on Tūr 'Abdīn's subsistence economy through the lens of the agricultural material culture. It thus aims to present an overview of photographic records from previous investigations of so-called exploratory archaeology over the last one hundred and fifty years, in a comparative perspective. It will include, among others, samples from the Gertrude Bell's Archive (1905, 1911) and an unpublished fieldwork image collection of the mission run during the 1980s under the auspices of the University "La Sapienza" in Rome. This will allow me to dwell upon the resilience of the peculiar human landscape of the Tūr 'Abdīn region, with a persistence of rural customs and practices which closely resemble those described by Early Byzantine and Medieval sources. The detection and analysis of long-lasting cultural specificity, namely the historical continuum of the Tūr 'Abdīn, and its resistance to the external vicissitudes, will help to identify a continuous and fluid transition between cultures.

4 CERAMIC PRODUCTION AND SOCIAL CHANGE IN THE SOUTH-EAST OF THE IBERIAN PENINSULA BETWEEN THE ISLAMIC AND CHRISTIAN PERIODS

Abstract author(s): Busto-Zapico, Miguel - García-Porras, Alberto (University of Granada)

Abstract format: Oral

The major social and political shifts undergone by the south-eastern Iberian Peninsula, and specifically Granada (Spain) between the fourteenth and seventeenth centuries brought about clear changes in the ceramic repertoire. This work analyses these changes through the comparative analysis of three archaeological sites: the Castle of Moclín, the Palace of the Abencerrajes and the Fortress of Lanjarón. These sites present a clear transitional sequence spanning Nasrid repertoires and Early Modern Castilian productions, including instances of both continuity and rupture.

The pieces under analysis were classified first by function and second by shape. A further subdivision considers formal variants within each shape group. After characterising the typologies, the standardisation of production within a sample of materials from the Palacio of Abencerrajes was estimated through the coefficient of variation. The resulting CV is a measure of standardised dispersion, which reflects the degree of craft specialisation. A number of constants established by ethnographic and ethno-archaeological studies were taken into account to detect patterns in production, degree of specialisation, random factors, scale of production, and production volume, assuming that these variables change over time.

This work aimed to offer a wide overview of the changes documented in ceramic repertoires in the Kingdom of Granada between the fourteenth and the seventeenth centuries, through the detailed analysis of three distinct archaeological sites. The shifts attested in the ceramic record were related to the profound social transformations undergone by the south-eastern Iberian Peninsula during this period. These transformations had far-reaching consequences on ceramic types and production techniques. Workshops and workshop practice also changed significantly, either through the substitution of former production models or by their adaptation to new market demands. From this point on, workshops implemented novel techniques, such as the finishing of pot bases on the wheel, and standardised their wares to increase productivity.

5 FROM MAJOLICA TO SLIPWARE: THE LONG TRANSITION TO THE MODERN ERA IN THE PISAN CERAMIC PRODUCTIONS

Abstract author(s): Giorgio, Marcella (Soprintendenza Archeologia, Belle Arti e Paesaggio per le province di Pisa e Livorno)

Abstract format: Oral

The study of Pisan ceramic production between the 15th and 16th centuries is the basis of the doctoral research that I conducted at the University of Pisa. This analysis has brought new results to better understand the evolution and change of city ceramic production between the Late Middle Ages and the Early Modern Age.

The revision of old contexts and the union of new data both from excavations and written and archaeometric sources has allowed me to reconstruct the evolution of Pisan ceramic workshops in a time of long transition between the 15th and the early 17th century.

This transition, in an important moment in the history of Pisa both at a political, social, economic and cultural level, allows us to see an important transformation in the local ceramic production: from the mid-fifteenth century the introduction of sgraffito slipware technique will accompany and, slowly, replace the production of archaic majolica. This slow change was influenced by the particular historical moment experienced by the city and the new sgraffito slipware ceramics for almost a century will maintain characteristics common to the last archaic majolica (shapes and decorations).

Only at the end of the 16th century, when new historical scenarios influenced the politics and economy of Pisa, the city workshops stopped producing majolica to produce sgraffito slipwares only that were so successful thanks to the trades to northern Europe and the American countries.

6 CROSSING CONTEXTS. THE SYNCHRONIC AND DIACHRONIC ROUTES OF MEDIEVAL POTTERY TO RECONSTRUCT LOCAL CONTEXTS AND HISTORICAL PROCESSES

Abstract author(s): Panetta, Alessandro (University of Genoa)

Abstract format: Oral

This paper addresses the contribution that the study of a specific ceramic class, the archaic thyrrenian sgraffito produced in the Savona area in the late middle ages, can give to challenging generalist historical reconstruction, both in a diachronic and synchronic sense.

On the one side, the “horizontal” contextual role of this pottery within the assembly of the material culture of 13th and 15th c. settlements in north-western Sardinia (Italy), highlights how localised archaeological analysis may face synthetic and large-scale traditional frameworks (the crusades, the maritime republics, the rise of medieval communes, the “Renaissance of the 12th century”, etc.).

On the other, through the cultural biography approach, the study of a ceramic class allows us to identify the “active” role that pottery played in the long term, both before and after its conventional period of use, assuming that objects can be analysed both referring to their “original” context of use, as in their “afterlife” reuse ones.

In the first case, pottery and other materials assemblages will be analysed, highlighting unexpected relationships. In the second one, the contribution analyses the pottery relationships with other social and political actors (noble families and private individuals) which were involved at an entrepreneurial and mercantile level, as such as the social groups that used them, i.e. questioning if it’s possible to use this ceramic as an indicator of overseas communities (as past studies demonstrated for example in the case of Hanseatic League towns in the Baltic Sea).

7 PLATES YOU CAN EAT: ARCHAOMETRICAL CHARACTERIZATION OF BUCARO POTTERY FROM PANAMA

Abstract author(s): Inanez, Javier (University of the Basque Country UPV/EHU)

Abstract format: Oral

Panamá Viejo was founded in 1519 by the Spanish expeditionary Pedrarias Dávila. At the time, it was the first permanent settlement in the Pacific Ocean, becoming a city by a royal decree in 1521. Shortly after its creation the city became an important base for the trade with Spain. Unfortunately, in 1671, the English pirate Henry Morgan attacked and sacked the city, resulting in a fire that destroyed the entire city. Thus, a new settlement was built a few miles west, which would become the origin of the modern Panama City.

Roja bruñida pottery, also known as bucaro pottery, is a very characteristic typology of ceramic within colonial contexts in America that is distinguished by a red/brownish clay paste with a shiny reddish thin slip. This study piles up information on the archaeometrical characterization of the so-called Roja Bruñida pottery from Panama unearthed in archaeological excavations at Panama Viejo and Casco Antiguo. A set of 45 ceramics have been characterized by means of chemical (NAA), mineralogical (XRD) and microscopical (SEM) analyses. The archaeometrical study of these wares will shed light into the understanding of the technological influence by European and local potting traditions within the cultural frame of societies in contact in a colonial context. Additionally, the supply of raw materials for the potting industry in colonial Panama is assessed diachronically considering the important historical disrupting episode that eventually ended in the relocation of the city. Differences in red slip technological choices can be tracked down archaeometrically, suggesting different workshops or traditions, while consume habits are presented in detail, like the associated bucaro-phagy practice related to these pots and documented in ancient literature. Larger archaeological and historical implications of this important ceramic in the Spanish colonial market within the region are also assessed.

8 THE CHANGE IN TEXTILE PRODUCTION IN AL-ANDALUS (8TH-13TH CENTURIES): A PROCESS OF SPECIALISATION FROM THE ARCHAEOLOGICAL PERSPECTIVE

Abstract author(s): Moreno Narganes, José María (University of Alicante)

Abstract format: Oral

The changes generated in the Iberian Peninsula since the conquest of the Umayyad state of Damascus in the 8th century materialised in a host of elements, both ideological (politics, society, etc.) and material. From the time of the conquest onwards, the archaeological record shows a profound change in the architecture, ceramic and metallurgical production systems and also in textile production.

From the 8th century onwards, the forms of production in both spinning and weaving were to change radically in the Mediterranean, where forms and instruments such as the weight loom were to disappear in favour of others that would now become the majority, such as the frame loom or the horizontal or pedal loom. In spinning techniques, the changes were equally important. From the 10th century onwards, the use of new materials for the manufacture of tools is documented, both in the production of spindle whorls and spindles.

This participation seeks to demonstrate how al-Andalus, as in ceramics and so many other productions, the textile industry underwent a process of productive complexity (ss. VIII-XIII) in parallel with the extension of a tax-based state that would be strengthened by the development of a market-based economy. This process will generate a productive specialisation, both in spinning and weaving, where new, more specific working tools will appear, leading to an increase in production. In addition, textile production is articulated in different production sites/workshops. In this research, special attention will be paid to working tools related to domestic spaces.

To explain these changes, textile working tools from different excavations (Tolmo de Minateda, Cordoba, Almeria, etc.) will be presented to demonstrate this process of change. The study will be completed with textual sources such as “hisba” treatises, historical or legal chronicles (apprenticeship contracts, etc.).

9 DRESS - DESIGNING FASHION FROM 16TH-CENTURY SOURCES. AN ARCHAEOLOGICAL FOOTWEAR STUDY

Abstract author(s): Garcia, Ana Catarina - Pinto, Carla (CHAM - Center for Humanities)

Abstract format: Oral

Integrated within the scope of DRESS project, which aims to contribute to the understanding of the historical, tactile and material dimension of women’s elite clothing in Portugal during the 16th century, this paper’s goal is to present a study focused on Portuguese and Iberian footwear. Starting from archaeological footwear finds recovered during underwater or interface interventions, namely shipwrecks and riverside contexts, the purpose is to address some of the identified and well-preserved leather collections. We aim to build a Portuguese footwear typology, using a chronological approach that allows not only the classification of future findings, but also contribute to the knowledge of Early Modern clothing. Evidence shows that this material culture is often disregarded in Portugal, which makes it paramount to identify shapes, sizes, functions, among other aspects, allowing the characterization of this type of footwear artifacts. The relevance of this material culture is now, recognized with DRESS, the first project that intends to study early Modern Portuguese fashion, through historical and archaeological sources, which main goal is to reconstruct the making process of a 16th century elite dress.

A. POTTERY PRODUCTION AT THE TOWN OF QUART (CATALONIA, SPAIN): AN EXPONENT OF CRAFT EVOLUTION BETWEEN MEDIEVAL AND MODERN TIMES

Abstract author(s): Travé Allepuz, Esther (Universitat de Barcelona) - Vicens Tarré, Joan (Universitat Oberta de Catalunya)

Abstract format: Poster

The town of Quart (Catalonia, Spain) has a long-lasting tradition of greyware pottery production known at least since the end of Middle age and still active today. Grey or black pots fired until reducing atmosphere were a daily ceramic product used in medieval Catalonia, being the most common artefact found in archaeological sites of this period. While they used to disappear progressively in most scenarios since the Late Medieval period, some areas kept an enduring craft tradition that made greyware production survive. In this context, Quart is a beautiful example of how potters managed to keep their production alive, to protect their economic interests, and to spread their expertise and techniques to nearby areas.

Analysing pottery production at this place from a global approach has provided a powerful insight about the processes that lead to vessels’ functional adaptation and technological change during the transition period from late medieval to modern era. The goal of this contribution is to offer preliminary results of an on-going research project focused on the understanding of crafts modernization and social organization of artisans at the dawn of Modern Age. The study included formal and technical characterization of vessels, the exploration of written sources, and the ethnographic approach to present day production. In doing so, we gathered useful data and exploited them from an archaeological landscape perspective in order to determine the networks of distribution, the raw material supplies and the spread of innovation in vessel’s shape and paste recipes.

Through this contribution, we aim at strengthening the interdisciplinary character of pottery analyses, and the global interpretation of cultural issues outlining the genuine character of local and regional production systems. The combination of micro- and macro-scales of observation lead us to a better perspective of greyware pottery evolution in transition periods.

B. MEDIEVAL SPACES OF VERANES (ASTURIAS, SPAIN). ANALYSIS OF A DOMESTIC STRUCTURE FOUND IN THE NORTHERN COURTYARD OF A ROMAN VILLA

Abstract author(s): Busto-Zapico, Miguel (University of Granada) - Gil Sendino, Fernando - Fernández Ochoa, Carmen (Universidad Autónoma de Madrid) - Gutiérrez González, José Avelino (Universidad de Oviedo)

Abstract format: Poster

The Roman villa of Veranes (Gijón, Asturias, Spain) is located about 800 meters from the road that connected the Roman enclave of Gijón with Asturica Augusta (Astorga), capital of the Conventus Asturum. Archaeological excavations here in 2002 and 2003 excavated a wooden Medieval house, which is the subject of this study. The associated ceramic material has allowed us to trace the continuities and breakages between Roman and distinctly Medieval horizons.

Veranes has a long historical trajectory, beginning with a first rural nucleus built during the second half of the 1st century A.D. Between the end of the 3rd century A.D. and the second half of the 4th century A.D., the enclave underwent a total remodeling that

transformed it into a luxurious Late Antique rural site. It functioned in this capacity throughout the 5th century A.D. and the first half of the 6th century A.D. The Medieval phase is first defined by the reuse of some of its outbuildings as a religious center during the second half of the 6th century.

The north courtyard of the villa contains the remains of wooden structures associated with habitation spaces. These elements are the negatives of post holes of a cabin made of wood and clay, which has a circular shape and a central hearth. The radiocarbon dating carried out on these remains places the structure's use between the end of the 7th century and the last quarter of the 9th century.

The study of the ceramic material has allowed us to observe some characteristics of the Early Medieval domestic assemblage. The technological and technical analysis of 2306 fragments identified 12 groups with a very limited number of forms. Although these forms did contain some characteristics of the preceding periods, it clearly comprised an Early Medieval repertoire.

533 BIOARCHAEOLOGICAL APPROACHES TOWARDS UNDERSTANDING THE IMPACT OF DIFFERENT FORMS OF CRISES ON HUMAN LIFEWAYS

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Michael, Dimitra (School of Archaeology, University College Dublin) - Fibiger, Linda (School of History, Classics & Archaeology, The University of Edinburgh; School of Archaeology, University College Dublin)

Format: Regular session

Throughout human history, cycles of growth and decline have succeeded one another. Periods of turbulence, hardship or even destitution – e.g. the end of the Late Bronze Age in South-Eastern Europe, the Fall of Roman Empire, the Justinian Plague, the Mayan Collapse, the Great Irish Famine, the Great Recession in the United States of America, the Dutch Famine - are manifestations of different forms of crises. Brought about by climate change, natural disasters, pandemics, socio-economic decline, political turbulence or wars/conflict, these periods of change and upheaval elicit diverse cultural and biological responses. Aiming to better comprehend the complex and varied responses to crisis and change throughout human history, this session brings together scholars from a range of bioarchaeological sub-disciplines to explore the impact of different forms of crises on human lifeways as expressed through funerary practices, health, diet, mobility, subsistence strategies and activity patterns. We invite case studies using interdisciplinary approaches to address research questions related but not confined to: 1) the dual role of human mobility as a possible cause but also a response to change and crisis, 2) the interaction of cultural and environmental factors as a cause of hardship and destitution, 3) the impact of crisis on gender relations and social organization and 4) cultural resilience and socio-economic responses to health crises. Throughout, we will consider how biocultural responses of crises in the past can inform us about challenges we face in the world today.

ABSTRACTS:

1 THE EFFECTS OF SOCIETAL COLLAPSE ON HEALTH: EXAMINING RECENT HISTORY TO CONTRIBUTE TO UNDERSTANDINGS OF LATE ANTIQUITY IN GAUL

Abstract author(s): Quade, Leslie (Masaryk University) - Gowland, Rebecca (Durham University)

Abstract format: Oral

Late Antiquity (c. 300-700 CE) has often been conceptualized as a period of socio-political rupture marked by the collapse of the Western Roman Empire and the transition to the Medieval period. The nature of this transition and whether it was marked by either catastrophic or more gradual change has been much debated. Societal collapse results in structural breakdowns and instability, which can impact life expectancy and population health. As such, bioarchaeological studies should be well-suited to contribute to debates over Late Antique 'collapse' or 'continuity'.

However, previous bioarchaeological studies have sometimes struggled to relate observed patterns in skeletal indicators of morbidity and mortality with socio-political changes. Therefore, a critical aspect of the present research was to consider the type of health changes occurring during societal collapse, based on a modern example (The Soviet Union). These observations were operationalized into a 'model' and applied to data from the Roman and Late Antique periods in Gaul to identify the more subtle effects of collapse on health in the past. While contextually far removed from the Roman Empire, the Soviet Union is the only example of a large-scale union of multiple countries for which clinical data relating to its collapse is available.

Femoral lengths and height-for-age (HAZ) Z-scores from non-adult and adult skeletal remains (269 individuals) from northern and southern Gaul were analyzed as a proxy for health. Although some of the tenets generated from health patterns observed during the collapse of the Soviet Union were met, the 'model' was found to lack sufficient specificity to identify if populations in Gaul experienced societal collapse during Late Antiquity. However, the model provided specific criteria that link bioarchaeological and modern analyses of health, well-being, cultural and social influences, and provides a novel framework for researching health in relation to historic trends.

2 SOCIO-ECONOMIC AND GEOPOLITICAL IMPLICATIONS OF CLIMATE CHANGE – A CASE STUDY FROM NORTHWESTERN CHINA

Abstract author(s): Cheung, Christina (UMR 7206, Eco-anthropologie - EA, Muséum National d'Histoire Naturelle, CNRS, Université Paris Diderot; UMR 7269, Aix Marseille Univ, CNRS, Minist Culture, LAMPEA) - Hepburn, Joseph - Zhang, Hua (Department of Archaeology, Simon Fraser University)

Abstract format: Oral

A recent meta-data analysis using mainly stable carbon isotope and dental health data revealed that a global climatic event – the Holocene Event 3 (beginning c.4200 BP) was likely a main contributing factor for wheat's adoption across Northern and Northwestern China towards the end of the Neolithic period. Throughout the Neolithic period, millet, a C4 crop, was the staple crop in the region, where wheat and barley, both C3 crops, were introduced sometime during the late Neolithic period. Isotopic data revealed that between 4500 – 4000 BP, communities along a 2000 km transect switched from a predominately C4-based diet to a mixed C3/C4 diet almost simultaneously, thus it is suggested that C3 crops such as wheat and barley were incorporated to help alleviate the pressure of resources shortage caused by this climatic anomaly. However, a closer examination at how different cultural groups responded to this crisis reveals a much more complex picture. In this study we focus on discussing the collapse of the Machang Culture (agricultural) and its subsequent branching into Qijia (agricultural), Xindian (agricultural), and Siwa (mixed pastoral-farming) cultures between 4500 – 3000 BP in Northwestern China. The groups evidently coped with resources shortages very differently, where some continued with a predominantly agricultural lifestyle, some adopted a mixed pastoral-farming economy. By combining isotopic, general health, and traditional archaeological evidence, we demonstrated that the Holocene Event 3 has caused much more than just a shift in subsistence economies across Neolithic China, but also instigated extensive socio-political and economic reorganizations in the region.

3 EXPLORING TEMPORAL AND GEOGRAPHICAL DIFFERENTIATIONS IN LATE BRONZE AGE GREECE: A COMPARATIVE BIOARCHAEOLOGICAL APPROACH

Abstract author(s): Michael, Dimitra - Molloy, Barry (School of Archaeology, College of Social Sciences and Law, University College Dublin)

Abstract format: Oral

The Late Bronze Age (LBA) of the Eastern Mediterranean was a highly networked center of intercultural interaction. Reaching a zenith in the 14th to 13th centuries BC, social upheavals in the decades around 1200 BC led to a collapse of elite political and economic networks. Climate change, earthquakes, environmental collapse, social revolts, mass migrations, changes in warfare, disease, or economic over-specialization have been proposed as causes of the collapse of the Mycenaean palatial system in Central and Southern Greece. In contrast, in northern Greece political systems and population levels appear to have been largely uninterrupted, while in Crete at 1200 BC many defensible villages were established showing thriving signs into the first millennium BC. The objectives of this paper - which lie at the heart of The Fall of 1200 BC project (European Research Council GA #772753) - are a) examining the relation between specific social characteristics of LBA sites in Greece with lived reality, through a comparative geographical bioarchaeological analysis and b) exploring potential temporal differentiations, during before and after the 1200 BC period, by implementing a comparative bioarchaeological approach. Skeletal assemblages spanning from Macedonia and Epirus to the Peloponnese and Crete, ranging from LBA to Early Iron Age were analyzed using health, lifestyle and stress indicators. Novel data will be critically evaluated and compared with published results towards a contextualized comparative approach.

4 THE MIGRATION PERIOD AT BASEL (SWITZERLAND): TRANSFORMATION OR CONTINUITY?

Abstract author(s): Depaermentier, Margaux (Department of Prehistoric, Early Historic, and Provincial Roman Archaeology, Vindonissa Professur, University of Basel) - Gerling, Claudia (Integrative Prehistory and Archaeological Science, Departement of Environmental Sciences, University of Basel) - Hajdas, Irka (Laboratory of Ion Beam Physics, ETH Zurich) - Krause-Kyora, Ben (Institute of Clinical Molecular Biology, Christian-Albrechts-University Kiel) - Schwarz, Peter-Andrew (Department of Prehistoric, Early Historic, and Provincial Roman Archaeology, Vindonissa Professur, University of Basel)

Abstract format: Oral

The so-called 'Fall of the Western Roman Empire' and the transition to the Merovingian Period is often described as a sequence of crisis and socio-cultural transformation. The 'Migration Period' was long associated with the scientific narrative that foreign people with foreign cultural perspectives deliberately and violently invaded a local (Roman) society and triggered its collapse. However, these ideas are mostly built from ancient written sources or were racially motivated from 18th-21st century political discourses.

In this context, Basel is a particularly interesting research object, because the city is located at the River Rhine, which formed the administrative boundary of the late Roman Empire – a socio-cultural melting pot during the Late Antiquity. Due to this location and the archaeological record the late antique Basilia and the early medieval Bazela provide a unique possibility to study societal development during this important transformation period in Central Europe at the periphery of the former Roman administration. The local society can be traced primarily through cemeteries, which are geographically distributed over the entire urban area of modern Basel covering the period between the 4th and the 8th centuries AD. Although the theory of the Rhine representing a sharp cultural boundary until the end of the 5th century AD is outdated, the burials on the right bank of the river are still addressed as 'Germanic', while those buried on the left bank are referred to as 'Romans'.

Integrating isotope, aDNA, radiocarbon and archaeological analyses, we want to explore these traditional narratives and investigate continuities or discontinuities in mobility patterns, subsistence strategies, lifestyles, and funerary practices in Late Roman to Early Medieval North-western/NW Switzerland. We will present a profound archaeological evaluation and critically discuss the scientific results of a first group of analysed burials.

5 THE SHAMROCK SHORE: ANALYSING THE HEALTH AND DISEASE OF IRISH IMMIGRANTS DURING THE GREAT IRISH FAMINE

Abstract author(s): Strang, Sheridan (Durham University; University of Iowa Office of the State Archaeologist) - Caffell, Anwen (Durham University)

Abstract format: Oral

The Great Irish Famine, that lasted from 1845 to 1849, was one of Irelands most disastrous periods in history. Ireland's reliance on the potato crop lead to devastating effects to Ireland socially and economically. By the end of the Famine, half of Ireland's population was gone, either through emigration or death. Those who did emigrate during the Famine were met with continuous challenges along their journey. Overcrowded and disease-ridden ships led to a high mortality before arriving to Great Britain or North America. Irish migrants in both Great Britain and North America, live in overcrowded and unsanitary neighbourhoods and mostly worked dangerous and unattractive jobs.

This study examines the health and disease from two predominately Irish migrant sites from Great Britain and North America through the macroscopic analysis of skeletal remains. Through a comparison between the health of Irish migrants with 19th century locals from Ireland, Great Britain, and North America, it was determined what aspects of migrants living and working environments had negatively impacted their health. This study examined 268 adults from Lukin Street London and 369 adults from Third Street Dubuque Iowa. These individuals were chosen due to isotopic and historic evidence linking these cemetery sites to those that emigrated during the Great Famine. High prevalence rates of dental disease, infection and trauma were observed within both Irish migrant communities. Similarities and differences in health statuses could be observed between sites. However, specific aspects such as living environment and occupation severely impacted the health statuses observed in both migrant sites.

Based on health patterns observed within Lukin Street and Third Street, this data can later be utilised in future studies to analyse and identify similar health trends in other possible migrant sites that emigrated in the 19th century.

6 UNLOCKING THE POTENTIAL OF STABLE ISOTOPES ANALYSIS TO UNDERSTAND THE DIET IN THE EARLY MIDDLE AGES IN NORTHERN ITALY

Abstract author(s): Marinato, Maurizio (Dipartimento dei Beni Culturali Università degli studi di Padova)

Abstract format: Oral

Diet is a central aspect of human life, but it can also be a proxy to have more information on social structures, economy, impact of climate changes through the course of history. Dietary choices and cooking practices can also be influenced by the arrival of new populations thanks to migrations / invasions. These are key factors in early medieval northern Italy, to better understand a period characterised by a multifaceted crisis: political (end of the Roman Empire and arrival of the 'Barbarians'), social, climatic, economic. However, the potential of the study of diet for this aim, has been undervalued until recently. Bioarchaeology and stable isotopes can play a central role in understanding diet, but most of the studies haven't accounted for the distinctive meaning of the different topographic locations (e.g. urban/rural, connection with economic routes), or haven't contextualized the isotopic data within the archaeological site.

This paper analyses six late antique and early medieval cemeteries located in different areas of northern Italy (regions of Lombardy and Emilia Romagna). It investigates trends in food consumption, evaluating the limits of interpretation in relation to the availability of local resources, political changes (i.e. the arrival of the Lombards), social structures. The Carbon and Nitrogen analyses performed in this study resulted in heterogeneous data, reflecting more the local resource ecosystems, than deliberate cultural choices.

Overall, the paper will call for caution when dealing with small set of data, which risk to result in biased interpretations.

7 "WE DON'T EAT, WHAT YOU EAT": CAN ISOTOPE-BASED DIET RECONSTRUCTION DETECT THE MOVEMENT OF CELTIC AND GERMANIC INVASIONS INTO ITALY?

Abstract author(s): Schmidtova, Dominika - Klontza-Jaklova, Vera (Faculty of Arts, Masaryk University) - Fernandes, Ricardo (Faculty of Arts, Masaryk University; Department of Archaeology, Max Planck Institute for the Science of Human History; School of Archaeology, University of Oxford)

Abstract format: Oral

Overpopulation, economic crisis, armed conflicts, climate change, or their combination are some of the causes that can lead to mass migrations. As migrant populations encounter a new physical and cultural environment their traditional lifestyle may undergo changes. In our project, we investigated the impact of spatial mobility on the dietary habits of migrant populations during the Iron Age and the Migration Period.

Our main research goal was to assess processes of dietary acculturation by Germanic and Celtic migrant populations arriving in northern Italy. During the 4th century BCE, the Etruscan region of Emilia Romagna (Northern Italy) witnessed the arrival of Celtic

populations from Central Europe while during the 5th and 6th century CE the region was one of the main clusters of Germanic settlement in the Po valley.

Our methodological approach combined archaeological and historical evidence with isotopic analyses to reconstruct subsistence and spatial mobility patterns of local and migrant populations. We relied on human assemblages from well-dated burial contexts. Oxygen stable isotopes measured on tooth enamel are employed to detect individuals that were not born at the place of burial while carbon and nitrogen isotopes measured in collagen extracted from different teeth and skeletal elements are employed to build individual dietary iso-biographies. From this and from isotopic comparisons with local populations it becomes then possible to investigate dietary acculturation processes.

During our presentation, we will present preliminary research results.

8 DIET MIGRATION AND HEALTH IN THE CONTEXT OF MEDIEVAL MORTALITY CRISES

Abstract author(s): Beaumont, Julia (University of Bradford) - DeWitte, Sharon (University of South Carolina) - Montgomery, Janet (Durham University)

Abstract format: Oral

Crisis mortality, a dramatic but temporary increase in mortality rate resulting from a single factor, is an important phenomenon in many populations. This project integrates paleodemographic and isotope analyses to examine temporal changes in diet and migration at the time of the 14th-century Black Death and the interactions among diet, migration, demography, health, sex, and socio-economic status in the context of the medieval mortality crises of famine and plague. This project will highlight the cultural and social aspects that affect crisis events and their outcomes. Clarifying how dietary resources were distributed in the medieval period will allow for an examination of the ways in which general resource availability in a population does not necessarily translate into widespread benefits in the face of socially-, economically-, or politically-prescribed patterns of access to those resources (Baro and Deubel, 2006; Wisner et al., 2004). This project will also contribute to an understanding of long-term changes in migration in the context of disaster and particularly the health consequences thereof. The results of this project can aid predictions about what might happen in future demographic crises. This project will be the first large-scale integration of hazard analysis-based paleodemography and isotope analyses, and will thus move the field forward in exciting and innovative ways. This approach will address the theoretical and analytical issues of heterogeneous frailty and selective mortality that substantially complicate reconstructions of life and health in the past using human skeletal remains (Wood et al., 1992). Application of the best paleodemographic analytical methods for assessing heterogeneous frailty and selective mortality in the context of medieval mortality crises is particularly important given that mortality crises are still experienced in many populations today, and thus it is crucial to examine how these crises have affected human populations and how people have responded to them throughout history.

9 THE MORTALITY OF CHILDREN UNDER FIVE YEARS OF AGE AT MONTE ALBÁN, MEXICO, DURING THE CLASSIC PERIOD (200-700 AD)

Abstract author(s): Camacho, Miriam (Physical Anthropology at Escuela Nacional de Antropología e Historia)

Abstract format: Oral

Monte Alban during the Early Classic Period (200-500 AD) experienced population growth and is related to the time of greatest flowering. During the Late Classic (500-700) Monte Albán experienced a population growth but at the same time had a decrease in its political power, due to the rise of Teotihuacan (Márquez et al., 1994; Joyce and Winter, 1996; Blanton et al., 1999). The population growth and its political crisis caused an unequal distribution of food among its inhabitants. In addition to this situation, the city suffered from a shortage of water, poor management of organic waste that caused the proliferation of infectious diseases. Children under five years of age were the most vulnerable to these situations, it is known that the first three years of life are critical stages of development that will determine their future health and probability of reaching adulthood (Bogin & Smith, 2012; Frenk, Bobadilla, Stern, Frejka, & Lozano, 1991; Hochberg, 2012). Therefore, their analysis makes it possible to measure the consequences of the social, political, environmental, cultural and economic context in which they lived. The present study aims to analyze the burials of children under five years of age buried in the housing units of the Monte Albán site during the Classic (200-700 AD), where their social position (burial location) will be evaluated along with their health conditions. and nutrition. The explanatory framework is based mainly on the biocultural approach, which provides the necessary tools to reveal the relationship between mortality and the factors that contribute to its incidence, since it sees the human being not only as a biological being but also as a social being that interacts with culture throughout his life (Kelso, 1978; Stinson, Bogin, O'Rourke, & Huss-Ashmore, 2012).

10 CONTESTED SPACES: A RE-INTERPRETATION OF THE EARLY IRON AGE MASS GRAVE FROM GOMOLAVA, SERBIA

Abstract author(s): Fibiger, Linda (School of History, Classics & Archaeology, University of Edinburgh) - Koledin, Jovan (Museum of Vojvodina, Novi Sad) - Molloy, Barry (UCD School of Archaeology, University College Dublin)

Abstract format: Oral

Since its excavation in 1971 the Early Iron Age Mass grave from Gomolava, Serbia, has been interpreted as the result of an epidemic. Located in a bend of the river Sava, between the Carpathian Basin and the Balkans in Western Serbia, the Gomolava mass burial is located at the border of different culture historical traditions and competing lifeways of the early 1st millennium BC. This period

of change involved cultural and population changes that impacted on social networks and life experiences. How did these highly transformative processes express themselves in the remains of those who lived through them? A recent re-analysis of the human skeletal remains from Gomolava as part of The Fall of 1200 BC project (European Research Council GA #772753) considered health, disease and lifeways indicators to explore the reasons for the burial of at least 77 children, women and men. Based on the bioarchaeological findings, this presentation is going to re-evaluate the story of the grave and the role that conflict and violence played in negotiating the contested spaces of the Carpathian Basin in the 1st millennium BC.

11 BRING OUT YOUR DEAD – WHO LIVED AND WHO DIED DURING THE LAST RESURGENCE OF PLAGUE IN BASEL, SWITZERLAND

Abstract author(s): Rindlisbacher, Laura (Integrative Prehistory and Archeological Science, University of Basel; Archäologische Bodenforschung Basel-Stadt) - Flatscher, Elias (Kunsthistorisches Institut, University of Zurich; Archäologische Bodenforschung Basel-Stadt) - Krause-Kyora, Ben (Institute of Clinical Molecular Biology, Kiel University) - Leder, Cora (Faculty of Archaeology, Leiden University) - Moser, Daria (Institute of Clinical Molecular Biology, Kiel University) - Spichtig, Norbert (Archäologische Bodenforschung Basel-Stadt) - Pichler, Sandra (Integrative Prehistory and Archeological Science, University of Basel)

Abstract format: Oral

The Early Modern period in Europe was characterized by catastrophic events. War, social unrest, a deteriorating climate, and numerous epidemics left their mark. The plague regularly descended onto Europe till well into the second half of the 17th century. It usually arrived in Switzerland and Italy through the border city of Basel, which had joined the Old Swiss Confederation in 1501.

Recent excavations on the grounds of the former Franciscan monastery in Basel, the so-called Barfüsserkloster, unearthed a number of early modern skeletons in multiple burials. Since none of these individuals showed any evidence of perimortem violence, they were suspected to have died because of an epidemic. To test this hypothesis selected individuals were sampled for pathogens. In five of the nineteen individuals analysed, genetic evidence of infection with *Yersinia pestis* was detected. The associated archaeological finds linked the burials with the last recorded plague wave in Switzerland, occurring from 1665 to 1670.

During an earlier plague outbreak in the years 1610/11 the local Stadtarzt Felix Platter (1536-1614) had documented the infections and collected detailed data on the number of the infected and recovered in the city of Basel. While the morbidity patterns differed between the two plague events, a comparison of the historical and osteological demographic data still provides a new perspective on the selection mechanisms of the plague.

The combination of bio-molecular and osteological analyses as well as the archaeological and historical records enables us to draw a nuanced picture of living conditions in Basel during the 1665-1670 plague epidemic. Moreover, by using a life course approach we hope to reconstruct the socio-economic backgrounds of the people buried in the cloister of the former Barfüsserkloster. Because there is certainly a strong social component to who lives and who dies during an epidemic, as present events clearly demonstrate.

12 WHAT DOES NOT KILL YOU, DOES NOT MAKE YOU STRONGER: ASSESSING THE IMPACT OF STRESSES IN A MODERN OSTEOLOGICAL COLLECTION

Abstract author(s): Batista-Goulart, Luana (Université Côte d'Azur, CNRS, CEPAM - UMR CNRS 7264) - Séguy, Isabelle (Institut national d'études démographiques - INED; Université Côte d'Azur, CNRS, CEPAM - UMR CNRS 7264) - Tzortzis, Stefan (Ministère de la culture; DRAC, service régional de l'archéologie de PACA; Aix Marseille Université, CNRS, Etablissement Français du Sang, Anthropologie bio-culturelle, Droit, Ethique, santé - ADES) - Quatrehomme, Gérald (Université Côte d'Azur, Institut Universitaire d'Anthropologie médico-légale, Faculté de Médecine; Université Côte d'Azur, CNRS, CEPAM - UMR CNRS 7264)

Abstract format: Oral

The city of Martigues (south of France) was affected by the last major plague epidemic in France, the Great Plague of Marseilles, which affected Provence and Haut Languedoc between 1720 and 1722, killing nearly a quarter of the inhabitants. This epidemic took place after a succession of crises (climatic problems, wars, famines and/or epidemics), attested by historical data, that have contributed to the fragility of the population. Considering the effects that famines, epidemics and chronic malnutrition can have on the development and health of individuals, we sought to measure the impact of food difficulties and/or epidemics that affected the inhabitants of Martigues at different times of their life cycle. Our study is based on a corpus of skeletons of victims of the plague of 1720, from Martigues. The observation of experienced stresses is based on the analysis of physiological stress markers (cribra orbitalia, porotic hyperostosis of the cranial vault and linear enamel hypoplasia). Our study thus demonstrated a link between birth around the years where crises occurred and the observation of a higher proportion of physiological stress markers on immature individuals. We have not observed the same phenomenon in adults, who were more evenly affected by stress. We attribute these results both to the effect of a natural selection, that adults may have experienced, and also to a vulnerability in the beginning of life.

13 HOLOCENE DIETARY AND BEHAVIORAL TRANSITIONS TRANSFORMED HEALTH AND WELL-BEING IN THE PAST, PRESENT, AND THE FUTURE

Abstract author(s): Larsen, Clark (Ohio State University)

Abstract format: Oral

The transition from foraging to farming beginning in early Holocene western Asia, followed by similar transitions in eastern Asia, Europe, North America, and South America, provided the basis for a pattern of highly dynamic evolution of modern humans. Simply, farming and its food products, activity associated with production, nutritional quality, and newly emerging settled communities shaped human social, behavioral, and health circumstances. The study of human remains from archaeological contexts globally over the last 40 years reveals that change in diet from full dependence on foods that were hunted and collected to foods that were cultivated was a central force in shaping our collective past, present, and future biology, well-being, and behavior. This paper tracks the challenges to health, with focus on the rise of infectious diseases (e.g., malaria, osteoperiostitis, dental caries) and nutritional deficiencies (e.g., iron deficiency anemia), and transitions in activity and workload (osteoarthritis, cross-sectional geometry) documented in contextualized archaeological settings globally (North and South America, Europe, Asia). These challenges created and shaped the complex circumstances of poverty, undernutrition, and morbidity in an increasing number of the world's communities in the last 10,000 years, including for the majority of the nearly eight billion human inhabitants of our increasingly challenged world in the early twenty-first century. The bioarchaeological record of the human condition provides the context for understanding the dynamics of long-standing and future health outcomes, including novel viral infectious diseases having pandemic consequences.

A. MASSACRES, CULTURAL CRISES AND ONTOLOGICAL INSECURITY

Abstract author(s): Martin, Debra - Edmonds, Emily (University of Nevada Las Vegas)

Abstract format: Poster

Massacres represent one of the most visceral and horrific forms of violence practiced by humans. It is a very ancient behavior, going as far back as we have archaeological data. What is unique about this form of violence is that the goal is to annihilate in totality some defined transgressor group including infants, children and all adults. The oldest case from North Africa 12,000 years ago, the massacres found throughout western Europe and later in central Europe in the early Neolithic, and those in North America, represent early massacre sites. These are examined to reveal the patterning as well as to reconstruct the cultural context within which these massacre sites are located. Moving the analysis from the victims to the broader political and cultural context necessitates using social theories about the nature of massacres. If massacres are seen as a process, that is, the unfolding of nonrandom patterns or a chain of events that preceded the massacre itself and continue long after, it shifts the focus permitting a more nuanced approach. And if assumed to be the response to a cultural crisis leading to ontological insecurity massacres may be seen as coherent and explicit attempts to bring the world back to order and to restore ontological security. The symbolic and ritualized nature of 80% of the massacres in the past demonstrate that massacres are not deviant events, rather they are performative and discursive and remain a part of collective memory over many generations.

B. INTERDISCIPLINARY APPROACH TO THE JUSTINIAN PLAGUE IN GAUL: THE EXAMPLE OF THE “CLOS DES CORDELIERS” BURIAL GROUND (SENS, FRANCE)

Abstract author(s): Holleville, Marion - Castex, Dominique - Deguilloux, Marie-France - Kacki, Sacha (Université de Bordeaux, CNRS, MC, UMR 5199 PACEA: De la Préhistoire à l'Actuel: Culture, Environnement et Anthropologie)

Abstract format: Poster

The *Yersinia pestis* bacterium has caused dozens of millions of deaths during three historical pandemics, which have deeply marked European societies. Among these, the “Plague of Justinian” took place between 541 and 750 AD in the Mediterranean Basin. Although this pandemic has been the subject of some works in recent decades, it remains poorly known due to a lack of textual records and archaeological evidence.

In 1989, archaeological excavations carried out at the « Clos de Cordeliers » site in Sens, Central France, revealed a large number of multiple burials, all dated from this pivotal period. A recent reexamination of the 80 skeletons excavated from the site has been conducted to confirm the cause of death and to assess the health status of individuals prior to infection, which could have caused a predisposition to plague. These questions were tackled using a multidisciplinary approach, primarily based on the examination of various bone and dental markers that may reflect episodes of stress or disease (dental enamel hypoplasia, endocranial lesions, porotic hyperostosis, cribra orbitalia, periosteal reaction on long bones and ribs). Oral hygiene was also considered in order to better assess the general health status. Moreover, paleogenomic analysis has been carried out on samples from dental pulp in an attempt to detect DNA from the plague bacillus. The correlation of these approaches reveal some specificities in the composition of the sample, which may reflect differences in susceptibility to plague infection according to age group, gender, and possibly preexisting health.

Acknowledgments: This research received support from the French Research National Agency in the framework of the PSCHEET project (PI: D. Castex; grant ANR-19-CE27-0012).

HUMAN-ENVIRONMENT INTERACTION IN NORTHERN EURASIA FROM MICRO- TO MACRO-REGIONAL LEVEL

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Vyazov, Leonid (Kazan Federal University) - Ponomarenko, Elena (University of Ottawa) - Ryabogina, Nataliya (Tyumen Scientific center SB RAS) - Ershova, Ekaterina (Moscow State University) - Blinnikov, Mikhail (StCloud State University)

Format: Regular session

Since the very beginning of human occupation, Northern Eurasia was a challenging region for the economic development of the societies of the past, resulting in creation of diverse and unique systems of human subsistence and land use. Land-use technologies of prehistoric societies reflect both general subsistence strategies adopted in specific climatic conditions and cultural traditions, making paleoecological research highly relevant to the reconstruction of cultural and historical processes. Recent developments in pedoanthracology, ichnology, phytolith analysis and palynology, combined with a drastically increased number of reliable radiocarbon dates and new statistical methods for processing multidimensional data, significantly expand opportunities for the reconstruction of past land use systems and associated dynamics of anthropogenic landscapes. We aim to discuss methods and methodological approaches to reconstruction of land use systems practiced from the Neolithic to the Late Middle Ages, north from the southern boundary of modern steppes region. We are looking for papers describing certain types and components of land use, their combination in the landscape, and methods of their identification. Examples include, but are not limited to fields, swiddens, pastures, nut and fruit groves, firewood and sacred wood groves.

ABSTRACTS:

1 FIVE PERIODS OF AGRICULTURAL TRANSFORMATION IN MIXED FOREST ZONE OF EUROPEAN RUSSIA AS THEY REFLECTED IN POLLEN DIAGRAMS

Abstract author(s): Nosova, Maria (Main Botanical Garden RAS) - Ershova, Ekaterina (Biological Faculty, Moscow State University)

Abstract format: Oral

During the last two decades, Russian palynologists accumulated several well 14C-dated sequences for Central European Russia. That pool of diagrams from Moscow, Tver, Smolensk, and Pskov regions allows some conclusions and generalizations over a large area. Preliminary we distinguished five evident milestones of human induced changes:

1. The conventional period of the "Neolithic-Bronze age" (3000) 4000-4500 BP and earlier (to 6000 BP), when anthropogenic indicators (AI) reflect the "Forest Neolithic" type of economy with the minimum deforestation. At this time, zonal vegetation in discussed regions was represented by mixed and broadleaved forests. Findings of Cerealia pollen are very rare and insufficient to confirm arable farming.
2. Late Bronze (2500-2700 BP). Cereal pollen grains as well as AI remain sparse but appear regularly. Crop cultivation was evident from that time and was accompanied by the small-scale deforestation.
3. Late Iron Age (1500-1800 BP). This stage of landscape transformation resulted from the colonisation wave that occurred during the Dark Ages. Some of the diagrams show significant decline of broadleaved trees and Alnus-decline.
4. Middle Ages (1000-1200 BP) stage began when arable lands expanded, and new technologies were brought by the Slavic tribes. Cerealia and AI reach their empiric limit (their graphs become continuous). Primary forests declined significantly. Several diagrams have a period of 500-800 BP when the agriculture declined, and primary forests temporary recovered despite the Little Ice Age. Possibly, it was due to the socio-economic reasons and great depopulation of 13th-17th cent.
5. The New Times (400-100 BP). Diagrams show the maximum of AI and grassland indicators, caused by the population growth and agriculture expansion following the end of the Times of Troubles in the 17th century. It was accompanied by the ultimate decrease of spruce and broadleaved forests.

2 MORPHOLOGICAL SIGNATURE OF PASTORAL ACTIVITIES IN PEATLANDS OF THE FOREST ZONE

Abstract author(s): Ponomarenko, Elena (University of Ottawa) - Tomson, Pille (the Estonian University of Life Sciences) - Baku-menko, Varvara (Tallinn University of Technology) - Kuzmina, Svetlana (Paleontological Institute RAS) - Ershova, Ekaterina (Moscow Lomonossov University)

Abstract format: Oral

Given the sparsity of meadows in the forest zone, utilization of peatlands for pastures could be widespread from the beginning of livestock husbandry millennia ago. Currently, pollen and non-palynomorph markers of pastoral activities are applied to confirm this type of land use at the site and layer level. However, such high-precision reconstructions are always localized. We searched for morphological indicators that could allow surveying past episodes of pastoral activities in peatlands at the landscape level. We studied soil morphology in historical peatland pastures of 19th century in Estonia and Canada, with Pre-European layers in the latter serving also as a "blank sample" due to the absence of pastoralism. The morphology of grazed layers reflected land clearance techniques (burning and, in recent pastures, draining) and movement of ungulates that trampled and destratified peat for the depth of hoof penetration and transferred mineral particles from mineral soils of droveways to peatlands. Grazed peat layers had no layering typical for

natural peat tiers and contained charcoal, reoriented wood fragments, and unsorted mineral grains of sand to small gravel sizes. The lower contact of destratified tiers had undulated pattern, typical for trampling by hooves. As the scale of transfer of mineral particles on hooves was not described in detail earlier, we estimated the maximum distance and maximum size of transported materials in field experiments with sheep, horses, and cows.

While undulation could be documented only in test pits, destratification and presence of unsorted mineral particles were visible even in very small (<1 cm³) peat samples available from deep augering of ancient layers. Several paleoecological analyses were applied to confirm association of the morphological indicators with pastures. Poaceae pollen and phytoliths, Chenopodiaceae seeds, and cocoons of earthworms were common attributes of grazed peat layers.

3 MODERN PHYTOLITHS AS A PALEOENVIRONMENTAL PROXY IN THE ARMENIAN HIGHLANDS AND THE SOUTHERN CAUCASUS

Abstract author(s): Jarl, Johan (University of Connecticut) - Kandel, Andrew (Research Centre 'The Role of Culture in Early Expansions of Humans' - ROCEEH at University of Tübingen) - Gasparyan, Boris (Institute of Archaeology and Ethnography, National Academy of Sciences, Yerevan) - Bruch, Angela (Research Centre 'The Role of Culture in Early Expansions of Humans' - ROCEEH at Senckenberg Research Institute and Natural History Museum, Frankfurt)

Abstract format: Oral

The Armenian Highlands and Caucasus lie at the border between Europe and Asia, constituting a biodiversity hotspot of widely varied environmental regions – covering most of the spectrum from lush warm-temperate forests to deserts. With evidence of hominin occupation since at least 1.8 Ma, the region is of great importance for understanding the development and migrations of the genus Homo. Archaeobotanical methods have a long history of shedding light on the environmental and climatic conditions in which our early ancestors lived. However, the research in the region suffers from poor preservation of pollen and macrobotanical remains. These first results of a pilot study reveal how phytolith analysis might aid as a proxy in paleoenvironmental reconstruction in Georgia and Armenia. In total, 143 surface soil samples across all modern vegetation units in Georgia and Armenia were analyzed. Through thorough morphological analysis, it is shown which phytolith morphologies occur in the region, and how they relate to modern taxa. The application of multivariate statistics on the dataset will uncover, if, and to what degree, the phytolith assemblages correlate with distinct vegetation units. Furthermore, this study investigates methodological issues of preservation and identification of phytoliths in the region. The obtained statistical vegetation-phytolith relationship will then be tested on archaeological samples from the Upper Paleolithic site Aghitu-3 Cave, Armenia, to assess the potential of using phytolith assemblages to reconstruct paleo-vegetation in the Armenian Highlands and southern Caucasus.

4 TRACES OF EARLY PLEISTOCENE HYDROMORPHIC SOILS IN EARLY PALEOLITHIC SITES OF DAGESTAN (NORTHERN CAUCASUS, RUSSIA) AND ARMENIA (LESSER CAUCASUS)

Abstract author(s): Stolpnikova, Ekaterina (A. N. Severtsov Institute of Ecology and Evolution; Lomonosov Moscow State University, Faculty of Soil Science) - Kovaleva, Natalia (Lomonosov Moscow State University, Faculty of Soil Science)

Abstract format: Oral

The understanding of climatic and landscape conditions of first Early Pleistocene settlements on Eurasian continent remains open now. Were these conditions similar to ancestral homeland Africa? Indeed, it is well known that the climate of the early Pleistocene remained favorable for the existence of rhinos, elephants, and Stenon's horses.

Archaeological sites of the Early Paleolithic in Armenia (Lesser Caucasus, Lori Plateau, sites Karakhach, Aghvoric) in Dagestan (North Caucasus, Russia, Muhkai II) were investigated at mid-altitudes of 1600-1800 m above sea level. The data on the isotopic composition of organic carbon and the distribution of n-alkanes, biomarkers of terrestrial vegetation, did not reveal the predominance of steppe biocenoses. Morphological data (Fe-Mn spots and grayish color) and values of magnetic susceptibility, as well as a large proportion of medium-chain alkanes, the predominance of even alkanes indicate the presence of waterlogged conditions. According to the signs of the proximity of water bodies, such as streams, sea lagoons or lagoon lakes, it is likely that the predominant type of vegetation was meadow, in some places - tree and shrub. Since there are pebble layers with findings in all objects (Amirkhanov et al., 2014; Lubin et al., 2015), it can be assumed that ancient humans used mainly stone beaches, but periods of habitation on soils are also possible during the period of their automorphic or semi-hydromorphic existence.

Acknowledgments: Research is supported by Russian Science Foundation (project nr. 17-14-01120).

5 ECOLOGICAL NICHE AND ENVIRONMENTAL ADAPTATION FEATURES IN NEOLITHIC (SOUTH OF WESTERN SIBERIA)

Abstract author(s): Ryabogina, Natalia - Enshin, Dmitry - Skochina, Svetlana (Tyumen Scientific Centre SB RAS)

Abstract format: Oral

We intend to present new paleoenvironmental data and discuss life-supporting strategies of Neolithic groups in the forest-steppe of Western Siberia. Shores of flow-through lake Mergen was attractive for the settlement since the end of the 7th millennium BC; one of the earliest stationary settlements in the region (Mergen 6) and several later Neolithic settlements were investigated here. Unlike other regions of Eurasia, in Siberia, neolithization is not associated with the introduction of agriculture or livestock breeding

but manifests as the emergence of the first long-term settlements, ceramic production and the complication forms of exploitation of the surrounding landscapes. But knowledge of the climate, landscape and living environment around Neolithic settlements in the region are extremely scarce. To fill this gap, we studied the dynamics of sedimentation, pollen, charcoal and geochemical markers in the bottom deposits of Lake Mergen. In addition, the pollen and phytoliths from cultural layers were studied to characterize the residential surroundings at different stages of habitation. Correlation between off- and on-site data allowed us to restore the sequence and specificity of environment changes over 9.5 ka years, including the conditions during the occupation phases. Studied Neolithic villages were located close, but at different relief heights, and they also sometimes changed the residential environment from open to the forest. This is due to the dynamics of the lake level and reflects experience in adjusting to changes in the resource base in the lake-channel-river system. The diversity in the paleoichthyo- and zoological collection, as well as in stone and bone toolsets, confirms the active year-round exploitation and the formation of a kind of adapted system of complex resources use of the lake and the surrounding land.

Thus, the chosen ecological niche ensured optimal seasonal productivity of hunting and fishing, which managed to maintain despite environment challenges throughout the Neolithic.

6 CHANGING LIFESTYLES IN THE NORTHERN STEPPE – STUDIES ON MAN-ENVIRONMENT INTERACTIONS OF BRONZE AGE SOCIETIES IN THE TRANS-URALS, RUSSIA

Abstract author(s): Stobbe, Astrid - Rühl, Lisa - Gumnior, Maren - Stolarczyk, Eliza (Goethe University Frankfurt) - Burger, Joachim (University Mainz) - Koryakova, Ludmila (Ural Division of Russian Academy of Sciences, Ekaterinburg) - Krause, Rüdiger (Goethe University Frankfurt)

Abstract format: Oral

Located at the northern fringe of the Eurasian steppe, the Trans-Urals have been a transfer zone and centre of economic and socio-cultural innovations during the Bronze Age, such as the fortified settlements of the Sintashta-Petrovka period around 2000 BC. The subsistence economy of their inhabitants has been discussed for long, and it was considered plausible that the onset of arable farming coincided with the establishment of the permanent settlements. However, our archaeological excavations and archaeobotanical analyses have shown that the Middle Bronze Age population did not engage in plant cultivation but consumed meat and milk as well as fish and wild plants; a phenomenon that is particularly noteworthy since cereal cropping was already prominent in neighbouring regions. The Sintashta-Petrovka pastoral system was obviously well adapted to the specific socioeconomic and environmental conditions. Our palynological studies prove that the fortified Sintashta-Petrovka settlements were erected during a relatively humid phase that resulted in a high biomass production, especially in the wide floodplains of the perennial rivers that offered ideal conditions for grazing. For the Late and Final Bronze Age, however, a more mobile lifestyle and the consumption of wheat and barley have been hypothesized. We are currently investigating whether a shift in subsistence strategy has taken place in our study area as well, and if it was triggered by climatic and ecological changes. Our interdisciplinary research project focuses on this evidently unique situation in the Trans-Urals, and involves archaeologists, archaeobotanists, geographers and geneticists.

7 ANCIENT POPULATION ON THE SHORES OF THE SYSTEM FLOW-THROUGH LAKES: THE DYNAMICS OF DEVELOPMENT AND LIFE SUPPORT SYSTEM (WESTERN SIBERIA)

Abstract author(s): Zimina, Oksana (Tyumen Scientific Centre SB RAS) - Idrisov, Ildar (Tyumen State University) - Sizov, Oleg (Institute of Oil and Gas Problems RAS) - Ryabogina, Natalia (Tyumen Scientific Centre SB RAS)

Abstract format: Oral

On the basis of complex paleogeographic studies, we have created a large-scale paleo-landscape map covering the territory of the Andreevskoye lake flow system, in-between the Tura and the Pyshma rivers (Western Siberia). We created a digital model of the relief of a vast territory, on this basis we simulated fluctuations in the levels of water bodies and, then, built paleolandscape maps for a series of chronological sections. The basis for the reconstruction of vegetation and climate were two complete high-resolution records of lake and peat deposits of 16000 and 9000 years old, the sequence of geochemical, palynological and paleobotanical data from them was analysed taking into account the age-depth model of sedimentation, based on 13 AMS dating. It was established that the driest conditions were about 7100-5500 BP, and the most humid and cool - started from 2850 BP. According to the results of paleolandscape mapping, we determined the ecological capacity for each stage of development of the territory, and we calculated the possibilities of bio-productivity of plant and animal resources, based on modern analogues. We traced the dynamics of the development of the territory of the Andreevskoe lake system based on the analysis of the spatial distribution of ancient settlements of different periods. The possible number of inhabitants was calculated by the resource supply of the territory around lake system in different periods. We reconstructed the area of pastures on the territory for 3200-2850 BP (Bronze Age) and 1000-500 BP (Middle Age) and showed, that these lands could provide from 800 to 1600 people engaged in animal husbandry. The natural resources, including wild bird, animals and fish, varied slightly and could provide approximately, both in the Neolithic and the Middle Ages - 100-130 people per year. The most significant amount of food could be provided by the fishery.

8 ADAPTATION, MIGRATION AND CULTURE TRANSFORMATION IN CHANGING ENVIRONMENT DURING THE IRON AGE AND MIGRATION PERIOD IN WESTERN PRE-URALS (MIDDLE KAMA)

Abstract author(s): Pereskokov, Mikhail (Perm State University) - Shumilovskikh, Lyudmila - Schmidt, Monika (Georg-August-University, Göttingen) - Sannikov, Pavel (Perm State University)

Abstract format: Oral

The world of the Early Iron Age (EIA) cultures of mid-Urals forest zone of the Eastern Europe consists of the cultures maintaining traditions of the Bronze Age. A transformation of the Ananyino culture to Glyadenovo culture in 5th-4th century BCE was triggered by the socio-economic factors with a gradual evolution of the socio-economic traditions in the same area. In contrast, Glyadenovo settlements were abandoned in the 5th century CE, which may have been triggered by environmental changes. In order to reconstruct vegetation and environmental changes in the middle Kama, palynological investigations on the sediment core Chernaya were carried out. The received results are synchronized with the archaeological data for the reconstruction of the economy type, adaptation mechanisms, and migration processes. Palynological data indicate a strongly increased anthropogenic impact on the environment since the Early Iron Age. Human activity included deforestation, potentially crop cultivation and grazing. The phases of high anthropogenic activities are reflected in the pollen diagram with a high proportion of Artemisia and other ruderal plants, spores of coprophilous fungi, spread of pioneer birch forests and high concentration of microcharcoals in sediments. The phases of anthropogenic activity alternate with the phases of restoration of the taiga forest with spruce, pine and fir. Non-pollen palynomorphs and the rate of carbon accumulation indicate a relatively dry period between 2300 and 1300 years ago, which occurred during the prosperity of the Glyadenovo culture. Subsequent moistening coincides with abandonment of the Glyadenovo culture of the Middle Kama region and migration of population from a wide Kama valley to narrower and drier valleys valley of Kama tributaries. At the final stage, with the application of GIS tools we will calculate the ecological capacity of the territory and create a dynamic model of population adaptation.

9 ALLUVIAL AND VEGETATION DYNAMICS IN THE CONTEXT OF HUMAN ACTIVITIES IN NOVAYA KIREMET, MIDDLE VOLGA REGION: GEOMORPHOLOGY, SEDIMENTS AND POLLEN

Abstract author(s): Cordova, Carlos (Oklahoma State University; Kazan Federal University) - Vyazov, Leonid - Salova, Julia (Kazan Federal University)

Abstract format: Oral

Our study sheds light on scarcely studied environmental dynamics and human influence on the landscape of forest-steppe in the Trans-Volga Region. Earliest traces of population in this region date back to Early Holocene with some peaks of population in Bronze Age, Migration Period, the 11th-13th and 18th-20th c. CE. We studied an off-site area of a 3rd c. CE settlement on the small inland river by several floodplain sections.

The recorded stratigraphy in the context of geomorphological features presents an interesting case of the evolution of a meadow-type stream. The fluvial valley of the Kiremet river began as a postglacial small lake that later was filled in with sequences of alluvium and peat. Pollen data suggested that this floodplain fluctuated from a wet meadow to a forest and back, apparently as a response to climatic shifts and human intervention. The latter seems to have been strongest in the Late Holocene, particularly as fire and grazing altered the slopes of the valley. Signs of fire appear not only by high concentrations of microscopic charcoal but also in the forest composition, particularly with abundant pine and birch. In the most recent historical period, the system was altered and the stream began to create channels. In the mid-20th century, with the construction of a dam upstream and widespread erosion, the channels concentrated in one cutting the floodplain and exposing the stratigraphic sections studied here.

10 LANDSCAPE DEVELOPMENT OF THE OKA RIVER VALLEY FROM THE BRONZE AGE TO THE MIGRATION PERIOD: NEW MATERIALS

Abstract author(s): Syrovatko, Alexander (Kolomna Archaeological Center; State social and humanitarian university, Kolomna) - Panin, Andrey (Moscow State University; Institute of Geography of the Russian Academy of Sciences) - Gol'eva, Alexandra (Institute of Geography of the Russian Academy of Sciences)

Abstract format: Oral

The report is devoted to a comprehensive study of the archaeological site found in the floodplain of the Oka River (right bank, 8 km to the city of Kolomna, 120 km to the city of Moscow). The excavation discovered 3 horizons covered with river alluvium of the 17th-20th centuries. This situation is unusual for the Oka River, because, as a rule, the Holocene soil is destroyed by the floods of the Little Ice Age in the low floodplain. The atypical stratigraphy of the floodplain made it possible to obtain data on natural conditions and anthropogenic impact on landscapes. The soil horizon under the alluvium has a 14C date of 1770 ± B.P. (GIN-15382, humus; all dates is uncalibrated), the base of this layer is 2145 ± 20 B.P. (charcoal, IGAN 7466). The 14C dates are fully consistent with the ceramics of the Migration Period. Horizon 2 is dated by humus to 2790 ± 100 B.P. (GIN-15383) and 3020 ± 20 B.P. (bone, IGAN 7607). This horizon is rich in Bronze Age pottery. The lower horizon has a humus date of 4470 ± 110 B.P. (GIN-15384) and charcoal - 6999 ± 25 (IGAN 7468). Its lower level contains rare flint artifacts. Its upper level contains ceramics similar to layer 2.

The report covers the results of geomorphological studies carried out using drilling, phytolith analysis data and palynological data. The synthesis of the results made it possible to trace the dynamics of changes in moisture conditions and determine the beginning

of alluvial deposition in the floodplain (about 5000 B.P.). The increase in humidity in the floodplain in the 1st millennium AD confirmed the data on the relationship between the topography of the Migration Period settlements located in the highest areas above the river level and natural conditions.

11 ANCIENT HYDROTECHNICAL STRUCTURES OF MSU ZVENIGOROD BIOLOGICAL STATION (MOSCOW REGION, RUSSIA): MULTI-PROXY STUDIES

Abstract author(s): Ershova, Ekaterina (Moscow State University; Kazan Federal University) - Krivokorin, Ivan (Tallin University of Technology) - Krenke, Nikolay (Institute of Archaeology RAS)

Abstract format: Oral

Ancient hydrotechnical structures (ponds, ditches, wells, dams etc.), hillforts and mounds are visually distinguishable elements of the anthropogenic landscape. The latter receive constant attention from Russian archaeology and paleobotany. However, hydro-technical structures are practically not investigated, despite the significant number of European publications on this subject. We applied pollen, moisture capacity, ash content, plant macrofossils, coprophilous fungi analysis and radiocarbon dating to investigate two ancient ponds on different sides of the Volkov bog (Moscow region, Russia), to determine the date of their creation and economic purpose, and to evaluate their impact on the surrounding wetland vegetation. The results showed that the ponds were dug in the 11th-13th century for economic purposes related to agriculture and cattle breeding. There were three periods of human economic off-site activity near the bog: 1) forest burning and plowing on the banks of the bog during the Early Iron Age (about 2000 BP); 2) burning of the forest for agriculture / grazing and the creation of ponds (about 800 BP); 3) drainage of the bog with drainage trenches and peat mining (18/19 century). The creation of the first pond and the drainage trench facilitated the temporary drainage of the eastern edge of the bog. The creation of pond № 2 contributed to the flooding of the northern part of the bog. After the termination of their economic use, both ponds began to accumulate peat. Our research demonstrates the potential for applying multidisciplinary analysis in the study of ancient ponds is extensive.

12 CHARCOAL IN THE CULTURAL LAYER OF EARLY IRON AGE AND MEDIEVAL HILLFORTS IN THE UPPER VOLGA BASIN (NW RUSSIA)

Abstract author(s): Kupriyanov, Dmitriy - Smirnov, Alexei (Institute of Archaeology Russian Academy of Sciences) - Bobrovsky, Maxim (Institute of Physicochemical and Biological Problems of Soil Science, Russian Academy of Sciences)

Abstract format: Oral

This study is aimed at the reconstructing the anthropogenic impact on the environment in the Upper Volga basin (North-West Russia) in the Early Iron Age and the Middle Ages by examining the botanical composition of charcoal particles in the cultural layers of the 13 hillforts. Sampling was carried out using Eijkelkamp soil corer continuously every 15 cm from the surface to the underlying rocks. 1028 charcoal particles and 16 types of wood were identified.

Botanical analysis of charcoal particles revealed the predominance of coniferous species in the cultural layers of all hillforts. Picea and Pinus make up more than 60% of the total number of identified charcoal taxa. In the cultural layers of earlier hillforts (Dyakovo culture) predominate Pinus wood with a significant abundance of broad-leaved tree species (Acer, Quercus, Ulmus, Corylus and Tilia), which are currently practically not found in the study area. In the layers of later hillforts Picea charcoal predominate, broad-leaved species are much less common, but Betula and Alnus wood (less often Populus, Salix and Corylus) have a considerable abundance.

According to the pollen data, the decrease of broad-leaved species in the forests of the study area began synchronously with the start of the hillforts functioning. We assume that the active broad-leaved trees species reduction in the forests and charcoal accumulation in cultural layers caused by the active use of these tree species as fuel, since these species have a high combustion temperature and can potentially be used for metal smelting. Changes in the charcoal botanical composition are weakly associated with climatic changes in the past and implicitly indicates the anthropogenic causes of ecosystem changes in the area of the studied hillforts. In addition, the botanical composition of charcoal particles in the cultural layers may reflect the cultural characteristics of the use of different wood species.

13 EARLY SLAVIC SUBSISTENCE IN THE PRIPYAT MARSHLANDS OF POLESIE (BELARUS)

Abstract author(s): Kasiuk, Alena (Institute of History, National Academy of Sciences of Belarus, Minsk) - Schneeweiss, Jens (Cluster of Excellence ROOTS, Centre for Baltic and Scandinavian Archaeology - ZBSA, Stiftung Schleswig-Holsteinische Landesmuseen Schloß Gottorf, Schleswig) - Bartrow, Anna (Martin Luther University Halle-Wittenberg, Institute for the History of Arts and Archaeologies of Europe) - Shevchenko, Anna (Max Planck Institute of Molecular Cell Biology and Genetics, Dresden) - Kittel, Piotr (University of Lodz, Department of Geomorphology and Paleogeography) - Shumilovskikh, Lyudmila (Georg-August-University Göttingen, Albrecht-von-Haller-Institute for Plant Sciences) - Lyashkevich, Elona (Institute of History, National Academy of Sciences of Belarus, Minsk) - Gorobets, Leonid (National Museum of Natural History of the National Academy of Sciences of Ukraine, Kyiv)

Abstract format: Oral

The Pripyat marshlands in Polesie are characterised by a settlement continuity throughout the 1st millennium AD. An important example is the settlement cluster of Snjadzin (Belarus). Five settlements and one necropolis belong to this period. The pit house

settlements were oriented towards the river. One objective of our interdisciplinary research on this settlement cluster is to find out more about diet and economy of the early Slavic settlers living here.

Archaeobiological and geoarchaeological investigations play an important role in this respect. While archaeozoological and archaeobotanical analyses belong to the standard methods, phytoliths are studied less frequently; palaeoproteomics on food crusts has hardly been used for archaeological questions so far. Geoarchaeology provides valuable additional data.

The first results prove a large diversity in the diet and indicate a complex economy of a sedentary population. Fish, waterfowl and wild game attest the intensive use of the water- and forest-rich natural environment, as do gathered fruits and berries. The main branch of the Pripyat as well as its distributaries and backwaters enabled the exploitation of at least 13 species of fish. Among domestic animals, the pig was the most important, followed by cattle. The surrounding mixed oak forests were well suited for wood pasture and pannage. Chickens were kept as poultry. Various cereals were cultivated, such as panic millet, barley, rye and spelt. Of interest is the abundance of bog iron ore, evidenced by metallurgical features and ore deposits within the settlements, but also by characteristic soil bacteria (Koribacter). Very likely are seasonally changing activities in the subsistence strategy (e. g. duck hunting in the winter half year).

The conservation conditions for organic matter are poor in the sandy, well-aerated soils with changing water levels. It is still open to what extent and where exactly the cultivation of crops (cereals) took place.

14 LAND USE SYSTEMS AND VEGETATION DYNAMICS IN THE DNIEPER FOREST-STEPPE IN THE LATE HOLOCENE (CASE STUDY KURILOVKA 2, RUSSIA)

Abstract author(s): Rodinkova, Vlasta (Institute of Archaeology, Russian Academy of Sciences) - Ponomarenko, Elena (University of Ottawa) - Salova, Julia (Kazan Federal University)

Abstract format: Oral

The macrofossil analysis of soils and deposits was applied at the Kurilovka 2 settlement (Kursk region, Russia) to detect past land use systems, reconstruct vegetation dynamics in the site, and determine the chronology of site occupations.

The settlement is located in the northern part of the East European forest-steppe zone, on a remnant terrace in the floodplain at the confluence of the Sudzha and Psel Rivers (the Dnieper basin). The human presence can be traced here from the Neolithic on, with advanced development of the territory occurring in the 1st-2nd millennium AD.

According to our data, at the beginning of the Late Holocene the area was covered with a broad-leaved forest dominated by oak. The forest was burned apparently at the Early Slavonic period of site occupation (2nd – 8th centuries AD). The macrofossil composition of soil large fractions (the shape, size and coating of charcoal fragments, and a low proportion of charred bark) indicate that deforestation was associated with the slash-and-burn agriculture. Millet and wheat were cultivated crops, as evident from finds of charred grains. Perhaps there were several swidden cycles in the early Slavonic time.

The abandonment and reforestation of the territory after the 8th century AD was followed by a short-term episode of clearing for agriculture in the 12th – 13th centuries. Finally, total deforestation of the area, including watersheds, and a widespread establishment of permanent fields took place in the region in 17–19th centuries. It was accompanied by the significant increase in frequency and intensity of floods.

The land use was not limited to the crop cultivation. Particularly, bones and teeth of fossorial mammals, charred and re-burned shoots of prickly plants, charred grasses, and Chenopodium seeds evidence that the area was open for some time and was used as a grassland/pasture.

15 NEW PALEOENVIRONMENTAL RECORDS FROM SMALL VALLEYS IN THE MIDDLE VOLGA, RUSSIA IN THE LATE HOLOCENE: HIGH-RESOLUTION DATA FROM SEDIMENTARY ARCHIVES

Abstract author(s): Blinnikov, Mikhail (St Cloud State University; Kazan Federal University) - Leonid, Vyazov (Kazan Federal University) - Cordova, Carlos (Oklahoma State University) - Ponomarenko, Elena (University of Ottawa)

Abstract format: Oral

Our team conducted investigations of natural-cultural connections of the Imenkovan people of the Middle Volga (ca. 4-7 centuries C.E.) using sedimentary archives (pollen, phytoliths, soil micromorphology and charcoal). One effort concerns precise 3D mapping of a hillfort and its vicinity (ca. 1 km radius) of a well-preserved 5th century C.E. Urnyak settlement and reconstruction of the extent of the agricultural and iron-smelting activity of its residents. This is a first attempt to produce a detailed map of the agricultural use near the hill-fort from the region. Another effort includes a study of an earlier and less prominent settlement in the Kiremet River valley (ca. 4th century C.E. and the likely predecessors) produced by a low-gradient meadow stream and exposed by channel incision, where evidence of five occupations exists in its stratigraphic sequence. The sequences of events interpreted from the sedimentation, soil formation, and evidence of fire reveal complicated relations between climatic changes and different forms of land use change by post-Neolithic peoples.

AGRICULTURE, MINING, AND SETTLEMENT PATTERN ON THE BANKS OF THE VOLGA RIVER DURING THE MIGRATION PERIOD

Abstract author(s): Vyazov, Leonid (Kazan Federal University) - Ponomarenko, Dmitri (Paleontological Institute, Russian Academy of Sciences) - Ponomarenko, Elena (University of Ottawa; Kazan Federal University) - Blinnikov, Mikhail (StCloud State University; Kazan Federal University) - Ershova, Ekaterina (Moscow State University; Kazan Federal University) - Salova, Julia (Kazan Federal University) - Petrova, Darya (Khalikov Institute of Archaeology, Tatarstan Academy of Sciences)

Abstract format: Oral

The ensemble of archaeological sites in Komarovka, Ulyanovsk region, the Cis-Volga, Russia, appears to be the first in the Middle Volga region, which preservation and full-scale investigation enabled the reconstruction of spatial distribution and land-use pattern of the Eastern European forest farmers during the Migration period at the micro-regional level. The ensemble includes two hillforts, several unfortified settlements, a burial ground, and several mining sites, used for iron production.

We used drone surveys for detecting structures and occupation areas, soil sections for stratigraphical analysis and subsequent land-use reconstructions, as well as pollen, phytoliths and soil charcoal as proxies for understanding the vegetation dynamics. Our preliminary results revealed dramatic changes in the local landscape, associated with the human occupation of the area in the 6th-7th c. CE.

Agricultural development of the area included two stages, with the sedentary agriculture and permanent fields replaced by the slash-and-burn cultivation system at the later stage. Deforestation of the surroundings of the Komarovka agglomeration was reflected in both the charcoal pool of the occupation layers and in the fuel selection for cremation burials.

But the most intensive environmental change appears to be related to iron smelting activities. We suggest that ore mining in sources of gullies was the main reason for the large-scale soil erosion, reflected in accumulation of thick alluvial deposits in the gullies.

Our study allows considering one of the models of land development, which supported survival and even flourishing of the local societies of the deciduous forest zone of Eastern Europe during the Dark Age Cool Period. It was based on swidden agriculture on sandy soils in gully systems, complemented by hunting and mixed livestock farming. The geomorphological settings of the sites provided opportunities for intensive iron smelting of siderite ores.

MICRO SWAMP VERSUS POND: THE STUDY OF THE INTERACTION OF NATURE AND MAN IN MUSCOVITE RUSSIA OF THE XV CENTURY

Abstract author(s): Ershova, Ekaterina (Moscow State University; Kazan Federal University) - Chernov, Sergey (Institute of Archaeology RAS)

Abstract format: Oral

Maslovskaya Lesnaya Dacha is a natural reserve located 17 km west of Moscow. This is a pine forest on fluvio-glacial sands measuring 7 x 4 km, next to the valley of the Moscow River. Authentic traces of human activity of the XIV-XVI centuries are preserved on the territory of the forest. These are archaeological sites (7 settlements and two burial grounds), a network of roads with preserved ditches, and remnants of ancient meadows.

During this period, Maslovskaya Lesnaya estate was part of the fiefdoms of the Moscow metropolitans with its centers in the villages of Aksinino and Dmitrovskoye. Due to this fact, documents have survived, in which the boundaries of the estates are described and the names of all the settlements are listed. They also indicate the amounts of payments made and works performed for the benefit of the metropolitan and the Zvenigorod prince. In particular, there is an archeological record of the settlement of Lagirevo, which belonged to Kharya Lagir, a ministry of Prince Yuri of Zvenigorod (1389-1434) which passed into the service of the metropolitan. A transcript of the court session, which sheds light on the fate of this man who lived from about 1400 to 1460, has been preserved. A signet ring, with which he sealed documents, has been found. The pond found in the village of Lagirevo is a reference object of paleoecological studies. They reveal 3 stages of its functioning: 1) a natural bog in a micro hollow, 2) a bog turned into a pond; 3) a pond, left by man, turned into a natural bog again. Due to the pollen analysis of "swamp/pond" deposits, we were able to reconstruct in detail the local history of land use of the settlement.

EASTERN CASPIAN IN NEOLITHIC

Abstract author(s): Alisher Kyzy, Saltanat (Institute of Archaeology and Ethnography Siberian Branch of Russian Academy of Science) - Yanina, Tamara (Moscow State University) - Shnaider, Svetlana (Institute of Archaeology and Ethnography Siberian Branch of Russian Academy of Science; Novosibirsk State University)

Abstract format: Oral

The Eastern Caspian Neolithic is represented by a few sheltered sites with stratified deposits (Kaylu, Jebel and Dam-Dam Cheshme1 and 2), and several open sites with surface deposits (Kuba-Sengir, Dhanurpa, Kyzyl-Lay et.al.). Recent reassessment of the materials from Eastern Caspian sites shows a complex pattern of cultural diversity in the Neolithic. Based on our techno-typological analysis of lithic materials from this period, we identify two different traditions of lithic production. The first one is associated with sheltered sites, and consists of a blade/lete industry. The tool types (end scrapers, notched tools, burin, symmetric points), and debitage found at these sites suggests they were used as hunting camps. The second tradition is represented by materials from open sites, which exhibit pressure microblade production (width of 3-7 mm), backed tools, scalene points, narrow triangles, microblades with

ventral retouch, nail-scrapers and bifacial narrow points. The lack of absolute dates at this class of sites complicates their chronological attribution, which we attempt on the basis of paleogeographic reconstructions. During the Holocene, more comfortable climatic conditions emerged during the first phase of the Newcasian transgression (7500-5600 BP). At this time, the climate became more humid, which may have increased plant biomass and opportunities for herbivore hunting. The location of these sites on the landscape appears related to sources of fresh water hunting opportunities. We hypothesize that during the Neolithic in the Eastern Caspian, these two material assemblage types represent two different cultural or functional traditions.

A. HUMAN IMPACT AS A KEY FACTOR OF LANDSCAPE DYNAMICS OF THE UPPER DNIEPER BASIN (WESTERN RUSSIA): A CASE STUDY

Abstract author(s): Lavrenov, Nikita - Ershova, Ekaterina (Lomonosov Moscow State University; Kazan Federal University)

Abstract format: Poster

Pollen analysis of bog sediments allows to reconstruct past dynamics of landscapes and qualitatively evaluate human and climatic impacts on them. We present the first results of the paleoecological study of the Akseinskiy Moh peatbog that is the source of the Dnieper River. The peatbog is distanced from all known archeological sites for more than 20 km, though the region is rich in the archeological sites of various time periods.

The dynamics of vegetation and crucial shifts in the local hydrology imprinted in the peat bog sediment sequence were linked to human activities that started at least in the Iron Age (radiocarbon dates pending). Sudden changes in the tree pollen composition, along with the permanent presence of anthropochors pollen in the bog indicate that the surrounding ecosystems were utilized by people. The pollen spectra documented all types of traditional agricultural systems: the early agriculture was detected by the presence of pasture herbs pollen, the first arable agriculture by the appearance of cereals pollen, and the Medieval period was marked by the presence of the rye pollen. The bog itself was formed from a lake after a series of fires which were probably caused by the local human activities.

Our results suggest that there are unknown archeological sites around the bog, which can be instructional for further archaeological surveying. The study was funded by RFBR, project number 19-34-90172.

B. DEVELOPMENT OF WATERSHED SPACES OF THE VOLGA- OKA RIGHT BANK IN 14TH-18TH CENTURIES AND DISASTROUS EFFECTS FOR FOREST LANDSCAPES

Abstract author(s): Khokhlova, Olga (Institute of Physicochemical and Biological Problems of Soil Science, Russian Academy of Sciences) - Sycheva, Svetlana (Institute of Geography RAS) - Gribov, Nikolay (Institute of Archaeology, Russian Academy of Sciences) - Ukrainskiy, Pavel (Belgorod State National Research University)

Abstract format: Poster

The landscapes of the Volga-Oka right bank are currently changed by human activity considerably. Most of the forests have been cleared. The soils are largely eroded. The zone of deciduous forests has actually turned into a natural-agricultural area. A geoarchaeological study carried out jointly with archaeologists in the area of the Medieval Russian sites of Blizhnee Konstantinovo-1 and Podvyazye-3 made it possible to determine the beginning and maximum of anthropogenic impact on landscapes, which caused catastrophic changes in biota, soils, and landforms.

During the existence of the Medieval Russian settlements of the 13-14th centuries in the study area, mixed and broad-leaved tree species grew on Retisols. The houses were built from oak and spruce. At first, the development of landscapes by the ancient Russian population proceeded along the banks of small and large rivers. Starting from the 14th century and especially sharply since the 18th century, accelerated anthropogenic soil erosion manifested itself. On the watersheds and slopes, the upper part of the soil profile (up to the Bt2 horizon) was destroyed by erosion. As a result, watersheds and slopes decreased by no less than 40-60 cm. Coastal ravines and microdepressions were almost completely filled with colluvium. Mordvin's gully has turned into a flat-bottomed ravine. The sediment thickness in the bottom of the ravine reaches 4.5 m. The depth of dismemberment has decreased by 4-5 m. The relics of the Ah and AE horizons of Retisols have been preserved only in a buried state on the slopes and in the bottoms of depressions. The reasons for the described ecological catastrophe are associated with the deforestation and plowing of land on an unfavorable natural background - climate change towards humidification and cooling (wet phase preceding the Little Ice Age). This work was supported by RFBR, grant N19-29-05024 mk.

PASTORALISM OF THE PAST: INSIGHTS INTO SOCIAL, CULTURAL AND ENVIRONMENTAL (IN) STABILITY

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Alaica, Aleksa (University of Toronto) - Windle, Morgan (University of Kiel)

Format: Regular session

Pastoralism and livestock management has been the basis for the economies, social capital and ideologies of societies throughout the past. Our contemporary world faces the reality of environmental transformations associated with large-scale agricultural practices and anthropogenically influenced ecological degradation. This session challenges participants to consider how pastoral practices have afforded and constrained past communities. How did the daily and annual rhythms of domestic species influence the

short and long-term strategies of people? In what way did the activities associated with animal management change in the midst of environmental fluctuation? How did sociopolitical and palaeoecological change impact consumption and ritual use of herded animals? These questions may guide participants in widening their research horizons, and how they consider the ways pastoral strategies have adapted to change or resisted against it. We invite contributions focusing on pastoralism through the archaeological lens to illustrate the ways that mobile animal management mitigated, exacerbated or sustained various lifeways. We hope to expand the discussion on how mobile animal management can serve in mitigating the economic, environmental and social complexities of the contemporary world. Perspectives from Asia, the Americas, Africa and as well as Europe are encouraged so as to reflect the diversity in pastoral patterns around the world and the varied insights those contributions represent.

ABSTRACTS:

1 NESS OF BRODGAR'S SEAWEEED-EATING SHEEP: ADAPTATIONS TO AN ISLAND ARCHIPELAGO ENVIRONMENT ON NEOLITHIC ORKNEY, SCOTLAND

Abstract author(s): Blanz, Magdalena (University of Vienna; University of the Highlands and Islands) - Mainland, Ingrid (University of the Highlands and Islands) - Balasse, Marie (Muséum National d'Histoire Naturelle) - Card, Nick (University of the Highlands and Islands) - Ascough, Philippa (Scottish Universities Environmental Research Centre) - Fiorillo, Denis (Muséum National d'Histoire Naturelle) - Taggart, Mark (University of the Highlands and Islands) - Feldmann, Jörg (University of Graz)

Abstract format: Oral

Constrained by coastlines and resource limitations, small islands tend not to be ideal environments for mobile pastoralists. However, trade and travel exist beyond the confines of the land, and even small island archipelagos can serve as a backdrop for the movement of large amounts of animals. Islands may also serve as naturally constrained pastures in extensive herding strategies (i.e. using small amounts of labour per area), and their inherent resource limits can incentivize adaptations to the environment that increase the islands' carrying capacities. One such example is the seasonal consumption of seaweed by Neolithic sheep on the Orkney archipelago (Scotland), which took place from the moment of their first introduction to Orkney.

Recent excavations at the monumental complex Ness of Brodgar (ca. 3500–2300 cal BC, part of the 'Heart of Neolithic Orkney' UNESCO world heritage site) have revealed large numbers of cattle (likely over 400 tibiae) and sheep remains. Based on the number of remains and the sheep mortality profile, it seems unlikely that all these animals were raised close to the site, and so may have been imported from other islands of the Orkney archipelago.

At the Ness of Brodgar, stable isotope ratios ($\delta^{13}C$, $\delta^{18}O$) suggest the consumption of seaweed in winter/spring by only 3 of 17 analysed sheep, considerably less than the archipelago-wide average (around half of all Neolithic Orkney sheep). Could this be an indication that for the sheep brought to the affluent Ness of Brodgar, seaweed-consumption was not 'necessary'? Or could a decline in seaweed-consumption be a sign of wider societal changes, including a turning-away from the sea as a dietary source?

2 WHERE DID THE SHEEP GO? COMBINING ZOOARCHAEOLOGICAL AND ISOTOPIC EVIDENCE TO ASSESS CAPRINE MOBILITY IN CLASSICAL-HELLENISTIC THESSALY, CENTRAL GREECE

Abstract author(s): Filioglou, Dimitrios (University of Groningen) - Valenzuela, Silvia (Consejo Superior de Investigaciones Científicas-Institució Milà i Fontanals - CSIC-IMF)

Abstract format: Oral

Located between the Macedonian empire in the north, and the city-states in the south, Thessaly experienced a long period of political instability from the 4th-1st century BCE (Westlake, 1969). Short periods of peace and unity among the Thessalian cities alternated with conflicts caused by internal rivals and external intervention. In this context, common herders were practicing their activities and supplying the local markets with meat and other animal products.

In this paper, we examine the role of animals in the local economies and the evolution of human-animal relationship under changing historical conditions. Looking at the species composition, kill-off patterns and conducting isotopic analysis in zooarchaeological remains, we attempt to reconstruct the animal husbandry strategies and the degree of animal (and consequently human) mobility. Previous research in the region has attempted to examine whether ancient herders practiced seasonal movements (transhumance) for large-scale specialized production or small-scale agrofarming for subsistence. Prummel (2003) proposed the practice of short-distance transhumance of caprines for specialized milk and wool production, based on limited zooarchaeological data, while Bishop et al. (2020) suggested four different types of management in four caprines based on isotopic evidence. However, more integration of zooarchaeological and historical evidence is necessary. Although isotopic analysis is a powerful tool which allows us to get direct evidence for animal diet and mobility, the results are more effective when they are examined in their historical and archaeological context. For the first time, we bring together new zooarchaeological, isotopic and historical evidence from several neighbouring cities in southern Thessaly, Greece – Magoula Plataniotiki, New Halos and Pherae (4th-2nd century BCE) – to approach animal husbandry practices in a context of continuous political instability.

3 PASTORALISM OF THE PAST: THE ROLE OF THE UPLANDS IN PREHISTORIC AND ANCIENT SICILY

Abstract author(s): Forgia, Vincenza - Burgio, Aurelio - Canale, Alessandra (Dipartimento Culture e Società, Università di Palermo) - Martín, Patricia (Institut Català de Paleoecologia Humana i Evolució Social - IPHES-CERCA; Universitat Rovira i Virgili - URV, Dept. d'Història i Història de l'Art; SERP, Departament d'Història i Arqueologia, Facultat de Geografia i Història, Universitat de Barcelona) - Messana, Chiara - Ollé, Andreu - Vergès, Josep Maria (Institut Català de Paleoecologia Humana i Evolució Social - IPHES-CERCA; Universitat Rovira i Virgili - URV, Dept. d'Història i Història de l'Art)

Abstract format: Oral

In this paper we present the results of two ongoing research projects on the uplands of Sicily, in particular in the Madonie mountain range; here we are documenting the origin and early development of the pastoral economy on the island. Traces of pastoral practices are scattered on the mountainous territory since the middle Neolithic (end 6th millennium BCE) when mobile communities and their livestock begun to exploit (and transform) the natural environment. From that period onwards, the mobile animal management system sustained (pre)historic lifeways, throught the metal ages and until its acme, in coincidence with the Greek colonization. During this last phase the native communities were strongly involved in the pastoral economy, as it has been evidenced by the archaeological data and as we can also perceive from their settlement strategies and ancient viability system. The pastoral tradition then became iconic in Sicily, reaching the symbolic sphere and achieving a collective meaning with the (native?) myth of $\Delta\acute{\alpha}\phi\nu\nu\varsigma$. We finally present a selection of the impressive ethnographic record that highlights the importance of the pastoral tradition, as one of the main activities sustaining the regional economy.

4 CAMELS AND CARNIVORES: EXPLORING THE TRILATERAL RELATIONSHIP BETWEEN PASTORALISTS, LIVESTOCK, AND LARGE PREDATORS THROUGH ROCK ART FROM NORTH-EASTERN JORDAN

Abstract author(s): Brusgaard, Nathalie (University of Groningen)

Abstract format: Oral

In regions of the world where pastoralists and their livestock co-exist with large carnivores, the human-animal relationship is often fraught with tension and conflict. Large predators pose a threat to herd animals and thus human livelihood, while competition for resources and retaliatory killing endanger the survival of the carnivores. This is causing increasing challenges for the conservation of sustainable animal and human subsistence alike. Co-existence between pastoralists, their herds, and large predators has, however, been a state of being for millennia. The particular relationship and dynamics between these groups are not unique to our time and many of the challenges posed by co-existence are, therefore, not be new. There are, however, few deep-time perspectives on this issue.

This paper explores the trilateral relationship between pastoralists, their herd animals, and large carnivores in the so-called Black Desert of north-eastern Jordan in the late first millennium BC and early first millennium AD. In this period, the region was home to nomadic pastoralists, their herds of dromedary camels, and a range of wild fauna, including various large carnivore species such as lions, hyenas, and leopards. While osseous remains are scarce due to poor preservation, the desert is rich in iconographic and textual evidence. Rock art and inscriptions provide unique insights into the relationships the pastoralists had with, in particular, dromedary camels and lions. This paper presents results on the first in-depth study of these engravings. It aims to contribute to our understanding of the dynamics between herders and animals from a deep time perspective and, simultaneously, to demonstrate the potential of rock art for exploring human-animal relationships in the past.

5 PASTORALISM MAY CONTRIBUTE TO RESOURCE PREDICTABILITY IN THE LATER STONE AGE OF THE SOUTHERN AFRICAN CENTRAL INTERIOR

Abstract author(s): Cameron, Michelle (University of Toronto)

Abstract format: Oral

The current climate emergency is associated with increased climate extremes and decreased predictability in weather conditions. In contemporary and past societies, pastoralist groups may be found in marginal regions with unpredictable environmental conditions and demonstrate resilience in these contexts. Archaeological sites located in the semiarid central interior of Southern Africa, particularly along the Riet River (approximately 1000–200 BP), highlight one response to the unpredictable environmental conditions prevalent in this region. Stable carbon and nitrogen isotope data from human skeletal remains and limited zooarchaeological evidence from these sites suggest high reliance on wild fauna. However, livestock was also kept in this area as indicated by large enclosures, faunal remains of domesticates, and historical reports of stock trading during the later occupation of these sites.

This paper discusses how bioarchaeological methods may clarify if pastoralism helped central interior groups resist local environmental unpredictability. Correlations were conducted between human skeletal measurements and previously analyzed bone collagen stable isotope data. In particular, intralimb proportions were investigated, as these proportions may reflect environmental stresses experienced during growth and development, including nutritional insufficiency. Here, this paper shows that the consumption of higher trophic level foods, such as products from domesticates, positively impacted growth and development and mitigated early life stresses in this unpredictable region. Wild resources predominated in the diet, however, the incorporation of pastoralism likely provided added stability for human groups living in this region. Pastoralism in this context may represent a strategy to mitigate unpredictability and maintain healthy growth and development in this semiarid environment.

6 PASTORAL POLITICS AND TRANSFORMING ANIMAL MANAGEMENT STRATEGIES: INSIGHTS ON CAMELID HUSBANDRY FROM THE ARID NORTH COAST OF PERU

Abstract author(s): Alaica, Aleksa (University of Toronto)

Abstract format: Oral

Pastoralism in the Andes is the basis for small-scale subsistence strategies, interregional interaction, and the emergence of social inequalities. Camelid pastoralism provided an integral network for trade, a renewable source of fiber, and nourishing resources of protein. Sustaining the care for and exploitation of camelids and their primary and secondary products were impacted by shifting sociopolitical structures and climatic (in)stability. By mobilizing zooarchaeological data from the site of Huaca Colorada of northern Peru, this paper examines the way that camelids were used in daily activities and large-scale feasts to bolster political power among elites and foster interregional and local relationships during the Middle Horizon period (600-1000 CE). Despite the volatile Late Moche phase (650-900 CE), the sustained use of camelids as the principal part of daily diet emphasizes the intertwined lifeways of pastoralists, agriculturalists, and fisherfolk on the northern coast. Sustainability in camelid management provided coastal societies with the means to disentangle themselves from the climatic, landscape, and marine fluctuations characterizing the end of Moche domination during the Middle Horizon and allowed for descendent communities to maintain aspects of their daily and ritual practices.

7 PASTORAL LANDSCAPES: A METHODOLOGICAL APPROACH TO THE STUDY OF PASTORALISM AND LANDSCAPE CHANGE

Abstract author(s): Domingo Ribas, Guillem - Carrer, Francesco (Newcastle University)

Abstract format: Oral

Pastoralism plays a central role in landscape narratives and it is regarded as one of the main causes of landscape transformation in many areas. However, its consequences over landscape can sometimes be overlooked. Thus, it becomes paramount to discern what the real influence of pastoral practices on the landscape is. Our research intends to address this question by suggesting an interdisciplinary methodological approach to the study of the long-term relationship between pastoralism and landscape. Starting from three case-studies (medieval Dartmoor, UK; 18th-20th century Aspromonte, Italy; today's Göksu river valley, Turkey) that comprise different pastoral strategies and ecological niches, and with a particular focus on pastoral mobility, we will define a methodological protocol using historical and archaeological literature, ethnographic observation, oral history, archaeological survey, archive sources (e.g., historic maps and documents) and GIS technologies.

The latter will be employed in conjunction with quantitative methods for the analysis of digital landscape datasets, as well as landscape mobility patterns, to provide a meaningful explanation of the spatio-temporal correlations between pastoral practices and the historic configuration of the territory. In this regard, ethnographic methods will be pivotal for coupling the recorded evidence to human activities and creating analogical models or narratives. Altogether, these approaches will enable us to address diachronically how pastoral groups in these areas have had an impact on the landscape, while analysing if other processes or driving forces of the territory (natural, socioeconomic, political, technological and cultural forces) have also influenced their practices. Additionally, this novel methodological approach allows to reinforce the need for interdisciplinarity in the historical reconstruction of pastoral landscapes.

A. SUBSISTENCE ECONOMY IN THE IRON AGE SETTLEMENT OF SAHARNA MARE (REPUBLIC OF MOLDAVIA). ARCHAEOZOOLOGICAL DATA

Abstract author(s): Malaxa, Daniel - Stanc, Simina (Alexandru Ioan Cuza University of Iasi) - Zancu, Aurel (Moldova State University of Chisinau, Republic of Moldova) - Mototolea, Aurel (National History and Archaeology Museum of Constanța, Romania) - Bejenaru, Luminița (Alexandru Ioan Cuza University of Iasi)

Abstract format: Poster

Archaeological researches carried out during 2017-2018 in Saharna Mare-“Dealul Mănăstirii” site revealed finds, which are attributed to early Hallstattian (Cozia-Saharna) and Thraco-Getic habitation periods. The archaeological site is located to the west of the Saharna locality, Rezina Rayon, Republic of Moldova, being placed on a promontory of quasi-trapezoidal shape, with an area of about 15 ha and an altitude of about 130 m from the level of the Dniester river.

During the research, 3709 faunal remains were collected, coming from different archaeological contexts (layers, pits). The identified remains belong to molluscs, fish, birds and mammals (which are predominant). The archaeozoological study aimed to evaluate the animal resources and the exploitation strategies of the identified animals.

The collected faunal material was divided into four samples, two from each cultural context. The remains of domestic mammals have the highest proportion in each of the four samples is the (91-97%), indicating the importance of the animal husbandry in the economy of the settlement. The identified domestic species are: cattle, sheep, goat, pig, horse and dog. The livestock was dominated by cattle (48-58%), followed by sheep-goat (15% - 22%) and then by pig (7.2% - 10%). The management of livestock was guided according to whether the interest was focused, on primary or secondary products. Both, cattle and sheep-goat were exploited, first of all, to secure secondary products.

Wild mammals (red deer, wild boar, roe deer, hare and fox) have a low proportion, not exceeding 10% in the samples.

542 EUROPE'S MEDIEVAL PASTS: A MANIFESTO

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Driscoll, Stephen (University of Glasgow) - Citter, Carlo (University of Sienna) - Wouters, Barbora (Vrije Universiteit Brussel) - Seppänen, Liisa (University of Turku)

Format: Round table

This roundtable session offers an opportunity to reflect on and critically evaluate the MERC Manifesto. These discussions will explore how we may deliver the aspirations it embodies. The Manifesto of the Medieval Europe Research Community seeks to awaken appreciation of the rich cultural resources embodied in our understanding of the medieval past. There is an urgent need to understand the foundations of contemporary Europe in order to help shape its future. Our vision promotes opportunities provided by archaeology to explore and to engage with the past, and to care for it and enjoy our shared European heritage. Perspectives grounded in the material remains of the past allow us to embrace cultural diversity over national exceptionalism. Experiencing archaeology enables and encourages us to be in dialogue with the past and through this immediacy, its local stories of global resonance. This Manifesto addresses our political responsibility as European archaeologists as set out in the 2019 EAA Bern Statement: Archaeology and the Future of Democracy (<https://www.e-a-a.org/BernStatement>). Our manifesto asserts that engagement with medieval archaeology is a matter of European importance.

The Manifesto is intended to build consciousness and inspire action. If you are interested in using it, you are warmly welcome to participate in these discussions. It can be downloaded at: www.mercmanifesto.org.

543 MATERIAL MINDS: EXPLORING THE INTERACTIONS BETWEEN CULTURAL ARTEFACTS, MATERIAL CULTURE AND EMBODIED MIND

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Criado-Boado, Felipe (Institute of Heritage Sciences - Incipit, CSIC) - Müller, Johannes (University of Kiel, Institute of Prehistoric and Protohistoric Archaeology)

Format: Discussion session

This session proposes to a wider audience thinking and reporting in what ways the worlds we build and inhabit alter our own minds and the ways we process information. The research problem this session wishes to address is: Do the material structures of our cultural artefacts, buildings, and landscapes change fundamental patterns of thought and mind, so that understanding change in these 'material codes' becomes part and parcel of understanding the emergence of the modern mind?

To answer these questions, we propose participants from different audiences and backgrounds to bring their expertise and experience to explore the hypothesis of materiality-driven cognitive change to build further understanding of the cycles by which we humans make and transform the structured worlds that make and transform our minds. Case studies and contributions could be based on different sets of information, spanning the vast diversity of present day archaeological practice, including prehistoric, historic, ethnoarchaeological and contemporary archaeologies. Empirical accounts of the intended proposals will be important. But we also call for methodological, conjectural or even speculative approaches.

The session is related to a newly awarded ERC Synergy Grant project on Material Minds (acronym XSCAPE). Their proponents are part of the team of Principal Investigators of this project, being the others Andy Clark, of the University of Sussex, Department of Informatics and Department of Philosophy (UK), and Luis M. Martínez, of the Spanish National Research Council-CSIC, Institute of Neurosciences-IN (Spain).

ABSTRACTS:

1 PERCEIVING TOOLS: VISUAL ATTENTION DURING LOWER PALEOLITHIC STONE TOOL EXPLORATION

Abstract author(s): Silva Gago, María - Fedato, Annapaola (Centro Nacional de Investigación sobre la Evolución Humana - CENIEH) - Hodgson, Timothy (University of Lincoln) - Terradillos-Bernal, Marcos (Universidad Isabel I) - Alonso-Alcalde, Rodrigo (Universidad de Burgos) - Bruner, Emiliano (Centro Nacional de Investigación sobre la Evolución Humana - CENIEH)

Abstract format: Oral

Humans evolved specializations to integrate tools into their cultural, perceptive and cognitive systems. Tools extend cognitive functions beyond the brain and directly improve the range of our cognitive skills. A characteristic of human beings is their hand-eye coordination, associated with a specialized visuospatial system. In fact, parietal lobes, larger and more complex in modern humans, are involved in the management of the relationships between brain, body and environment. Tools activate brain motor regions even during passive viewing. When a tool is touched, it is integrated into the body scheme, expanding the peripersonal space. Recently, different disciplines have adopted an embodied cognition perspective arguing that physical tools should be considered as a functional part of the cognitive network. Vision is the dominant source of sensory information in primates, channelling action and body-environment relationships. We applied eye-tracking technology to investigate visual perception during human interaction with Lower Paleolithic stone tools. We quantified visual attention during a free exploration of stone tools in peripersonal space and during tool physical

manipulation. Our results suggest that choppers are usually more explored at the upper region and cortex, while handaxes receive more attention at the base and edges. We can consider whether choppers, displaying a simpler morphology, may require less attention associated with the grasping strategy, while handaxes, with a more complex profile and more grasping and use possibilities, may need a finer exploration of its base. That differences during visual exploration are the same whether or not the tools are physically manipulated, suggesting haptic exploration simply serves visual perception, without influencing the visual exploration scheme. The analysis of visual behaviour associated with these affordances can supply information on the early steps of this brain-body-tool interaction, evidencing common factors as well as type-specific perceptual differences.

2 MATERIAL CULTURE, LANDSCAPE PERCEPTION AND “MODERN” MIND IN MIDDLE PLEISTOCENE. A NOVEL ARCHAEOLOGICAL WORKING HYPOTHESIS LINKING MATERIALITY AND COGNITION

Abstract author(s): Romagnoli, Francesca (UAM - Universidad Autónoma de Madrid)

Abstract format: Oral

The first problem when approaching the concept of modern mind in Prehistory is to define which evidences attest it. There is a general agreement in taking into account symbolic-mediated elements, i.e. coloured pigments, personal adornment, and ‘art’. Technologies are usually bound in the sphere of the materiality and are analysed in terms of production sequences; productivity; time and energy costs of raw material supply, processing and transport; and efficiency of tool design. Thus, materiality is usually a negligible concern in the “modern behaviour” issue. The second problem is that the studies debating cognitive capacities in our species usually sustain the higher level of cognitive complexity in sapiens according to the lack of complexity in the pre-sapiens archaeological record. However, this inferiority is based on a traditional list approach, which is untrustworthy according to the novel data, and is biased by an Upper Palaeolithic European perspective and the lacking of an in-depth knowledge of pre-sapiens cultural evolution.

In this paper, I review the technological innovations that appeared in the archaeological record at approximately 400.000 years before present and are attested by the exploitation of previously unused resources. I discuss these innovations in the frame of the genetic, palaeoneurological, and behavioural changes that appeared in this period and through ethnoarchaeological evidences. I propose that these technological novelties expressed a ground-breaking cognitive complexity and possible new human relationships with things and the landscape. This novel working hypothesis looks at artefacts and raw materials as expressions of an indivisible union of functional and symbolic factors. It could open new perspectives in the search for the archaeological evidences of modern mind. Furthermore, it could allow overcoming the vicious circle that bias the modern behaviour issue in Prehistory and contribute to test the relevance in human evolution of shared communication and symbolic codes underlying material culture.

3 MATERIAL CULTURE AS MATERIALIZATION OF THOUGHTS

Abstract author(s): Gralak, Tomasz (University of Wrocław)

Abstract format: Oral

It was assumed that before any material object was created, there was always earlier an idea how to make it. This is what allows us to explore the way of thinking of its manufacturer. Analysis of Bronze Age material culture artefacts reveals a striking stylistic difference between ceramic and metal objects. This phenomenon is characteristic of almost all cultures from that period. Vessels were adorned mostly with rectangular and triangular ornaments, while various circular motifs were dominant among the decorations on bronze objects. It would seem that this division is a result of different sources of inspiration for each category of objects. As one might suspect, ceramic vessels imitated forms of those made of organic resources (see skeuomorphism), often manufactured by weaving or plaiting. This also applies to patterns or ornaments that decorated them. In case of metal objects, their most characteristic feature – shine, made them resemble (see metaphor) other shining phenomena. This would probably involve astronomic objects – stars, the Moon and above all else the Sun. This association might have been the reason behind various circular and spiral motifs. It seems plausible that it was a way of imitating shapes and movements of celestial bodies. Such a way of connecting different meanings seems to be similar to Vygotskian complex thinking. All this leads us to the question: to what extent did material objects reflect ideas, and to what extent they illustrated very simple beliefs about the workings of the world. Characteristically, the same beliefs pertained to very different fields (cosmos and bronze objects, weaving and ceramics). Therefore, it cannot be ruled out that these activities were a realization of cognitive schemas.

4 MATERIAL “BIG OTHER”: ON RELATIONS BETWEEN LANGUAGE AND MATERIAL CULTURE

Abstract author(s): Mlekuž Vrhovnik, Dimitrij (University of Ljubljana; Institute for the protection of the cultural heritage of Slovenia)

Abstract format: Oral

This is a highly speculative take on the relation between embodied mind and material culture, by juxtaposing the structuralist reading of Leroi-Gourhan’s chaîne opératoire with Lacanian theory of language.

Leroi-Gourhan puts chaîne opératoire as the nexus of interaction between body, mind, social and material world. The gesture cannot be understood in isolation but rather as part of a chain of operations, a dynamic process that refers to the rules guiding the manufacturing process. These rules should be understood as a syntax, as rules about relationships that define the time-spatial organization of production.

In this way, it is isomorphic with language, which is defined by structural linguistics define as a structure composed of differential elements. Language is understood as “chain of signifiers”, a stream of signifiers combined following the laws of grammar.

The gesture is at once individual and collective, concrete and abstract. Leroi-Gourhan emphasizes the collective knowledge that stands behind individual human action.

This is another similarity it shares with language. Lacan uses the term “discourse” is to emphasize the trans individual nature of language. This is the “big Other” where a system of determining relationships between signifiers is put into place. The big Other is the structure that symbolically institutes the subject’s place in an established order with signifiers that pre-existed him.

Is there a material “big Other”? The individuals are born in a world transformed by a deep history of technological operations. Operational sequences are embodied in the material world, changed by previous gestures. Tools, artefacts, material culture, plays a role of technical big Other. The moment the subject begins to engage with the world enters into a relationship of dependency vis-à-vis this material big Other. This makes a relationship between technical and cognitive a recursive one, and structurally different from the language, with several interesting consequences.

544

ARCHAEOLOGY TOURISM AND SUSTAINABILITY

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Czonstke, Karolina (University of Gdansk; Archaeological Museum in Gdańsk) - McAttackney, Laura - Riis Andresen, Jens-Bjørn (Aarhus University) - Caretta, M. Nicolas (Bornholms Museum)

Format: Regular session

This session is organised by the ArchaeoBalt consortium, an association of museums and universities from the South Baltic Region. Our project is a cooperation between universities and museums across three countries (Poland, Sweden and Denmark) who use archaeological excavations to learn more about our common past and communicate these findings in the South Baltic region through tourism initiatives. We believe that archaeology can help us to locate and build up local and regional identities that can result in wider social bonds as well as pride in our transnational, common heritage. We recognize that archaeological heritage projects can support the local and regional community identities and economies by linking and promoting archaeology and culture heritage with sustainable tourism but currently they are not fully utilized. This focus on the “local” has become even more important, especially in the current pandemic situation in which people are restricted in their movements but want to be involved in cultural activities.

We invite colleagues from all over Europe who work with archaeology and cultural heritage management as tools of social integration and / or sustainable tourism to this panel. The intention is to share experiences and inspire each other through presenting methods and approaches to promoting cultural heritage and developing its economic and social potential. Papers can include case-studies or best practice that employ new and innovative trends as well as utilizing inspirational ways of building and developing archaeological potential, tourism audiences and transnational collaborative networks. Archaeology projects are broadly defined to include open excavations, collaborative projects, use of social media and / or social projects dedicated to particular groups or broad collaborations. We would like to discuss how we can cooperate even more effectively and how we can locate new archaeotouristic and cultural heritage stakeholders.

ABSTRACTS:

1 MODERN PROBLEMS REQUIRE ANCIENT SOLUTIONS: A LONGITUDINAL STUDY OF ENVIRONMENTAL AND CULTURAL SUSTAINABILITY

Abstract author(s): Maddox, Timmis (University of Wisconsin-Milwaukee) - Caretta, Nicolás (Bornholms Museum)

Abstract format: Oral

The following paper introduces a project co-designed by the Bornholms Museum and the University of Wisconsin-Milwaukee which explores the potential value of using studies of prehistoric urbanization—and the environmental issues encountered by ancient communities—to aid in the development of sustainable modern growth. The increasing urbanization of modern civilization is creating an expanding set of challenges for human society. As cities around the world rapidly grow, the destruction of the natural landscape is magnifying environmental hazards. Modern communities on the Danish island of Bornholm are also experiencing rapid development, with large growth taking place in both local agriculture and tourist industries as part of Bornholm’s “Green Island Initiative”. As a result, the local government is seeking ways to promote sustainable development. The prehistoric Sorte Muld settlement complex on Bornholm represents one of the first cities of southern Scandinavia, focusing a wide array of activities into a single spot and extending up to two hundred hectares. Using an interdisciplinary methodology, this project seeks to study the socio-environmental relationship between the occupants of Sorte Muld and the surrounding landscape and how it may have changed as the site developed. In doing so, it seeks to provide data which could be used towards the promotion of sustainable local growth and development—granting an exciting opportunity to determine how archaeology can directly influence modern social practice.

2 WALKING TOURISM AND URBAN CONTEXTS: THE CHALLENGING ROLE OF ARCHAEOLOGICAL HERITAGE

Abstract author(s): Salvarani, Renata (European University of Rome)

Abstract format: Oral

Walking is identified as a privileged way to restart tourism in the Covid-19 Age; cultural pathways provide chances to meet local communities and to share experiences in the field; the emerging concept of "walking society" unites people of different conditions (migrants, tourists, pilgrims, seekers of different ways of life), changes in deep self-perceptions and lays the foundations for a new social cohesion.

Archaeological Heritage has a central role, displaying open-air sites, offering meeting places of great emotional impact, and making evident elements of local memory and identity.

But what happens when Cultural-Historical Routes cross cities? What is a local community when we deal with a metropolis? How can tourism be re-designed to include peripheries, rural areas, and different social groups? Can archaeology supply effective chances to this process of cultural integration between tourism and new global urban communities?

Some problematic answers can come out analyzing the Via Francigena at her very heart: the intersection between the historical medieval roadways and the urban area of contemporary Rome.

The paper starts from data collected during the pandemic spread by the European Association of Vie Francigene (walking experiences, monitoring, accesses to heritage sites and services along the pathways, re-use of medieval buildings).

Further introduces results of researches carried out on the ground by CeSHet (Study Center for Heritage and Territory) of the European University of Rome on the critical overlapping between the historical route and nowadays multiethnic metropolis (projects on possible urban pathways; rural historical landscapes and peripheries; parks and protected areas; archaeological sites along via Appia, via Aurelia, and via Triumphalis; medieval xenodochia used to host walkers; devotional practices and liturgies both for pilgrims and for local communities).

Some experiences of social integration based on walking activities in and around archaeological heritage will be introduced as well (such as the "Ecomuseo Casilino").

3 HERE BE DRAGONS - CREATING OPPORTUNITIES FOR SUSTAINABLE EDUCATIONAL TOURISM IN NORTH WEST WALES

Abstract author(s): Moeller, Katharina (Prifysgol Bangor University)

Abstract format: Oral

The Llŷn IVeragh Eco-museums (LIVE) project uses the community-based co-operative Ecomuseum model to enable coastal communities to promote their natural and cultural heritage, thus creating opportunities for sustainable tourism. To this end it aims to provide the tools for local residents to engage more deeply with their local environment and culture and supports them in developing a strong, distinct identity for the region that can be used to attract tourists. Part of the project focusses on the archaeology of the Llŷn peninsula, a popular tourist region in north west Wales with some interesting, yet sometimes hard to reach, archaeological sites. While the originally planned excavation with public participation and outreach elements had to be postponed due to the COVID-19 pandemic, LIVE has created digital and non-digital resources for eco and educational tourism. This paper looks at the different methods LIVE uses to make the archaeology of the Llŷn more accessible to the local community and the resources created to support sustainable tourism.

4 CONTRACT ARCHAEOLOGY IN THE AGE OF CORONA - INNOVATING AND ADAPTING NEW WAYS FOR PUBLIC MEDIATION AND PARTICIPATION

Abstract author(s): Nelson, Matthew (Linnaeus University)

Abstract format: Oral

Excavations in contract archaeology are often unique opportunities to experience archaeological heritage at a local site, a temporal window to the accumulated history and memories of a familiar or perhaps unrecognized place, open only to the public for a short time. The events and results of many excavations are often quite limited in their outreach, discarding the potential for sampling and forming knowledge and memories, shaping connectivity, identities and giving a sense of place associated with these sites.

Many times, results from excavations find themselves trapped in a report published mainly for a small group of experts and professionals. Finds may be displayed in museums long after the excavation took place, often losing some of its contextual relevance both in space and time. By acknowledging and finding solutions for the challenges in mediation and participation, there is great potential for contract archaeology to have enhanced cultural and sustainable effects on the heritage landscape in real time, transforming it to an archaeological landscape. A wider and more active public inclusion in the whole archaeological process can strengthen the cultural values and connectivity in society to the heritage landscape and enhance its democratic function.

The pandemic year of 2020 has caused several challenges for mediating and participating archaeological events, also having a huge impact on the tourism sector. However, finding solutions for achieving set cultural heritage goals for public inclusion in archaeological projects, has led to new ideas for outreach and accessibility. In my presentation I will show a few solutions used in excavation

projects during this past year and share some experiences. I will also discuss how we may learn from these innovations and adaptations, leading to better ways of implementing and developing mediation and participation in archaeology for the future.

5 ARCHAEO TOURISM IN THE SOUTH BALTIC REGION – THE ARCHAEOBALT PROJECT PERSPECTIVE

Abstract author(s): Czonstke, Karolina (University of Gdańsk; Archaeological Museum in Gdańsk) - Świątkowski, Bartosz (University of Gdańsk)

Abstract format: Oral

What are the current needs of a modern tourist and what are their expectations? How can the new branch of tourism, known as archeotourism, answer them? Is it a chance to make better use of the often undervalued cultural heritage in the South Baltic region, such as archaeological sites and artefacts? Or does it pose a threat to the relics of the past?

The ArchaeoBalt project spans three Baltic countries - Poland, Denmark and Sweden - which are otherwise connected by a mutual history of numerous intercultural contacts. This shared past has so far been presented from the perspective of individual countries. The ArchaeoBalt project offers a starting point for creating a common story about the South Baltic region's past. Different experiences and traditions in the field of public archaeology activities are an advantage and, at the same time, a challenge to the project partners who are trying to create a coherent narrative. In order for these activities to be effective and achieve an appropriate response, it is necessary to include people, institutions and companies in the tourism, transport, and hotel industries, as well as regional and local government organizations. The current ongoing COVID-19 pandemic has presented a new and formidable challenge to this work. The new reality makes it impossible to carry out many originally planned activities and many other plans have changed as a result of the pandemic. At the same time, the pandemic forces ArchaeoBalt to search for new solutions and means of expression and prepare for a new, uncertain post-pandemic future. Is the current situation only an obstacle, or is it a unique opportunity for the development of archeotourism?

6 HERITERRA – A TASTING CROSS-BORDER EXPERIENCE

Abstract author(s): Vintar, Anja (Institute for the Protection of Cultural Heritage of Slovenia) - Črešnar, Matija (Department of Archaeology, Faculty of Arts, University of Ljubljana) - Kiszter, Sarah - Mele, Marko (Archäologie & Münzkabinett, Universalmuseum Joanneum)

Abstract format: Oral

Today's travelers and tourists are more and more seeking experiences and not just tourist attractions. Engagement of all five senses with interaction has almost become a must for any tourist destination. This is also true for archaeological museums, sites, and landscapes. An international partnership of institutions and communities from Austria and Slovenia has set itself the goal of strengthening the position of archaeological heritage in the tourism sector by engaging all five senses.

The PalaeoDiversiStyria project was implemented in the years 2016 to 2019 as part of the cross-border EU-program Interreg Slovenia-Austria. The focus was on researching and communicating archaeobotanical knowledge to the general public. The HERITERRA brand was created to make this topic interesting for a wide audience and at the same time support the local tourism infrastructure. The international brand connects local producers, such as farmers, bakers, butchers, inns, accommodations..., who offer products that draw their identity from the local archaeological heritage and are based on scientific results of archaeology and archaeobotany. The brand not only offers new tourist products of high quality but also serves to raise general awareness of the archaeological heritage and thus the protection of monuments. More about the project and the brand can be found here: <http://www.heriterra.eu/> and <http://www.interarch-steiermark.eu/>

The authors would like to present the process of establishing the Heriterra brand and at the same time point out the challenges and opportunities for the future of such projects.

545 SOUTHEASTERN EUROPE IN 5TH AND 4TH CENTURY BC - INDIGENOUS COMMUNITIES IN CLASSICAL WORLD

Theme: 6. Material culture studies and societies

Organisers: Potrebica, Hrvoje (University of Zagreb, Faculty of Humanities and Social Sciences, Department of Archaeology; Center for Prehistoric Research) - Pravidur, Andrijana (National Museum of Bosnia and Herzegovina in Sarajevo)

Format: Regular session

This session aims to discuss different aspects of relation of indigenous communities of South-eastern Europe and powerful powers of the Classical world - primarily Greeks. The fifth and fourth centuries in Greek history represent the highest economic, political, and cultural flowering of the city-state. It is also period of the most important events that will define course of Greek and European history in general: from the Greco-Persian Wars, over the Peloponnesian and Corinthian War to final Macedonian domination. At the same time, north of Greece world was also changing. Powerful Early Iron Age cultural groups from Hallstatt Cultural Complex in Pannonia, over Donja Dolina and Glasinac cultural groups in Balkans to northern Macedonia were dissolving leaving place to new rising communities of the Late Iron Age that would enter the historical stage through their intensive contacts and interactions with Greeks. These are also the communities that we would later define in terms of indigenous ethnicities on larger and smaller scale (such as Illyrians, Thracians, Macedonians...), We would like to discuss:

- origins of these new communities especially in early stages of formation
- different ways in which indigenous communities demonstrated their specific identities and how these concepts changed over time
- initial contacts between Greeks and indigenous communities and consequences of these contacts on development of these communities
- Greek colonisation in the area of south eastern Europe
- different models of interaction between Greeks and indigenous communities

We would welcome papers addressing one or more of these issues from different aspects of archaeological theory or material culture.

ABSTRACTS:

1 CULTURAL MOSAICS: ARCHAEOLOGICAL VIEW ON THE CULTURAL INTERACTIONS ON THE WESTERN BLACK SEA COAST

Abstract author(s): Nikolova, Veronika (Independent researcher)

Abstract format: Oral

One of the directions of the Greek colonization was towards the Western Black sea coast, where the colonists met the local indigenous tribes such as Thracians and Scythians. The historical development of the coastal territories in the region has an important role and impact on the settlement system before and during the Classical period. Both the relations of the colonies with the neighboring tribal unions and the interventions by the Achaemenid Persia, Athens and Macedonia play a role in this process.

These developments will be examined by diachronically tracing the establishment of new settlements with different functions in the outer territories. They were probably related to the needs of individual poleis, e.g. Apollonia Pontica, Histria etc. In addition to the settlements created by the colonists, new local settlements or settlements of mixed origin were established in the area. Their archaeological manifestation will be commented to help us understand the relations between Greeks and natives and how they were influenced by each other.

Particular attention will be paid to the changing settlement system on the western Black sea coast. The disappearance or emergence of new settlements show diverging paths in the social and economic life of the contact zone between local groups from and around the poleis. The initial dominantly peaceful cohabitation from the Archaic period is replaced by more complicated interactions during the Classical and Hellenistic periods. Apart from the settlements, the necropolises and sanctuaries in this area also show regional variations in the relations between different groups of the population and the introduction of one culture into the other and vice versa.

2 GREEK EMPORION TO THRACIAN TOWN: DE-COLONISING PISTIROS AND RE-ASSESSING THRACIAN-GREEK RELATIONS AT ADZHIISKA VODENITSA NEAR VETREN, BULGARIA

Abstract author(s): Dimova, Bela (British School at Athens)

Abstract format: Oral

Migration and encounters between different societies have been a defining feature of the Mediterranean world since deep prehistory. In the first millennium BC archaeological, literary, and epigraphic evidence make it clear that people moved long distances to explore, settle, and live overseas, voluntarily or by force. The scholarship on Greek colonisation has been revised in the past 30 years, so it is now clear that Greek settlement overseas took place in the context of wider mobility. The revisions also emphasise that 'Greek' cities were often inhabited by people from different places and their prosperity depended on a cooperative, mutually beneficial relationship with indigenous communities. Some of the critical post-colonial scholarship has specifically examined encounters between Greeks and indigenous groups in the north Aegean. Yet, Greek colonisation and Hellenisation remain the dominant models for imagining relations between Greeks and non-Greeks in the Balkans and these models have stifled analyses of inter-cultural relations in the region.

The city at Adzhiiska Vodenitsa near Vetren, Bulgaria, opens an excellent opportunity to challenge the existing views and move towards a new model for understanding Thracian-Greek relations. The site allows us to study a city with a mixed population, operating under the authority of a Thracian ruler. The dominant interpretation considers the site a Greek colonial establishment, the emporion Pistiros. However, a critical review of the archaeological evidence does not support this idea. Instead, the rich material culture of the site allows a nuanced account of production, consumption and exchange practices. It shows that Adzhiiska Vodenitsa was a multi-cultural town which brought together people with diverse backgrounds and their encounter and co-habitation produced a variety of technological, commercial, and commensal exchanges.

3 MEMORY OR FORGETTING? – INDIGENOUS ELITES OF NORTHERN MACEDONIA AND THE THERMAIC GULF IN THE EARLY CLASSICAL PERIOD

Abstract author(s): Heilmann, Daniela (LMU Munich)

Abstract format: Oral

During the Late Archaic period, a profound change in funerary practices is evident in Northern Macedonia and Northern Greece, which is still echoed into the Classical and Hellenistic times. The very beginning of these transformations seem to be marked by ostentatious graves, occurring as early as the middle of the sixth century BCE at the Thermaic Gulf. The Sindos and Archontiko cemeteries are the most famous, especially for graves furnished with gold masks and sheets, golden and silver jewellery as well as Mediterranean imports. Typical for these ostentatious graves is a standardisation of the furnishing of the male individuals with a set of weapons and of the female individuals with jewellery.

On the basis of this uniform funerary practices it is assumed that a collective identity emerged. This concerns not only the groups of lavishly furnished individuals, but also the burial communities in the entire area of the Thermaic Gulf as well as Pella and Vergina. While ostentatious graves in Macedonia are mainly limited to the Late Archaic period, the standardized furnishing with weapons and jewellery continues to be evident at least into the Early Classical period.

By comparing the grave furnishings of the Late Archaic and Early Classical periods against the socio-historical background, a diachronic attempt will be made to shed light on the changes and adaptations which occurred over time and how these can be interpreted regarding the question of changing identity concepts.

4 IRON AGE SANCTUARY IN GORICA NEAR GRUDE (BOSNIA AND HERZEGOVINA)

Abstract author(s): Pravidur, Andrijana (National Museum of Bosnia and Herzegovina, Sarajevo)

Abstract format: Oral

The site of Gorica near Grude in Bosnia and Herzegovina was discovered in 1899 when Ćiro Truhelka excavated foundations of a drystone building with mixed remains of burned wood, human bones and abundance of iron and bronze objects roughly dated to Iron Age. The building apparently had two rooms with porch and central communication from the porch through the first room to the identical second room. He thought it was some kind of biritual cemetery object where both cremation and inhumation were practiced in the Early Iron Age. Today we know that skeletal human remains probably belong to medieval cemetery, which covered the whole field where remains of the building were located and that all metal finds were concentrated in a backroom of the building. The finds consist of defensive weapons (a bronze Greek-Illyrian helmet), over 40 pieces of iron offensive weapons (spearheads and short curved swords), and more than three hundred ornaments (mostly of bronze, but with some silver, amber and glass). The ground plan of the building, composition and location of finds (probably votive gifts) as well as their dates suggest that this could be some sort of sanctuary of local community, which perfectly fitted into general Mediterranean ideology and religious practice.

5 IRON AGE LANDSCAPES OF SOUTHERN ADRIATIC – NECROPOLIS OF ZAKOTORAC

Abstract author(s): Potrebeca, Hrvoje (University of Zagreb, Faculty of Humanities and Social Sciences, Department of Archaeology)

Abstract format: Oral

The discovery of already famous necropolis of Kopila with clusters of dry-stone constructions with hundreds of burials dating from the late 5th century BC to the Roman Age was thought to be example of unique development of burial customs specific for particular Iron Age community on the western part of the Island of Korčula. However, recent surveys and excavations on the peninsula of Pelješac suggest otherwise. In framework of the project Prehistoric Landscapes of Pelješac initial survey concentrated on the area of Nakovana with the Iron Age hillfort, famous cave sanctuary from Hellenistic period and dozens of stone mounds. Mapping of the mounds immediately showed two basic differences in construction: simple large mounds characteristic of the large area of Adriatic coast and inland in period between Eneolithic and Late Bronze Age, and more meticulously constructed mounds with several kinds of stone fill and carefully constructed concentric perimeter walls as well as rectangular drystone constructions inside the mound. The later were in terms of construction similar to mounds in Kopila. At the same time rescue excavation on the site of Zakotorac, also on Pelješac, revealed very interesting landscape with necropolis of over 25 mounds of the same type concentrated behind dominant hill and above important natural communication. The excavation in one of the mounds revealed large amount of Greek pottery (over 30 vessels), large amount of bronze and silver ornaments as well as over 500 glass and amber beads. Initial anthropological analysis suggest at least one male and one female adult and one child. Large amount of iron fragments probably belong to weapons but the most significant discovery was bronze Greek-Illyrian helmet of the type III A1. All finds belong to 4th century BC.

6 FOUND IN TRANSITION: THE COLAPIANS - THE IRON AGE PEOPLE IN BELA KRAJINA, SLOVENIA

Abstract author(s): Grahek, Lucija (Institute of Archaeology, ZRC SAZU)

Abstract format: Oral

The cultural image of the Iron Age societies in the hinterland of the northern Adriatic consists of various smaller territorial communities, such as the Dolenjska hallstat community in southeastern Slovenia. The southern part of this cultural area is Bela krajina, a geographically clearly delimited region along the upper reaches of the Kolpa River. Especially at the beginning of Iron Age this region was

of great importance in communication with the Balkans and the Danube region, as well as with the Adriatic and the western Italian cultures. The first significant changes in the Iron Age settlement of Bela krajina can be observed in the Late Hallstatt period, in the 6th century BC, when its cultural development became distinguished and isolated from the central area of the Dolenjska Hallstatt community. Until recent discoveries, this was thought to be reflected in the absence of princely graves and the objects of Situla art. However, it is not yet clear whether the change in the development of Bela krajina was decisively influenced by the expansion of the lapodes, who began to spread northward and eastward from their original territory of Lika (Croatia) during this period. They probably reached the Kolpa River towards the end of the 5th century BC and had a significant influence on the emergence and development of the Vinica cultural group in the Late Iron Age. The carriers of this culture are associated with the Kolapians, who are still very poorly studied. By presenting the results of new settlement excavations in Kučar and discovery of a large cemetery on Pezdirčeva njiva in Podzemelj, where burials began in the 5th century BC and then continued at least until the 2nd century BC, we will try to give an insight into the development and socio-political changes occurring in Bela krajina in the younger Hallstatt.

546 IDIOSYNCRATIC BURIALS: INTERPRETING THE POLITICS OF DEATH AND DEAD BODIES

Theme: 6. Material culture studies and societies

Organisers: Szeverenyi, Vajk (Déri Múzeum, Debrecen) - Polányi, Tamás (Independent scholar)

Format: Regular session

Recent decades in archaeological theory and practice witnessed increased attention on the complexities of mortuary practice. Breaking from characterizations of burial assemblages as normative and reflexive representations of social and biological facts, more emphasis has been given to idiosyncratic facets of the mortuary domain in an attempt to highlight human agency and the politics of death. In our perspective, idiosyncratic mortuary behaviour can materialize through a wide range of deposits from 'mass graves' to the minute, but significant, differences observed between the burial assemblages within a cemetery. However, such variability in mortuary practice often remains viewed through the lens of perceived cultural logic and grammar by merely introducing more nuanced, but still mostly non-negotiable biosocial categories—such as age-at-death, genetic variability, etc.—into the interpretative mix. Although it is undeniable that certain aspects of mortuary practice are governed by strict cultural rules and remain remarkably consistent over time and space, there are truly idiosyncratic, and contingent elements of funerary behaviour that can shed light on contemporary politics.

Moving beyond the basic comparative and statistical assessment of mortuary assemblages, understanding idiosyncratic, 'deviant' or unorthodox elements and instances of funerary practice require different approaches, such as microarchaeology and archaeo-thanatology. We invite papers to our session that investigate such 'non-normative' mortuary behaviour in any region and period and seek to make sense of such rituals and political acts through their analysis.

ABSTRACTS:

1 EVERYDAY LIFE OF DEATH: ACCESSING HISTORY ON A HUMAN SCALE

Abstract author(s): Polányi, Tamas (Independent Scholar)

Abstract format: Oral

Understanding the role human agency and interaction play in the flows of history is a challenging task. Archaeology is well equipped to study history as sequences of transformative events linked together loosely by the thread of time, or as a continuous process of everyday life where time serves as a function of cultural persistence. On a macro-scale the sweeping reconfiguration of human-material relations marked by events and interpreted as cultural change have been at the center of archaeological practice since the first descriptions of 'cultures' as convenient analytical and spatio-temporal units of analysis. Within narratives of everyday life, the emphasis shifted to the mundane, to the multivocality and messiness of social existence. Corresponding to the decreasing scale of analysis and interpretive context, the struggle became to present the ways in which people's repetitive day-to-day practices mattered and figured into broad-scale historical events. In this paper I attempt to redirect focus from easily discernible events to political discourse, to the processes that lead up to change and to the ways in which agency constitutes the texture history. Through the analysis of mortuary practice I will present a case study exploring the ways in which members of the Bronze Age Kajászó community engaged in political action surrounding change and persistence in the wake of some momentous transformations.

2 BEYOND THE GRAVE: INTERPRETING PROCESS AND PERFORMANCE IN THE MORTUARY ARCHAEOLOGY OF ROMAN BRITAIN

Abstract author(s): Phillips, Reanna (University of Chester)

Abstract format: Oral

Previous archaeological studies of Roman Britain have mainly categorized funerary evidence by paradigms of grave construction, body treatments (i.e. 'cremation' or 'inhumation'), demographics of the deceased, or grave good typologies. However, these research conventions prioritize the excavated burial context as the 'final' and most emblematic 'product' of funerary practices. This structures the interpretation of burials as singular, static depositions rather than as extended and nuanced mortuary rituals of engagement between the living and the dead. These frameworks also reinforce dichotomies in archaeological data which may not

reflect the understandings and motivations behind mortuary behaviors, ultimately failing to depict the complexities in individual burial treatments.

This paper analyses individual grave contexts from the major cemetery sites of Cirencester, Lankhills, York, and London in Roman Britain and identifies previously overlooked evidence of mourners' actions and manipulations. The paper interprets this increasingly varied evidence to signify the enactment of commemorative performances and extended interactions between the living and the dead. In addition to developing a more dynamic understanding of individual burial contexts, this approach will demonstrate wider variation within larger cemetery sites and contribute an enriched narrative to these key Romano-British burial assemblages. This interpretive framework will demonstrate the importance of challenging burial research paradigms, investigating mortuary practices as extended processes, and the need for theoretical interpretations of performances across the spectrum of Romano-British burial practices.

3 MANAGING DEATH IN EAST CRETE DURING LM III PERIOD

Abstract author(s): Psallida, Maria (Archaeologist; Ministry of Culture and Sports)

Abstract format: Oral

In LM II new burial types coming from the Mainland appeared in Crete associated with changes in the funerary performance. These changes were spread in the eastern part of Crete during LMIII. The cemeteries became the arenas where the social groups tried through the funerary performance to maintain their integrity. The funerary performance presupposes the participation of the living subjects in the mourning and the separation of the dead. The process is necessary for the healing of the trauma caused in the community by the loss of its member. The variabilities in the funerary cycle, visible mainly at the manipulation of the body and the grave offerings, are associated not only with the grief of the community for the loss but also with the social role and the status given by the livings to the dead.

Most of the tomb types which are used during LM III in East Crete are chambers and tholos tombs of medium or small size. However, among the usual architectural forms, there are some peculiar ones, which may indicate affiliation with specific social groups. Similar oddities can be seen in the body treatment and the accompanying burial offerings: "warrior tombs", clay larnakes with elaborated decoration, special grave offerings with symbolic meaning, the ritual killing of the offerings. This paper aims to focus on the peculiarities that can be traced in the funerary realm at the eastern part of Crete. Therefore, the complexity in the funerary performance will be pointed out, which is related either to the ritual beliefs of the living or to the need of the community to maintain its social cohesion.

4 PLAYING WITH FIRE: PARTIAL CREMATIONS AND MORTUARY VARIABILITY IN THE EARLY MEDIEVAL BALKANS

Abstract author(s): Parvanov, Petar (Department of Medieval Studies, Central European University)

Abstract format: Oral

Common sense in archaeology dictates that the so-called 'deviant' (or less controversially atypical and irregular) burials are a phenomenon exclusively recognizable in inhumation burials. The systematic collection of such discoveries from the eight-tenth century northern Balkans, however, provides an opportunity to challenge this generalization. Perhaps the easiest and most accurate description for the burials in question is partial cremation. The selection of six burials juxtaposing elements from the two principal modes of bodily deposition is scattered across the early medieval Adriatic littoral and the Lower Danube region.

As much within the context of their respective burial grounds, as within the wider variety of mortuary practices, these finds manifest a truly idiosyncratic funerary events. The seldom and often insufficiently recorded discoveries prove problematic to standardized analysis and traditional discourse. Further, their association with other forms of corporal manipulation such as decapitation and mutilation also deserves attention.

To the extent allowed by the available, mostly archival evidence, the particular combination of cremation and inhumation rites will be addressed through the lenses of funerary performance and local socio-political processes. Another line of thought that should be pursued in this respect is how these cases reveal and possibly advance the archaeological way of thinking about human remains.

5 THE BURIAL GROUND MAKSIMOVKA I – THE MONUMENT TO THE ENEOLITHIC AGE IN THE FOREST-STEPPE VOLGA REGION

Abstract author(s): Shalapinin, Anton - Korolev, Arkady (Samara State Social Pedagogical University)

Abstract format: Oral

The burial ground Maksimovka I is situated on the left bank of the Samara River – the tributary of the Volga River. The works at the monument started in 2017. 12 interments dated to Eneolithic Age were studied during this period. These interments are assigned to two stages of the Eneolithic Age, to the early one and to the late one. A single interment is dated from the early stage of the Eneolithic Age. It is oriented Nord-East-South-West. The deceased was lain extended prone in anatomical position, and was scattered with ochre. The inventory included pendants of marmot incisors, bone awl, bone rods, finial of horn in form of an elk head, polished adze, arrowhead, nucleus, flint plates. This burial place is similar to Mariupolskiy type monuments. The skeleton in semisitting position with its legs bent at the knee and with the head oriented to the East and North-East is typical of the Late Eneolithic interments.

The skeletons with burned skulls were among these interments. The burial place consisted of 4 skulls and compact gathering of skeleton bones near them is rather a unique one. The inventory of interments included the pendants of marmot incisors, bone and stone pendants, pearl beading, arrowheads, flint plates, awl, scrapers, metal ring, probably a copper one. These burial places have radiocarbon dating indicating the period 4350-3710 calBC (68.2%) or 4360-3695 calBC (95.4%).

*The study is done with the support of the Russian Science Foundation: (project No. 19-78-10001) "Ethno-cultural interaction of the Middle Volga populace in the Stone Age (Mesolithic - Eneolithic)".

6 A "MASS GRAVE" FROM THE MIDDLE BRONZE AGE SETTLEMENT OF TISZAFÜRED, EASTERN HUNGARY: THE PRELIMINARY RESULTS OF MULTIDISCIPLINARY ANALYSES

Abstract author(s): Kiss, Viktória (Institute of Archaeology, HAS) - Mester, Edit (Pál Kiss Museum, Tiszafüred) - Dani, János (Déri Museum, Debrecen) - Gál, Erika (Institute of Archaeology, HAS) - Hajdu, Tamás (Institute of Biology, University Eötvös Loránd, Budapest; Hungarian Natural History Museum) - Kovács, Gabriella (Matrica Museum, Százhalombatta) - Kulcsár, Gabriella (Institute of Archaeology, HAS) - Szeniczey, Tamás (Institute of Biology, University Eötvös Loránd, Budapest) - Szeverényi, Vajk (Déri Museum, Debrecen) - Gémes, Anett (Institute of Biology, University Eötvös Loránd, Budapest)

Abstract format: Oral

In the autumn of 2020, during construction works, Middle Bronze Age features were disturbed in the outskirts of Tiszafüred, eastern Hungary, a few hundred metres south of the well-known Middle Bronze Age tell settlement of Tiszafüred-Ásotthalom and northeast of its cemetery, Tiszafüred-Majoroshalom. One, unique pit contained the comingled remains of at least 58 individuals in multiple layers, with complete, articulated skeletons lying mostly at the bottom. The study of this unique find is being carried out by a multidisciplinary team of archaeologists and scientist. The aim of our paper is to present the preliminary results of the multidisciplinary analyses carried out on the assemblage, including archaeological, biological anthropological, palaeopathological, zooarchaeological, malacological, soil micromorphological, stable isotope and biomolecular studies. Our questions include: Is there a difference between the population of the previously excavated cemetery and the new features in terms of lifestyle, health or origin? Why were some people interred in settlement pits instead of the usual, strict inhumation rite practices in this region and period? Why were most of the skeletal remains placed in the pit comingled, not in anatomical order? Did diseases or an epidemic cause this type of burial, or are we confronted with alternative or secondary burial rites and body manipulations?

This paper was supported by the Hungarian Scientific Research Fund (OTKA FK 128013) and the Momentum Mobility research project (Institute of Archaeology, Research Centre for the Humanities) granted by the Hungarian Academy of Sciences (Project Nr. LP 2015-3).

7 DING DONG BELL, BODIES IN THE WELL. WHO PUT THEM IN...?

Abstract author(s): Aulsebrook, Stephanie (University of Warsaw)

Abstract format: Oral

Mortuary practices in the Argolid region of the southern Greek Mainland during the Late Bronze Age were in general uniform and stable. At Mycenae, the foremost centre in this area, the majority of the population were buried in similar underground family tombs accompanied by a selection of grave goods apparently linked to specific aspects of their status (particularly gender and social position). Consistent application of set secondary rites facilitated the re-use of these tombs. Elite individuals were buried in more grandiose versions. More than two hundred such tombs cover the wider landscape around Mycenae, and were in use over a period of several centuries. Why then, in 1953, did excavators discover multiple skeletons of men, women and children in an abandoned well shaft under the foundations of a large house, thrown in along with ordinary household rubbish? Details of the exceptional find, including the lack of grave goods, the withholding of basic mortuary rites and the placing of three bodies at the mouth, alongside a large dog, further heighten the mystery. This paper discusses the applicability of the usual explanations given for mass graves and the possible relationship to a similar find at the neighbouring site of Argos. In particular, I argue that the treatment meted out to these individuals, so shockingly different from the norm, implies a fear or hatred that cannot be easily explained through causes such as a natural disaster or disease, which evidence suggests the community at Mycenae were able to cope with without the need for such an atypical solution.

8 BETWEEN PATTERN AND IDIOSYNCRASY: HUMAN REMAINS FROM SETTLEMENTS IN THE BRONZE AGE CARPATHIAN BASIN

Abstract author(s): Szeverényi, Vajk (Déri Múzeum, Debrecen)

Abstract format: Oral

Human remains from prehistoric settlements in the Carpathian Basin are rare finds mostly referred to in the literature as "irregular burials", and thought of as victims of unique events such as epidemic or warfare. During the past few years, such remains from Early and Middle Bronze Age (ca. 2600-1500 BC) settlements were collected in a database and analysed as part of a postdoctoral research project. The aim of this paper is to present some of the results of this research to reveal both possible patterns and unique depositions and provide interpretations of such depositions. These remains entered the archaeological record through a number of different processes and in many different forms, thus they represent a rather diverse group of evidence, which may reflect multiple social practices. Especially when studied in comparison with "normal" mortuary practices observed in cemeteries, this important

but largely understudied group of remains provides important new information on (often alternative or secondary) burial rites, ancient views on the afterlife, and concepts and treatments of the (dead) body.

9 GLASS BURIAL SUITS AND GLASS PLAQUES IN HAN MORTUARY RITUALS

Abstract author(s): Lam, Eileen Hau-ling (Education University of Hong Kong)

Abstract format: Oral

Current researches on ancient Chinese glass mainly focused on the issues of origin and considered this medium as an evidence of China's contacts with outside civilisations. This paper, on the contrary, will discuss the objects of glass suits and glass plaques (most of the plaques are considered as parts of a burial suit), which undoubtedly were locally manufactured. To date, a considerable number of glass plaques have been excavated in different Han burials, and it appeared to be used in funerary context over a rather short period of time—from late Western Han through early Eastern Han. Because of the ostensive resemblance, some of the unearthed glass plaques have been confused with ceramic, stone, or even jade. In the meantime, due to the similarity of Chinese glass and jade, scholars generally perceive glass objects as less precious simulations of those of jade. However, by studying recent discoveries, the use of glass during the Han period, particularly in the mortuary context, did not necessarily follow that logic. This paper will explore the possible functions and political significations of adopting glass plaques in Han burial rituals, and also discuss the contemporaneous perceptions of immortality in relation to the materiality of glass.

10 THE BOOK OF THE DEAD BENEATH HEAD OF THE MUMMY ON THE COFFINS FROM THE CACHE-TOMB OF BAB EL-GASUS

Abstract author(s): Abdelfattah, Asmaa (Egyptian museum, Cairo; Cairo University) - Abdel Ghany, Khaled (Georg-August University, Göttingen) - Eissa, Ahmed (Cairo University)

Abstract format: Oral

"Bab el-Gasus" is the modern name given to the collective tomb of the priests and priestesses of Amun located in the Theban necropolis dating to the 21st Dynasty, discovered in 1891 beneath the temple of Hatshepsut at Deir el-Bahari. It yielded 153 burials consisting of coffins, papyri and many other artifacts.

Many Scholars focused in their studies on the vignettes of Book of the Dead that were depicted on the different sides of these coffins from a textual and iconographical point.

Therefore, it was necessary to study one of the complementary sides of those studies that had not been previously researched before, which is to deal with the funeral scenes that were depicted under head of the mummy on the anthropoid coffins of 21st Dynasty and analyze them to know not only type of these depictions, but also its magical and religious purpose.

By studying many of these coffins, The researcher was able to obtain various unpublished iconographic motifs. This composite iconography was inspired by the vignettes of Book of the Dead, shows evolved and intense details to identify these vignettes, despite not being fully illustrated in terms of artistic details and accompanying texts to fit the available surface of the coffins.

The deceased had carefully chosen the vignettes that express his desire to get out from the underworld, such as the motif of the solar cycle in the spell 16, as well as the scene of the horizon from the spell 17 of the resurrection of the sun god, in addition to the scene of the deceased taking the form of a swallow from the spell 86, in order to move freely in the Netherworld. Finally, these illustrations were the main characteristics of the decoration under head of the Mummy to express the new creation.

A. PRONE BURIALS IN LITHUANIA DURING THE LATE MODERN PERIOD

Abstract author(s): Paskonyte, Jurate (Klaipėda University, Šiauliai)

Abstract format: Poster

Prone burials are among the most distinctive deviant burials during the medieval and early modern period. The 57 prone burials are found in the 27 different cemeteries of the 14-17th century. These burials do reflect the continuity of some certain pagan burial rituals and traditions. Prone burial traditions progressively disappeared because of the Christian post-existence concept and burials in churchyards and sanctified cemeteries. For this moment the only face-down burial of the late modern period was found in Ylakai Church's of Lord's Revelation to St. Mary environment. The men above 20 years old were buried face-down, with no coffin marks. The grave is from the second half of the 19th century. It was found in a mixed brown clay layer when the new brick church was built in Ylakai. During this event, it is possible, the cranial part of the grave was destroyed.

According to a small number of analogs from the Middle Ages in Western Europe, the face-down burial situation was very rare and could have been interpreted in several ways. First of all, the buried individual may have been highly respected (priest?). Such cases have been discovered in the 19th century period in Western Europe. Another implication is that the deceased was feared and thus unwilling to return to the world of the living for vengeance. Of course, this trend has been more prevalent in Western Europe during the Middle Ages, but it has persisted until Modern times. In this way, the buried did not pretend to resurrection promoted by the Christian world. Another negative aspect of this burial link between the living and the dead is that the individual had a serious illness, meaning he was a sinner. It was also expected that a serious illness would be stopped in the living world.

DOWN BY THE RIVER - EVIDENCE OF MATERIAL CULTURE FOR PREHISTORIC WATERBORNE COMMUNICATION ALONG EUROPEAN RIVERS, LAKES AND COASTAL WATERS

Theme: 6. Material culture studies and societies

Organisers: Luebke, Harald (ZBSA - Centre for Baltic and Scandinavian Archaeology) - Bockius, Ronald (RGZM - Leibniz-Forschungsinstitut für Archäologie) - Erič, Miran (ZVKDS - Institute for the protection of Cultural Heritage of Slovenia)

Format: Regular session

Mobility is a basic requirement for the exchange not only of material goods, but also of knowledge and ideas and thus of great importance for the socio-economic, cultural and socio-political systems already in prehistoric time. Cultural constraints, behavioral interactions and social norms might have regulated mobility and communication. Technology and ergology can express the identity of a group and provide insights into contacts and communication between different prehistoric societies.

It should be agreed that in the Early and Middle Holocene the communication and transport routes were largely based on the intra-European water network and coastlines. The humans' adaptive and innovative ability to respond to environmental changes with technical innovations has led to the development of well-organized mobility strategies and the invention of new boatbuilding technologies. However, it is still unclear in what form an exchange of goods, ideas and individuals took place and which vessels were available. In northern Europe, paddles have been proven as a means of propulsion for the Preboreal, but boats have only been found for the late Boreal. It is therefore still being discussed whether, instead of dugouts, boats made from soft material were already being used, whose archaeological evidence is much more difficult.

This session aims to deepen current knowledge within the framework of local, supra-regional, and diachronic development and application of waterborne transport and communication as well as other linked activities. In locations where direct evidence is insufficient, various kinds of indirect evidence are employed. Therefore, apart from the studies utilising archaeological sources, we would also like to encourage researchers contributing with studies applying analogous data, from the viewpoint of, e.g., ethnography, anthropology, and ethnohistory to help build the frames of reference and further our understanding about waterborne transport and communication as a phenomenon and its dynamics in the long term.

ABSTRACTS:

1 SHIP TECHNICAL CONSIDERATIONS ON MESOLITHIC AND NEOLITHIC BOAT BUILDING IN CENTRAL & NORTHERN EUROPE

Abstract author(s): Bockius, Ronald (Roemisch-Germanisches Zentralmuseum; Leibniz-Zentrum fuer Archaeologie)

Abstract format: Oral

It is largely accepted that beside logboats which were in use since the late Boreal, other types of watercraft existed in Holocene Europe and beyond. Archaeological remains of prehistoric bark and skin boats are hardly available, however such vessels might have been built already long before the inventions of dugouts. Since the late Pleistocene tools and technologies fulfilled to construct boats from natural sources by glewing and sewing.

More sophisticated boat building principals are archaeologically attested for the first time by British and Welsh finds of Early Bronze Age multipartite wooden boats which share morphological and structural features of contemporaneous dugout vessels.

This paper discusses data and methods to identify non-rigid boatbuilding in Early Holocene Northern Europe. It focusses also wood technical evidence from the Neolithic found in the Western Baltic and in Swiss lake-dwellings. Findings show the same type of timber joints well-known from Northwestern European Bronze Age "plank boats". From this results that techniques other than the concepts of lashing and sewing to construct multipartite wooden craft were at disposal to Neolithic communities on the continent as early as in the middle of the 4th millennium BC.

2 MYTH BUSTING: THE ANTLER FROM HUSUM (GERMANY) AND ITS INTERPRETATION AS EARLY EVIDENCE OF FRAME BOAT BUILDING IN LATEGLACIAL EUROPE

Abstract author(s): Wild, Markus (Cluster of Excellence ROOTS; University of Kiel; UMR 7041 ArScAn - Ethnologie préhistorique) - Jensen, Theis (Section for Evolutionary Genomics, Department of Biology, University of Copenhagen) - Hartz, Sönke (-) - Lübke, Harald (Centre for Baltic and Scandinavian Archaeology - ZBSA)

Abstract format: Oral

There is widespread agreement in archaeological research that the colonisation of northern Europe after the last Ice Age could not have taken place without suitable watercraft. However, so far vessels have only been found in late Boreal and younger periods. In this context it has always been debated whether frame boats were – instead of or in addition to dugouts – used in the earlier phases. Consequently, D. Ellmers interpreted a fragment of a reindeer antler beam from Husum (northern Germany) as a part of a boat frame in 1980. Many researchers accepted the find as a key to proof the existence of Lateglacial fur-covered frame boats. Therefore, this interpretation became part of the standard works on early boat-building technology. Although doubts were raised quickly and direct AMS dating since the 2000s questioned the age of the find, the interpretation of the antler fragment as part of a Lateglacial frame boat can still be found in recent literature.

As a result, the find was re-investigated in detail in the context of a technological analysis of Lateglacial antler artefact inventories from the southwestern Baltic region and the Paris Basin. In addition, ZooMS analysis finally made it possible to determine unambiguously the animal species. This paper will present the research history and the new results. Finally, it will explain why this find has to be excluded from the discussion on the existence of Lateglacial and Early Holocene frame boats, even though the authors principally still consider their existence possible.

3 WATERBORNE EXCHANGE IN CIRCUM-ALPINE NETWORKS: INSIGHTS INTO A NEOLITHIC PILE DWELLING AT IMMENSEE/KÜSSNACHT, CANTON SCHWYZ

Abstract author(s): Ries, Marie-Claire (Office for Urbanism, Underwater Archaeology and Laboratory for Dendrochronology Zurich)

Abstract format: Oral

Central Switzerland's rich archaeological landscape houses several long-known prehistoric lake settlement sites. Previous archaeological research along the shorelines of Lake Zug focussed mainly on the northern lake area. It had already been assumed, however, that Neolithic activities also took place at Immensee on the south-western lake shore. Here, the historically significant land corridor "Hohle Gasse" connects Lake Lucerne to Lake Zug. If the waterways of the rivers Reuss, Lorze, Aare, Sihl, Limmat and Rhine are considered as well, this site appears as a node of transalpine networks between the inner alpine regions, Lake Lucerne, Lake Zug, Lake Zurich and eventually the pre-alpine foreland. This key site for prehistoric local to supra-regional limnic transport and communication routes has finally been discovered in 2020 during a construction project in Immensee. The Office for Urbanism, Underwater Archaeology and Laboratory for Dendrochronology Zurich, on behalf of the Cantonal Office for Culture in Schwyz, conducted an impromptu rescue excavation. We adopted a new, database-driven documentation system aiming for rapid analysis in 3D. Some 350 m² were excavated and sampled in a detailed stratigraphic fashion.

First results provide evidence of multiple settlement phases. Artefact assemblages are associated typochronologically with Horgen and Corded Ware cultural groups from the late fourth millennium BC to the early third millennium BC. Plentiful lithic objects represent the full spectrum of the chaîne opératoire with a focus on serpentinite. The site has the potential to cast more light on the northern (pre-)alpine distribution network of an important raw material from the Gemsstock massive in the Gotthard region while also serving as evidence for the mobility of objects, technical innovations and knowledge traditions in past societies. Furthermore, numerous sediment samples of the waterlogged cultural deposits provide the opportunity to study the economical and socio-cultural functioning of a settlement in an edaphically suboptimal setting.

4 THE PREHISTORIC PASTORALISTS OF RUSSIAN FOREST-STEPPE/STEPPE AND THE WATER TRANSPORT: HOW, WHEN AND FOR WHAT?

Abstract author(s): Kashina, Ekaterina - Gak, Evgeniy (State Historical Museum, Department of Archaeology) - Okorokov, Aleksandr (Russian Heritage Institute) - Shutikhin, Aleksandr (Independent researcher)

Abstract format: Oral

The archaeological finds of the forest belt of East European Plain and Trans-Urals contain the indirect evidences of carcass boats, most probably the birch bark canoes, since the Mesolithic. The most ancient logboat in Eastern Europe, dated the Final Stone Age, comes from Lithuania. The most ancient logboat in Russia found in 1954 near the Schuchye village, Voronezh region, was believed to be the Neolithic, according to some paleopedological observations. Nevertheless, after the AMS-radiocarbon dating recently made in two different laboratories, it was firmly established that the Schuchye 1 logboat belongs to the Late Bronze Age, 18-17 cc. cal BC (research funded by the Russian Foundation of Basic Research (project no. 19-09-00301). According to the morphological characteristics it was a cargo vessel 7,5 m long, available for minimum 1000 kg load. Being made of oak, it was slightly unfinished and left at the shore or was accidentally rafted down the river, stuck and then drowned and deeply buried under the alluvial sediments.

The lifestyle of the Srubnaya (Timber-Grave) archaeological culture communities was based on the mobile cattle herding. The existence of a rich cluster of the Srubnaya settlements and burial mounds at the area of Shuchye, generally contemporaneous to the logboat, allows to reconstruct the active interconnections between both banks of the Don River, the constant ties between relatives, and the effective use of multiple local pastures. The logboat was supposed to be a multifunctional vessel, fitted to transport equally the cargo, the people and the cattle.

The use of boats for the livestock transportation between pastures is confirmed by the ethnographical sources describing the Kalmuck people of South Russian steppes. Thus, logboats were essential for the Prehistoric mobile pastoralists, no less than for the hunting or farming societies.

5 WATERCRAFT AND WATERBORNE COMMUNICATION BETWEEN BRONZE AGE COMMUNITIES ON THE GREAT HUNGARIAN PLAIN. ARCHAEOLOGICAL AND ENVIRONMENTAL DATA

Abstract author(s): Bodnár, Csaba (Eötvös Loránd University, Budapest; Museum of Fine Arts, Budapest)

Abstract format: Oral

The central part of the Carpathian Basin, the Great Hungarian Plain was a major crossroad for much of prehistory. Not only have raw materials and finished products moved over this landscape for thousands of years, but so have people, practices, and ideas.

During the Holocene this region had an extremely complex hydrological system: the landscape was networked by meandering rivers, streams and torrents, permanent or intermittent water-bearing areas, swamps and bogs. Until the great water regulation works of the 19th century, floods could cover hundreds of thousands of hectares of agricultural land for months, thereby they played a significant role in the daily life of people who lived along these watercourses. Paleo-hydrological data show that watercraft had to be indispensable means of trade and travel in this area from prehistoric times till the 19th century.

In this paper, I am going to present paleo-hydrological and archaeological evidence that directly or indirectly refer to the use of water transport and watercraft during the 2nd millennium B.C. on the Great Hungarian Plain. In the 1920s, a wooden, badly preserved object was discovered in the early layers of the Bronze Age tell site, Tószeg-Laposhalom, which the excavators identified as a logboat – so far it is the only known Bronze Age boat uncovered in Hungary. In addition to placing this find in a broader cultural and environmental context, I would like to give an overview of the different types of archaeological data that are available on Bronze Age water transport on the Plain. Furthermore, by presenting some archaeological case studies, I will argue that rivers in this region were important elements of the local and regional communication networks: they facilitated rather than hindered contacts between Early and Middle Bronze Age communities who lived on their two banks as several shared material practices suggest.

6 DUGOUTS FOUND IN THE KUPA RIVER IN SISAK, CROATIA

Abstract author(s): Škrkulja, Rosana (City Museum of Sisak)

Abstract format: Oral

The paper gives an overview of the dugouts found in the Kupa River in Sisak during the 1980s and '90s: their description, purpose, cultural context, and time-frame. The boats date from the 4th century BC to the 1st century AD (C14). In continental Croatia, it matches the period from the end of the late Iron Age to the consolidation of the Roman rule. During the late Iron Age, Segesta/Segestica settlement existed

on the left and right Kupa banks. The Romans destroyed Segesta in 35 BC and established a fort on the left Kupa bank. In an account of the Roman siege (Cass. Dio), the dugouts were mentioned. The passage stated that the Segestarni had fought in their boats against the Roman fleet. The neighboring communities had also tried to send the relief to Segesta via the Sava and the Kupa. The variety in morphological features and dimensions points to the different purposes, and possibly origin, of the vehicles. Some features of the vessels and the density of the finds point to a dock on the left bank of the Kupa. An underwater survey found a dozen more boats in the Kupa in Sisak, which attest to the importance of navigation in this area since prehistory. Future research will hopefully provide more information on this rather neglected class of objects and give a nuanced understanding of their use and connection to the local and regional economic systems.

7 DUGOUT BOATS IN IRELAND - THE EVIDENCE AND RELEVANCE OF TECHNIQUES OF PROPULSION

Abstract author(s): Gregory, Niall (Gregory Archaeology; IAI - Institute of Archaeologists of Ireland; EWA - Early Watercraft - A global perspective of invention and development)

Abstract format: Oral

Recent discoveries of dugout boats in Northern Ireland have evidenced new features integrated into the boats' hulls. These features, which previously never entered the archaeological record, are new evidence for an expanding number of methods for propelling these boats.

With this extended diversity of methods of dugout boat propulsion across the island of Ireland, this paper examines these boats in the context of these features. It explores, the boats' hull size and shape; dating; regional and environmental data in order to understand any correlations in boat use and propulsion techniques. Given the relatively small size of Ireland, the number of recorded discoveries of dugout boats significantly approaches 500. Consequently, this paper also postulates that within a small island, whether a pattern is emerging that some of these propulsion techniques are confined within a regional or environmental constraint.

The paper further queries the role and relevance of propulsion techniques in understanding and analysing emerging dugout boat typology.

8 WHAT WERE IT USED FOR AND HOW DID IT GET THERE. TWO WRECKS FROM BAVARIA, GERMANY

Abstract author(s): Weski, Timm (retired)

Abstract format: Oral

From rivers and lakes in Bavaria several logboats are known. Further rafts and landing places have been in the focus of research showing the importance of watertransport. In this paper a logboat dating to 900 BC from the Starnberger See will be presented. It was only partly preserved, but a 3-D survey made it possible to reconstruct the shape of the hull. Its stern is shaped in a complicated unusual form with a square balk protruding aft and several auger holes, which have not been observed at other wrecks. Possibly it was propelled by rowing facing forward, a means of propulsion which has not been recorded for this period yet. The quality of the oak trunk and its length of ca. 14 m indicates a use not as a fishing or transport boat, but as a ceremonial or warrior vessel. The other wreck is the remains of a plank boat discovered in the River Danube from the middle of the 18th century AD. The hull section with double chines is not known in that region at that time, but is common in the Rhine area. The analysis of the oak timbers revealed that

the trees grew in that area. Therefore the boat must have been transported across the European watershed between North Sea and Black Sea over land. A task which has not been recorded elsewhere.

548 TRACING THE PAST, CHARTING THE FUTURE: EXPLORING ARCHAEOLOGICAL RESEARCH COLLABORATION BETWEEN THE AMERICAS AND EUROPE

Theme: 4. Globalisation and archaeology

Organisers: Saintenoy, Thibault (Université des Antilles) - Lazzari, Marisa (University of Exeter) - Hattori, Marcia (Incipit-CSiC) - Gomes Coelho, Rui (Durham university) - Geurds, Alexander (Leiden University)

Format: Discussion session

International collaboration between European and American teams for archaeological research has a long history of both practical and theoretical interactions. In addition to scientific achievements resulting from dialogues between schools of thought and exchanges of technical knowledge, this collaboration has also contributed to the creation of international institutions dedicated to Americanist research, such as museums, conferences, research centers, and university programs. Through a historiographic perspective, we would like to reflect on the future of such practices of international collaborations in the current global world where ubiquitous interconnections coexist with national borders, geopolitical interests, and the ongoing decolonial process.

This session welcomes testimonies and insights on diverse experiences of international collaboration for Americanist archaeological research based on the life stories of institutions, projects, and/or individuals. Contributions might refer to equity-related issues along the decolonial axis: what is happening on that end? In how far are there trends in Europe? What patterns do we see in local, regional, and national contexts in the Americas that shape such practices?

Our goal is to understand which purposes drove past international collaborations and which ones should motivate us to conduct new projects in the complex local/global frameworks of our time.

Organising team contains also Mariusz Ziółkowski (University of Warsaw) and John Carman (University of Birmingham).

ABSTRACTS:

1 EL INSTITUTO FRANCES DE ESTUDIOS ANDINOS: A FRENCH RESEARCH PLATFORM ABROAD, AND/OR AN ANDEAN ACADEMIC PLACE?

Abstract author(s): Saintenoy, Thibault (Université des Antilles) - Lara, Catherine (Instituto Frances de Estudios Andinos - UMI-FRE 17 MEAE/CNRS)

Abstract format: Oral

The Instituto Frances de Estudio Andinos (IFEA) is a well-known actor of archaeological research in the Andean countries. Since its creation in 1948, its editorial activity is responsible for the publication of dozens of books, as well as many papers in its scientific journal. Its library in Lima, which gathers thousands of books on the shelves of the archaeology section, has welcomed generations of Andean scholars, aside from the main Andean universities. As a place, the IFEA is also an Andean laboratory for French and local research projects, as well as a pan-Andean crossroads for many scientific events.

Through a historiographic perspective, illustrated by the most significant archaeological research projects the IFEA has collaborated with, I highlight the potential of such a particular research infrastructure, and discuss the past and present of the French concept of "scientific diplomacy", in order to situate it in the history of the global international collaboration framework for Andean archaeology.

2 FRENCH MISSIONS AND BRAZILIAN ARCHAEOLOGY

Abstract author(s): Hattori, Márcia (Institute of Heritage Sciences - Incipit)

Abstract format: Oral

Since the first decades of the 20th century, different foreign research missions were developed in Brazil. Of this period, two are particularly noteworthy: the United States mission and the French mission. Their contribution in contemporary Brazilian archaeology is undeniable, especially in its professionalization by contributing in methodological approaches, the first generations of archaeologists in Brazil, and in the consolidation as an academic discipline.

The aim of this paper is to reflect on the contributions of these foreign missions, especially the French mission, to Brazilian archaeology. Departing from a decolonial perspective, this study is based on interviews with several researchers who worked in different periods, and those who inherited and/or continue to engage in investigations initiated by these missions, as in the states of Mato Grosso and Piauí. Thus, I aim to examine whether different practices, theoretical perspectives that implied forms of action and dialogue with local communities and Brazilian researchers have changed over time.

3 STORIES FROM CALCHAQUÍ (NW ARGENTINA): CIRCULATION, ASYMMETRIES, AND ALTERNATIVE PATHWAYS

Abstract author(s): Lazzari, Marisa (University of Exeter) - Scattolin, Maria (Instituto de las Culturas- Universidad de Buenos Aires & CONICET; Universidad Nacional de La Plata)

Abstract format: Oral

European-led archaeological exploration and research varied enormously across the Americas in the late 19th Century and early 20th Century. The lesser known history of these engagements in NW Argentina (NWA) points at root problems that continue to affect international cooperation today. Besides some remarkable records that are still in use today, the collective activities of early European practitioners have impacted enormously on both local researchers and descendant communities' ability to both understand and engage with the region's pre-Columbian past. This complex legacy, characterised by systematic and unsystematic excavations, field diaries and notes, as well as extensive artefact collection and exportation practices of various calibres, was predicated on the alienation of living indigenous communities from their past. This epistemic violence erased, through the will of the camera, the pen, and the spade, the desires and expectations of those who, as hired field labourers and guides, fearfully complied with orders to exhume ancient bodies and artefacts. This steady stream of practices and discourses concealed native peoples behind their objects and shaped Argentina's early scientific archaeology, setting the bases for its development throughout subsequent decades.

From the perspective of the Calchaquí valleys region of NWA, we propose three themes to critically address this legacy: Early travellers; Object Lessons; and Roads and Habitats. The first theme examines the enduring impact of the words and actions of very different figures in the late 19th Century and early 20th Century. The second theme the strange relocation stories of two objects, exposing a system of hierarchical and asymmetric practices of heritage management and knowledge production, which continue to undermine contemporary collaboration. The third theme addresses cooperation and collaboration today, through the lens of our experience in the last 13 years, offering conceptual elements for more equitable, integrated, and sustainable international cooperation.

4 ORIGINS AND EARLY EVOLUTION OF THE INTERNATIONAL CONGRESS OF AMERICANISTS

Abstract author(s): Ziolkowski, Mariusz (Centre of Andean Studies, University of Warsaw)

Abstract format: Oral

The International Congress of Americanists is probably one of the most long-lasting scientific conferences in the world. The first one took place in 1875 in Nancy (France). At that time the first 16 points of its statute were formulated, of which the most important for the subject of the present symposium is the first one. It defined the areas of interest of the future meetings, namely: Contribution to the progress of the study of the ethnography, linguistics, and historic relations of the two Americas, especially during the pre-Columbian period.

But the Congress also had a strong political aspect at that time: all the major states sent their official delegates as far away as Japan and Turkey.

The first 10 congresses were held in Europe, but since the eleventh one in Mexico City it has been established that the meetings will be held alternately in Europe and in the Americas. During this initial period there was an interesting evolution of the themes of the presentations and discussions, which reoriented the direction of studies on the New World past.

549 ANCIENT PASTORALIST ADAPTATIONS IN THE EURASIAN STEPPE: THE INTERSECTION OF BIOMOLECULAR AND LANDSCAPE ARCHAEOLOGY

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Wright, Joshua (University of Aberdeen) - Makarewicz, Cheryl (Institute for Prehistoric and Protohistoric Archaeology, Kiel University)

Format: Regular session

The Eurasian steppe is a vast, culturally connected region long inhabited by pastoralist societies that developed highly successful adaptations to its challenging landscapes. Extensive archaeological excavations and survey has uncovered a deep record of mortuary activity set within a rich monumental landscape that brought together spatially disparate communities and served as dynamic arenas of socio-political negotiation. Genomic research revealing major genetic turnovers associated with large-scale population movement and replacements has further distinguished the steppe as a busy geographic locale, a zone of interaction one flowing with people who carried with them their diverse technologies, modes of social organization, and styles. However, surprisingly little is known about the scales and modes of mobility that underscored the reshaping of steppe populations or how livestock husbandry – the backbone of pastoralist societies, emerged and evolved in the varied cultural and ecological contexts of the steppe. Similarly, the ways in which pastoralist diets were shaped by access to other animal and plant resources are generally not well-understood, and the articulation between political organization and economic dynamics has been theorized but not yet studied in detail.

This session seeks to bring together new insights into the subsistence, socio-political, and mobility dynamics of ancient pastoralist communities that inhabited diverse environmental and cultural contexts of the Eurasian steppe. This session welcomes new perspectives derived from excavations and survey, fauna and botanical remains, and the biomolecular and genomic records with

the overall aim of building holistic explanatory frameworks that better resolves why and how pastoralism spread across the diverse environments of the steppe and examine the ways in which pastoralist intensification, diversification, and longevity contributed to the formation of complex societies of the steppe.

ABSTRACTS:

1 COMPARATIVE LANDSCAPE ARCHAEOLOGY IN CENTRAL EURASIA: DEVELOPING THE ARCHAEOLOGY OF PASTORALISM IN LOWLAND AND HIGHLAND RESEARCH

Abstract author(s): Rouse, Lynne (Eurasia Dept, DAI)

Abstract format: Oral

The archaeological study of pastoralism in ancient central Eurasia is undergoing a sea change. Perceptions of pastoral economic, cultural, and political systems developed during the 20th century are bumping up against an increase in the number and types of sites recorded through excavation and survey data, new quantitative data streams from previously-uncollected or -uncollectable types of remains, and theoretical revisions to the concept of "nomadism" in neighboring areas of the Old World. Especially in light of the diverse forms pastoralism and its developments took across ancient central Eurasia, how might we attempt to reconcile our previous and emergent perceptions of pastoralism in the region? This presentation offers a brief overview of the intertwined development of scholarly views of pastoralism and landscape archaeology approaches in the region, illustrated through a comparison of research in lowland and highland zones. These examples help outline the importance of local socio-economic context and analytical scale in (re-)building our perceptions of ancient pastoralism, and ultimately, the ways pastoralist diversity may be incorporated into holistic regional frameworks describing the long-term development of Eurasian social complexity.

2 EURASIAN BRONZE AGE PASTORAL ECONOMY AND PEOPLES 'MOVES

Abstract author(s): Shishlina, Natalia (State Historical museum)

Abstract format: Oral

Creation and development of a new economic model by steppe mobile pastoralists was accompanied by development of new principles of intra-site organization and landscape resource use. New methods and approaches facilitated discovery of a special type of settlements that appeared in the arid areas of the steppe belt of the Russian Plain, i.e. a seasonal campsite.

Analysis of characteristics of the occupation layer, archaeological, archaeozoological and archaeobotanical materials from the discovered campsites, seasonality, radiocarbon dating, isotope data on humans and animals provided an opportunity to discuss subsistence and seasonal migration systems as well as settlement patterns of pastoral groups, which inhabited the Sal-Manych steppes in 5200-2200 calBC. Isotopic markers of animals as well as of humans are also very helpful in reconstructing movements of the population and their herds across the exploited areas. Seasonal migrations of small mobile pastoral groups, whose aim was to search for and exploit rangelands beyond the nearby areas, were traced down.

3 MOBILITY IN THE GOBI-ALTAI MOUNTAINS (MONGOLIA): A DIACHRONIC ANALYTICAL APPROACH

Abstract author(s): Dal Zovo, Cecilia - Parcero-Oubiña, César - González-García, A. César (Incipit-CSIC) - Güimil-Fariña, Alejandro (DIMENSO Spatial Technologies)

Abstract format: Oral

The archaeological research increasingly investigates the mobility of nomadic and semi-nomadic communities in light of their potential role in the development of early trans-Eurasian interconnections. Spatial modelling based on the analysis of genetic, archaeological, and zoo-archaeological information has recently opened stimulating research horizons on pastoral mobility in Central Eurasia. However, the chronological depth of modern paths and routes interconnecting steppe, high-mountain, and arid environments has been scarcely considered in this regard. In this paper, we illustrate our mapping of paths presently or until-recently used by the local herders in the Gobi-Altai Mountains (Bayankhongor Aimag, Mongolia). Moreover, we analyse paths' relation to ancient archaeological features, particularly the (1181) Late Prehistoric mounds located in the same research area. The results of our spatial analysis indicate that there is a consistent pattern of spatial proximity between modern pastoral paths and ritual and funerary structures of the 2nd and 1st millennium BC. This (statistically) significant relationship is open to multiple interpretations that will hopefully contribute to the general discussion. The outcomes of our study namely suggest that the modern articulation of both long-distance and local paths could be rooted in the spatial choices of the Late Bronze and Iron Age people. This diachronic perspective can also help to elucidate the impact of pastoral mobility on the shaping of local and global dynamics in the Eurasian landscape over time.

4 DYNAMICS IN BURIAL CUSTOMS OF THE SINTASHTA CULTURE AND THE BEGINNING OF PASTORALISM IN THE SOUTHERN URALS

Abstract author(s): Schreiber, Finn (Independent researcher)

Abstract format: Oral

Sumptuous archaeological burials capture the imaginations of scholars and the public alike. This is also true for the Sintashta and related Middle Bronze Age cultures, which is famous for an elaborate burial ritual including even traces of some of the earliest chari-

ots in history. Interpretations for these “charioteers” range from warrior elites to religious authorities in a kin-based society. But the temporal dynamics of burial customs in the Sintashta culture have not yet been fully explored. Sintashta burials are rich in variation and extent, making interpretations challenging. In recent years, multivariate statistical approaches have revealed the dynamic adaptations of burial rites revealing long lasting developments. At the same time, first Bayesian modelling on radiocarbon dates, isotope analysis, and aDNA analyses have been conducted on Sintashta materials and Sintashta settlement archaeology has risen to a new level. This paper attempts to combine the results from burial studies with scientific information to identify how the unique Sintashta burial customs developed and changed over time and what it can tell us about the beginnings of pastoralism in the Southern Urals.

5 MULTI-ISOTOPE INVESTIGATION OF ANIMAL HUSBANDRY AT EARLY AENEOLITHIC MONJUKLI DEPE, SOUTHERN TURKMENISTAN

Abstract author(s): Eger, Jana (Eurasia Department, German Archaeological Institute) - Knipper, Corina (Curt Engelhorn Centre for Archaeometry) - Pollock, Susan - Bernbeck, Reinhard (Institute for Near Eastern Archaeology, Free University of Berlin)

Abstract format: Oral

Isotopic compositions of skeletal remains can provide substantial information on human-animal interactions and the organization of domestic animal herds in early village societies. The aim of the multi-isotopic (nitrogen, carbon, oxygen, and strontium) study conducted on material excavated from the late Neolithic and early Aeneolithic site of Monjukli Depe in southern Turkmenistan was to gain insights into animal husbandry practices primarily of sheep and goats. The approach presented here integrates analyses of bone collagen and sequentially sampled tooth enamel from caprine individuals in order to explore the life histories of animals herded at the site. $\delta^{13}C$ and $\delta^{15}N$ values of bone collagen are examined to understand long-term dietary behavior. $\delta^{13}C(\text{carbonate})$ and $\delta^{18}O(\text{carbonate})$ values and $^{87}Sr/^{86}Sr(\text{apatite})$ ratios of animal tooth enamel are used to assess seasonal patterns related to grazing habits or foddering. Finally, $\delta^{18}O(\text{carbonate})$ values from second and third molars of sheep and goat provide insights into the annual timing/seasons of birth. The results support a scenario in which sheep and goats were kept in small flocks at ecologically different locations close to the settlement. Herding practices in the Monjukli case seemed to focus on landscape micro-variability rather than exploiting advantages of altitude differences.

6 EARLY EVIDENCE OF DOMESTIC SHEEP FROM CENTRAL ASIA

Abstract author(s): Shnaider, Svetlana (ArchaeoZOOlogy in Siberia and Central Asia - ZooSCAn, CNRS – IAET SB RAS International Research Laboratory, IRL 2013) - Taylor, William (University of Colorado Museum of Natural History) - Pruvost, Melanie (Bordeaux University) - Rendu, William (ArchaeoZOOlogy in Siberia and Central Asia - ZooSCAn, CNRS – IAET SB RAS International Research Laboratory, IRL 2013) - Posth, Cosimo (Archaeo- and Palaeogenetics group, Institute for Archaeological Sciences, University of Tübingen; Department of Archaeology, Max Planck Institute for the Science of Human History, Jena) - Abdykanova, Aida (American University in Central Asia) - Jeong, Choongwon (School of Biological Sciences, Seoul National University) - Hermes, Taylor - Douka, Katerina (Department of Archaeology, Max Planck Institute for the Science of Human History, Jena) - Warinner, Christina (Department of Anthropology, Harvard University; Department of Archaeology, Max Planck Institute for the Science of Human History, Jena)

Abstract format: Oral

In the last decade, the study of Early Holocene sites in the Central Asian highlands has been actively carried out by an international team, with the site of Obishir-5 (Fergana Valley, Kyrgyzstan) emerging as the best-studied locality from this region (Shnaider et al., 2017). The layers dated between 9-5 kaBP have yielded an assemblage rich in faunal and lithic remains attributed to the Early Neolithic. To cope with the high fragmentation of the bones (NR=90%), we performed collagen fingerprinting (ZooMS) to taxonomically identify indeterminate faunal remains. This analysis showed that most of the remains belong to the genus *Ovis* and *Capra*, with isolated finds belonging to *Canis*, *Cervidae*, *Lagomorph* and *Rodentia*. Cementum increment analyses suggest an exploitation of the ovicaprine during late autumn and early winter, consistent with pastoral management patterns. Finally, using DNA recovered from animal teeth at Obishir, we identified sheep mitochondrial DNA assigned to haplogroup A, which is common among domestic *Ovis aries*, and genome-wide diversity fell within the range of domesticated sheep breeds. These results suggest the presence of domestic animals and Neolithic economies deep into the heart of Central Asia already by the early Holocene.

7 RE-EVALUATING FISH PROCESSING IN THE SIBERIAN TAIGA: SPECIES IDENTIFICATION OF POTTERY PROTEIN RESIDUES FROM EXPERIMENTAL MIXTURES

Abstract author(s): Pal Chowdhury, Manasij - Buckley, Michael (Manchester Institute of Biotechnology, School of Natural Sciences, University of Manchester; Interdisciplinary Centre for Ancient Life, School of Natural Sciences, University of Manchester) - Makarewicz, Cheryl - Piezonka, Henny (Institute for Prehistoric and Protohistoric Archaeology, Kiel University)

Abstract format: Oral

Hunter-gatherers and pastoralists inhabiting the Siberian steppes and forests during the Neolithic Bronze Ages regularly exploited fish, but it is unknown to what extent these groups also used other resources, including waterfowl and forest birds. Here, we explore the utility of archaeological proteomics, now considered an indispensable part of the archaeologists' toolkit, particularly for identifying exploitation of resources to their species level (i.e., as a species, and often tissue-specific biomarker), for species-specific identification of processed foods. Despite the increasing prevalence and importance of such studies, detailed methodological in-

vestigations remain rare. Bottom-up /shotgun proteomics whereby the proteins are digested prior to probability-based sequence matching, the approach commonly employed in archaeological investigations, can be ambiguous about identifying the specific origin of peptides, and as such is heavily reliant on the choice of a suitable database. Despite its pivotal importance in accurate identification of species, studies have not so far looked at how the choice of databases and other parameters can influence the species identification of proteins, and comparison between various extraction techniques also remain rare. In this work, we compare a novel protein extraction method to the standard GuHCl-based approaches, and also investigate how varying time, temperature and ultrasonication can influence the retrieval of proteins from ceramics. We also analyse a series of experimental ceramics in which bird and fish meat have been cooked to investigate how the choice of databases can affect the protein identification and tracing their source to a specific species. Our results show that despite the commonly accepted premise of proteins as species-specific biomarkers, considerable ambiguity can exist in identification of species, even with the use of highly specific databases. We further explore the utility of proteomic approaches to identifying food processing in archaeological cooking vessels through analyses of Neolithic and Bronze Age ceramics from the Eurasian steppe.

8 FIRST DIRECT ^{14}C DATING OF EQUINE PRODUCTS PRESERVED IN ARCHAEOLOGICAL POTTERY VESSELS AT BOTAI AND BESTAMAK, KAZAKHSTAN

Abstract author(s): Casanova, Emmanuelle (Organic Geochemistry Unit, School of chemistry, University of Bristol) - Knowles, Timothy (Bristol Radiocarbon Accelerator Mass Spectrometry, University of Bristol) - Roffet-Salque, Mélanie (Organic Geochemistry Unit, School of chemistry, University of Bristol) - Outram, Alan (Department of Archaeology, University of Exeter) - Evershed, Richard (Organic Geochemistry Unit, School of chemistry, University of Bristol)

Abstract format: Oral

The Eurasian steppe is a key region for understanding the exploitation and domestication of horses. Identification of horse products in pottery vessels at several Kazakh sites emphasised the importance of horses in the economy of prehistoric pastoralists in the region, especially at Botai where the earliest evidence for mare's milk exploitation was found. Direct radiocarbon dating of horse products would help resolve the antiquity of their exploitation. Direct dating of food residues preserved in ancient pottery vessels is now possible using a newly developed method that has demonstrated its ability to establish timeframes, in the absence of conventional materials, and to directly date specific food commodities (so far ruminant meat and milk). Using this method, we conducted for the first time, compound-specific ^{14}C dating on horse products identified from two pottery assemblages in Kazakhstan. The direct dating of horse lipids extracted from Botai potsherds anchored them in the 4th millennium BC, which is compatible with the site chronology and demonstrates the reliability of the dating method on horse products. We then dated horse fats preserved in Bestamak pottery typologically ascribed to the Neolithic, but from a multi-period site lacking detailed absolute chronology. These case studies highlight the benefits and potential for establishing the chronology of horse product exploitation by prehistoric pastoralists in the Eurasian steppe through their direct ^{14}C dating.

9 PASTORALIST DIETARY DYNAMICS IN BRONZE AGE ALTAI

Abstract author(s): Makarewicz, Cheryl (Kiel University) - Roffet-Salque, Melanie - Casanova, Emmanuelle (University of Bristol) - Grushin, Sergey - Tishkin, Alexey (Altai State University) - Evershed, Richard (University of Bristol)

Abstract format: Oral

The initial spread of domesticated animals into the Altai Mountains during the late fourth millennium brought a novel, readily replenishable food source to the region, sparking the development of new subsistence systems by indigenous Bronze Age communities that fused livestock keeping with local subsistence systems. However, the relative contribution of proteins and fats derived from livestock and those originating from fish, widely available in the lakes and rivers of the Altai Mountains, to the diets of early livestock herders remains poorly understood, due in part to isotopic equifinality in the human isotopic record. Similarly, the role of cultivars such as millet, documented in the isotopic record of pastoralist groups inhabiting the Minusinsk Basin by the mid-second millennium BC, in Altai subsistence systems is undefined. Here, we explore dietary dynamics across the Altai region during the late fourth – third millennium BC, when domesticated livestock were established first established and then proliferated, through multi-stable isotopic analyses of well-dated human and faunal skeletal material, as well as biomarker and isotopic analyses of organic residues in ceramics.

DETECTING DAIRY IN THE ANCIENT EURASIAN STEPPE: METHODOLOGICAL DEVELOPMENTS IN PROTEOMIC ANALYSES OF HUMAN DENTAL CALCULUS

Abstract author(s): Palmer, Karren (School of Natural Sciences, Manchester Institute of Biotechnology, The University of Manchester) - Makarewicz, Cheryl (Institute for Prehistoric and Protohistoric Archaeology, Kiel University) - Tishkin, Alexey - Tur, Svetlana (Department of Archeology, Ethnography, and Museology, Altai State University) - Chunag, Amartuvshin (Mongolian Institute of Archaeology) - Diimajav, Erdenebaatar (Department of Archaeology and History, Ulaanbataar State University) - Jamsranjav, Bayarsaikhan (National Museum of Mongolia) - Buckley, Michael (School of Natural Sciences, Manchester Institute of Biotechnology, The University of Manchester)

Abstract format: Oral

The role of dairy in the diets of ancient pastoralists that roamed the Eurasian steppe remains poorly defined, but direct detection of dairy proteins preserved in human dental calculus is revealing new insights into the presence of this comestible, thought to be crucial to pastoralist dietary regimes. Here, we discuss the pros and cons associated with the current sample preparation and analytical techniques available, and offer a new approach through analysis of the oral proteome recovered from the dental calculus of 150+ individuals interred in monumental mortuary complexes located in Russia and Mongolia dating from the late 4th to late first millennia BC. Specifically we compare current methodologies involving ultrafiltration and acetone precipitation with the newer paramagnetic bead approach SP3, and take into consideration the role of demineralisation acids, chaotropes and sample preparation techniques on proteome recovery, focusing in particular on the observed proteome complexity (i.e. peptide numbers in post-translational modification state) and sequence coverage (i.e. matched to significant proteins). We trace the relative ubiquity of dairy consumption by Bronze and Iron Age pastoralists in the Russian Altai and Mongolian steppe, and as part of our efforts, discuss how these methodological developments affect protein identification and taxonomic resolution and, consequently, impact our understanding of animal husbandry practices and human dietary intake in mobile pastoralist communities.

ISOTOPIC PERSPECTIVES ON EARLY PASTORALISTS IN THE WEST SIBERIAN FOREST STEPPE

Abstract author(s): Reinhold, Sabine (German Archaeological Institute) - Marchenko, Zhanna (Institute of Archaeology and Ethnography Siberian Branch of the Russian Academy of Sciences - IAET SB RAS) - Eger, Jana (German Archaeological Institute) - Knipper, Corina (Curt Engelhorn Centre for Archaeometry - CEZA)

Abstract format: Oral

How do people change their economy? One of the most important adaptations of societies at the northern frontier of the Eurasian steppe belt was the transition from a hunter-gatherer to a pastoral economy during the Bronze Age. Several hypothesis and timelines regarding the cultural and economic adaptation processes related to this transition have been outlined. We present here first results of a German-Russian research project with a multidisciplinary, bioarchaeological research agenda focusing on the analysis of stable isotopes to reconstruct changes in diets and mobility pattern. The study primarily focuses on the Vengerogo site cluster in the Baraba forest steppe in Western Siberia, where cemeteries such as Tartas 1 and Sopka 2 cover several millennia of cultural evolution. First results of stable isotope data ($\delta^{13}C$, $\delta^{15}N$) indicate considerable shifts in diets compared to the Early Bronze Age and earlier parts of the Middle Bronze Age. This concerns individuals associated with the Late Krotovo and even more those of the Andronovo complex. Both represent an epoch of significant transformations associated with migration processes from the steppe into the forest steppe. We notice a differentiation into diets, which resemble earlier patterns of a local hunter-gatherer-fisher economy on one hand, and a new form of dietary habits that indicates food obtained from animals fed on steppe like pastures on the other. Changing animal husbandry practices appear to enlarge the catchment areas for pasturing, eventually including more southern steppe biomes. These human individuals reflect a population with increased shares of pastoral economy or genuine pastoralists. For the first time in Siberia, we also apply a combination of strontium ($^{87}Sr/^{86}Sr$) and oxygen isotope ($\delta^{18}O$) composition of tooth enamel to assess mobility pattern as well as the Bayesian mixing model FRUITS to track these different dietary groups.

THE SHIFT FROM HUNTING-GATHERING TO PASTORALISM IN THE MONGOLIAN STEPPE: COMPOUND-SPECIFIC AMINO ACID ISOTOPE EVIDENCE

Abstract author(s): Kendall, Iain (Organic Geochemistry Unit, School of Chemistry, University of Bristol) - Diimajav, Erdenebaatar (Department of Archaeology and History, Ulaanbataar State University) - Chunag, Amartuvshin (Mongolian Institute of Archaeology) - Jamsranjav, Bayarsaikhan (National Museum of Mongolia) - Tsaagan, Turbat - Altangerel, Enkhtur (Mongolian Institute of Archaeology) - Honeychurch, William (Department of Anthropology, Yale University) - Evershed, Richard (Organic Geochemistry Unit, School of Chemistry, University of Bristol) - Makarewicz, Cheryl (Institute of Prehistoric and Protohistoric Archaeology, Kiel University)

Abstract format: Oral

The spread of mobile pastoralism across the Mongolian steppe during the Bronze Age (ca. 2800 – 1400 BCE) is thought to have initiated a major shift in steppe subsistence strategies that amplified the contribution of animal proteins and fats to human diets via dedicated exploitation of domesticated livestock. Meat and milk intensive diets, supported by intensive livestock herding, are considered a hallmark adaptation of mobile pastoralist communities to harsh steppe environments poorly suited for cultivation. High bulk $\delta^{15}N$ values measured from the bone collagen of ancient pastoralist groups across the steppe are in general attributed to a strong trophic level shift associated with outstandingly high consumption of animal proteins ostensibly derived from domesti-

cated livestock herds. Here, we apply compound-specific nitrogen and carbon isotope analysis to bone collagen single amino acids isolated from Neolithic hunter-gatherers, Bronze Age mobile pastoralists, and Iron Age herders engaged in millet cultivation from the Mongolian steppe, all yielding high bulk collagen $\delta^{15}N$ values, as well as domesticated livestock, in order to explore human dietary change over the transition from hunting-gathering to food production.

MEDITERRANEAN ARCHAEOLOGY: FROM INTERCONNECTED PATCHWORKS TO OVERARCHING INTER- AND TRANSDISCIPLINARY FRAMEWORKS

Theme: 5. Assembling archaeological theory and the archaeological sciences

Organisers: Peters, Manuel J.H. (Department of Applied Science and Technology, Politecnico di Torino; HERCULES Laboratory, Universidade de Évora) - Fundurulic, Ana (Sapienza University of Rome, Italy; HERCULES Laboratory, Universidade de Évora) - Bhattacharya, Sriradha (Université Bordeaux Montaigne; HERCULES Laboratory, Universidade de Évora)

Format: Discussion session

The Mediterranean has historically been a patchwork of regions connected by trade networks and ancient civilisations.

Nowadays, there are significant variations in the archaeological research traditions in the area, influencing the methodological approaches and the potential future research. In the past decades, archaeological research has become an increasingly interdisciplinary field, applying and combining knowledge from several scientific disciplines. While the compatibility of the approaches brought forth by these disciplines is not always obvious, these multifaceted approaches enable to “think outside the box” and create innovative methodologies. Regardless of the numerous advantages of this approach, a well-defined goal is frequently lacking in interdisciplinary studies.

This session intends to continue the fruitful discussion brought forth during the EAA2020 session “How to promote inter- and transdisciplinarity in Mediterranean Archaeology?” by exploring previously identified issues and working towards the establishment of more inter- and transdisciplinarity in training and research.

Papers discussing projects and case studies related to Mediterranean Archaeology that involve the combination of various disciplines are encouraged. Contributors are invited to share their experiences, obstacles, and solutions. The session will aim to address questions along the following lines:

- What are the best practices employed to study materials and cultures in an inter- or transdisciplinary way?
- What are the questions we can and need to ask, depending on the material?
- How to advocate for a specific approach within the project, especially when budget and time are limited?
- Who formulates the main goal? (Different fields have different questions to ask and different approaches)
- What is the professional identity of the inter- or transdisciplinary researcher?

ABSTRACTS:

INTER- AND TRANSDISCIPLINARY RESEARCH IN THE MEDITERRANEAN: RECOGNISING THE POTENTIAL AND THE OBSTACLES

Abstract author(s): Peters, Manuel J.H. (Department of Applied Science and Technology, Politecnico di Torino; Department of History, Universidade de Évora; HERCULES Laboratory, Universidade de Évora)

Abstract format: Oral

The interconnectedness of the various fields related to archaeology has increased significantly over the past decade. International collaborations are a common sight, and there is specific funding to stimulate networking across institutions and countries. Within this framework, there appear to be two bottlenecks: first of all, each field has its own methodology, theoretical frameworks, and preferences for sample properties and analytical methods. Secondly, most regions have their own research traditions. This can make comparison and collaboration a complicated matter, although these issues are not always recognised by the parties involved. An overarching approach that achieves clear goals is sometimes lacking, since inter- and transdisciplinary work is not automatically successful and requires more than individual attempts at bridging the gap between ivory towers.

Unique questions can be answered by transcending disciplinary boundaries, although this sometimes only becomes visible once the lines fade and a new understanding evolves.

To move forward in a constructive manner, regional and disciplinary inconsistencies should be recognised, rather than ignored. When addressed explicitly, these different methodologies and frameworks can complement each other, instead of causing conflict. A more targeted approach to mediating these issues can be found, as is the case with survey archaeology, where efforts are underway to bridge the gap between the various methodologies across the Mediterranean, especially concerning legacy data. By addressing inconsistencies and merging datasets, new questions are being posed and answered.

Within archaeometry, research is often still conducted within disciplinary or institutional limitations. This lecture will highlight some of the advantages and complications of transdisciplinarity, using the investigation of degradation processes of metallic artefacts as a case study. A transdisciplinary approach can provide a more holistic view of the degradation process of these artefacts. By recognising the potential and the limitations of the individual fields, greater overall questions can be answered.

2 MICROORGANISMS AND MOONMILK IN THE CAVES FROM THE VÉZÈRE VALLEY (DORDOGNE, FRANCE)

Abstract author(s): Bhattacharya, Sriradha (IRAMAT-CRP2A Archéomatériaux Research, UMR 5060 CNRS - University of Bordeaux M; HERCULES Laboratório, Universidade de Évora) - Caldeira, Ana Teresa (HERCULES Laboratório, Universidade de Évora; Department of Chemistry, School of Science and Technology) - Chapoulie, Rémy (IRAMAT-CRP2A UMR 5060—CNRS-Université Bordeaux Montaigne, Maison de l'archéologie) - Ferrier, Catherine (PACEA UMR 5199—CNRS-Université de Bordeaux) - Mirao, José (HERCULES Laboratório, Universidade de Évora; Department of Geosciences, School of Science and Technology) - Lacanette, Delphine (I2M UMR 5295—Bordeaux INP) - Bassel, Léna (PACEA UMR 5199—CNRS-Université de Bordeaux) - Salvador, Catia (HERCULES Laboratório, Universidade de Évora)

Abstract format: Oral

Caves represent one of the best illustrations of hypogean environments. They may contain very diverse microbial communities. Moonmilk, a secondary speleothem, is a problem that plagues this art. Caves are considered as extreme environments due to little or complete absence of sunlight and limited interaction with the outside ecosystem. This context determines the growth of microorganisms that can easily adapt to these extreme conditions. Microorganisms play an important role in the development of biotransformations inside the caves, especially biomineralization and probably in the formation of moonmilk, thus leading to potential degradation of cave art. Moonmilk is identified by its distinctive crystalline fibres, referred to as Needle Fibre Calcite (NFC).

Moonmilk formation is not completely understood being attributed to abiotic processes and / or mediated by biotic processes. This study deals with the identification of the microorganisms sampled in three non-ornated caves (named Leye, Pilier and Racine) in the Vézère Valley (Dordogne, France) listed as a UNESCO World Heritage Site in October 1979.

In situ DinoLite Microscopy confirmed the existence of microorganisms and needles. In vitro culture showed the presence of bacteria, fungi and yeast. High Throughput Sequencing (HTS) was used to explore, compare and characterise the microbial communities present in the three caves. Scanning Electron Microscopy (SEM) helped us discriminating the different types of needles along with microbial deposits present in the caves. SEM micrographs showed in particular the presence of monocrystalline, polycrystalline and serrated needles, which occur due to biomineralisation. Bacterial communities are mainly composed by Proteobacteria, Actinobacteria and Firmicutes. Phylums like Nitrospirae, Tenericutes, Spirochaetes and Verrucromicrobia are also present in the caves.

Taking into account these data, the next step is to perform some simulation assays to better understand the microbial involvement in the formation of moonmilk.

3 IMPORTANCE OF LOOKING IN THE SAME POT

Abstract author(s): Fundurulic, Ana (Sapienza University of Rome)

Abstract format: Oral

Exploration of the past material culture has been in the center of archeological research resulting in diverse approaches and methodologies centered on object typology, dating, and utilization... The increase in studies focusing on use-wear and microscopic analysis, contents, and chemical and molecular markers brought to light plant-related remains and products that were often invisible in the archeological record or detectable only through indirect or contextual evidence. Attempts to bridge this gap in knowledge created a mosaic of diverse approaches in the study of plant materials from the past usually specializing on the type of organic remains like starch, phytoliths, pollen, residues etc. This causes discrepancies in terminologies used by researchers from different backgrounds, conflicting strategies of sampling, loss of information and destruction of potential plant remains, as well as a variation in the interpretations. A discussion is necessary to examine potentials and limitations of the utilized methods. On the basis of the theoretical study of contents of vessels in search of plant remains, the presentation looks into a possibility of a more inclusive workflow, exposes the pitfalls uncovered through research, reviews current terminology and encourages a path towards new lines of research and questioning.

4 ORGANIC RESIDUE ANALYSIS AND THE ARCHAEOLOGICAL STUDY OF ROMAN AMPHORAE: EARLY ROMAN AFRICAN AMPHORAE AS A CASE STUDY

Abstract author(s): Pecci, Alessandra (ERAAUB, Universitat de Barcelona) - Contino, Alessia (Ministero dei beni e attività culturali e del turismo del Lazio) - Mileto, Simona (ERAAUB, Universitat de Barcelona) - Capelli, Claudio (Università di Genova) - Toniolo, Luana (Parco Archeologico di Pompei) - Reynolds, Paul (ERAAUB, Universitat de Barcelona; ICREA)

Abstract format: Oral

Amphorae have always been crucial artifacts for the investigation of Roman networks, trade and economy. Traditionally, epigraphy and type forms have been used to assess the provenance and content of amphorae. In more recent years, petrographic analyses have provided a fundamental approach to better identify the provenance of these vessels. However, after the first attempts during the Seventies, it is only lately that systematic content analyses have given information on the goods actually transported in amphorae and their possible re-use. Here we present the results obtained through the organic residue analysis of different types of early Roman African amphorae found in Pompei and Ostia, which had been previously typologically and petrographically studied to characterize their provenance. The analyses were carried out by gas chromatography coupled to mass spectrometry. The paper is part of the activities of the RACAMed project (HAR2017-84242-P) founded by the MINECO Spanish Ministry, and the ERAAUB (SGR 2017-01173).

5 WHEN DIFFERENT DISCIPLINES USE THE SAME WORDS

Abstract author(s): Alliata, Victoria (CRC 1266: Scales of Transformation Kiel)

Abstract format: Oral

Communication in interdisciplinary work is definitely a challenge, since different disciplines walk their unique paths and are embedded in different traditions. Starting from diverse and sometimes subconscious presuppositions, terms are often used in different ways showing a different understanding of the underlying concepts and their application. A good example is the examination of the terminology and concepts used in describing transformation processes in Iron Age settlement development: Centralization and Urbanization, as well as the terms related to them, carry a baggage of traditions, pre-assumptions and images. This shows a significant potential for misunderstanding when it comes to a practical comparison of archaeological evidence. That is the case when we try to compare patterns of settlement transformation from the Mediterranean to the Baltic.

In order to enable an interdisciplinary comparison, there must be a mutual understanding. Finding the comparable components of terms and concepts across the disciplines is one first constructive step. A clear definition of common concepts to describe transformation and development processes is the key to an interdisciplinary discourse, which allows an actual comparability of different Iron Age contexts on a transregional level.

6 THE ANALYSIS OF ROMAN CENTURIATION AS A MEAN FOR THE INTERCONNECTION OF MEDITERRANEAN ARCHAEOLOGICAL RESEARCH THROUGH INTERDISCIPLINARY APPROACH

Abstract author(s): Ortega, Maria Jesús - Palet, Josep Maria - Orengo, Hèctor (Catalan Institute of Classical Archaeology)

Abstract format: Oral

Centuriation, the grid-based parcelling of landscapes for land distribution and field allotment, is a key evidential paradigm for tracing the Romans' transformation of the environments they colonised in order to fit their economic and productive needs. It reflected the rational thinking of the Classical world and was also linked to urban development, so that, as described in ancient land-surveying treatises, it represented for the Romans the ideal extension of the city to the territory. Advances in research have demonstrated that centuriation's apparent uniformity is in fact relative. Particularities within individual territories depended on chronology, cultural/social backgrounds, and geographical features of each territory. Also, written sources mention the existence of undivided areas within the centuriae, the integration of forests and grasslands, and the adaptation of these systems to mountain areas, natural relief and streams, fact that corresponds to modern planimetric reconstructions. The phenomenon of centuriation remains crucial for understanding the Roman idea of territory and the European historical landscapes, for that centuriation has influenced their evolution until the present day. Indeed, this system may be considered the basis of many European landscapes. From the 1980's a broad suite of approaches, techniques and methods have been used to identify and analyse many centuriations, showing them to have been a crucial element in the formation of cultural landscapes. But there is so far not a single case in which all the available approaches have been integrated holistically. This paper aims to bring out the need of a standardised methodology for the studies of centuriation by combining the different techniques and approaches used in several research projects focused on centuriated landscapes. To this end, we present a brief comparison of 4 case-studies in Mediterranean and Atlantic areas that would allow to analyze and compare how centuriation worked and evolved in different territories.

683 CONTESTED COLONIAL COLLECTING: REVITALIZATION, REPATRIATION AND REBURIAL

Theme: 3. The new normality of heritage management and museums in post-Covid times

Organisers: Ojala, Carl-Gösta (Uppsala University) - Fossum, Birgitta (Saemien Sijte - South Sámi Museum)

Format: Discussion session

The aim of this session is to discuss contested museum collections from colonial/postcolonial, Indigenous and minority group contexts, with special focus on repatriation and reburial processes. Furthermore, the session aims to explore challenges and possibilities of decolonizing and revitalizing archaeology and museum collections and developing new practices of collaboration between archaeologists, museums and local and Indigenous communities.

We invite contributions dealing with colonial collecting, Indigenous cultural rights, repatriation and reburial claims, debates and processes, local and Indigenous decolonization and cultural revitalization movements, roles of museums in contemporary societies, the meaning and importance of collections for local and Indigenous communities, and visions for future heritage management. Contributions concerning relations and dynamics between archaeology, museums and Indigenous communities are especially relevant. We also encourage critical perspectives on histories of collecting and management of museum collections of sensitive material objects and human remains, as well as examination of ethical aspects and the roles and responsibilities of archaeologists and museum professionals.

At present, there is a great need for reflections and discussions in the archaeology and museum communities on the future of contested collections and ways of dealing with traumatic and highly sensitive colonial history and heritage. In this session, we wish to explore, evaluate and compare experiences from revitalization, repatriation and reburial cases and processes. In the session, we aim for an open discussion, reflecting different perspectives and experiences, and welcome presentations discussing more general issues as well as case studies from different geographical and historical contexts.

ABSTRACTS:

1 COLLECTIONS OF SÁMI HUMAN REMAINS AND INTERNATIONAL NETWORKS OF COLLECTORS IN THE 19TH AND EARLY 20TH CENTURIES

Abstract author(s): Ojala, Carl-Gösta (Uppsala University)

Abstract format: Oral

In this paper, I wish to discuss the collecting of Sámi human remains in the 19th and early 20th centuries, as part of larger international contexts of colonial collecting and physical anthropological and racial research. In particular, I will explore some aspects of the international networks of scholars and collectors interested in Sámi human remains, and trace some of the international exchange and trade with Sámi human remains that took place in the 19th and early 20th centuries.

In the paper, I argue that archaeologists and museum professionals need to critically examine the histories of their disciplines, including the darker sides of these histories, such as involvement in colonialism, racial science and grave plundering. I also argue that the contexts of collecting should be relevant for contemporary debates on repatriation and reburial, and for the ways in which we deal with these remains today. This paper stresses the need to examine the international contexts and the roles of networks of collectors and scholars in the collecting of human remains from Indigenous and other groups, as well as the importance of international collaboration today in order to better understand the histories behind the present collections of human remains.

2 THE REPATRIATION OF ARCHAEOLOGICAL ARTIFACTS TO ANGOLA

Abstract author(s): Barros, Beatriz (Indiana University Bloomington)

Abstract format: Oral

Angola was a Portuguese colony until 1975. During this period, particularly during the twentieth century, Portugal promoted many archaeological and anthropological expeditions to Angola, collecting thousands of archaeological artifacts in the process which were shipped back to Portugal in order to be studied. To this day, over 170000 of these artifacts remain in Portugal. What are these artifacts? What treatment has been given to and what knowledge has been produced about them in the meantime? What steps have been taken for the realization of their repatriation to Angola? What steps can be taken going forward? What does the repatriation of these artifacts mean for each of the countries involved? It is indisputable that repatriation has been associated with decolonizing practices and healing and empowering processes – is that also the case in this specific case study? How are these artifacts mediating the interaction between the two countries at this postcolonial moment?

This presentation will approach these questions and discuss how repatriation strategies are not one-size-fits-all and should be developed case by case, regardless of the importance and value of comparisons.

3 NORTH BY NORTHWEST: RUSSIA'S BALTIC GOVERNORATES – A CHALLENGE TO THE METROPOLE/ PERIPHERY MODEL OF IMPERIAL SCIENCE?

Abstract author(s): Howes, Hilary (The Australian National University)

Abstract format: Oral

Over the course of the 18th century, large parts of what are now the independent Baltic states of Estonia and Latvia were incorporated into the Russian Empire as the governorates of Estland, Livland and Courland. The highest local executive official and military authority in these governorates was the Baltic Governor-General, appointed by the Russian Emperor. In this regard the political situation of the Baltic governorates can be compared to that of present-day Australia, New Zealand and India under British colonial rule: the Baltic governorates were effectively the 'periphery' to the Russian 'metropolises' of St Petersburg and Moscow. However, the Baltic governorates punched well above their weight in terms of scientific achievement, providing much of the intellectual stimulus, personnel and literature for the professionalization of physical anthropology in Russia over the 18th and 19th centuries, as well as many of the connections to scientific centres in western Europe. This paper explores the extent to which Russia's Baltic governorates pose a challenge to the metropole/periphery model of imperial science, focusing specifically on the removal and study of Indigenous human remains during the long 19th century.

684 IMAGINATIONS AND IMAGINARIES OF THE PALAEOLITHIC AND MESOLITHIC – DISTORTED VIEWS, EMBELLISHMENT, AND WHAT WE MAKE OF IT (PAM)

Theme: 6. Material culture studies and societies

Organisers: Grimm, Sonja (ZBSA - Centre of Baltic and Scandinavian Archaeology) - Hussain, Shumon (Aarhus University)

Format: Discussion session

Archaeology, we often claim, studies past humans, their actions, and interrelations. Yet, actually we excavate and describe static material remains of these past humans and their actions – artefacts and features – that we interpret in comparison with other findings and ethnographic analogies as reflections of social norms, behaviours, and choices. Our underlying views and concepts of the past very much shape what we make of the available archaeological information. Because our imaginations of past life weight in so heavily on our interpretations and because the actual evidence is often sparse, poorly dated and highly fragmented, a reflexive

approach is important in these periods, yet the sensitivity of these underlying paradigms is better developed and more openly discussed in later prehistoric or historical periods.

In order to make our science more reflective, we aim to discuss in this session the following set of questions (open to expansion):

- How do we get from archaeological remains to people? Do we even get to people or rather to anonymous social formations?
- What concepts and theories are we using? How might received Palaeolithic/Mesolithic cultural taxonomies reflect recent political or other processes that have little to do with prehistoric reality? And do such received vocabularies structure our interpretations?
- Are we in need of more thorough and more critical history of science for the European Palaeolithic and Mesolithic archaeology?
- How to develop and install new concepts across different research practices?
- Is the borrowing of ideas and concepts from other disciplines and discursive contexts still useful and appropriate to answer big and long-standing question? What are the dangers of this practice and how self-determined needs Palaeolithic and Mesolithic research to be?
- Do we need to rethink our relationships to philosophy of science, STS and the emerging field of interdisciplinary science studies?

ABSTRACTS:

1 BECAUSE THEY SAID SO! PITFALLS IN THE DATING OF 'MESOLITHIC' SITES IN ALPINE CONTEXTS – AN AUSTRIAN EXAMPLE

Abstract author(s): Posch, Caroline (Department of Archaeologies, University of Innsbruck)

Abstract format: Oral

In Western Austria, more than 200 sites can be found in montane, subalpine, and alpine contexts, which are mainly assignable to the Mesolithic period.

Or are they?

When looking more closely and asking for clearly datable artefacts or reliable radiocarbon dates, the number of Mesolithic sites shrinks rather drastically from over 200 to roughly 30. But then why are there in the scientific and popular literature as well as in various museums artefacts and sites denominated as 'Mesolithic', which do not support this attribution? If this question is put forward to the respective authors and persons in charge of the exhibitions in question, the answer predominantly is: Because the Mesolithic archaeologists said so.

Within this discussion contribution, I would like to explore how regional research history, perceptions of prehistoric lifeways and the uncritical adoption of scientific assumptions structure and bias our conception of 'Mesolithic' sites in alpine contexts within the archaeological landscape of Western Austria. Furthermore, I would like to discuss the possibilities of how to recognise and bypass these seemingly inevitable pitfalls.

2 WRITING THE IRISH MESOLITHIC

Abstract author(s): Warren, Graeme (University College Dublin)

Abstract format: Oral

This conference paper will be presented shortly after I have submitted a manuscript for a new book on the Mesolithic in Ireland (Hunter-Gatherer Ireland: Making Connections in an Island World, Oxbow - expected 2022). The book is intended for readers beyond archaeology as well as within the discipline. In particular, the book will be available at CHAGS13 (Conference on Hunting and Gathering Societies) to be held in Dublin in June 2022. The book aims to show the hunter-gatherer past in Ireland to the international audience of hunter-gatherer specialists who will be attending CHAGS. It is very much written with this audience in mind. The book is not a work of theory, but it is heavily informed by a variety of 'post-human' work across different disciplines and decolonising perspectives. In this short paper, I review the approach developed in the book and the role of creativity in constructing the Mesolithic past.

3 THE MESOLITHIC BURIAL OF BAD DÜRRENBERG AND THE IMAGINATION OF SHAMANISM

Abstract author(s): Porr, Martin (University of Western Australia)

Abstract format: Oral

The notion of shamanism has undergone extensive criticism in anthropology and archaeology in recent decades. It is no longer regarded as a unified and monolithic category. Rather, together with notions such as 'animism', it is now rather seen as a product of universalising Western and colonial processes of knowledge creation. However, while this position is widely accepted within academic contexts and critically debated, shamanism continues to be an enduring motive in public and popular discourses. In the latter case, shamanism is widely regarded as humanity's original religion and, therefore, placed close to the universal origin of human religiosity and spirituality. This understanding is not only reflective of a problematic progressive view of human history/evolution. It is also connected to the Western layered concept of each human being as a reflection of human history. As such, earlier stages are contained

in each human being and, therefore, everyone can connect or re-connect to his or her shamanic heritage. As an imaginary religious feature of humanity, shamanism not only acquires problematic esoteric dimensions. It also supports the interpretative appropriation of ethnographic practices, evidence, and material objects within a universalising framework of history and archaeological narratives. In this paper, these considerations are discussed with reference to the widely known Mesolithic shaman burial of Bad Dürrenberg and its representation in popular media.

4 PICTURES WITH A PAST – VISUAL REPRESENTATIONS OF PALEOLITHIC HUMANS AND THE THEORIES BEHIND THEM

Abstract author(s): Fries, Jana (Niedersächsisches Landesamt für Denkmalpflege)

Abstract format: Oral

Archaeological discourse is impossible without visual representation. We even might say, communication about the past is impossible without images. However, just like words, pictures express more than is intended and even more than we are aware of. And things get even more complicated if people are represented in the pictures.

Whenever an archaeologist (or a video game developer, an actor or an illustrator) depicts a person of the past, especially of the ancient past, there is a big chance that a lot more about this person is expressed than was intended – about its age, health, values, social standing, body concept, or gender just to name a few examples. Even more is said when several interacting humans are shown in a scene.

Pictures subtly transport our convictions, our view of the world, of ourselves and of other people.

In my presentation I will demonstrate how concepts of gender (and race) of the 19th century middle class were incorporated into fundamental theories about the Paleolithic and how they are influencing the visual representations of Paleolithic humans today. Their impact is mostly unconscious and even stronger beyond the archaeological community, in movies, advertisements, novels etc. I hope to discuss how we can become more aware of the underlying concepts of our pictures and get closer to more balanced representations of Paleolithic humans.

685 BETWEEN EAST AND WEST. MATERIAL STUDIES OF SOCIAL INTERACTIONS IN 3RD MILLENNIUM BC ON THE NORTHERN EUROPEAN PLAINS

Theme: 6. Material culture studies and societies

Organisers: Klecha, Aleksandra (University of Warsaw) - Tkachova, Mariya - Charniauski, Maksim (Institute of History, The National Academy of Sciences of Belarus)

Format: Regular session

In the 3rd millennium BC, the border between Western and Eastern European Plains was inhabited by paraneolithic communities with hunting, fishing and gathering strategies and incidentally visited by farming and pastoral groups. Despite the apparent proofs of this contacts as flint axes, amber or pottery imports, there are also other intermediate premises to indicate interactions such as style or technology. Analysing syncretic materials may provide more data on their occurrence, intensity and character.

This session aims to discuss materials and results of their studies, especially those that primarily show relics of contacts occurring between locals and newcomers.

We welcome papers focusing on:

- archaeological premises for interaction,
- studying materials of syncretic character,
- intercultural networks from the past,
- searching for interactions causes, proceeding and results,
- interpreting nature of social and cultural interactions,
- finding new interpretational possibilities for interactions.

We also invite all papers dealing with transmission of knowledge in the field of prehistoric production.

ABSTRACTS:

1 FOREIGN GODS: EVIDENCE OF WORLDVIEW TRANSFORMATIONS IN THE MATERIAL CULTURE OF PEAT SETTLEMENTS OF THE BELARUSIAN LAKE LAND REGION

Abstract author(s): Charnianski, Maxim (Department of the prehistory archaeology, Institute of history, NAS of Belarus)

Abstract format: Oral

The Belarusian Lake land region on the border of the 4th/3rd millennia BC was a fairly homogeneous region inhabited by bearers of the Usviaty archaeological culture. The latter is a typical representative of the forest Neolithic tradition of North-Eastern Europe. Among the materials of this culture, there is a characteristic set of artefacts made of bone, horn and amber, which gives us an idea of the complex beliefs of the local population of that time. However, soon the region began to penetrate the carriers of completely

different cultural and economic traditions - first of the Globular Amphorae Culture, and then of the Circle of the Corded Ware Culture. Newcomers are associated with the appearance at the settlements of the Lake land region of artefacts, probably associated with the cult of the sun. These are key-shaped pendants, ring pendants, fragments of amber discs, as well as the appearance of notch-beam ornament on the surface of both new types of bone and antler amulets and previously known forms. These new beliefs, however, did not replace the existing ones. The material of the peat settlements of the Kryvina peat bog shows that these new elements have been added to already existed and participated in the creation of a more complicated worldview. This, in turn, may suggest that the physical composition of the population in the Belarusian Lake land region have not actually changed under the newcomer's pressure, but new cultural influences were strong enough to make significant changes in local's traditions and beliefs.

2 ON THE TIP: THE RESULTS OF THE TRACEOLOGICAL ANALYSIS OF BONE STEMS FROM KRIVINA PEAT BOG, BELARUS

Abstract author(s): Malyutina, Anna (The Institute for the History of Material Culture) - Charniauski, Maxim (Institute of History of the National Academy of Sciences of Belarus)

Abstract format: Oral

Archaeological sites of Krivina peat-bog (end of the 4th – middle of the 2nd mill. BC) are located on the (Biešankovičy district, Vitebsk region). Due to specific features of formation and bedding conditions in cultural layer of sites, artifacts made of organic material – bone, antler and teeth have remained and we were able to conduct a traceological analysis of the entire collection. According to the results of the study, a separate category of artifacts (26 examples) made of trade animals bones was identified in the material of the sites. These products are small (up to 3, 5 cm in length) sharpened stems (points) with a processed or not end. On most of the items, there are remnants of an adhesive substance for fixing the stems in the base (wooden or stone, the remains of which have not reached us). Analysis of micro-traces of wear on the surface of the points showed their functional difference. Thus, traces associated with plant and soft (wool) materials were recorded. Some of the items find analogies in bone artifacts related to fishing. To correctly interpretation the wear marks found on the points from the Krivina peat bog, the author of the study conducted a series of experiments on the manufacture and use of bone stems. The results of the experimental-traceological analysis indicate the presence of special composite tools (cards, combs) for processing plant fibers, wool, which was previously unknown for the material culture of hunter-gatherers of the forest zone of Eastern Europe.

3 CORDED WARE HORIZON ON THE ZEDMAR A SITE: CULTURAL ATTRIBUTION

Abstract author(s): Tkach, Evgenia - Malytina, Anna (Institute for the History of Material Culture Russian Academy of Sciences)

Abstract format: Oral

In report we present preliminary results of the research of the Corded Ware materials, which were excavated in 70-80s of the XX century on the Zedmar A site (Kaliningrad district, Russia, South-Eastern Baltic). This site is multilayer: above the Corded materials were found ceramics of the Early Iron Age, below the Corded materials – layer of the Early Neolithic Zedmar culture. According to stratigraphy, Corded Ware horizon poorly identified. Main attention be devoted to ceramic materials, which represented by profiled flat-bottom ceramic, ornamented by corded imprints and notches. Also were found ceramic which could be attributed to the "Early A-horizon" of the Corded Ware culture distribution. Within bone and antler industry with the Corded materials we could correlate bone awl, which has direct analogies amongst Corded materials in Estonia. There are no typological or technological data to correlate flint materials with Corded Ware horizon due to multilayer character of the site.

These materials are an evidence of the distribution of the Corded Ware culture tradition to the South-East Baltic region and date to III mill. BC.

4 LATE NEOLITHIC POTTERY AS AN INDICATOR OF SOCIAL CHANGE IN NE POLAND

Abstract author(s): Klecha, Aleksandra (University of Warsaw) - Manasterski, Dariusz (Faculty of Archaeology at the University of Warsaw)

Abstract format: Oral

In the Late Neolithic the area of NE Poland was inhabited by communities of the Neman culture belonging to the last hunter-gatherers of continental Europe. During this period they were exposed to various cultural interactions with the environment of Central European agrarian, pastoral and chalcolithic groups, which in consequence led to a cultural differentiation of the indigenous folk. One of the manifestations of this is pottery identified as Linin type and Ząbie-Szestno type. The main characteristic of discovered pots is a distinct stylistic-morphological eclecticism. Materials of this type have been identified as a specific type of record with a toponymic character, a stylistic horizon with a chronological distinction, and more recently as a manifestation of a broader local production affiliated to the Neman cultural sphere. Syncretic forms, which were developed as a result of various cultural interactions, ultimately led to the formation of the early Bronze Age Trzciniec culture - the groups of which initiated a new type of social activity in the region. This paper presents a brief overview on a process that resulted in formation of a new unique unit that spread afterwards to wider territories of today's Poland, Belarus and Ukraine.

5 ON THE EASTERN PERIPHERY - BELL BEAKER MATERIALS FROM THE MASURIAN LAKE DISTRICT

Abstract author(s): Klecha, Aleksandra (University of Warsaw) - Manasterski, Dariusz - Januszek, Katarzyna (the Faculty of Archaeology at the University of Warsaw)

Abstract format: Oral

The research of the 20th and early 21st century on the Bell Beaker phenomenon in Poland established a conventional border zone of spreading of such records eastwards on the Vistula line. Although the presence of Bell Beakers' artefacts was suggested in the areas reaching the Eastern European Lowland, these were only single finds discovered on the Belarusian territory. Recent discoveries from the area of northern Podlasie, however, unequivocally confirm the presence of new Late Neolithic materials of this unit in the area far beyond the Vistula line. Material analyses, especially focused on pottery, have not revealed any analogies with Central European variants of this cultural phenomenon. Instead, they have indicated numerous references to the materials of the transatlantic Bell Beakers' package. With the exception of such distant analogies, numerous similarities, especially to pottery, were found on sites with syncretic materials of the Neman cultural sphere. Research carried out on selected fragments of pottery from this area, previously interpreted as influences from the neighbouring Iwno culture, revealed the presence of numerous Bell Beakers components of western and north-western European provenance. These conclusions became an inspiration to revise previous views and to extend the verification research with further archaeological records - pottery, but also flint artefacts from the best explored sites: X in Ząbie and II in Szestno from the Masurian Lake District. This paper presents the results of these analyses.

A. CHANGING PERSPECTIVES - THIN SECTION AND ICP-MA/ES ANALYSES OF NEOLITHIC POTTERY FROM THE ÅLAND ISLANDS, FINLAND

Abstract author(s): Brorsson, Torbjörn (Ceramic Studies) - Lucenius, Jenni (University of Turku) - Stenbäck, Niklas (Department of Education and Culture, Government of Åland Islands)

Abstract format: Poster

Ålands location in the Baltic Sea between Finland and Sweden during the Neolithic influenced its material culture and pottery traditions. Our study challenges the focus on typology by examining the technical composition of the ceramic ware and its provenance. The methods used are ICP-MA/ES analysis and analysis of thin sections of the clay used. The study includes early and late Comb ceramics, Jettböle I and II type of Swedish Pitted ware and Finnish Kiukais ceramics. Some sherds, interpreted as mixed with influences from both Comb- and Pitted ware, representing the succession between traditions, display a reinforcement of earlier ceramic traditions. The thin section analysis indicates a local technological continuity in the ceramic traditions visible in the preferred clay. A chronological difference in the choice and handling of the temper suggests different preferences within traditions. The ICP analyses indicate that some of the artefacts, as e.g. a clay figurine seems to be of non- Åland origin.

687 MEDIEVAL STONE MONUMENTS: THE MATERIALITY OF REMEMBRANCE

Theme: 6. Material culture studies and societies

Organisers: Caval, Saša (University of Reading; University of Primorska) - Busset, Anouk (University of Glasgow; Université de Lausanne)

Format: Regular session

Three major processes of human memory are encoding, storage, and retrieval. The medieval stone monuments encapsulate all of them, displaying various strategies of remembrance that are concerned with materiality and temporality. The chosen information was encoded and permanently recorded in stone, maintaining the information over periods, only to be recalled in future. Even if monuments were not initially created with the intention of memory recollection, they are subsequently perceived in terms of their ability to evoke the remembrance and imbue the mute stone with associations. They become mnemonic agents, which are read and interpreted differently throughout the past. This session calls for contributions detailing the research into the stone material culture of the medieval period. We invite colleagues to present their research into a wide variety of ways in which remembrance was materialised in stone in the period between 600 and 1600. We are interested not only in the European trends but also beyond, trying to gain a perspective on contemporary techniques, roles and meanings of stone material culture, whether architectural, funerary or other, across the globe.

ABSTRACTS:

1 THE SLEEPING BEAUTY OF KOPER THAT HYBERNATED THROUGH THE MIDDLE AGES BUT WOKE UP TO TELL THE STORY

Abstract author(s): Mileusnic, Zrinka - Pobežin, Gregor (University of Primorska)

Abstract format: Oral

We refer to the Sleeping beauty story as it best resembles the life story of a stone slab, (re)discovered in Koper during the recent restoration in the Assumption Cathedral and installation of the new organ in 2019. The modern Sleeping beauty is known for the say-

ing »If he loves me, he will let me sleep.«, but being a team of archaeologist and a classical philologist, we just could not let that happen. We had to research the story, actually many stories this monument had to tell. Moreover, we do have some further questions.

The appealing part of this monument is that both sides were decorated, revealing stories about two periods of the history of Koper, 1000 years apart from each other. The marble slab was used twice. In the second half of the 6th century, it was used in a late antique church as part of an altar partition. The material and the methods of realization are confirmed by its sources coming from the Byzantine workshops. Its discovery represents evidence of late antique church testifying to the existence of the diocese, which also confirms the urban character of the settlement in the second half of the sixth century. The slab can tell us for sure that in the 16th century, it was not living its primary function anymore. At that time it was used again for another purpose. The little-known inscription until the latest (re)discovery, dedicated to Aurelio Vergerio, was engraved on the back of the slab. The inscription commemorates Aurelio Vergerio the oldest of the three Vergerii brothers, the youngest of whom was Pier Paolo Justinopolitan bishop and famous apostate. Because of his apostasy, he suffered the fate of damnatio memoriae shared by his older brother Giovanni Battista. The damnatio memoriae is a striking feature of the inscription.

2 FOR ALL TO SEE, AND YET FORGOTTEN: (RE)DISCOVERING THE MEDIEVAL CARVED STONE PANEL IN NEW MALTON, NORTH YORKSHIRE

Abstract author(s): Steinforth, Dirk (Independent researcher)

Abstract format: Oral

Mounted high up in the façade of the tower of St Leonard & St Mary RC church, New Malton, North Yorkshire, England, a weathered Romanesque carved stone panel displays an intriguing figural scene of a man with a crozier giving a benediction and standing on the necks of two dragons. In scholarly literature, this sculpture is hardly ever mentioned, let alone discussed and analysed. However, it certainly merits closer attention, as it represents one of the rare examples in the British Isles of the motif of 'Christ trampling the beasts'. This image has its origins in the eastern Mediterranean and features prominently in Christian art, such as in Carolingian book illumination, for example, as illustrations of the famous Psalm 91:13: 'Upon the viper and the cockatrice you shall tread, And you shall trample the lion and the dragon'. This paper is going to present and describe this neglected monument for the first time, analyse its iconography, and, comparing it to similar images, examine its place in medieval Christian art.

3 FAMILY TIES: THE GOVAN RECUMBENT CROSS-SLABS

Abstract author(s): Kasten, Megan (University of Glasgow)

Abstract format: Oral

Early medieval carved stones imbue the landscape with meaning specific to the contemporary people and connect them across Time and Space. The 'Govan School' refers to a group of art-historically similar carved stones in Western Scotland that attest to the prominence of the kingdom of Strathclyde. Digital imaging techniques, such as photogrammetry and Reflectance Transformation Imaging, have facilitated easier comparison between stone monuments and allowed for more direct comparison of their worn decorative elements (especially the form of crosses and their proportions). This approach has highlighted intriguing similarities in the design of the recumbent cross-slabs from the sites of Govan and Inchinnan, which likely covered the graves of an expanding elite class. Because the monuments lack inscriptions, I argue that the decorative elements are encoded with meaning and the identity of the deceased individual, and similarities in design embodied connections between members of kin groups across the region of Strathclyde.

4 MONUMENT, MOVEMENT AND MEANING: THE VARIED LIVES OF MEDIEVAL STONE MONUMENTS ON THE ISLE OF MAN

Abstract author(s): Johnson, Andrew (Manx National Heritage)

Abstract format: Oral

The Isle of Man is known internationally for its carved medieval stone cross-slabs. Over two hundred survive in either complete or fragmentary form, and are derived from over sixty locations - almost all of them funerary - throughout the island. Today they are mostly gathered at just twelve parish churches, despite the creation of these administrative units postdating the floruit of stone carving. The end of cross-carving is now thought more closely to coincide with the setting up of the parishes, suggesting that the latter may even have been the cause of the former.

The presence of substantial decorated and inscribed cross-slabs, which had only quite recently been erected, can now be seen as part of the process of 'place-making' which contributed towards the selection of these sites as the centres of these new parishes in the twelfth century, and also of others chosen as assembly sites, fairs and market-places, and as places for the administration and dispensing of justice and even execution. Other factors in place-making are the means of access, and its maintenance through time: this can be explored through map regression and the use of GIS.

Whilst some of these stones continued to serve a monumental function drawing people through and across the landscape - and perhaps even across the sea - others were broken up or reused, their carvings and inscriptions perhaps unintelligible and thus no longer relevant or even drawing suspicion, before being rediscovered and newly cherished around two hundred years ago.

The varied biographies of these monuments - and increasingly their modern replicas and proxies - can tell us much about the regard in which the Manx crosses have been held through time.

5 MIGRATION PERIOD PICTURE STONES FROM GOTLAND AS WITNESSES OF AN ORAL CULTURE

Abstract author(s): Strehlau, Hannah (Centre for Baltic and Scandinavian Archaeology - ZBSA)

Abstract format: Oral

The Gotlandic picture stones are a unique find group that is limited to the Swedish island of Gotland. The carved stone slabs occur in various sizes and forms between 400 and 1000 CE. The Swedish researcher Sune Lindqvist divided the monuments in five different groups, A to E. The oldest group is, thus, group A (400-600 CE) and is central to this PhD project.

The so-called A-stones appear in trapezoidal or axe-shaped form and show a rather abstract ornamentation of geometric motifs, in combination with anthropomorphic and zoomorphic figures and border decorations. The sudden appearance in perfectly elaborated form and without previous development phase gives reason to explore their parallels and possible predecessors in Scandinavia and the Roman provinces. A possible connection exists to remote Spain and Portugal where Roman Imperial tombstones contain similar decorations.

In an oral culture, carved stone monuments, which were erected visibly in the landscape, were an important medium of communication. It is not only the choice of motifs but their arrangement and composition that can give valuable insight to strategies of remembrance and thinking patterns. A comparison to other stone monuments can show different narrative structures and help clarify processes of idea transfer. The task of this PhD project is therefore, to collect material that is similar to the Gotlandic A-stones regarding style and motif to shed light on the long unanswered research question of the origins of these monumental stones.

6 OVERLAYING PREHISTORIC WITH MEDIEVAL REMEMBRANCE IN BOSNIA AND HERZEGOVINA

Abstract author(s): Caval, Saša (University of Reading; University of Primorska)

Abstract format: Oral

Medieval cemeteries with stećci in the western Balkans are frequently located on prehistoric burial mounds. A few such sites that have been studied demonstrate the reuse only of prehistoric sites and avoiding Roman-period burial sites. Acknowledging that the medieval reuse of prehistoric mounds is frequently encountered around Europe, it is nevertheless extraordinary that such practice appears in the western Balkans so much later - about 200-400 years later according to the current research - than the rest of comparable examples (Greece: Curta 2016; Hungary: Türk 2014; the western Europe: Van de Noort 1993; Bradley, Williams 2013). Can this be attributed to the geographical isolation of the medieval BiH, or it is a testimony to the (un)exploration of this important and information-rich cultural heritage?

Transhumance is another feature that voices the connection of medieval Bosnia and Herzegovina to prehistory. Transhumant pastoralism was a significant part of the local economy from prehistoric to recent historical periods. Placing cemeteries along these ancient herders' routes was a custom, highly praised among Balkan cattle-breeders, aimed to enable the deceased to oversee the herd (Antonijević 1982). In fact, the prehistoric princely tombs reflect a social structure and territorial organisation similar to the medieval transhumant communities (Palavestra 1995). Thus, if similar economic and social models were in use in the medieval Western Balkans, stećci cemeteries had to have a meaningful position within their micro-region and a specific role within a geographic network; the role to cultivate individual and collective identity recognition, to preserve social memory and to nurture the spiritual domain.

7 MEMORY AND MEMORIALISATION: CARVED STONES CONNECTING PEOPLE AND PLACES

Abstract author(s): Busset, Anouk (University of Glasgow; University of Lausanne)

Abstract format: Oral

Stone monuments are a link in the temporal fabric that connects the past, present and future. They are first and foremost erected as an act of commemoration(s), even though their context might determine their other functions. By reusing an ancient significant landscape, for instance, early medieval societies created a tangible connection to the past, or the past they perceived. Indeed, it is not rare to find early medieval carved monuments erected at or close to 'ancient places', such as burials, mounds, stone circles, or even larger structures, such as hillforts. Through associations, the stone monuments connect to the past, and relieve or reactivate it, by recreating a place. In that sense, carved stones participate in the formation of social memory. Exploring case studies from Scotland, Sweden and Norway, this presentation will engage with the multiple layers of commemorative practices encoded within early medieval carved stones, from their inscriptions or imagery to their landscape settings.

8 MEDIEVAL BRICKMAKERS' MARKS AND REMEMBRANCE IN THE MEDIEVAL DIOCESE OF TURKU, FINLAND

Abstract author(s): Aalto, Ilari (University of Turku; Aboa Vetus Ars Nova Museum)

Abstract format: Oral

In the medieval Diocese of Turku (Sw. Åbo), Finland, brickmakers' marks can be found in stone churches constructed between 1440 and 1500. These marks, similar to masons' marks studied elsewhere in Europe, consist of depictions of everyday objects, symbols,

letters, and merchants' marks that were drawn on bricks before they were fired. Although the marks were probably initially used in controlling the production of bricks and paying wages, their placing in church masonry hints to other functions as well. The marks can be found in highly visible areas such as doorways and pillars, whereas they are only rarely found in areas hidden from view. For example, the marks visible in the outer wall of All Saints Chapel of Turku Cathedral are a tell-tale case of intentionality, as all visible marks are placed at elevations visible from the ground. This paper gives an overview of the brickmakers' marks used in the stone churches of the Diocese of Turku and considers their possible functions as methods of remembrance, signature and devotion.

9 INTERPRETATIO CHRISTIANA: THE POSSIBLE CHRISTIAN CONTENT OF THE RE-USED ROMAN STATUE OF ICARUS

Abstract author(s): Smid, Katarina (University of Primorska)

Abstract format: Oral

In 1956 the Roman statue of Icarus, which was a part of the funerary monument, was discovered during the restoration of the Old Castle in Celje, next to the ruins of the chapel. The finding place, the fact, that no other Roman remnants have been found in the Old Castle so far and the small dent in the occiput suggest that it was secondarily used in the castle chapel instead of an angel.

In the Late Middle Ages, as it is recorded in several medieval testimonies (De Europa by Aeneas Silvius Piccolomini, Itineraries by Paolo Santonino), the physical remains of the Roman Celeia were ubiquitous in its medieval successor. Due to the fact that the Old Castle was the principal seat of the Counts of Celje (German Cilli), the statue was in all probability re-used at their command, as the ruling dynasty showed certain interest and affinity for the Roman heritage, what is best indicated by the female Roman statue (a goddess?), which was discovered built into the outer walls of the Princely Palace in the semi-circular niche that was carved especially for the statue.

688 SOCIETY FACING CHANGES. REGIONS ON THE SOUTHWEST BALTIC BETWEEN 2500 - 1500 BC

Theme: 1. Widening horizons through human-environment interconnections

Organisers: Czebreszuk, Janusz (Adam Mickiewicz University in Poznań) - Müller, Johannes (Christian-Albrecht-Universität zu Kiel) - Szmyt, Marzena (Adam Mickiewicz University in Poznań; Museum of Archaeology in Poznań)

Format: Regular session

The session will be devoted to the summary of the German-Polish project "Late Neolithic and Early Bronze Age in the South-West Baltic areas (2500 - 1500 BC). Why did political structures of the Bruszczewo-Łęki Małe type arise?" So far, the researched areas have been treated as peripheral (lying between) with respect to such centers as Southern Scandinavia, Mittelbe-Saale-Gebiet or Silesia. As part of the project, for the first time, areas on the Southwest Baltic have concentrated a multi-year collective effort by an interdisciplinary team of researchers. It concerned socio-cultural changes that led to the emergence of communities with a complex structure and a clear internal hierarchy in the studied areas. The goal is achieved through an interdisciplinary approach with the use of new data and the re-analysis of archival information using modern analytical methods. A significant "added value" is an in-depth, multi-faceted analysis of data from the cemetery in Łęki Małe, the only necropolis of princely mounds in the Unetice culture. The papers will also cover environmental, settlement and economic changes, including metallurgy.

ABSTRACTS:

1 LANDSCAPE TRANSFORMATIONS FROM THE NEOLITHIC TO THE BRONZE AGE IN GREATER POLAND INDICATION CHANGES IN SETTLEMENT PATTERNS

Abstract author(s): Doerfler, Walter (Institut fuer Ur- und Fruehgeschichte Kiel) - Radke, Iwona - Rzodkiewicz, Monika (Institute of Geoecology and Geoinformation, Adam Mickiewicz University)

Abstract format: Oral

What was the environmental background for the transition from the Young Neolithic (single grave time) to the Late Neolithic (dagger time) and the succession into the Early Bronze Age? In the time between 2500 and 1500 cal BC an up and down of anthropogenic pressure on the landscape is visible in pollen diagrams of Greater Poland that is accompanied by a general transformation in the tree composition: The spread of hornbeam characterises the change in the woodlands. Climatically the continental influence seems to prevail in the first half of this millennium with high values of pine and low for alder. From 2000 BC onwards higher Alnus values indicate a shift to a more oceanic climate regime with wetter and cooler summers and mild winters. High values of settlement indicators show a continuous land-use until ca. 1800 BC when a clear gap indicates a fast abandonment of arable fields for ca. 100 years in the surrounding of Lake Woniesc. A sequence of fast increase and reduction of land-use intensity characterises the 17th century BC before settlement indicators decrease again for a period of ca. 100 years after 1600 cal BC. The general picture shows stable conditions during nearly 700 years (2500 to 1800 BC) and a much more unstable pattern of land use during the following 300 years indicating either different land use practices or a less permanent settlement behaviour in this phase of the Early Bronze Age.

2 THE BRUSZCZEWO MICROREGION REVISITED: GEOARCHAEOLOGICAL PROJECT OF BRUSZCZEWO LAKE. FIRST RESULTS AND THEIR IMPACT ON THE ARCHAEOLOGICAL STATE OF KNOWLEDGE

Abstract author(s): Niebieszczanski, Jakub (Adam Mickiewicz University in Poznań)

Abstract format: Oral

The archaeological site in BruszczeWO (Central Greater Poland) is most famously known by its unique fortified settlement from the Early Bronze Age. Until now, several later occupation phases has been distinguished, including the Late Bronze/Early Iron Age, Roman Period and Early Medieval. The well-established archaeological narrative of the microregion was already supplemented by initial geoarchaeological activities in the early XXIst c., however little is still known about the palaeolake and marshes that dominated the landscape in prehistory and early historic times.

Since 2020, the new geoarchaeological project of BruszczeWO ("Living by the Lake")*, puts the landscape transformations of the area in a new perspective. Several cores obtained from the basin brought new data on the landscape changes in temporal, and most importantly, spatial aspects. Chronostratigraphy of vibra-core transect across the former lake and wetland revealed gradual diminishing of the lake as well as the fluctuation of environmental changes in different parts of the basin. One of the vibra-core was obtained from the direct proximity of the settlement in BruszczeWO. It's stratigraphy tells about the former depth of the reservoir just nearby the site and supports the idea that the lake was an important element of the defensive system of BruszczeWO EBA settlement. The additional LIDAR and cartographic study, combined with the another set of verification drillings allowed to distinguish unknown to date morphological features which might force us to reexamine the microregion's landscape appearance in the past.

*The study "Living by the Lake(...)" is funded by the National Science Centre, Poland, grant no. 2019/33/B/HS3/00193.

3 SPATIAL-COMPARATIVE ANALYSIS OF ARCHEOLOGICAL SITES FROM LATE NEOLITHIC AND EARLY BRONZE AGE IN NORTH-WESTERN POLAND

Abstract author(s): Lawniczak, Marcin (Adam Mickiewicz University in Poznan)

Abstract format: Oral

The AZP (Archaeological Picture of Poland) program, conducted since '70s in the form of field prospection covered whole country and allowed to found of nearly half a million archaeological sites. Unfortunately, these data are still in analogue form and have not been digitized. As a part of the project „The Late Neolithic and Early Bronze Age in Southwestern Baltic area (2500-1500BC). Why did BruszczeWO-Łęki Małe type of power structures apperal?“ Late Neolithic and Early Bronze Age archaeological sites from north-western Poland have been digitized.

The total number of 15 000 archaeological sites were divided into chronological units such as Funnel Beaker Culture, Globular Amphora Culture, Corded Ware Culture and Interstage Neolithic and Bronze Age. In addition, separated areas were designated, to conduct spatial analysis (slope, aspect, elevation etc.) in relation to archaeological sites and chronological units.

The results of the analysis were presented as percentag. Comparative studies of individual regions and cultures allowed capturing some trends in the settlement bias that changed depending on the cultural and geographical course.

4 THE NEOLITHIC TO THE BRONZE AGE TRANSITION IN THE SOUTHWEST BALTIC AREA IN THE LIGHT OF MATERIAL CULTURE STUDIES

Abstract author(s): Teska, Sebastian (Adam Mickiewicz University)

Abstract format: Oral

The following presentation concern the development of societies in the transition period between the Neolithic and the Bronze Age in the particular area of Central Europe. Southwest Baltic Area, chosen for the study, extends from Schleswig-Holstein on west, eastward to the Vistula river. During examined time period (ca. 2300/2200-1800/1700 BC), it was inhabited by various societies, including those connected with Bell Beaker Culture, Corded Ware Culture, Únětice Culture and Trzciniec Culture. In my research I have focused on selected zones within Southwest Baltic Area: Lower Oder Region, Cuyavia, Southwest Greater Poland and terrain along the Noteć and Warta River. Collected data were studied in several steps. Fundamental one was the typochronological study of selected materials. It included typology of ceramic, metal and amber artefacts, flint and stone tools and basic features of burials. Its extension were results of geometric morphometric analysis of macromorphological differences in ceramic set. The result of conducted preliminary survey was a database containing number of variables reflecting features of studied archaeological material, combined in the further steps with radiocarbon data. The main aim of my research was tracking links between archaeological data, mostly from sepulchral context, throughout statistical methods and embedding them in a wider context.

5 KEEPING UP WITH THE TIMES. TYPOLOGY OF YOUNG NEOLITHIC TO EARLY BRONZE AGE CERAMIC VESSELS IN THE SOUTHWEST BALTIC AREA

Abstract author(s): Pfeiffer, Annalena - Raese, Hendrik (Institute of Pre- and Protohistoric Archaeology, Kiel University)

Abstract format: Oral

In the southwest Baltic region, socio-cultural changes led to the emergence of communities with a complex structure and clear internal hierarchy. In order to clarify the causes of the emergence of these power relations, as well as their origins and relationships

to the preceding socio-cultural phenomena of the Younger and Late Neolithic, intensive typochronological investigations were conducted. An important find category to answer these questions is the ceramic material, since vessel shapes as well as the prevalent ornamentations can be used as a tool for visualizing the continuity of distinct cultural phenomena. In this context, changes of material culture can be explained by chronological development or contemporary interaction with neighbouring regional groups or other cultures. Therefore, ceramic material from Corded Ware, Bell Beaker, Dagger Period, and Early Bronze Age inventories, especially from the north-eastern part of Germany was examined. Based on this data and the material from neighbouring regions, a detailed recording system regarding morphology and ornamentation of the vessels was developed by using but also discarding (e.g. cluster analyses) different approaches. In consequence, a typology was implemented through a synthesis of computational clustering, indices-based pre-selection and impressionistic comparisons. Due to the hierarchical structure of this system, it is possible to apply and adapt it for different aspects of our research questions. This will help us answering the question of socio-cultural changes and distinguish between the spheres of local groups as well as overarching cultural phenomena with the help of modern statistical methods in form of multivariate analyses.

6 ANIMALS AS THE BASE OF SUBSISTENCE STRATEGIES OF ÚNĚTICE CULTURE IN THE CONTEXT OF ZOOARCHAEOLOGICAL DATA FROM CENTRAL EUROPE

Abstract author(s): Makowiecki, Daniel - Krajcarz, Magdalena - Osipowicz, Grzegorz (Institute of Archaeology, Nicolaus Copernicus University in Torun)

Abstract format: Oral

Animals as a component of subsistence strategies in the Early Bronze Age societies on the Polish Lowland are poorly understood. This is due to the low number of sites where animal remains were recovered. The excavations carried out in BruszczeWO (1995-2008), delivered an assemblage of animal bones. The remains were collected from various parts of the settlement, and dated to the Early Bronze Age. This paper focuses on comparative study of zooarchaeological data from the BruszczeWO settlement and other regions of Central Europe. The aim of the analyzes is an attempt to define the role of domestic and free-living animals in subsistence patterns of the Únětice culture societies. Which animal management practices were common among Early Bronze Age, and which ones were culture-specific? To what extent had the Early Bronze Age societies still practiced the late Neolithic animal subsistence practices? To what extent did the Early Bronze Age societies based on animal husbandry, and to what extent did they explore natural resources - game mammals, birds and fish? Additionally, preliminary paleoenvironmental and palaeoecological data will be reported based on stable isotope analysis of bone collagen. They will give an insight to human impact on the ecosystem, with a special focus on changes in ecology of wild mammals. The revisited analysis of blades made of mammal scapulae will provide an additional insight into the management over mammal resources. The revisited analysis of blades made of mammal scapula will provide an additional insight on new knowledge concerned their production and utilisation.

*) The study is supported by the National Science Centre, Poland, projects: a) 'Late Neolithic/Early Bronze Age developments in the south-west Baltic area (2500 1500 BC) (grant No. 2014/15/G/HS3/04720); b) 'Isotopic paleoecology of mid-sized carnivorans during Postglacial within the Polish territory (grant No. 2017/27/B/NZ8/00728).

7 MACRO-LITHIC TOOLS IN METALLURGICAL WORK PROCESSES: THE CASE STUDY OF BRUSZCZEWO 5 (POLAND)

Abstract author(s): Delgado-Raack, Selina (Universitat Autònoma de Barcelona) - Kneisel, Jutta (Christian Albrechts Universität Kiel) - Escanilla, Nicolau (Universitat Autònoma de Barcelona)

Abstract format: Oral

The settlement of BruszczeWO 5 is supposed to have been a leading site in centralizing mineral resources of distant provenance and redistributing metal objects, among other valuable goods. Part of the resulting production was very likely deposited in the princely graves of Łęki Małe, where they accompanied the death of the Únětice ruling class. Both the remarkable remains of different kind recovered in the old excavations of the tumuli of Łęki Małe, and the macrolithic tools found in the settlement of BruszczeWO during the last decades, together with the new techniques applied for their analysis, offer interesting empirical information to evaluate the possible link between BruszczeWO and Łęki Małe.

In this presentation, 36 macrolithic artefacts coming from the wet-soil area of BruszczeWO and used as tools in metallurgical tasks, according to use-wear traces, were measured under pXRF, searching for chemical evidence of metal adherences. Among them, a mold, anvils, sharpeners and pierres à cupule were included. This exploratory attempt seeks to define the materials that came into contact with the stone surface and to make a proposal of the manufacture and/or use process, in which macrolithic artefacts were involved. From a methodological perspective, this strategy allows checking previous results derived from functional analysis (i.e., production traces) and tracking metallurgical work processes from a different point of view, namely the tools implemented for manufacturing metal objects.

8 POTTERY WITH TEXTILE PRINTS FROM THE EARLY BRONZE AGE DEFENSIVE SETTLEMENT IN BRUSZCZEWO IN THE LIGHT OF THE LATEST RESEARCH

Abstract author(s): Czebreszuk, Janusz (Adama Mickiewicza University of Poznań) - Podkańska, Małgorzata (Independent Researcher) - Schaefer-Di Maida, Stefanie - Müller, Johannes - Kneisel, Jutta (Christian-Albrechts-Universität zu Kiel) - Szmyt, Marzena - Jaeger, Mateusz (Adama Mickiewicza University of Poznań)

Abstract format: Oral

Pottery with textile prints is found in many stages of European prehistory. The beginning of the Bronze Age (turn of the 3rd and 2nd millennium BC) undoubtedly belongs to the periods of its particularly intense use. Archaeologists initially treated this type of vessel surface finishing as a cultural distinguishing feature. Today, we already have a sufficient amount of information to recognize that ceramics with textile prints were known from various genetic contexts, and its importance should be located in other dimensions of the life of the studied communities. Thanks to these sources, we have a chance to get acquainted with one of the most important branches of prehistoric production, which was undoubtedly weaving. Moreover, having this information, we can undertake the task of reconstructing the social significance of this craft in the analyzed period.

In the above context, the settlement in Bruszczevo deserves special attention, where during the excavation works that lasted over a dozen years, a rich collection of ceramics with textile prints was discovered. It consists of a total of about 600 samples. They were analyzed using the same methodological questionnaire. Thanks to this, it was possible to determine such issues as: what types of textiles or sprang left their imprints on the surface of the dishes and what material they were made of. The subject of a significant technological complication of the investigated traces, revealing the extensive knowledge of the manufacturers, was also discussed. This knowledge also concerned the methods of preparing textiles before their use, which left imprints on the surfaces of the dishes. In Bruszczevo, a large variety of prints was observed and an attempt was made to typologize them. Finally, selected aspects of the social interpretation of textile production in the Early Bronze Age Bruszczevo are presented.

9 CHRONOLOGY OF THE LATE NEOLITHIC AND THE EARLY BRONZE AGE IN THE LOWER ODER REGION

Abstract author(s): Matuszewska, Agnieszka (University of Szczecin) - Krzysztof, Kowalski - Kozłowska, Dorota (National Museum of Szczecin)

Abstract format: Oral

Around 3500 BC in the region of the lower Oder intense development and crystallization of local features of the settlement of the Corded Ware culture (CWC) communities occurred. In the following centuries, the Lower Oder CWC group clearly had influence on neighbouring regions: Mecklenburg, southern Brandenburg, western Kuyavia and Greater Poland. At the same time, already in 2300 BC, the CWC communities from Pomerania got in contact with proto-Bronze cultures by adapting selected elements from their inventories and laying the foundations for introducing the discussed area into the early Bronze Age civilization circle. This initial stage, which lasted to around 2000 BC, is known as the Dagger Period, and it was definitely temporary. Assemblages of grave goods analysed indicate that new Early Bronze Age models of behaviour were put on traditional patterns. The actual/developed Early Bronze Age in Pomeranian zone did not start until intense influx of bronze object of Únětice type reached this region.

Until recently all findings on periodization of this period were based on conventional comparative methods and relative chronology. Now radiocarbon dates taken from three cemeteries located in the Lower Oder region: Czelin, Dębogóra and Szczecin Płonia were obtained. The analysis of the results is the subject of this presentation.

10 ABSOLUTE CHRONOLOGY OF THE CEMETERY IN ŁĘKI MAŁE IN THE LIGHT OF NEW RADIOCARBON DATING

Abstract author(s): Goslar, Tomasz (Poznanskie Laboratorium Radiowęglowe; Adam Mickiewicz University in Poznań) - Czebreszuk, Janusz (Adam Mickiewicz University in Poznań) - Müller, Johannes (Christian-Albrechts-Universität zu Kiel) - Szmyt, Marzena (Adam Mickiewicz University in Poznań; Archaeological Museum in Poznań)

Abstract format: Oral

The princely burial mound in Łęki Małe has a unique character in the entire Unetice culture (UC). Elsewhere, burial mounds with richly equipped burials, probably of people representing the elite of a given community, appear singly (for example, Leubingen or Helmsdorf). In Łęki Małe we are dealing with a cemetery encompassing at least 14 mounds, 5 of which were excavated many years ago. Detailed description of archaeological finds was then presented in monographs, however it suffered from the lack of specialist analyzes, because of very constrained capability of Polish archeology at the time. This drawback concerned also absolute dating, limited to a few 14C determinations made (Michigan, Groningen, Berlin). Nevertheless, it is worth emphasizing that some of them were among the earliest 14C analyses made on finds from Polish lands. Fortunately, the excavation research in Łęki Małe was very reliable, many samples were collected with a precisely described cultural and stratigraphic context, which were carefully stored for years at the Archaeological Museum in Poznań. These samples became the basis for redefining our knowledge about the chronology of the cemetery. These were relics of wood, charcoal, as well as human and animal bones. In total, over 100 determinations in AMS technology were obtained, the vast majority of which was related to the activity of the UC community. They came from four mounds: I, II, III and IV.

This paper analyzes these new radiocarbon data using innovative analytical techniques and confronts them with information on the stratigraphy and cultural context. The result of these procedures brings a new knowledge about the chronology of the entire cemetery and the dynamics of the use of individual mounds.

11 THE SOUTH-WEST BALTIC AREA BETWEEN 2500 1500 BC: WHY DID THE BRUSZCZEWO-ŁĘKI MAŁE TYPE OF POWER STRUCTURES APPEAR?

Abstract author(s): Czebreszuk, Janusz (University of Adama Mickiewicza in Poznań) - Müller, Johannes (Christian-Albrechts-Universität zu Kiel)

Abstract format: Oral

Studies on the new chronology of princely barrows will be presented: a key element of the package of cultural features indicating the formation of stable power centers in the UC. New data was provided by sources from the cemetery in Łęki Małe, based on the 14C method supported by dendrochronology.

We will propose an extended concept of the functioning of the northern borderland of the UC, showing the range, dynamics and nature of the presence of features of this culture in the areas from Schleswig-Holstein to Eastern Pomerania, with particular emphasis on the so-called the Kościan group of the UC in southern Wielkopolska. Information on aDNA (burials from Łęki Małe), the production of ceramics and metallurgy (from the settlement in Bruszczevo) and the features of the products of material culture (their genetic analysis) turned out to be useful in this respect.

We will present in-depth knowledge of manufacturing, especially prestigious products (made of gold, amber and bronze), as well as special-use tools ("knives" made of bones) and ceramics (a very large category of pottery with textile imprints in Bruszczevo). The general feature of the results of these studies is to show the extensive knowledge of manufacturers and the complications of socio-production processes related to the analyzed manufacturing.

The results of new studies on the cultural landscape of the Kościan group will be discussed, showing its complicated organization. On the other hand, research on the human-environment relationship has revealed the depth and radical nature of the phenomenon of anthropopresser with its local spatial dimension. This knowledge, in addition to the previously mentioned archaeological data, made it possible to build a model for the functioning of the community of the UC Kościan group.

690 GENERAL SESSION: NEW METHODS AND RESULTS

Chair: to be confirmed

Format: Regular session

ABSTRACTS:

1 HOW TO HARNESS A HORSE?

Abstract author(s): Bauer, Anna (Independent Researcher)

Abstract format: Oral

Whats the difference between a cattle and horse yoke? How can I know what I see? Interested? In my presentation I will explain the way they differ. Up from the neolithic till today and which problems you have to handle with a harnessed horse in contrast to a harnessed cattle. A short explanation: Cattle yokes either rest on the neck, on the forehead or in the front of the withers, for this reason cattle yokes have not big cavities. All types of twin-yokes have been known since the Neolithic and each design has its pros and cons. The only single cattle yoke known until now comes from Pforzheim and is a single yoke for the withers. Horses were also put to the twin yoke, recognizable by its big cavities for clasping the ribs of the horse. Single horse yokes occur in the shape of an iron bow, which rested on upper side of the neck. Its counter piece could have been a well padded semi-collar or a breast girth. The speed and carrying capacity of the animals are different and in some cases remarkable. The efficiency of animals always depends on their health condition. Remember the celtic warrior, he was driving into the battle, he was no rider.

2 POTENTIALS AND LIMITS OF PORTABLE X-RAY FLUORESCENCE ANALYSIS (P-XRFA) FOR POTTERY MATERIAL

Abstract author(s): Schauer, Michaela (Cifa Deutschland/LMU München)

Abstract format: Oral

X-ray analysis (XRFA) is known as a technique for archaeometry and geological research for quite a while now. I could almost be called a 'common' technique - if it would be widely applied and understood properly. The technique offers many possibilities for the study of clay objects: the elemental composition or fingerprint of a given sample can be identified through X-ray fluorescence and used to characterize material qualitatively and quantitatively. Portable XRF (p-XRF) additionally offers the option to get to the material that need to be analysed which is extremely helpful for archaeologists working in countries where export of finds is impossible. p-XRF thereby offers the opportunity to identify different clay pastes and sources for pottery of a given settlement, region etc. and contributes greatly to our knowledge of past societies and their organisation. This paper will explore the potential of pXRF for pottery

analysis but also discusses (methodological) pitfalls the author encountered by working with pottery from Germany to Aserbaïd-schan ranging from the Early Neolithic up to the Middelages.

3 COMPASSION IN ARCHAEOLOGY BY ARCHITECTURAL DESIGN METHODS

Abstract author(s): Lengyel, Dominik - Toulouse, Catherine (BTU Brandenburg University of Technology Cottbus-Senftenberg)

Abstract format: Oral

One very natural connection between materiality and emotion is haptics, and it is not for nothing that the metaphorical second clothing is architecture. Few spatial structures have as great an emotional impact as architecture. So what could be more obvious than to use the emotional impact of architecture for archaeological research? It is the passion of every architect to perceive architecture emotionally and to use its methods to make this experience also an experience of non-architects. The sophisticated mediation of archaeological hypotheses can be emotionally appealing as well as scientifically sound and even remain active. For this, however, it is necessary to translate archaeological hypotheses visually according to all the standards of architecture, including the expertise of design, i. e. the genuine shaping of artificial artefacts. This does not refer to so-called virtual reconstructions that disregard scientificity and rely solely on pure fiction. It is precisely the discipline of architecture that is able to make targeted and skilful use of abstraction and to create engaging visions out of abstract geometry, which are able to adequately express the uncertainty in the knowledge of archaeology, above all by the methods of architectural photography, which remain scientifically well-founded.

The presentation aims to demonstrate and illustrate this method by several projects developed by the authors in cooperation with archaeological research institutions:

- Cologne Cathedral and its Predecessors (by order of and exhibited in Cologne Cathedral),
- Bern Minster – its first century (by order of and published by Bern Minster Foundation)
- The Metropolis of Pergamon (within the German Research Fund Excellence Cluster TOPOI),
- The Palatine Palaces in Rome (by order of the German Archaeological Institute, both latter exhibited in the Pergamon Museum Berlin),
- The Ideal Church of Julius Echter (by order of the Martin von Wagner Museum in the Würzburg Residence).

4 ORIENTATION OF NEOLITHIC HOUSES IN THE POMORAVLJE REGION, SERBIA: A CHRONOLOGICAL PARAMETER OF THE DYNAMICS OF THE SETTLEMENT EXPANSION

Abstract author(s): Savic, Ružica (Institute of Archaeology, Belgrade)

Abstract format: Oral

The method of geophysical prospection enables the research of large settlements and their surroundings without the use of destructive excavation methods. This method has proved to be important for the study of Late Neolithic (Vinča culture) settlements, because the houses were burned, which resulted in the reading of strong anomalies on geomagnetic plans. Vinča houses have a rectangular form, with surface area from 20m² to over 100m². In addition to insight into the structure and organization of the settlement, geomagnetic plans, among other things, provide data on the orientation of buildings within the settlement.

This research is based on the assumption that the orientation of houses changes according to a certain rule, making it possible to roughly reconstruct their relative-chronological sequence. Determining the orientation of houses within a settlement could play a key role in deciphering the development of large settlements. In previous studies of orientation of houses on the geophysical settlement plan, a systematic deviation in the orientation of houses was observed, i.e., whenever houses were intended to be oriented in a certain direction and parallel to each other, there was an error in perception that caused a slight counterclockwise rotation, a phenomenon known as 'Pseudoneglect'. This paper will investigate the extent to which systematic errors in the orientation of houses can clarify the chronology, i.e. the simultaneity of buildings within a settlement, but also the dynamics of the expansion of Neolithic settlements in the Pomoravlje region (Serbia).

5 A SONG OF GIS AND FIRE. DETERMINATION OF FIRING TRAJECTORIES IN AN OFF-TELL ENEOLITHIC CONSTRUCTION AT SULTANA-MALU ROȘU (SOUTHEASTERN ROMANIA)

Abstract author(s): Covataru, Cristina - Opris, Ionela (Research Institute of the University of Bucharest, University of Bucharest) - Opris, Vasile - Ignat, Theodor (Bucharest Municipality Museum) - Panaiotu, Cristian - Dimofte, Daniela (Paleomagnetism Laboratory, University of Bucharest) - Lazar, Catalin (Research Institute of the University of Bucharest, University of Bucharest)

Abstract format: Oral

The 5th millennium BC witnessed a plethora of major changes in Southeastern Europe. The tell settlements became the main form of habitation, complemented by flat settlements, cemeteries, and temporary occupancies on the area nearby the tell site, also known as the off-tell habitation. In Romania, off-tell habitations were documented in several sites such as Sultana-Malu Roșu, Pietrele-Gorgana, and Vătași-Măgura.

This paper aims at presenting the current information regarding the distribution of firing temperatures inside a burnt Eneolithic construction located in the off-tell area at Sultana-Malu Roșu. Since the discovery in 2014 of burnt daub in the necropolis area, new information contributed to changing our views relative to this unique site's spatio-temporal evolution.

Our study implements an interdisciplinary approach integrating multiple analytical data (obtained using methods such as XRD, FTIR, magnetic susceptibility analysis) into a GIS application to perform a comparative spatial analysis of the temperature trajectories inside the construction.

The results of our multiple analytical approach provide insights concerning structure's design as well as the potential operations that led to its burning and destruction.

This work was supported by a grant from the Romanian Ministry of Education and Research, CNCS - UEFISCDI, project number PN-III-P4-ID-PCE-2020-2369, within PNCDI III.

6 THE USE OF DOT AND LINE PATTERNS ON THE BONE TOOLS FROM THE LATE NEOLITHIC AND CHALCOLITHIC EAST BALKANS

Abstract author(s): Azeri, Hazal (German Archaeological Institute, Eurasia Department) - Christidou, Rozalia (CNRS/UMR 5133-Archéorient) - Margarit, Monica (Valahia University Targoviste)

Abstract format: Oral

The study centres around patterns with dotlike depressions cut using mechanical drilling and with grooved lines, which are observed on bone tools from East Balkan sites of the late 6th and the 5th millennia BC. An ongoing survey of similar markings from the region shows that they were also made on bone figurines and personal ornaments. The types, raw materials and manufacturing quality of the artefacts marked, as well as their spatial and chronological distributions help analyse the use of the marks as a common practice or as unusual, still non-random, actions. In the latter case, patterns were mostly shaped on sleeves and edged instruments perforated for hafting and pegging, made from deer antler. These tools do not seem to have occurred at the same time in the entire region under study, and this could be the result of long-distance contacts and knowledge transfer. Objects that represent singular or rare finds in the areas where they were found, for example, a comb and a harpoon based on deer antler and a pig tusk, respectively, were also marked. Despite spatial and chronological variations, the tools of the Late Neolithic and Chalcolithic periods provide evidence for differential use of raw materials, skilled production as well as technological change including product innovation. Making patterns on specialised and new tool types could suggest a desire for sharing and promoting these technologies. It could vary or multiply connotations attached to them and support their dissemination and maintenance in the peoples' social and economic activities.

7 MINING AND MEMORY: BRONZE AGE COPPER MINING AT THE GREAT ORME MINE, UK

Abstract author(s): Wager, Emma (None)

Abstract format: Oral

It is now well-established that, during the second millennium BC, people mined for copper ore at various locations in Britain and Ireland. Research and interpretation have focused on identifying the chronology, content, scale and tempo of prehistoric ore extraction at these sites and how this was then linked into the organisation of contemporary bronze production and circulation. It is increasingly recognised, however, that to contribute more fully to wider discourses on the character and organisation of Bronze Age society, such studies also need to consider how a practical engagement with mining and mines by people in the prehistoric past was embedded in on-going processes of social reproduction.

This paper considers this issue from the perspective of the relationship between the creation and maintenance of memory; the active, lived experience of mining as a technological process; and the reactions provoked in prehistoric communities by encounters with the residues of this activity. The archaeological case study presented is mining for copper ore in the second millennium BC at one of Europe's largest prehistoric mines, on the Great Orme, north Wales, UK. It uses material evidence from the mine, north Wales and elsewhere in Britain to assess the interaction between collective and individual memory and the practical, social configuration of routines of ore extraction at this remarkable site over more than 500 years. It argues that, for Bronze Age communities with a strong desire to maintain links to the past, copper mining on the Great Orme became a 'technology of tradition', with a significance that reverberated beyond the mine as a place and each physical instance of mining - and even beyond the mine's productive prehistoric life.

8 NEW PERSPECTIVES FOR THE SCIENTIFIC STUDY OF LEVANTINE ROCK ART: SURFACE CONSOLIDATION

Abstract author(s): Serrano Aranda, Claudia - Bea Martínez, Manuel (Universidad de Zaragoza) - Zalbidea Muñoz, M^a Antonia (Universitat Politècnica de València)

Abstract format: Oral

Rock art of the Mediterranean Arc of the Iberian Peninsula constitutes a singular group of works in Europe, this led to it being declared a World Heritage Site by UNESCO (1998). In Spain, specifically in Aragon, there's a group of rock art sites that stand out for their exceptional thematic, technical and stylistic features, as are the examples of Albarracín Mountain Range (Teruel).

This research focuses on the study and analysis of an intervention proposal for the shelter of Toros del Prado del Navazo (Albarracín, Teruel). The results of this study make it possible to extrapolate the study to other similar shelters thanks to the analyses carried out.

This work promotes the conservation and restoration of rock art from a scientific perspective, which complements the archaeological research initiated: multidisciplinary work to favour the preservation of the sites. In fact, thanks to the conservation proposals, it contributes to the stability of the groups, the improvement of visibility or even the possible appearance of new figures.

The analysis of the previous state of conservation and of the original materials by means of analytical techniques, like SEM-EDX, it've helped to define a correct working proposal.

Specifically, surface consolidation has been studied with the aim of halting or minimising the alteration mechanisms that accelerate the degradation of paints, allowing the particles to cohere and improve their mechanical properties. Within this study, consolidating products with nanoparticles and organosilicates have been evaluated. In addition, the interaction of the consolidation treatment with the stone material has been studied thanks to technological tests, SEM-EDX and spectrophotometry.

This work is a preliminary study that is planned to be further developed in future research but aims to initiate a conservation protocol for the assemblages adapted to their climatological situation and the physico-chemical nature of the original materials.

9 MIGRANT INDICATORS: THE ARCHAEOLOGICAL IDENTIFICATION OF MIGRANTS IN THE PREHISTORIC MEDITERRANEAN

Abstract author(s): Giardino, Claudio (University of Salento) - Mieli, Gianfranco (Museum of the Emigrant, Introdacqua - L'Aquila) - Pisoni, Luca (Independent researcher) - Zappatore, Tiziana (University of Salento)

Abstract format: Oral

The growing presence of migrants in the European Union has pressured our societies to face a phenomenon that is new in many ways. Europe, that has been an immigrant continent for centuries, has now seen the migratory flows overturned, and it has become a host area.

It is possible to understand contamination between ancient cultures by comparison with modern migrations, studying what the migrants bring with them on their journey, even as intangible assets.

An ethno-archaeological research allowed us to understand values, skills and objects brought by the illegal immigrants from Africa and Asia. What do the migrants bring with them? What "identity" do they choose when they move to other countries? All objects reunite them with an intimate dimension made up of friends and relatives. Traditional clothes and foods participate with these objects in a representation of social identity (in the sense of agency).

It is possible to archaeologically identify ethnic, religious and social markers which help us recognize elements in prehistoric contexts connected to the presence of foreigners, to their material and immaterial cultures, to the effects between different contexts and to resilient practices.

Aspects of material culture - such as food, domestic ceramics, home furnishings, burials - have a very strong symbolic and identity value, not unlike personal effects. This identity value sometimes survives even for ensuing generations, even after assimilation, without necessarily conflict with the host society.

These identity indicators were observed in archaeological contexts of the protohistoric Mediterranean. Migrations have shaped European societies since ancient times. We present some case studies of migration indicators displayed in the material culture. E.g.: they are attested in some particular burials in southern Italy, or in the pottery produced by people coming from the central Mediterranean that were found in Bronze Age Crete and in the Mycenaean world.

10 A TRACEOLOGICAL AND EXPERIMENTAL APPROACH TO SURFACE PROCESSING OF BRONZE AND IRON AGE CERAMICS IN SW POLAND

Abstract author(s): Gawron-Szymczyk, Aleksandra (Institute of Archaeology University of Wrocław)

Abstract format: Oral

The biographic method – that is, tracing artefact 'life' from manufacture, through its use, and lastly to its deposition – is frequently applied in the analysis of flint, lithic and metal objects. Ceramic vessels are very common artifacts at many archaeological sites, but they are seldomly objects to such analysis. I focused on the short period of time during the "life" of a ceramic vessels when its surfaces were smoothed or/and burnished. Both are typical features of Bronze/early Iron Age pottery found in today's Poland. I examined two components that affected the desired definitive result: the vessel drying time and the used tool(s). To complete this study, I combined the results of observations of 46 samples from three settlements and two cemeteries in southwestern Poland, as well as the interpretation of experimental reference samples. I indicated that the drying time was fundamental, while the tool kit was composed of rather simple, usually unprepared, matters such as pebble, pieces of antler and bone, pottery shred and wooden stick. During the smoothing process, I also noticed an association between surface selection (internal/external) and the intention to which the vessel was deposit (settlement/funerary).

11 THE PHOENICIAN SITE OF CASTILLO DE DOÑA BLANCA, GEOPHYSICS AND MODELLING CONTRIBUTIONS TO ITS ARCHAEOLOGICAL PLAN

Abstract author(s): Trapero Fernández, Pedro - Ruiz Gil, Jose Antonio - Lagóstena Barrios, Lázaro - Pérez Marrero, Jenny - Catalán González, Javier - Martín Mochales, Domingo (Cádiz University) - Parrilla Giráldez, Rubén (Seville University) - Rondán Sevilla, Isabel - Ruiz Barroso, Manuel (Cádiz University)

Abstract format: Oral

We propose in this communication a model for integrating new techniques in the study of archaeological sites, using the combination of non-invasive techniques like Ground Penetrating Radar, photogrammetric flight with RPA, and the archaeological plans generated by excavations, all of them incorporated into a Geographical Information System that allows us analysis and comparison. To exemplify this model, we use the case study of Doña Blanca's castle, an important Phoenician settlement, in the Ancient Mediterranean Far West, located at the base of the Sierra de San Cristobal and at the old estuary of the Guadalete River. This archaeological settlement has an intricate stratigraphy of several meters, so has the difficulty of visualizing different overlying levels with geophysical techniques. Also is hard to distinguish possible levels of archaeological abandonment. All this with the problem of combining the non-invasive data with the planimetry of the city, which is already excavated and can give us an idea of its chronology and functionality.

12 ASSEMBLING POTTERY PRACTICES FOR THE STUDY OF EARLY VILLAGER HOUSEHOLDS IN THE SOUTHERN ANDES

Abstract author(s): Vazquez Fiorani, Agustina (Universidad Nacional de Cordoba) - Franco Salvi, Valeria (Instituto de Humanidades - IDH, Cordoba; Consejo Nacional de Investigaciones Cientificas y tecnicas - CONICET) - Salazar, Julian (Instituto de Estudios Historicos - IEH, Cordoba; Consejo Nacional de Investigaciones Cientificas y tecnicas - CONICET)

Abstract format: Oral

Pottery has been one of the key proxies in Archaeology to understand past societies. Most studies tended to characterize ceramics as closed packages often representing cultural groups, technological behaviors, and groups' transmitted 'ways of doing'. Recent contributions in social theory focus on the vibrant nature of materials. This has a crucial consequence for material studies, as it challenges its study as neatly closed boxes and instead, it highlights the hybrid temporal and spatial nature of human-things nets that are mutually dwelled. Among these contributions, an assemblage toolkit allows us to think about how things, in this case, pottery vessels and fragments, create and sustain past worlds, but also how they contribute to pulling them apart. It contributes to reconstructing how crafting practices bundled together several spaces and times, materials and beings, and also maintained communities over time.

In this way, our communication will focus on pottery practices of early villager households from La Cienega valley, in Northwest Argentina. Excavations carried out in a house compound showed a complex stratification formed by an acretional occupational floor, several pits carved below it, and post abandonment filling strata. The pottery samples coming from these different units were made from different raw materials, manufacturing techniques and were part of multiple-use scenarios and depositional events. We propose these activities can be thought of as multiscalar assemblages, applying procurement, morphological and technological analyses in pottery.

13 KEEP YOUR OBJECTS CLOSE, KEEP YOUR BONES CLOSER. HUMAN REMAINS AS HEIRLOOMS

Abstract author(s): de Roest, Karla (University of Groningen, Groningen Institute of Archaeology)

Abstract format: Oral

Re-used or 'old' artefacts found in graves spark the idea that these were heirlooms. From modern notions of heirlooms, it follows that these objects had significant meanings and an emotional laden biography. Whereby at some point, their role in the world of the living ended, and they now belonged with the dead. It is possible to imagine fitting stories to these archaeological finds.

However, the question raises whether the opposite is also true: How to approach graves that do not contain such older objects, or entirely lack material culture? Must we conclude that the concerning people did not use objects for mnemonic purposes during and after funerals? How does this effect our reconstructions of social bonds and identities?

To address these questions, I explore Late Iron and Early Roman Age graves in the Dutch region. Mortuary practices in this period were varied: next to cremations and inhumations, human remains were deposited outside formal cemeteries, and in settlement contexts. Probably, some death rites left no physical evidence at all. What the recovered graves have in common, is a lack of man-made objects and monumentality. This seems to be the result of a past society placing less emphasis on their deceased; as if they were to be forgotten. Yet, some of the bones show signs of being kept in circulation.

My PhD-research proposes that objects belonging to the now dead, or items that evoked their memory, were kept close to the living, and are thus not found in graves. Moreover, that the lack of visibility of graves is partly the result of human remains being used as tokens of remembrance; as direct physical evidence of prolonged bonds. Probably, the bones referred to the identity of a specific person and were handed down as heirlooms, to be transformed over time to communal ancestors.

14 OSTEOMETRIC ANALYSIS OF CATTLE IN THE ROMAN VILLA OF ALMENARA-PURAS (VALLADOLID, SPAIN)

Abstract author(s): Pazos García, Rocío (University of Salamanca)

Abstract format: Oral

This presentation will provide the necessary data to understand the changes in livestock practices in the Hispano-Roman villa of Almenara de Adaja-Puras (Valladolid, Spain).

Spanish zooarchaeology has frequently used the analysis of osteometric data. However, the limited publication of raw data makes it difficult to compare different corpuses of measurements, particularly when they are elaborated by different authors.

For this study, all the faunal remains from the so-called 'garbage dump' of the settlement were analyzed from the anatomical, taxonomic and osteometrical point of view. The fauna studied was found in 23 stratigraphic units. This collection was excavated during the 2002 campaign and is dated between the II and IV centuries AD. Thanks to these measurements, taken according to the abundance of elements, we will understand the changes in the livestock practices during this period, the way of cattle feeding, the distinction between sexes, the presence of different breeds, or the possible introduction of improved animals.

15 MEDIEVAL ARCHEOLOGY ON THE PERIPHERY. THE CASE OF THE MIDDLE CÔA (PORTUGAL)

Abstract author(s): Ramos, Tiago (Institute of Medieval Studies - Nova University of Lisbon)

Abstract format: Oral

This paper is the results of a Phd thesis in Medieval Archaeology. The objects of the study were the diachronic analysis of the medieval settlement in the Middle Côa, and the understanding of the genesis of the Côa river as frontier. To this end, the methodology was based primarily on an archaeological approach which was complemented with the contribution of historical data and GIS analysis.

The presence of rock cut graves and the correlations with material and structural traces demonstrate the effective presence of human occupation of the territory and its exploitation. However, there was a peripheral space during the High Middle Ages, with autarchic forms of territorial organization proliferating mainly based on a local scale.

This scale is also evident during the beginning of Late Middle Ages. However, a process of articulating the territory at a supralocal level is now evident. This process, carried out by external agents, will be based on the pre-existence of existing hierarchies of power in the territory, integrating or transforming them.

It was in this context that the genesis of the Côa River must also be understood as a border line between two kingdoms in the process of territorial expansion and consolidation. More than a line drawn in the territory, this is mainly a conceptual framework that can be appropriated both by supralocal agents and by local populations. However, and despite the dispute and alteration of the frontier at the end of the 13th century having given some relevance to the territory, its main characteristic - periphery - will tend not to change.

16 ENWHALED EUROPE. ON THE CONSUMPTION OF WHALE BLUBBER AND BONE DURING 16TH AND 17TH CENTURIES

Abstract author(s): Escribano-Ruiz, Sergio (University of the Basque Country - UPV/EHU)

Abstract format: Oral

Whale blubber and bone arriving from Newfoundland became highly sought-after products by European markets and went on to form part of the consumer revolution which an increasing number of authors are tracing back to the sixteenth century. As a consequence, large regions of North America underwent a severe ecological and social transformation. In turn, the increasing access to those products deriving from transatlantic fisheries may have offered European citizens a form of exoticism that they were able to enjoy in their homes and show off on their own bodies. In this presentation we aim to interpret the widespread consumption of whale products across Europe. By focusing on the beginning of the large-scale exploitation of whales in North American fisheries, we will be able to trace and understand the broad consequences of these American products on European daily life and lifestyle, especially both in clothing and lighting policies. Specifically, we will analyse the effects of whale blubber on the main European countries interested in its commercialisation and, besides, correlate this with the evolution of clothing deriving from whalebone.

17 BETWEEN INNOVATION AND TRADITION, OR HOW EARLY MEDIEVAL LOCAL COMMUNITIES BUILT THEIR GROUP IDENTITY (WESTERN POLAND)

Abstract author(s): Zamelska-Monczak, Kinga (Institute of Archaeology and Ethnology of the Polish Academy of Sciences, Center for Prehistoric and Medieval Studies, Poznań) - Kolenda, Justyna (Institute of Archaeology and Ethnology of the Polish Academy of Sciences, Department for Research on Late Antiquity and Early Medieval, Wrocław)

Abstract format: Oral

The subject of our research is ceramic from early medieval sites located in the peripheral zone of the area that was the centre of the formation of the first Piast state. The aim of the research is to verify the hypothesis according to which local communities operating in the Wielkopolska borderlands (on the borders of the emerging Piast state) in the existing new realities make self-determination of their cultural identity, and the result of these changes is the formation of a new landscape and the acceptance, or not, of new solutions in ceramics. This process concerns the 10th and 1st half of the 11th century. We refer to the definition of style as a so-

cio-cultural phenomenon that implies social relations and identifies a given community. Style is a way of visual communication and combines the decoration, form and technology of the vessel. However, at each stage of its formation, the limitation is the individual decision and creativity of the creator as well as the existing, unconscious cultural framework or tradition.

Ceramics, as one of the manifestations of changes taking place in local communities and the resulting need to manifest one's group identity (group identity is not identified with ethnicity by us), allows for capturing various models of expressing it. The analysis of selected ceramics from strongholds located in the peripheral zone in relation to the centre of the Piast state shows that such an effect may be: adapting new cultural patterns and adapting to a new situation, or rejecting all innovations and changes, or acquiring only selected details while maintaining traditional.

In the further research perspective, the method of combining landscape studies with archaeometric studies of ceramics will be used as basic data for formulating knowledge about the processes influencing the group identification of the local communities.

18 INFRASTRUCTURES FOR CAPTURING, INTERPRETING AND VISUALISING TEXTS FOR ARCHAEOLOGICAL ANALYSIS: THE EXAMPLE OF THE RURAL-CY PROJECT

Abstract author(s): Paraskeva, Charalampos - Hadjittofi, Petroula - Rizopoulou-Egoumenidou, Euphrosyne - Vionis, Athanasios (Archaeological Research Unit, University of Cyprus)

Abstract format: Oral

Following the Ottoman conquest of 1571, the Christian Orthodox Church of Cyprus developed into one of the main political, economic and social actors on the island. In order to consolidate and expand its power, the Church undertook various agriculture-oriented income generating activities and became involved in wide economic networks spanning the island and beyond. Those activities are documented in a number of invaluable textual sources, including monastic property lists, which consist the focal point of the RURAL-CY (Rural Economy and Society in Early Modern Cyprus) project. Specifically, the project aims to explore the dynamics, strategies and patterns of rural-based economic activities by fully digitising, systematically recording and statistically-spatially analysing the Grand Manorial Codex, an unpublished document of 1188 pages dating to the late 18th century AD, which records in detail the movable and immovable property of 213 ecclesiastical institutions (churches and monasteries with glebes), located mainly in rural areas across Cyprus. In order to fulfil the above objectives, a novel archaeological information recording system has been developed with a view to capture textual data and their interpretations in a manner that renders them quantifiable and meaningful. The system consists of a fully normalised MySQL database and a custom-made graphical user interface developed in Microsoft Access 365 that allows data input, management, querying, filtering and output. As will be demonstrated the system allows the user to construct in-depth vocabularies associating specific words with abstract terms, enrich vocabularies with multimedia and bibliography, produce and record a logical tree-form topology of information, transcribe, translate, and automatically transliterate the source text; and break down the noetic structure of the Codex's contents, whilst retaining and constructing further logical relationships and assigning certainty values to each recorded data unit to allow statistical metanalysis using fuzzy statistics and spatial analysis using GIS software after data collection/consolidation.

19 ARCHIVAL STUDIES AND ACTUALIZATION OF THE ARCHAEOLOGICAL HERITAGE OF THE TAMAN EXPEDITION (1929-1932)

Abstract author(s): Zastrozhnova, Evgenia (Archive of Russian Academy of Sciences) - Medvedeva, Maria (Institute of History of Material Culture of RAS)

Abstract format: Oral

1930s became a very difficult period in the history of Russian archaeological science. At that time, the whole country was under the pressure of political repression and ideology. The results of many archaeological investigations of these difficult years still remain unknown and unpublished, and their memory has been preserved only in museum and archival collections. Actualization of their scientific heritage is one of the most important tasks of modern science. The study of the Taman expedition heritage provides us with an example of when archival documents became almost the only source of information about the work of the largest archaeological expedition. It was organized by the State Academy for the History of Material Culture (Leningrad, Russia). Since 1929, the expedition members have carried out large-scale studies of archaeological sites of different chronological periods on the Taman Peninsula (southern Russia). They were engaged in the identification and fixation of archaeological objects in this region, made a map of them, conducted small excavations and monitoring the state of already known monuments. As a result, important and significant scientific material was accumulated from antiquity to the Middle Ages. During the organization and work of the expedition, there was a clash of interests of several scientists and scientific organizations. The Soviet power used these circumstances, the story ended with the arrest and death of the main initiators of the expedition and the scientific leader of the expedition. The results of the fieldwork were never fully published. However, the scientific heritage of the Taman expedition has been preserved in various archives and museums of St. Petersburg, Moscow and Taman. Thanks to the support of the Russian Foundation for Basic Research, it became possible to collect all the materials, systematize and publish them.

The study was conducted with the financial support of the RFBR grant 20-09-00180.

A. **DENTAL PHENOTYPIC SIMILARITIES IN THE CHALCOLITHIC-BRONZE AGE HUMAN POPULATIONS FROM NORTH-EASTERN ROMANIA: A STATISTICAL MODELLING OF THE SECOND MOLAR MORPHOLOGY**

Abstract author(s): Popovici, Mariana - Groza, Vasilica-Monica (Romanian Academy – Iasi Branch, “O. Necrasov” Center of Anthropological Research) - Petraru, Ozana-Maria - Bejenaru, Luminița (Romanian Academy – Iasi Branch, “O. Necrasov” Center of Anthropological Research; Faculty of Biology, “Alexandru Ioan Cuza” University of Iași)

Abstract format: Poster

The dental morphology variations are often used to answer research questions related to archaeology and paleoanthropology. The teeth are generally well preserved in archaeological sites, even when the preservation of associated skeleton is poor. Furthermore, the tooth form is highly heritable and evolutionarily conservative, representing an excellent marker for testing various hypotheses on human history.

The dental morphology is approached in our study aiming to contribute at the understanding of the relationships between prehistoric human societies in north-eastern Romania. Upper and lower second molars (n=100) from several Chalcolithic and Bronze Age archaeological sites were used as phenotype marker. The study consists in the analysis of the size and shape of the second molar and of the covariation between them by techniques of geometric morphometrics. The quantitative data were collected using a set of landmarks located on the dental occlusal surface, at groove intersections, and a set of semilandmarks traced on the periphery of the same surface.

Results of this study reveal an important inter- and intragroup variability derived from dental morphology. The discriminant function of the upper second molar (M2) is mainly determined by the mesiodistal direction and the lingual cusps, while in the lower second molar (M2) the variability of the protoconid and the entoconid determines the characteristic phenotypes of the Chalcolithic and Bronze Age populations. Partial least squares (PLS) indicates that the upper and lower second molar are weakly covariate in both Chalcolithic and Bronze Age, according to the smaller RV coefficient (< 0.4).

This study provides evidence that may be used to infer interactions between different biological human groups correlated with historical events.

This work was supported by a research grant made with financial support from the Recurring Donor Fund, available to the Romanian Academy and managed by the “PATRIMONIUM” Foundation GAR-UM-2019-II-2.1-16.

B. **RESEARCH OF PREHISTORIC POTTERY TRADITIONS - THE POTENTIAL AND PROBLEMS OF A HOLISTIC APPROACH**

Abstract author(s): Kudelic, Andreja (Institute of Archaeology Zagreb)

Abstract format: Poster

The tradition of studying archaeological ceramics on the territory of Croatia is deeply rooted in the culture-historical approach, especially when it comes to prehistoric pottery, which represents most of the archaeological record on prehistoric societies. Furthermore, our knowledge about prehistoric, especially Bronze Age communities in the area has been stagnating for decades. However, the amount of excavated archaeological sites and pottery as well as publications are greater than ever before.

The paper will present the project and methodological concept according to which over the next five years it is planned to conduct extended research on Bronze Age (2400-800 BC) pottery traditions on the territory of Croatia. A large-scale and well-designed systematic archaeometry research programme will be combined with macroscopic physical forms of examination of already excavated ceramic material. The study of pottery throughout its lifecycle from raw material selection, different stages of production, to distribution and use, and final discard, will provide valuable research contributions, but it also represents a huge data set. Therefore, the methodological challenges, as well as the challenges arising from the nature of the processed material, will be presented too. Accordingly, interdisciplinary (mis)understanding, the correlation of different data sets, quantification methods, and digitalization of such data currently present the biggest challenges. In that sense, awareness of the advantages but also limitations of analytical methods and a well-formed theoretical framework, research questions, and hypotheses are key parameters of an optimal methodological approach.

691 **GENERAL SESSION: BURIALS, RITUALS AND MEMORIES**

Chair: Müller-Scheeßel, Nils (Kiel University)

Format: Regular session

ABSTRACTS:

1 **REVISITING STONE AGE SETTLEMENTS AND ROCK ART IN ALTAFJORD, NORTHERN NORWAY. A NEWFANGLED OVERVIEW**

Abstract author(s): Gjerde, Jan Magne (NIKU - Norwegian Institute for Cultural Heritage Research)

Abstract format: Oral

Alta displays the largest concentration of Stone Age rock art in northern Europe with more than 7000 figures. The rock art is inscribed on the UNESCO World Heritage List. Less known is the somewhat “forgotten” rich settlement record due to the unique and unparalleled rock art. Revisiting the previously known settlement record, supplemented by surveys and extensive fieldwork in the Altafjord region is part of the ongoing research project; Stone Age Demographics: multi-scale exploration of population variations and dynamics. The fieldwork resulted in the discovery of new settlements sites, new rock art sites and new quarries. The up-to date settlement record displays an extensive settlement record with nodes or central places in the Stone Age seascape in the Altafjord region. Based on a hunter-fisher-gatherer coastal economy, the location of settlements displays a maritime orientation where boats would have been a prerequisite living in this seascape. The maritime focus is supported by boats and maritime activities depicted in the rock art. The settlements and rock art relates to the raised shorelines due to the land uplift. Subsequently the changing seascape shed light to the shore connection of settlements and rock art. This overview further investigates the spatio-temporal distribution of settlements and associations with rock art in the Altafjord region.

2 **RITUALS AND REMEMBRANCE IN THE WARTBERG GALLERY GRAVE OF ALTENDORF**

Abstract author(s): Rinne, Christoph (Kiel University) - Drummer, Clara (Orthodrone GmbH)

Abstract format: Oral

The death of a loved one is a heavy loss for the bereaved. The process of coping with loss, of overcoming grief, is a multi-stage process. This process has been analysed in detail by psychology and at the same time reflects the process of recognising one’s own mortality and impending death (E. Kübler-Ross; V. Kast). We also know from antiquity the actions that are now called grief work. In the Iliad and the Odyssey death and the often ritualised act of burial are omnipresent. These ritualised acts result in a memory of the dead on the personal level and, through narrative, in a memory of the community (Assmann).

Neolithic collective graves, especially megalithic graves, are regularly understood as an expression of collective memory and monument. The archaeological evidence regularly cited is the long-term use of the graves, the effort involved in grave construction, conversions and extensions, or the deposition of vessels at the grave. The gallery grave of Altendorf is a typical grave for the Late Neolithic Wartberg Group in northern Hesse (Germany). On the basis of a meticulous analysis of the depositional processes and an extensive series of 14C-datings, a comparative presentation of rituals and remembrance is possible. On the one hand we can develop the archaeological model of changed burial rituals and on the other hand a well dated three-phase model of use. Here, the third phase reveals cyclical reburials of a few individuals over an entire millennium until the beginning of the Urnfield Culture. We thus grasp for the first time the collective memory of a burial community with intervals, as presented by Assmann.

3 **CONTINUING THE RESEARCH ON THE CEMETERIES OF MARIUPOL TYPE: NEW PERSPECTIVES**

Abstract author(s): Andriiovych, Marta (Institut für Archäologische Wissenschaften)

Abstract format: Oral

During the XX century in the Middle and Low Dnieper was opened near 20 big Neolith cemeteries, united after the common name as Cemeteries of Mariupol type. These sites are unique among the Neolithic burial sites. It is a relatively big concentration of cemeteries alongside a Dnieper river and nearby in the region. All sites had a large number of graves and common burial rituals also were colored with red ochre.

The excavations in the XX century were usually a part of archaeological rescue operations caused by collapsed banks of the Dnieper river and water reservoir.

The biggest problem nowadays is that archaeological materials were only partly published and dated. Another question that appears the access to the original materials and documentation which during the last 50 years were partly relocated to the different institutions.

But even with published and accessible information together with new approaches, the new results would be found.

4 ALTO-ADRIATIC LEKANIDES FROM VALLE TREBBA NECROPOLIS OF SPINA: THE SHAPE IN THE FUNERAL PRACTICE OF PO DELTA

Abstract author(s): Serra, Anna (University of Salerno) - Trevisanello, Carlotta (University of Bologna)

Abstract format: Oral

The Etruscan city of Spina, founded in the late 6th century BC in the Po Delta, represents a pivotal point in the Mediterranean trade routes. The settlement was part of a broader trade system in the Etruscan Po Valley based on the central city of Bologna/Felsina. Spina's necropolises, consisting of more than 4000 tombs dated from the end of the 6th to the 3rd century BC, documented the harbor's importance. The grave goods displayed items produced from all over the continent: from north Italy and Europe to Greece and the East Mediterranean. Over time, the evolution of trade routes led to different commercial partners, exemplifying the city's dynamic role in the coastal community. In the late period (4th-3rd century BC), this scenario led to local ceramic productions that displayed foreign influences locally elaborated.

This paper will address the Alto-Adriatic ware, which developed in the northern part of the Adriatic Sea, as local figurative production. During the Valle Trebba Necropolis's systematic study, which has been conducted by the University of Bologna, it was possible to enlighten the evolution of this ceramic class as a fundamental expression of the economic-social dynamism of the Spinetic community. The analysis will focus on a type of vessel (lekanides) recovered in the funeral kits of the period, representing an interesting case study to examine the production context, the class's evolution, the iconographical and morphological references, and at least its role in the local funeral practice.

5 URNS, EMOTIONS AND MEMORY IN BRONZE AND IRON AGE ALBANIA: CLOSING THE CIRCLE OF LIFE

Abstract author(s): Trinder, Ermelinda (Staffordshire University)

Abstract format: Oral

Cremation in burial mounds in Bronze and Iron Age Albania was a complex, versatile and long process, which involved communities coming together to prepare and organise these highly emotional events. The mourning cycle started with the preparation of the dead body and often concluded with urns either being buried in grave structures or placed on burial mounds.

Cremation as a healing mechanism for dealing with the trauma of loss and death has been explored both in archaeology and psychology. Building on this, through a series of archaeological case studies, I will explore how the act of burying in graves or placing urns on burial mounds impacted upon emotions, sensory experiences, bereavement and the healing process. I will also consider the importance of urns as material objects which helped create an emotional bridge between the deceased and bereaved societies. I suggest urns were far more than just containers of body and soul, they helped preserve memories of loved ones whilst creating new individual and communal memories for those left behind. Alongside remembering, I will explore the importance of deliberately forgetting and how the connection between forgetting and remembering could have played a pivotal role in the healing process.

6 “δῶρον δ’ ὅτι κέ μοι δοίης, κειμήλιον ἔστω” (HOM. OD. 4, 600). NOSTALGIC REFLECTIONS IN EARLY GREEK VOTIVE PRACTICE

Abstract author(s): Vlachou, Aphrodite (Postdoctoral Researcher; Amykles Research Project)

Abstract format: Oral

According to Homer, keimelia were objects which because of their shape, design, or way of manufacture brought back memories of events and persons, from whom one had received them as a gift.

Material items of the Mycenaean period found in early Greek sanctuaries have been occasionally referred to as heirlooms, that were handed down from generation to generation because they were linked with reminiscences of the heroic age and symbols of kingly power. The survival of these artifacts may indicate that memories of older elements of the cult were also preserved in later periods, and may have been expressed in the local artistic production of the 8th century B.C. Male and female nude figures, riders seated side-saddle, miniature double-axes, pomegranate pendants, and representations of chariots and charioteers in bronze and clay, imply a reconnection with the mythical past, based on the memory of the sacredness of certain artistic trends.

That shift to the past must be considered in the context of specific social and political concerns shared by a community, most likely occurring in transitional periods or times of crisis. After the fall of the Mycenaean palaces, the early Greek societies went into a long process of self-definition, which influenced the ways in which the past was commemorated, as well as the parts of the past which were considered worth remembering. Memory and objects of memory were used to legitimize and control social and political power, or to allow different societies to participate in processes of shared identity formation.

Focusing on specific categories of votive objects and ritual communal acts, the paper aims to explore how images or memories of the past could be incorporated into, and possibly play a crucial role in shaping religious and social behavior in the early Greek world.

7 THE CRAFT OF MEMORY. POTTERIES CURATED AS KEIMËLIA IN THE IBERIAN SOCIETIES OF THE UPPER GUADALQUIVIR (VI-I C. B.C.), SPAIN

Abstract author(s): Moreno Padilla, María Isabel (Grupo Patrimonio Arqueológico en Jaén - HUM 357; Departamento de Geografía, Historia y Humanidades. Universidad de Almería) - Ruiz Rodríguez, Arturo - Rueda Galán, Carmen (Instituto Universitario de Investigación en Arqueología Ibérica de la Universidad de Jaén)

Abstract format: Oral

The main objective of this proposal is to review certain contexts and material assemblages linked to the Iberian societies of the western Mediterranean during the Iron Age. Specifically, we analyze the symbolic life of those ceramics preserved over time as objects of memory and tradition, as attributes of identity. These items can be ascribed to the cultural category of Keimêlia, or objects with history (Reiterman, 2016). They are associated with family inheritances or linked to aristocratic distribution circuits (Ruiz y Molinos, 2018: 47-48). We focus on ceramic containers due to its importance in the discourses of power of the Iberian aristocracy, the social sector to which these types of manifestations are typically associated. This type of material normally have extended biographies of use and presents some distinctive characteristics: typological, chronological, iconographic, symbolic and cultural. These characteristics respond, ultimately, to the different mechanisms of production and reproduction of memory in Iberian times. These mechanisms differ according to the context, the territory, and the formulas used, although all of them have in common the desire to transmit a specific message of tradition, continuity, recognition and legitimacy. Also, the display of these items serves as communication hub with the community and with the divinity. Because of this, these keimelia contribute to the construction of mythologies of legitimation of power. That is, they contribute and participate in the genesis and transmission of some key stories of power.

In this session, several case studies related to Iberian necropolises (Baza, Tútugi, Castellones de Céal, Hornos de Peal or Piquía) will be presented. In addition, this study has incorporated, among others, the new theoretical and methodological approaches linked to the archeology of the senses (Skeates and Day, 2020), the Actor-Network Theory (Olsen et al., 2012) and ceramic sociology (Shanks, 1999; Gosden, 2005).

8 SACREDNESS IN THE NORTHEAST PHRYGIA: THE INHERITANCE OF PAST PERCEPTIONS IN THE EAST OF ESKIŞEHİR PROVINCE, TURKEY

Abstract author(s): Güney, Hale (Aarhus Institute of Advanced Studies)

Abstract format: Oral

An epigraphic survey covering more than half the province of Eskişehir in central Turkey, which commenced in 2014, has provided evidence for Roman and Byzantine necropoleis and later churches that are still considered as a sacred land designated to Muslim tombs (or dervish lodge - tekke) by the locals. Also, modern inhabitants esteem the sanctuary of Zeus Sarnendenos and surroundings as a sacred grove. The aim of this paper therefore is to present preliminary results of the research (as a by-product of the survey project) about the sacred land and sacredness in the northeast Phrygia. The research focuses on ten case studies including sanctuary of Zeus Sarnendenos and its surroundings, Roman and Byzantine necropoleis and churches in the survey area located to the east of Eskişehir province. This continuous phenomenon (what I call 'the inheritance of past perceptions') frequently attested in Asia Minor will be examined with the help of the results of short interviews made with the locals. There are at least few reasons to observe such continuity: At first sight, the availability of stone (most of time marble and limestone and in good shape) at older sites is one reason to make new burials for revered figures. When the first Turcoman families came to a region, they reused the same available material for their need. Beyond this practical reason, when we listen the inhabitants of the region, we hear the stories including their personal experience which reflect the inheritance of past perceptions, e.g. god's anger, seeking god's help for the fertility in one particular place and their hesitation to use such places for festivities. All evidence eventually indicates the role of strong oral tradition accumulated through the centuries in one particular region and reflects the 'unchanged' nature and the need of the inhabitants settled in the countryside.

9 TIBURTINI CALICES OR GEMMATA POTORIA IN THIN WALLED WARE: A LUXURY ROMAN PRODUCTION OF THE FIRST IMPERIAL AGE

Abstract author(s): Puppo, Paola (Miur - Ministero Istruzione Università e Ricerca)

Abstract format: Oral

Gemmata potoria in thin walled ware is a particular production of the ager Romanus, represented by drinking vessels (beakers, mugs and small cups) decorated with vegetable motifs and embellished with gems of colored glass paste (pasta vitrea). This type of pottery, dating from the Augustan period to the imperial period until the Flavian age, was found in funerary contexts (for example in the child's grave of the necropolis Settecimini) and religious contexts (many specimens have been found at the Ara Maxima in the Foro Boario and in the sanctuary of Tivoli, both dedicated to the worship of Hercules Victor). The precious decoration à la barbotine is made with points, stems and drops arranged to form phytomorphic elements and embellished with inserts of glass paste of blue gradation encapsulated in clay. These drinking vessels are used closely in Rome and surrounding areas. The specimens found in the urban contexts (as the luxury villa in Privernum or the residential quarters in Ostia) provide significant elements to identify the sources and the cultural traditions that this particular class of ware reflects. This pottery hasn't been produced only for the libations in the funeraries and sacred contexts, but it may have been used on request by clients of a certain level as proved by Seneca

in Epistulae to his friend Lucilius. The production seems to lie in Tivoli, whose figulinae workshops were already fully active in the production of fine ware such as the Hellenistic reliefware (the so-called Italo-megarian bowls) and the thin walled ware.

10 GODS, HUMANS AND THE MATERIALITY OF MEMORY AT THE ACROPOLIS OF ELEUTHERNA*

Abstract author(s): Spanou, Nikolia - Kalpaxis, Athanasios (University of Crete) - Bitis, Ioannis (Aristotle University of Thessaloniki) - Tsigonaki, Christina (University of Crete)

Abstract format: Oral

The systematic excavations of the University of Crete have focused,

for the past thirty years, on the Central Plateau of the Pyrgi hill, the acropolis of ancient Eleutherna (Central Crete). The archaeological investigations demonstrated the public nature of the Central Plateau, directly connected to the political and religious functions of the city down the centuries. An Archaic temple and an imposing Christian church were brought to light during the excavations. These buildings seem to have been the landmarks of Eleutherna's acropolis during different phases of its history. Their architectural remains, along with other vestiges, such as ritual depositions of feasting residues and votives, inscriptions and building materials constitute the "memory record" of the place. Through their study, we will try to explore its dynamics and transformation and how they were affected by the intention of maintaining or obliterating the community's existing collective memory in each successive phase of the acropolis.

*This research is co-financed by Greece and the European Union (European Social Fund- ESF) through the Operational Programme «Human Resources Development, Education and Lifelong Learning 2014- 2020» in the context of the project "From the Ancient Temple to the Christian Church: the transformation of the "sacred topography" (MIS 5049038).

11 MEMORY MANIPULATION, MOVEMENT, AND CHRISTIANISATION ASSEMBLAGES ON A CROSSROADS IN EPHEBUS

Abstract author(s): Selsvold, Irene (Department of Historical Studies, University of Gothenburg)

Abstract format: Oral

Memory is fluid. It is continuously shaped and reshaped through repeated encounters between people and their material environments. In this talk, I demonstrate how religious memory was reshaped in an urban environment during the Christianisation of the Roman Empire. The Triodos intersection is at first glance inconspicuous in the narrative of the material Christianisation of Ephesus; The destruction of the great temple of Artemis and the construction of the monumental basilicas of St. John and Mary have played the lead roles. The Triodos intersection was a street environment without monumental temples or churches, and have been overlooked as a locus for the Christianisation effort. Yet, the devil is in the details, so to speak. I combine social memory and materiality theory in the concept 'memory manipulation' to demonstrate how the material assemblage that together constitute the Triodos crossroads was altered through an array of small transformative efforts. I draw on ideas of lived religion and spatial archaeology to argue that ritual and everyday movement in Roman streets are key to better understand how lived experience and the mutually affective relationships between people and material environments shaped the religious transformation in Roman Late Antiquity.

12 THE LONG TRANSITION FROM THE REIHENGRÄBERFELD TO THE CHURCHYARD

Abstract author(s): Müller, Kathrin (University of Freiburg)

Abstract format: Oral

The paper provides an overview of the central issues of my PhD project on the development of burial grounds in Early to High Middle Ages in southern Germany. From the 7th century onwards, the archaeological remains reveal significant changes in the structure of burial grounds. The Reihengräberfeld, which has been used almost exclusively since the 5th century, is used less frequently and a number of new forms are emerging. On the one hand we can observe cemeteries which are defined by their spatial "separation" from the Reihengräberfeld. On the other hand, we can also observe an increasing shift of burials into the settlement, either in/at churches or without any relation to a church. The currently still used model of the process until the churchyard emerges as the only place of burial, assumes a short transition phase of about 50 to 100 years. This is due to the circumstance that from the 8th century onwards, fewer and fewer furnishings were placed inside the graves. Thus, the graves without furnishing were not dated and the end of the burial ground was set parallel with the end of the practice to bury with goods. More recent results point to a much longer duration of the different forms of burial grounds until at least the 9th/10th century. This is mainly due to the increasing number of radiocarbon dating. The aim of my project is to establish a more accurate model of the development of burial grounds up to the general establishment of the churchyard in the High Middle Ages.

13 WONDERS FROM BEYOND: LUXURIOUS AND EXOTIC GOODS IN THE GRAVES OF VIKING AGE RITUAL SPECIALISTS

Abstract author(s): Gardela, Leszek (The National Museum of Denmark)

Abstract format: Oral

Over the last twenty years, interdisciplinary research combining archaeology, textual studies and folklore has led to the identification of more than forty graves of presumed Viking Age ritual specialists. Although each grave is unique, they share a number of

common traits and often include iron staffs (probably used in the practice of magic and/or serving as emblems of religious authority and power) and small-size objects which likely played the role of amulets. Another characteristic feature of these presumed ritual specialists' graves is the occurrence of luxurious portable goods such as metal vessels, jewellery, and small utensils that stem from geographically and culturally distant locations, including the British Isles, Eastern Europe and Asia. The present paper will try to trace more precisely the origins of some of these items and will investigate the dynamic and complex networks of influences they were part of. How were these 'wonders from beyond' understood by their new Northern European owners? Did they serve merely as exotic curiosities or did they have significant roles to play in shaping and manifesting secular and sacred power?

14 SPEAK, MEMORY: THE ROLE OF SOCIAL MEMORY, IDENTITY, AND STORYTELLING IN THE REUSE OF MAYA MONUMENTAL ARCHITECTURE

Abstract author(s): Ruf, Kim (University of Cambridge)

Abstract format: Oral

Research on the relationships and interdependence between human beings and the built environment mostly seems to have labeled monumental architecture as plain vehicles for sociopolitical messages. These structures, however, convey meanings beyond the political sphere. Due to their monumentality, they outlive subsequent generations and their reuse can be considered another form of storytelling: one in which collective memories, ideas, and ideologies are materialised, and aspects of the past are consciously being carried over into the present.

Drawing from archaeological evidence, ethnographic and indigenous sources, and archival materials, this research investigated the reuse of Maya monumental architecture in pre- and post-colonial times, focusing on social memory and collective identity both in ancient Maya and modern indigenous communities in Yucatán. Two main questions lay at the heart of it: Firstly, how is the present constructed by reusing past material elements, specifically monumental architecture? And secondly, what is the role of social memory in constructing narratives of identity and community, both in past and present communities?

This paper concluded that social memory powered the reuse of monumental architecture as a means to encapsulate the past in the present. It was also used to establish new settler communities and build collective and individual identities on the interpretation of ancient structures – often through constructed memories of the distant past and invented lineage connections. Moreover, social memory and narratives of identity as practised in the reuse of ancient Maya structures serve to strengthen and anchor present-day indigenous communities through shared memories and traditions, and even allowed people to survive and overcome traumatic events. Investigating this interrelationship between the reuse of ancient material culture, social memory, and identity will allow us to comprehend how people perceive the past which is woven into monumental architecture and put on display so prominently, both in ancient and modern times.

15 SUBSTITUTE BIOGRAPHIES: SOCIAL MEMORY AND HEIRLOOMS WITHIN EARLY MEDIEVAL SUB-ADULT BURIALS

Abstract author(s): Costello, Brian (University of Chester)

Abstract format: Oral

From the 5th-7th centuries AD, Anglo-Saxon inhumations were furnished with grave-goods to either display or idealise the identity of the deceased. While grave contexts demonstrate rigid adherence to social protocols in aspects of grave furnishings and body positioning, the inequality of the number and type of objects created individuality within a socially competitive environment. For example, though generally found with few or no grave goods, a small number of sub-adult burials were lavishly furnished with objects of exceptional quality, some of which have been identified as likely heirlooms. These heirlooms consist of socially significant brooches which displayed noticeable abrasion patterns providing evidence of their extended use, frequent adornment, and thus recognisability within the community.

Previous discussions have demonstrated that grave goods placed in the burial acted as mnemonic devices and enhanced the collective remembrance of the mourners attending the funeral. The visual presence of an heirloom, with an extended and known biography, would create a focal point to amplify the social remembrance of the mourners participating in the funeral. The inclusion of such biographical objects within the graves of sub-adults may have been intended to reinforce or bolster the shortened biography of a child. Using examples from 5th-7th century AD Kentish cemeteries, this paper interprets the rare cases of sub-adult graves containing curated objects and their effects on social remembrance.

16 FELDLUFTPARK PORI: LANDSCAPE OF WAR AND MEMORY

Abstract author(s): Väisänen, Teemu (University of Turku; Satakunta Museum)

Abstract format: Oral

World War II is a period often associated with destruction, but it's also a period of extensive construction efforts. This can especially be observed through airfields, many of which were heavily modernized and expanded due to their strategic importance.

For example, the Pori Airfield in Finland grew from a small airfield into a massive aviation equipment depot containing hundreds of construction. After the war, many of the buildings were given a new life, as the airfield remained in military use until eventually be-

coming an important hub for civilian and commercial aviation. While some of the constructions were abandoned into the woods, they were never truly forgotten, as aircraft shelters and ruins became places for children to play at.

Thus, the memories tied to the constructions eventually outlived their original wartime purposes. But how can we connect materiality, emotion and memory, especially as the collective memories tied to the constructions have changed with new generations. During Feldluftpark Pori research project, oral recollections regarding wartime constructions and their modern use have been tied to space and time. Through GIS, these memories can be combined into a projection, which demonstrates the landscape of war as well as changes in collective memory.

692 GENERAL SESSION: ENVIRONMENTAL IMPACTS ON HISTORY

Chair: to be confirmed

Format: Regular session

ABSTRACTS:

1 UNDERSTANDING THE EARLY COASTAL CONTACTS THROUGH NEWLY DISCOVERED ONSHORE ARCHAEOLOGICAL SITES IN COASTAL WEST BENGAL, INDIA

Abstract author(s): Ghosh, Ahana (Archaeological Sciences at Indian Institute of Technology-Gandhinagar)

Abstract format: Oral

An exploration was carried out in a so-far unexplored region along the shoreline of Bay of Bengal, located in East Medinipur district, West Bengal. The survey resulted in the discovery of three intertidal archaeological sites named Shankarpur, Tajpur and Chandpur represented by scattered mudflats and large ceramic assemblages just near the shoreline. The ceramic assemblage found within the site is diverse in nature. The ceramic assemblage consists of Red Ware, Black and Red Ware and Black Ware, Buff Ware and Black Slipped Ware. Interestingly, the shards found within the shore surface showed some kind of roundness questioning the actual context of the site. The discovery of these sites in the region for the first time has thrown light on the early settlement near the shoreline which was previously considered to be of marginal significance and the detailed analysis of ceramic assemblage also has shown some traces of possible coastal contact with Southeast Asian countries. Moreover, it has opened a new arena for understanding the early coastal communities settled just near the shoreline. This discovery has opened new possibilities for more geoarchaeological and marine archaeological research in this part of the coastal region in future.

2 HOLOCENE COASTAL ENVIRONMENTAL DYNAMICS AND THE ROLE OF SEA-LEVEL, CLIMATE AND HUMAN IMPACT IN MARANHÃO STATE, NORTHEASTERN BRAZIL

Abstract author(s): de Moraes, Caio (Georg-August-Universität Göttingen) - Lima da Costa, Marcondes (Federal University of Pará, Institute of Geosciences, Faculty of Geology) - Guida Navarro, Alexandre (Federal University of Maranhão, Laboratory of Archeology) - Nunes da Silva Meneses, Maria (Federal University of Tocantins, Laboratory of Soils) - Boiadeiro Ayres Negrão, Leonardo (Martin Luther University Halle-Wittenberg, Research Group Mineralogy, Institute of Geosciences and Geography) - Behling, Hermann (University of Goettingen, Department of Palynology and Climate Dynamics)

Abstract format: Oral

Little is known about the history of the coastal environment in northeastern Brazil and the role of sea-level and climate change as well as the human impact during the past. In order to shed more light on coastal ecosystem dynamics and its influencing factors, a 300 cm long sediment core has been taken from Lagoa do Formoso archaeological site located around 150 km from the coast in Maranhão State. The core has been radiocarbon dated and analyzed by pollen, spores, charcoal, X-Ray Fluorescence (XRF), X-ray Powder Diffraction (XRPD), and sedimentary characteristics. During the period from 7560 to 5070 cal yr BP occurred a dominance of mangrove vegetation and a high relative sea-level (RSL), indicating that the coast of the Atlantic Ocean was close to the study area. In the following period from 5070 to 2590 cal yr BP, the predominant sandy sediments have a chemical and mineralogical composition typical from continental sources. The vegetation is represented mainly by herbaceous and arboreal vegetation, while the mangrove is absent, indicating an RSL decrease. The period between 2590 and 1320 cal yr BP, is marked by the lower water table and the stronger presence of rainforest and increasing presence of palms trees, indicating probably the beginning of the human establishment. The last period after 1320 cal yr BP, is marked by an even stronger anthropogenic influence in the study area as it is also evidenced by the records of the stilt-house settlements. These records together with others from the same region are the only evidence of stilts-houses from the pre-colonial period in South America.

3 ENVIRONMENTAL, FIRE AND HUMAN HISTORY OF THE EAST EUROPEAN FOREST-STEPPE FROM LATE GLACIAL TO PRESENT – STUDY SITE ZAMOSTYE

Abstract author(s): Lukanina, Ekaterina - Shumilovskikh, Lyudmila (Georg-August-Universität Göttingen)

Abstract format: Oral

East European forest-steppe is one of the most important crop districts of humanity. It is known for the most fertile soils in the world – the chernozems. An active agricultural use and modern climate change strongly affect the natural vegetation endangering ecosystems and plant species. Archaeological data show the presence of humans in the region since the early or mid-Palaeolithic. In order to study the human and climate impact on the East European forest-steppe in the past, we investigated the study site Zamostye located in the center of the forest-steppe zone. The sediment core was taken from a silted oxbow lake and studied for pollen, non-pollen palynomorphs, macroremains and charcoal to reconstruct environmental, fire and human interactions. The core covers the time period from 14 655 cal y BP to present providing unique data on the Late Glacial period for the area. The data revealed the major changes in the vegetation had occurred during the glacial-interglacial transitions. During Holocene the area was covered with mixed-broadleaf forest and did not experience considerable changes. In the last 1000 years, the processes of active deforestation and agricultural use increased, turning the area into a forest-steppe.

4 THE FUR TRADE, MARKET INTEGRATION, AND HUMAN-ENVIRONMENT INTERACTIONS IN NORTHERN ALASKA: DATA FROM THE WALAKPA SITE

Abstract author(s): Jones, Emily Lena - Judkins, Abigail (University of New Mexico)

Abstract format: Oral

In northern Alaska, sporadic interaction with fur traders starting in the 18th century and subsequent integration into a global market system changed how human populations exploited the animal species present in this region. The fur trade increased the focus on certain taxa, such as caribou (*Rangifer tarandus*), that had previously been a primary food source, but impacts on animals less of interest to fur traders are less well-understood. Did the increased focus on fur-bearing animals for trade lead to changes in the other species exploited for food? In this paper, we use results from our analysis of the pre-contact Thule and historic zooarchaeological assemblages from the Walakpa site in northern Alaska to examine the effect of the fur trade on animal populations and human subsistence. We then consider the significance of these changes for understanding the impact of increasing market integration on human-environmental interactions in this region in the twentieth and twenty-first centuries.

5 THE IMPACT ON THE ENVIRONMENT OF THE NEOLITHIC PERIOD GÖBEKLİ TEPE EXCAVATION AND THE FIGURINE DIALECTIC IN ANATOLIA

Abstract author(s): Sozer Kolemenoglu, Selma (Universidad Empresarial De Costa Rica)

Abstract format: Oral

In the culture of the Neolithic period in Anatolia, communities came together symmetrically, with a horizontal and vertical approach and it can be seen from the ontological messages they have left that, for instance, they warned of the symbol figurines exceeding the dual ambivalence of typological humans. Metaphoric, rhetorical and religious deliriums and to open up space for themselves with universal dialectic quests. According to the Theological and Monotheic point of view, they also identify the cult of the pharaohs, which they wish to sustain with the envoys of the cruel demons living on Anatolian lands, with the cult of Göbekli Tepe. The very large number of phalluses found during the excavation can be explained as an image of a cult centre pointing towards the satisfaction of the Flesh, with a perception of a sect which is in pursuit of the mysterious Red Apple. The historic perverse force of energy reflected by the figurines idols, also carry a message of complaint by the figurines.

What stands out in today's Turkey is the desire of the demon culture to establish a political agenda with the liberated mythological bull culture which wishes to dominate by propounding the excavation of Göbekli Tepe, with unethical human typologies which want to ensconce the ancient Egyptian cultural structure in the political social arena. The boundless oppressive tyranny has eroded the social perspective and the denominational cult struggle of the understanding of Monotheism in the system of faith and is the important political dialectic which is the peripheral problem of today.

Chair: to be confirmed

Format: Regular session

ABSTRACTS:

- 1 **ROLE OF SOCIAL MEDIA AS AN INFLUENCER IN HERITAGE CONSERVATION INITIATIVES IN INDIA**
Abstract author(s): Ghosh, Ahana (Archaeological Sciences -Indian Institute of Technology-Gandhinagar) - Konar, Snigdha (Department of Archaeology, University of Calcutta)
Abstract format: Oral
 This research had thrown light on the influence of social media platforms in generating awareness among general masses on heritage conservation in India. Social media is an important platform for developing any kind of connections these days. It will also look into the implementation and impact of the concept of citizen science in heritage conservation process and the participatory aspect within the whole process. Specially during the Covid-19 pandemic where everything got transformed from offline to online and online platforms became pertinent one. So, in this scenario the individual efforts of conservation or organizational efforts started enlightening awareness among people with enormous social media implications. Previously, a lot of surveys have been conducted centering around the topic of heritage conservation but not much work has been done on understanding the social media implications of these heritage conservation units (individual and organizational). A questionnaire based verbal or non-verbal interviews have been conducted on the resource persons related to these social media platforms. This method was followed by a qualitative and quantitative analysis of the yielded data. Individual efforts were also given much importance during the research as sometimes individual efforts tend to have more influence than organizational or collective efforts. It has been noticed that social media pages are also acting as a voice for protest sometimes. So, this research is presenting the current state of social media influence and citizen science management in heritage conservation in India with proper statistics and also throwing light on its future endeavors.
- 2 **TRUST AND TRIBULATIONS; HOW CITIZEN SCIENTISTS IN ONTARIO, CANADA CAN HELP ARCHAEOLOGISTS WITHIN PLOUGHZONE CONTEXTS**
Abstract author(s): Beaulieu, Kiara (University of Birmingham)
Abstract format: Oral
 In Ontario, Canada very few collaborative efforts are finding strong roots in the citizen scientist/metal detecting communities. As such, limited pilot projects or collaborative efforts have been established and only due to the perseverance of a few dedicated individuals. Many detectorists enjoy posting on forums, Facebook groups and websites geared specifically to like-minded persons, yet are hesitant to work with archaeologists or submit their find locations or artifacts to help further cultural heritage knowledge. The relationship and trust doesn't exist to instill confidence that hobbyists will be treated fairly and with respect-causing some hesitation for collaboration. Currently no project exists within the province that allows detectorists/citizen scientists to engage in a meaningful way with the archaeological data they do collect. A proposed pilot project considers the feasibility of a citizen scientist lead initiative that is geared to recording finds unearthed in cultivated contexts/ploughzones. This paper explores such a venture and considers what is needed in order for such a project to be viable within the Ontario heritage landscape, what challenges exist, what ethical concerns present from participants and observers, how would the partnership function, and finally who would maintain control of the data.
- 3 **EXPERIENCES AND EMOTIONS IN THE NOTEBOOK PAGES OF THE FINNISH POWS FROM THE ISLE OF MAN**
Abstract author(s): Ylimaunu, Timo (University of Oulu) - Mytum, Harold (University of Liverpool)
Abstract format: Oral
 We will discuss in our paper experiences, memories, and emotions which the Finnish Prisoners-of-War shared with each other when they were held in the Isle of Man at the 1941–1944. The notebook was found hidden in a former boarding house which had been requisitioned as part of the Mooragh internment camp. British and other Allied authorities took several hundred Finnish sailors as prisoner of war during the World War II, and more than 400 Finnish sailors were placed in the internment camps on the Isle of Man. They were released from captivity at the fall 1944. The notebook consists of 36 pages, mainly song lyrics and drawings, which were written and drawn, probably, by five or six different people. This is a rare example of material culture from the Mooragh camp, in contrast to other camps on the Island which produced craftwork and newspapers. We will discuss how image and text reveals what the Finnish internees experienced, and what kind of emotions these lyrics and drawings transmit. These shared experiences and emotions that can be compared with those revealed by newspapers from other camps that housed other nationalities.

4 THE TROUBLESOME CASE OF A HUMAN SKELETON, POSSIBLY OF A CALIFORNIA INDIAN, IN A SWEDISH MUSEUM COLLECTION

Abstract author(s): Wärländer, Sebastian (Stockholm University)

Abstract format: Oral

Museum collections involving human remains have become an ethic dilemma during the last decades. The earliest collections of human skeletons were derived from scavenged Indigenous graves, or from anatomical dissection of the executed and the very poor. The more recent skeletal collections are almost always the result of cemetery removals, or consist of unclaimed bodies from hectic city morgues. In neither case have the individuals in question, or their families, consented to having a museum box as a final resting place. But should this really be required, and if so, should all old collections be disassembled and the skeletons repatriated and reburied? What is the benefit of keeping these museum collections, and if the old ones are discarded, should new ones be created? Here, we present the case of an unidentified human skeleton – possibly of a California Indian - in a Swedish museum collection. The case is used to illustrate some of the ethical concerns that European museums currently are facing, especially with regard to human skeletal identification, repatriation, and display.

5 EMOTIONAL ARCHEOLOGY FOR THE HERITAGE MANAGEMENT OF A WIDE TERRITORY. THE MASAV PROJECT (ÁVILA, SPAIN)

Abstract author(s): López García, Juan Pablo (MASAV)

Abstract format: Oral

In 2017, the Terra Levis project, Archeology in Community, was launched at the proposal of the AC Abulaga, based in the mountain town of San Juan del Olmo -Ávila, Spain-. Work processes based on rural heritage and participation, led with the creation in 2018 of the MASAV - Open Museum of the Sierras de Ávila and Valle Amblés-. This communication reflects on emotions in archeology beyond their possible reflection in material culture. The work strategies based on a continuous communication flow between all the agents involved, the horizontal management of the project, the transformation of the sites through art as well as the scope of our concept of community are guaranteeing the continuity of a regional project that he perceive cultural heritage as one of the last remaining opportunities for a territory haunted by the specter of depopulation. Emotion has become a fundamental pattern for the connection of communities with the landscape, materiality and with the project itself.

6 WIKITOPIA ARCHIVES: INVOLVE EVERYBODY ABOUT ARCHAEOLOGY HISTORY

Abstract author(s): Gransard-Desmond, Jean-Olivier (ArkéoTopia, une autre voie pour l'archéologie)

Abstract format: Oral

WikiTopia Archives is a program for digitization of archaeological sources run by the association ArkéoTopia, an alternative approach to archaeology. Launched in March 2018 with a first corpus of letters from the 19th century, the program is aimed at individuals interested in archaeology and at archaeologists, both students and researchers as well as enthusiasts. Its objective is to encourage them to digitize and then publish their historical sources on Wikimedia via the Open Source tools. In this way, the various documents will be accessible to the greatest number of people all over the world and research on them will be encouraged.

With this first experience, we hope to encourage private individuals to enhance their personal collections, archaeology students to contribute to the work of referencing, and researchers to take note of the information on display and to study them. The goal is to complete the current project on Anatole de Barthélémy's archives and to initiate others, all archaeological periods combined.

The communication will come back on the genesis of the program and will present the study in progress in order to attract attention about how Wikimedia projects can help to design citizen science research program without important funds.

7 COMMERCIAL ARCHAEOLOGY IN PORTUGAL 2008-2020: THE PANDORA BOX, THE GLOBAL CRISIS AND BRIEF PROFESSIONAL CHARACTERIZATION

Abstract author(s): Luciano, Vanda Bela (UAL)

Abstract format: Oral

Commercial archaeology in Portugal began to take their first steps, after projects of public development as Foz Côa. After our ratification of the Malta Convention in 1997, and consequent legislation aimed at safeguarding cultural heritage. That concern extends to monitorization of archaeological, prospecting or surveys, when public or private works took place. The boom in commercial archaeology would have disastrous consequences a few years later, in 2008 when the crisis hits us. Companies needed to reinvent themselves and archaeologists needed to diversify their range of skills in order to adapt to this new demand. Recently we invert the tendency of a sector in crisis, commercial archaeology rise up again, with tourism and development of the real estate. A united and more capable professional class is required, also the universities need to adapt their role to that quest. For that matter we have to establish new forms to approach these two sides, that are still apart.

Index of Authors

(SESSION ORGANISERS AND MAIN AUTHORS)

	SESSION		SESSION		SESSION		SESSION		SESSION		
A											
Aalto, Ilari	347, 687	Alterauge, Amelie	452	Atzbach, Rainer	57	Battiloro, Ilaria	298	Binde, Marion	509, 510	Brami, Maxime	119
Abar, Aydin	300	Álvarez Fernández, Noemi	453	Auffermann, Bärbel	500	Bauer, Anna	510, 690	Bison, Giulia	281	Brandl, Michael	205, 206
Abballe, Michele	219	Alves, Daiana	246	Augereau, Anne	100	Bausch, Ilona	367	Bizzarri, Giulia	373	Brandt, Luise	287
Abdelfattah, Asmaa	546	Amadío, Marialucia	383	Aulsebrook, Stephanie	260, 546	Baysal, Emma	525	Bjerketvedt, Linda	361, 487	Brandtstätter, Lennart	492
Acuna, Katerina	318	Amicone, Silvia	351	Auth, Frederic	269	Bazzanella, Marta	259, 279	Blackwell, Bonnie	337	Brasoveanu, Casandra	330, 354
Adams, Sophia	515	Amirova, Saltanat	287, 501	Avramidou, Amalia	523	Beamer, Jennifer	515	Blagojevic, Tamara	330	Braun, Ricarda	337
Adlung-Schönheit, Lilian	236, 471	An, Jingping	246	Ayán, Xurxo	85, 347	Beaulieu, Kiara	693	Blaich, Markus C.	57	Breu, Adrià	480
Agolli, Esmeralda	339, 343	Anders, Alexandra	100	Ayers-Rigsby, Sara	97	Beaumont, Julia	533	Blanchet, Cecile	402	Bricking, Adelle	390
Aguiar, Antônia	251	Andersen, Anna-Theres	367, 389	Azeri, Hazal	690	Becerra Fuelleo, Paula	231	Blankenfeldt, Ruth	339	Brinkmann, Johanna	16, 392
Aguirrezábal, Diego	375	Anderson, Emily	313	Azizi, Hamid	86	Becher, Julia	365	Blanz, Magdalena	456, 541	Brisset, Elodie	528
Ahlgrimm, Svenja	143	Andreasen, Kathrine	462			Beck, Malene	48	Blasetti Fantauzzi, Chiara	334	Brito-Mayor, Aitor	427
Ahlqvist, Laura	114, 504	Andreev, Konstantin	276	B		Beck, Sólveig	206, 435	Blaszczyk, Dariusz	178, 505	Brogliá de Moura, Samara	379
Ahola, Marja	520	Andreeva, Olga	395	Babenko, Anna	496	Becker, Fabian	321, 453	Blaževicius, Povilas	57, 496	Bro-Jørgensen, Maiken	462
Aigner, Katherine	522	Andreu Diez, Oriol	251, 326	Babić, Staša	409	Becker, Valeska	514	Bleasdale, Madeleine	417	Broka-Láce, Zenta	178
Äikäs, Tiina	156	Andriiovych, Marta	394, 691	Bai, Yang	377, 445	Bede, Ilona	509, 510	Bleicher, Niels	143	Brorsson, Torbjörn	685
Akkaya, Ecem	327	Andriopoulou, Nafsika	251	Bailey, Phyllida	453	Beek, Roy	217	Blickstein, Joel	337	Brown, Antony	179, 427
Alaica, Aleksa	529, 541	Androvitsanea, Anna	441	Baillif-Ducros, Christèle	509	Behrens, Anja	217	Blinnikov, Mikhail	251, 537	Brown, Sophie	149
Albert, Rosa Maria	326	Anglikier, Erica	322, 427	Bajcev, Olga	351	Beka, Georgia	327	Bliujiene, Audrone	501	Brozio, Jan Piet	217, 493
Alberti, María Emanuela	491	Anguissola, Anna	440	Bak, Judyta	475	Belaj, Juraj	352	Blom, Alette	149	Brönnimann, David	465
Albertini, Ilaria	115	Annis, Karissa	236, 348	Balaban, Radmila	514	Belarte, Maria Carme	207	Blond, Ninon	179, 528	Bruck, Joanna	468, 516
Albouy, Benjamin	297	Antolin, Ferran	21, 278, 282	Balasescu, Adrian	509	Belford, Paul	233, 273	Bobou, Olympia	281	Brufal, Jesús	85
Albris, Sofie Laurine	389	Aparicio, Patricia	246	Balasse, Marie	21, 456	Bell, Carol	114	Bockius, Ronald	547	Brughmans, Tom	487
Aleixo, Patrícia	85	Apiar, Jana	453	Balatti, Silvia	528	Bell, Taryn	87	Bodnár, Csaba	547	Brundke, Nina	130, 390
Alessandri, Luca	202	Aquaro, Antonella	520	Balaur, Radu	5, 514	Bellat, Mathias	496	Boecker, Velia	334	Brunner, Mirco	504
Alfsdotter, Clara	390	Araque Gonzalez, Ralph	120	Balbi, Jose	46, 233	Bellia, Angela	95, 404	Boenke, Nicole	313	Brunson, Katherine	516
Algrain, Isabelle	131	Araque, Ralph	34	Balco, William	246	Belyaev, Leonid	85, 86	Bogaard, Amy	169	Bruseker, George	260
Alinezhad, Khadijeh	337	Araújo, Ana Cristina	144	Balen, Jacqueline	330	Benetti, Francesca	94, 265, 347	Boisard, Solène	297	Brusgaard, Nathalie	529, 541
Alisher Kyzy, Saltanat	537	Araujo, Renata	245	Ballmer, Ariane	169, 273	Benkert, Helene	510	Bolder-Boos, Marion	334	Bruvoll, Hallvard	171
Allen, Ruth	440	Arauz, Emily	467	Bandeira, Beatriz Brito De	471	Benvenuto, María Laura	246	Bolliger, Matthias	169	Bruyere, Caroline	115
Allen, Susan	169, 219	Arbuckle, Benjamin	516	Bandovic, Aleksandar	521	Berger, Daniel	34	Bolohan, Neculai	48	Brünenberg, Clemens	404
Allen, Tim	249	Archila, Sonia	230	Bánffy, Eszter	216	Berglund, Birgitta	141	Bonacchi, Chiara	111	Brysbaert, Ann	417
Alliata, Victoria	315, 681	Arikan, Bulent	382, 487	Banyté Rovell, Rasa	389	Berikashvili, Prof. David	101	Bonczarowska, Joanna	149	Buchanan, Brian	214
Alliot, Pascal	277, 279	Armada, Xose-Lois	501	Baranova, Svetlana	85	Bernal, Vanessa	517	Bonga, Lily	351, 394	Bueno Guardia, Miriam	152
Allison, James	487	Armbruster, Barbara	49	Barbieri, Alvise	465	Bernard, Elisa	180	Boogers, Stef	487	Burdo, Nataliia	514
Allué, Ethel	207	Armit, Ian	5, 114	Barboni, Doris	340	Bernardi, Martina	259, 463	Borderie, Quentin	319, 465	Burke, Ariane	297
Almansa-Sanchez, Jaime	119, 436	Armstrong, Felipe	238	Barker, Jane	509	Berrica, Silvia	85	Borgius, Andréa	273	Burke, Clare	351
Almeida, Nelson	231	Armstrong, Jeremy	440	Barnett, Tertia	503	Berryman, Duncan	268	Bornauw, Freija	94	Burkhardt, Laura	504
Almela, Iñigo	85	Arnhold, Simone	101	Baron, Justyna	518	Bersani-Pancheri, Monica	395	Boroneant, Adina	518	Bursak, Daniel	16
Alonso, Patricia	300	Arnold, Bettina	521, 522	Barrett, John C.	367	Berseneva, Natalia	343	Borowski, Pawel	192	Busset, Anouk	214, 687
Alonso-Eguiluz, Mónica	179, 326	Arntz, Monique	377, 496	Barros, Beatriz	683	Berthon, Remi	456	Bors, Corina Ioana	94, 482	Bustamante Álvarez, Macarena	445
Alpagut, Canay	351	Arponen, VPJ	120, 392	Bartelheim, Martin	231, 417	Berthon, William	510	Bortolotto, Susanna	140	Busto-Zapico, Miguel	530
Alram, Eva	514	Arranz Otaegui, Amaia	513	Basilio, Ana Catarina	231	Best, Julia	141, 214	Botic, Katarina	395, 518	Butler, Ciara	497
Altena, Eveline	149	Atakuman, Cigdem	238	Basso Rial, Ricardo	231	Bethard, Jonathan	130	Botica, Natalia	476, 503	Bühler, Birgit	348, 510
		Atkinson, Christopher	249	Batista-Goulart, Luana	533	Betts, Matthew	355	Bouissac, Paul	313	Büster, Lindsey	230, 417, 468
		Attema, Peter	259	Battaglia, Frank	375	Beylier, Alexandre	207	Bouwmeester, Jeroen	233, 268	Byrnes, Emmet	249
		Attolini, Davide	251, 279			Bhattacharya, Sriradha	681	Boyd, Rebecca	233, 313		
						Bianco, Sabrina	453	Boza Cuadros, Maria Fernanda	517	C	
						Biehl, Peter F	472, 514	Böckler, Nadja	152	Cadamarteri, Julian	144, 441
						Bièvre-Perrin, Fabien	298	Bradley, Daniel	516	Çakırlar, Canan	221, 529
						Biliaieva, Svitlana	86	Bradtmöller, Marcel	479	Calandra, Ivan	300
						Bilotti, Giacomo	344	Brainerd, Leah	282		

SESSION		SESSION		SESSION		SESSION		SESSION		SESSION	
Calapà, Annalisa	334	Charisi, Drosia	149	Covataru, Cristina	690	Davies, Tom	140	Díaz-Andreu, Margarita	361, 409	Dwan, Christopher	230
Calastrenc, Carine	277	Charnianski, Maxim	188, 685	Cowley, Dave	344	Davis, Loren G.	415	Díaz-Navarro, Sonia	436	Dzhanfezova, Tanya	394, 518
Calgaro, Ilaria	501	Chaukin, Sergey	273	Crabb, Nicholas	321	Davis, Oliver	165, 273	Díaz-Zorita Bonilla, Marta	231, 327	Dzhaubermezov, Murat	412
Calomino, Eva	445, 491	Chelazzi, Francesca	383	Crellin, Rachel	300, 516	Davis, Olivia	529	Dielemans, Linda	500	Dzienkowski, Tomasz	273
Camacho, Miriam	533	Cheung, Christina	171, 533	Crema, Enrico	5, 367	Davydov, Roman	360, 501	Dietrich, Laura	221		
Camarós, Edgard	381, 390	Chevalier, Alexandre	246, 256, 326	Crescenzi, Nicole	180	Dawson, Helen	202, 322	Dietrich, Oliver	238	E	
Cameron, Michelle	541	Chevassu, Valentin	279	Črešnar, Matija	5, 417, 504	Dawson, Tom	355	Dikkaya, Fahri	521	Eckelmann, Rebekka	456
Campanaro, Danilo	404	Chieli, Annalisa	360	Criado-Boado, Felipe	543	Day, Jo	95	Dimopoulou, Sotiria	172	Edgeworth, Matt	48
Campedelli, Alessandro	164	Chikunova, Irina	232, 496	Crifò, Camilla	340	Dayet, Laure	360	Dimova, Bela	513, 545	Eekelen, Bart	463
Canale, Alessandra	202, 259	Chowaniec, Roksana	491, 498	Crowley-Champoux, Erin	524	de Angelo Laky, Lilian	322	Dittmar, Jenna	149	Egelund Poulsen, Martin	115
Cantisani, Matteo	313, 498	Christensen, Lisbeth	411	Cuartero, Felipe	247	De Bernardin, Michela	180	Djamali, Morteza	528	Eger, Jana	549
Cantó, Ana	360	Chroni, Athina	370	Cubas, Miriam	346	de Carvalho, Liliana	131, 149	Djukic, Ksenija	346	Eilbracht, Heidemarie	389
Capanna, Maria	130	Chroustovsky, Lubos	390	Cucchiaro, Sara	179	de Groot, Beatrijs	351, 513	Dobos, Adrian	500	Eiroa, Jorge	57, 85
Capek, Ladislav	22	Chub, Nataliia	470, 514	Culioli, Camille	144	de Jong, Carmen	279	Dobrovolskaya, Maria	35, 469	Eisenmann, Stefanie	511
Capuzzo, Giacomo	130	Chueng, Karina	340	Cupitò, Michele	115, 368	de Moraes, Caio	692	Dods, Roberta	313	Elliott, Benjamin	479
Carbonell, Arnau	277	Chvojka, Ondřej	368	Cuscó Badia, Oriol	273	De Mulder, Guy	411	Doerfler, Walter	421, 688	Ellis, Natalie	427
Carbonell-Roca, Joan	365	Cianciosi, Alessandra	322, 350	Cvjetecanin, Tatjana	178	de Neef, Wieke	277, 523	Doga, Natalia	518	Ellwart, Anika	265
Caretta, M. Nicolas	544	Ciela, Marika	395	Czebreszuk, Janusz	482, 688	de Oliveira Teixeira, Luisa	222	Doherty, Sean	529	Emanuelsson-Paulson, Therese	383
Carey, Chris	321	Cieśliński, Adam	389	Czerniak, Lech	337	de Raad, Jesper	165	Dolbunova, Ekaterina	394, 395	Emmenegger, Lea	520
Carloni, Delia	377	Çilingiroğlu, Çiler	221	Czerwinski, Sambor	337	de Roest, Karla	236, 690	Domingo Ribas, Guillem	339, 541	Engovatova, Asya	337
Caro, Joséphine	276	Cintas Peña, Marta	343	Czifra, Szabolcs	417, 495	De Simone, Claudio	202	Domingo Sanz, Ines	238	Ensor, Bradley	468
Carracedo Recasens, Robert	100	Cirelli, Enrico	530	Czonstke, Karolina	389, 544	De Smedt, Philippe	296	Donnelly, Colm	294, 438	Enzmann, Jonas	144, 296
Carrer, Francesco	528	Citter, Carlo	441, 542	Czuppon, Tamás	339	de Torres Rodríguez, Jorge	85, 379	Donoghue, Nora	491	Epimakhov, Andrey	418
Carrero-Pazos, Miguel	362, 388	Civilyte, Agne	482	Csiky, Gergely	509, 510	de Vareilles, Anne	278	Dore, Maitri	140	Erič, Miran	247, 547
Carrignon, Simon	322	Civis, Greta	294	Csippán, Péter	21	De Vincenzo, Salvatore	334	Dorison, Antoine	282	Eriksen, Berit Valentin	222
Carrion, Pablo	511	Clara, Blanchard	348			De Vivo, Caterina	265, 347	Douché, Carolyne	359	Eriksen, Marianne Hem	230
Carter, Tristan	206	Clop García, Xavier	395	D		Debels, Pauline	377	Downes, Jane	427	Ernée, Michal	504
Cartwright, Rachel	344, 524	Closa Ribera, Ariadna	463	da Hora, Juliana	322	DeBlasis, Paulo	322	Doyle, Emily	496	Erokhin, Sergey	362
Carvajal Lopez, Jose	85, 86	Cocozza, Carlo	149, 511	Da Vela, Raffaella	202, 334	Deckers, Pieterjan	22	Doyle, Ian	204, 294	Ershova, Ekaterina	537
Carver, Martin	85, 216	Coe, Heloisa Helena	340	Daems, Dries	480, 487	Deerpaul, Yadhav	350	Drak, Labib	390	Ertsen, Maurits	487
Casanova, Emmanuelle	549	Colomer, Laia	327	D'Agostini, Francesca	256	Del Fattore, Francesca Romana	259, 279	Dreibrodt, Stefan	256, 337	Escribano-Ruiz, Sergio	244, 690
Casarotto, Anita	295	Coltofean-Arizancu, Laura	489, 521, 522	Dahle, Kristoffer	179	Delacruz, Michael	334	Dreshaj, Merita	529	Espana-Chamorro, Sergio	192, 375
Casas, Lluis	440	Comendador Rey, Beatriz Pilar	503	Dahlström, Hanna	149	Delbey, Thomas	496	Drillat, Quentin	445	Espinosa, Isaac	463
Casimiro, Tania	284, 471	Connelly, Joan	322	Dal Corso, Marta	246, 256	Delgado-Raack, Selina	688	Driscoll, Stephen	542	Esteban, Irene	246
Cassard, Laura	445	Cooper, Anwen	48	Dal Zovo, Cecilia	549	Della Casa, Philippe	277	Drnić, Ivan	505	Ethier, Jonathan	379
Cassidy, Lara	468	Coppe, Justin	247	Dalen, Elin	472	Delvoye, Adrien	377, 496	Drob, Ana	351, 480	Evans Tang, Harriet	188
Cassuto, Deborah	365	Cordemans, Karl	249	DalGLISH, Chris	508	Dematte', Paola	238	Drummer, Clara	520	Evans, Christopher	48
Castanheira, Patricia	87	Cordova, Carlos	340, 537	Dalla Longa, Elisa	115	Denis, Solène	276	Druzhinina, Olga	340	Everill, Paul	101
Castellano, Lorenzo	282	Corkill, Claire	294, 347	Dall'Agnolo, Daniel	490	Denker, Ahmet	370	Duan, Qimeng	319	Evet, Rand	251
Castillo-Jiménez, Samuel	247	Corradini, Erica	296	Dalle, Sarah	48	Depaermentier, Margaux	330, 533	Dubovtseva, Ekaterina	394	Evoy, Angela	300
Caval, Saša	687	Cortell-Nicolau, Alfredo	5, 382	Damm, Charlotte	5, 222, 479	Derenne, Eve	377	Dubreuil, Laure	300		
Cecalupo, Chiara	230	Cortese, Francesca	228, 359	Dammer, Evgenia	395	Derrett, Sally	144	Duch, Michal	232	F	
Cechura, Martin	352, 438	Cosic, Natalija	180, 521	Danielisova, Alzbeta	245, 505	Detjens, Stine	321	Duffy, Paul R.	330	F. Romhányi, Beatrix	352
Celma Martínez, Mireia	143, 337	Costa, Annalisa	207	Daragan, Marina	287	Devi, Taelman	295	Dumitrache, Iulia	35	Fábíán, Szilvia	213, 480
Cembrzyński, Paweł	233, 315, 454	Costa-García, José	192	Daravigka, Klea	522	Devos, Yannick	233, 319, 342, 465	Dunning Thierstein, Cynthia	490, 495	Fallgren, Jan-Henrik	214
Chadburn, Amanda	46	Costanzo, Stefano	362	Dardeniz, Gonca	432	Dezhamkhooy, Maryam	167	Dunseth, Zachary	246	Fallu, Daniel	179
Chadraabal, Enkhtuul	379	Costello, Brian	691	Darie, Adelina	493	Di Febo, Roberta	440	Dupuy, Paula	287	Farago, Norbert	171
Chairkina, Natalya	486	Costello, Eugene	508	Daróczy, Tibor	5, 87	di Giovanni, Andrea	315	Dusseldorp, Gerrit	278	Farinetti, Emeri	130
Chalendar, Véréne	525	Coto-Sarmiento, Maria	487	Darvill, Timothy	164	Di Maida, Gianpiero	445	Duval, Hervé	273, 523	Farley, Julia	515
Chantran, Aurélie	473	Cott, Eva	249	Davara, Javier	365	Diachenko, Aleksandr	267, 341	Duval, Pauline	394		
Chapman, John	100, 518	Coupeur, Camille	473			Dias, Raphaella	251, 340	Dvoráček, Daniel	273		

	SESSION		SESSION		SESSION		SESSION		SESSION		SESSION
Farrujia de la Rosa, Jose	327, 522	Fries, Jana	100, 684	Gelabert, Pere	5	Gowen Larsen, Margaret	495			Henriksen, Merete	432
Faupel, Franziska	202	Frujina, Ovidiu	153	Gembicki, Maciej	21	Göhring, Andrea	456			Hermans, Rosalie	319
Fawsitt, Sarah	244	Fry, Megan	497	Gentile, Valerio	232, 300	Gradoli, Maria Giuseppina	34			Hermenault, Léa	350
Fecher, Franziska	441, 520	Ftaimi, Tiffany	525	Georgiou, Artemis	114, 383	Graff, Gwenola	238			Hernández Robles, Alicia	100
Fedorchenko, Alexander	205	Fuchs, Katharina	428	Georma, Fragoula	233	Graham, Ellie	97			Hernández-Casas, Yaiza	57
Fedorina, Anastasia	339	Fuerst, Sebastian	49	Gerasimov, Dmitriy	144	Grahek, Lucija	545			Herrero-Corral, Ana	381
Feeser, Ingo	337	Fuks, Daniel	16, 511	Gerling, Claudia	418	Gralak, Tomasz	172, 543			Hertz, Ejvind	144
Fejer, Eszter	482	Fulminante, Francesca	130, 202, 487	Geurds, Alexander	548	Gramsch, Alexander	409			Hessing, Wilfried	489
Fera, Martin	213	Fundurulic, Ana	346, 681	Gheorghiu, Dragos	313, 351	Gransard-Desmond, Jean-Olivier	693			Heumueller, Marion	217
Fernandes, Ricardo	130, 344	Furholt, Martin	330, 516	Ghilardi, Matthieu	321	Grant, Kevin	204			Higginbottom, Gail	388, 462
Fernandez, Eva	516	Füzesi, András	330	Ghosh, Ahana	692, 693	Grau, Ignacio	417, 513			Hilbert, Lautaro	246
Fernández, Irene Minerva	359			Giaime, Matthieu	441	Gravel-Miguel, Claudine	297, 487			Hill, David	259
Fernández-Götz, Manuel	192, 273, 344	G		Giamakis, Christos	119	Gray Jones, Amy	475, 497			Hilpert, Johanna	228
Fernández-Palacios, Enrique	465	Gaëlle, Dieulefet	441	Giannitrapani, Enrico	313	Grębska-Kulow, Małgorzata	518			Hinrichs, Moiken	222
Fernée, Christianne	505	Galán López, Ana Belén	505	Giardino, Claudio	471, 690	Green, Adam	171, 382			Hinz, Martin	421, 445
Ferrara, Vincenza	498	Galán Palomares, Laura	267	Gibbons, Michael	322	Gregorio de Souza, Jonas	487			Hjørungdal, Tove	343
Ferrer-Martín, Meritxell	34, 95	Galik, Alfred	221	Gilb, Hannah	514	Gregory, Niall	547			Hladikova, Katarina	381
Fibiger, Linda	533	Gallinaro, Marina	238, 503	Gillis, Rosalind	48	Gretzinger, Joscha	468			Hlásek, Daniel	48
Figueiredo, Sofia	503	Gameiro, Cristina	206	Ginter, Artur	48	Grguric, Maja	528			Hodos, Tamar	511
Filatova, Sofia	281	Ganiatsou, Elisavet	453	Giorgio, Marcella	530	Griffith, Jacob	529			Hodson, Martin	256
Fildhuth, Jesko	491	Garate, Diego	361	Gironès Rofes, Ivan	382	Griffiths, Mark	515			Hoer, Alexander	298
Filet, Clara	202	Garbacz-Klempka, Aldona	482	Giroto, Chiara	235, 245, 515	Grimm, Oliver	141, 188, 287			Hoernes, Matthias	298
Filioglou, Dimitrios	541	García Bustos, Paula	360	Gjerde, Jan Magne	222, 691	Grimm, Sonja	297, 684			Hoffmann, Robert	228
Filipovic, Dragana	221, 432	García Casas, David	277, 528	Gkazi, Ariadni	327	Grobe, Lars	404			Hofmann, Daniela	418, 468
Filippi, Dunia	130	García Sánchez, Jesús	295	Gleba, Margarita	287	Gron, Kurt	418			Hofmann, Kerstin	269
Finlayson, Sarah	515	García-Sánchez, Jesús	295	Glomb, Tomáš	202	Gronenborn, Detlef	228			Hofmann, Robert	330, 470
Finn, Ellen	390	García, Ana Catarina	530	Glykou, Aikaterini	462	Groom, Kaelin	503			Hohle, Isabel	172
Fischer, Claire-Elise	468	García-Collado, Maite	359	Gnecchi Ruscone, Guido Alberto	468	Groß, Daniel	217			Holata, Lukáš	179, 515
Fischer, Tom	379	García-Escárzaga, Asier	456, 462	Gobic-Bravar, Đeni	490	Großmann, Ralph	171, 228			Holguín, Amy	169
Fisher, Lynn	222	García-Fernández, Ángel-Luis	370	Godfrey, Evelyne	376	Groza, Vasilica-Monica	149, 359			Holleville, Marion	533
Fitton, Tom	281	García-Granero, Juan José	246, 256	Golánová, Petra	233	Gröcke, Darren	456			Holmqvist-Sipilä, Elisabeth	206
Flohr, Pascal	456	García-López, Arturo	49	Goldberg, Martin	521, 524	Grömer, Karina	452			Holt, Emily	34
Flores Fernandez, Carola	441	García-López, Zaira	453	Goldberg, Paul	465	Grundvad, Lars	214			Holtorf, Cornelius	495
Flyen, Anne-Cathrine	97	García-Martínez De Lagrán, Íñigo	395	Golyeva, Alexandra	340	Grunwald, Susanne	178, 521			Holyoak, Vincent	249
Foldøy, Isabella	236	García-Moreno, Carlos	346, 453	Gomart, Louise	276	Guba, Szilvia	381			Horak, Jan	454
Fonseca, Sofia	436	García-Porras, Alberto	530	Gomes Coelho, Rui	548	Guegan, Izold	152			Horn, Christian	232, 445
Fontana, Giacomo	273	García-Suarez, Aroa	319	Gomes, Francisco	49	Guillon, Mark	438			Hošková, Kristýna	251
Fonville, Thierry	427	Garcia-Ventura, Agnes	95, 522	Gomez Bach, Anna	480	Guillot, Bénédicte	473			Hostettler, Marco	520
Forgia, Vincenza	279, 541	Gardela, Leszek	691	Gonzalez Alvarez, David	528	Guimarães-Chiarelli, Silvia	513			Host-Madsen, Lene	294
Forsyth, Doug	322	Gardner, Jonathan	167	González Carretero, Lara	221, 359	Gullbekk, Svein H	172			Howard, Andy	321
Fort, Joaquim	487	Gardner, Tom	219	González Reyero, Susana	279	Gur-Arieh, Shira	246, 365			Howes, Hilary	683
Fossum, Birgitta	683	Garnier, Aline	246	Gonzalez, Joseph	515	Gurova, Maria	205, 206, 518			Hoxha, Zana	508, 524
Fouseki, Kalliopi	111	Gassiot Ballbè, Ermengol	277, 279	González-García, Antonio César	46, 453	Gustavsson, Anna	521			Hoyer, Daniel	367
Foxhall, Lin	440	Gates St-Pierre, Christian	377	Gonzalez-Marcen, Paloma	100, 327	Gutsmiedl-Schümann, Doris	236			Hölscher, David	213
Frank, Anja	456	Gaveriaux, Fanny	282	Gorgues, Alexis	114, 417	Guttormsen, Torgrim	111			Höpfer, Benjamin	228, 368
Frankovic, Filip	213	Gavranovic, Mario	482	Górkiewicz Downer, Abigail	524	Guzman, Paloma	111			Höpker, Sebastian	456
Franzmeier, Henning	114	Gawron-Szymczyk, Aleksandra	690	Goslar, Tomasz	688	Güney, Hale	691			Hristov, Pavel	518
Frascella, Selene	294	Gaydarska, Bisserka	100, 236	Gosner, Linda	34	Günther, Gerrit	297			Huber, Barbara	511
Friedmann, Jonathan	152	Gearey, Benjamin	515	Gourichon, Lionel	513	Gyuris, Balázs	412			Hudson, Mark	367
Friedrich, Matthias	416	Geary, Kate	443, 489	Gourvenec, Michaël	149					Hueglin, Sophie	140
Frieman, Catherine	468, 516	Gebremariam, Kidane	318, 501	Govantes-Edwards, David	85, 86					Huemer, Max	491

SESSION		SESSION		SESSION		SESSION		SESSION			
Huet, Thomas	238, 269	Jerbic, Katarina	144	Karoune, Emma	251	Knipper, Corina	418	Kulcsár, Gabriella	368	Legut-Pintal, Maria	281
Huggon, Martin	268	Jerem, Elizabeth	213	Karpinska, Klaudia	141	Knockaert, Juliette	528	Kulenovic, Igor	373	Legzdina, Dardega	337
Hull, Emily	100	Jesse, Friederike	205	Karpova, Julia	465	Knoop, Riemer	165	Kulow, Malgorzata	351, 518	Leichliter, Jennifer	456
Hunold, Angelika	16	Jiménez Arteaga, Carolina	462	Kasapidou, Georgia	246	Knox, Elizabeth	438	Kunze, Rene	101	Leighton, Chloe	287
Hunter, Sacha	164	Johannsen, Jens	228	Kashina, Ekaterina	188, 547	Knusel, Christopher	390	Kupriyanov, Dmitriy	537	Leite, Adriana	346
Hussain, Shumon	269, 486, 684	Johannsen, Niels	392, 493	Kasiuk, Alena	537	Knutson, Sara Ann	294	Kurila, Laurynas	412, 469	Lekka, Anna	525
Hutcheson, Andrew	367	Johansen, Iben	284	Kask, Silvia-Kristiin	412	Knüsel, Christopher	149, 390	Kurisoo, Tuuli	416	Lema Seabra, Ana	497
Hutchinson, Oliver	144	Johansson, Marianne	244	Kasten, Megan	687	Kobialka, Dawid	165	Kurzawska, Aldona	365	Lemm, Thorsten	116, 273
Hüglin, Sophie	164	Johnson, Andrew	441, 687	Katona, Csete	116	Kočár, Petr	354	Kvapil, Lynne	179	Lengyel, Dominik	153, 690
		Johnson, Paul	295	Katz, Ofir	256	Koch, Julia	343	Kvetina, Petr	377	Leplongeon, Alice	269
		Johnson, Tyler	153	Kauhanen, Riku	222	Kochman, Alicja	205	Kyle, James	489	Leroy, Gilles	143
		Jones, Andy	388	Kaur, Anubhav	205	Kohler, Tim	228, 421			Leskovar, Tamara	497, 500
		Jones, Cara	443	Kecheva, Nadezhda	476	Kok, Marjolijn	131			Lesure, Richard	238
Ibáñez, Juan	300, 513	Jones, Emily Lena	692	Keil, Jessica	16	Kolář, Jan	421			Levine, Evan	322
Iborra Eres, Maria Pilar	513	Jones, Samantha	427, 453	Keller, Marcel	468	Kolláth, Ágnes	233	La Porta, Alice	247, 300	Lewis, Carezza	165, 473
Ibsen, Timo	273	Jong-Lambregts, Nancy	463	Kelm, Rüdiger	495	Komoróczy, Balázs	156	Laabs, Julian	169, 421, 504	Lewis, Michael	22, 156
Iglic, Sara	522	Jongman, Willem	130	Kempf, Michael	330	Koncz, István	468	Lacerda, Sofia	295	L'Héritier, Maxime	501
Inanez, Javier	530	Jonuks, Tönno	188	Kendall, Iain	549	Konstantinidi, Eirini	390	Łaciak, Dagmara	480	Lidén, Kerstin	462
Inskip, Sarah	149	Joosten, Ineke	376	Kerbler, Lukas	180	Kontes, Zoe	467	Lada, Anton	269	Lillios, Katina	231
Intagliata, Emanuele	101	Joray, Sophia	368	Kerig, Tim	228, 267	Kopij, Kamil	404	Ladegaard-Pedersen, Pernille	456	Lindstrom, Torill Christine	341
Ion, Alexandra	119, 120	Jorayev, Gai	265	Kerk, Lukas	230	Korzynska, Marta	228	Laffont, Pierre-Yves	279	Lindström, Tobias	238
Iovita, Radu	269	Jorda, Guillem	282	Kerr, Sarah	268, 355, 441	Kosciuk-Zalupka, Julia	518	Lagóstena, Lázaro	295	Lipkin, Sanna	87, 438, 452
Iršenas, Marius	416	Jordan, Peter	415, 462	Keute, Jennifer	394	Kosta, Elissavet	213	Lai, Luca	34	Lisá, Lenka	465
Ivanova, Maria	278	Joyce, Rosemary	238	Khaksar, Sepideh	152	Koterova, Anezka	428	Laky, Lilian	322	Lisowski, Mik	281
Iversen, Rune	171	Judson, Anna	496	Khamnueva-Wendt, Svetlana	342	Kougia, Nickoula	267, 441	Lam, Eileen Hau-Ling	546	Lisztes-Szabó, Zsuzsa	246
Ivleva, Tatiana	131, 440	Judson, Catharine	35	Khan, Doa	476	Kouzelis, Athanasios	140	Lamb, Andrew	49	Liveri, Angeliki	95, 509
Iwaniszewski, Stanislaw	46	Juszczuk, Karolina	375, 445	Kharobi, Arwa	130	Kovacevich, Brigitte	206	Lamentowicz, Mariusz	337	Ljungkvist, John	214
Iwe, Karina	236			Khatsenovich, Arina	205	Kovács, Bianka	22	Lamotte, Agnes	500	Lo Russo, Sarah	441, 465
Izeta, Andres	476			Khokhlova, Olga	465, 537	Kovacs, Lorand	213	Lancelotti, Carla	256	Loftus, James	445, 520
				Kholkina, Margarita	377, 495	Koval, Vladimir	85, 86, 273	Lang, Franziska	404	López Barja de Quiroga, Pedro	453
				Khomiakova, Olga	389, 469	Kowalczyk, Zuzanna	153	Lang, Perry	46	Lopez Garcia, Antonio	192
				Kienzle, Peter	164, 490, 495	König, Tomáš	116	Langer, Christian	344, 370	López García, Juan Pablo	294, 693
				Kim, Jinhoh	367	Köpp-Junk, Heidi	95, 152	Langlitz, Meredith	436	López Lillo, Jordi A.	228, 404
				Kiosak, Dmytro	171, 297	Kraemer, Charles	277	Langó, Péter	116	Lopez, Giuseppa	144
				Kipke, Natascha	188	Krämer, Robinson	334	Langova, Michaela	381	López-Bertran, Mireia	49, 95
				Kirkinen, Tuija	49, 188	Krasnikova, Anna	362	Lans, Aja	517	Lopez-Bulto, Oriol	359
				Kirleis, Wiebke	340, 359	Krauskopf, Christof	57	Larsen, Clark	533	López-Costas, Olalla	453, 462
				Kishkurno, Maria	35	Kreiser, Jane	404	Larson, Greger	516	López-Tascón, Cristina	360
				Kiss, Viktória	482, 546	Kreiter, Eszter	94	Larsson, Anton	435	Lorans, Elisabeth	473
				Kjellberg, Joakim	22	Krenn-Leeb, Alexandra	368	Larsson, Birgitta	490	Lorber, Crtomir	178, 409
				Klassen, Sarah	228	Kristiansen, Kristian	521	Larsson, Lars	475	Lorente Sebastián, Paloma	298
				Klecha, Aleksandra	685	Kristiansen, Søren	144, 441	Lattard, Alexia	528	Lorzadeh, Zahra	86
				Kleijne, Jos	231	Król, Dariusz	470	Laugier, Elise	246	Lourenço Gonçalves, Pedro	321
				Kleinitz, Cornelia	95	Kroon, Erik	377, 496	Lavento, Mika	486	Louwen, Arjan	411
				Klinkenberg, Victor	179	Kroonen, Guus	171	Lavrenov, Nikita	537	Løvschal, Mette	388
				Klir, Tomas	375	Krukowska, Olga	284	Lawniczak, Marcin	688	Loy, Aida	373
				Kluger, Anne	178, 409	Krupski, Mateusz	337, 465	Lazar, Catalin	470	Loy, Anna	245, 315
				Knagenhjelm, Christoffer	244	Ktalav, Inbar	525	Lazzari, Marisa	548	Ložnjak Dizdar, Daria	381
				Knapp, A. Bernard	511	Kubiak-Martens, Lucy	359	Lbova, Liudmila	415	Lualdi, Carlo	298
				Kneisel, Jutta	222, 232	Kudelic, Andreja	690	Lecce, Lucia	298	Lucci, Enrico	282, 491
				Knight, David	97, 204	Kudryavtsev, Andrey	339	Lechterbeck, Jutta	179, 228	Luciano, Vanda Bela	204, 693

	SESSION		SESSION		SESSION		SESSION		SESSION		
Luebke, Harald	547	Margaritis, Evi	383	McCrane, Samantha	35	Miznazi, Diana	404	Musaubach, Maria	246	Niveau-de-Villedary, Ana María	95
Lukanina, Ekaterina	692	Maric, Miroslav	330	McGinnis, Meghan	172	Mizoguchi, Koji	367	Mutri, Giuseppina	35	Nixon, Lucia	295
Lukasik, Sylwia	428	Marik, Jan	495	McGovern, Thomas	355	Mlekuž Vrhovnik, Dimitrij	392, 543	Müller, Johannes	344, 470, 543, 688	Noback, Andreas	404
Lumsden, Alastair	298	Marin-Arroyo, Ana	500	McKillop, Heather	441	Mlynarczyk, Jolanta	383	Müller, Kathrin	691	Nocon, Kamila	383
Lundström, Victor	5	Marinato, Maurizio	533	McLaughlin, Rowan	492	Moedlinger, Marianne	376	Müller, Michael	514	Noergaard, Heide	482, 501
Luneau, Elise	528	Marino, Sara	480	Meadows, John	492	Moeller, Katharina	347, 544	Müller-Liedtke, Catharina	315	Nordell, Linnea	244
Lupiáñez Corpas, Natividad	529	Marinova, Elena	278, 359	Mech, Anna	416	Moen, Marianne	172	Müller-Scheeßel, Nils	428, 691	Nordez, Marilou	49
Lüdecke, Tina	456	Markiewicz, Joanna	49	Megier, Austin	152	Moetsch, Angela	417	Müth-Frederiksen, Silke	233	Nordholz, Daniela	100
Lymperaki, Marianna	221	Marom, Nimrod	21	Mehofer, Mathias	501	Moffett, Abigail	85, 281	Myers, Brett	298	Nordqvist, Kerkko	486
Lyons, Mike	235	Marreiros, João	300	Meier, Jessica	490	Moilanen, Ulla	412	Mylnikova, Liudmila	394, 395	Nordström, Annika	441
M		Marston, John	282	Mejías-García, Juan Carlos	144	Molinari, Alessandra	85, 179	Mylona, Pantelitsa	337	Nørgaard, Heide	482
Maár, Kitty	468	Martens Vandrup, Vibeke	97, 472	Mejuto, Javier	46	Molist, Miquel	207, 480	Mytum, Harold	409, 435	Nørtoft, Mikkel	171
Macane, Aija	486	Martín Civantos, José María	508	Mele, Marko	204, 213	Møller, Niels	411	Myzgin, Kyrylo	469	Nosova, Maria	537
Macdonald, Danielle	300	Martin Seijo, Maria	143	Melheim, Lene	417, 432	Molloy, Barry	114, 115			Novak, David	94, 476
Machacek, Jiri	178	Martin, Daphne	440	Melis, Eszter	381, 482	Mom, Vincent	46	N		Novakovic, Predrag	409, 436
Machado, David	340	Martin, Debra	533	Melo, Linda	231	Moncel, Marie-Hélène	247	Naglak, Matthew	153	Novichenkova, Maria	277
Maciel, Silvia	295	Martin, Janine	514	Mendizabal Sardonis, Oihane	192	Monetti, Lisa	497	Nagy, Szabolcs	57	Novikov, Vasily	362, 510
Mackay, Helen	427	Martinez, Jorge	143	Meneghetti, Francesca	383	Monforte-Barberan, Andreu	206, 207	Nakoinz, Oliver	202, 267, 513	Nowakiewicz, Tomasz	389
Maclaren, Fergus	495	Martinez, Maria	205, 206	Menelaou, Sergios	383	Montagnari Kokelj, Manuela	259	Nash, Carole	97	Nožinová, Sona	368
MacRoberts, Rebecca	346	Martins, Ana Cristina	409, 521, 522	Menendez Blanco, Andres	375	Montón-Subias, Sandra	343	Natalia E., Belousova	205	Nugent, Ruth	390
Maczek, Dušan	172	Martinsson-Wallin, Helene	427	Menne, Julia	164	Moragas, Natalia	48	Nativ, Assaf	167, 516	Nyland, Astrid	222, 479
Maczkowski, Andrej	169	Martisius, Naomi	300	Mennenga, Moritz	217	Morand, Nicolas	359	Naumov, Goce	362, 514		
Maddox, Timmis	544	Martz de la Vega, Hans	46	Mentesana, Roberta	377, 498	Mordovin, Maxim	86	Neef, Wieke	259	O	
Madella, Marco	278, 365	Martz, Anne-Sophie	491	Meo, Francesco	298	More, Alexander	511	Neff, Delphine	318	O Carroll, Ellen	249
Mader, Christian	418	Marx, Amala	476	Mester, Zsolt	500	Moree, Jelle	217	Neið, Michael	222, 501	Ó Murchú, Séamus	249
Magin, Elisabeth	382	Masek, Zsófia	282, 362	Meyer, Ann-Katrin	394	Moreno Escobar, María del Carmen	192, 377	Nejrotti, Luca	48	Ó Riagáin, Russell	86, 463
Magno, Laura	491	Mashkour, Marjan	528	Meyer, Christian	48	Moreno Megias, Violeta	192, 377	Nelson, Matthew	544	Obradovic, Djurdja	359
Mahlstedt, Svea	217, 222	Masriera-Esquerra, Clara	236, 327	Miazga, Beata	501	Moreno Narganes, José María	530	Némethi, János	339	Ochir-Goryaeva, Maria	346, 468
Maixner, Birgit	273	Massy, Ken	5, 368, 504	Michael, Dimitra	533	Moreno Padilla, María Isabel	269, 691	Nenova, Denitsa	322	Ødegaard, Marie	339
Majchczack, Bente	144, 523	Matau, Florica	395	Michael, Maria	525	Moreno Ibáñez, Miguel	390	Neri, Diana	334	Odgaard, Ulla	5, 222
Majorek, Magdalena	452	Matczak, Magdalena Domicela	149	Mickleburgh, Hayley	390, 497	Morgado-Roncal, Leyre	521	Nessel, Bianka	432, 504	Oehrl, Sigmund	141
Makarewicz, Cheryl	516, 549	Matelo Mitxelena, Suberri	294	Middleton, Guy	114	Morillo León, José Miguel	346	Neumann, Katharina	251	Oelbüttel, Merle	432
Makarov, Nikolaj	339	Mateu, Marta	207	Miera, Jan	504	Morquecho Izquier, Aarón	427	Neves, Maria João	390	Offermann, Karl Johann	389
Makowiecki, Daniel	510, 688	Matias, Jo Zalea	236	Mighall, Tim	453	Morrow, Giles	153	Newsom, Bonnie	355	Ogawa, Takuro	267
Malaxa, Daniel	282, 541	Matic, Uros	131, 343	Mihelic, Sanjin	213, 500	Moser, Daria	428	Newson, Victoria	101	Ohlrau, René	171
Malyutina, Anna	475, 685	Matsugi, Takehiko	367	Mileusnic, Zrinka	687	Moskal-del Hoyo, Magdalena	278	Niccolucci, Franco	476	Ojala, Carl-Gösta	683
Mandescu, Dragos	509	Matta, Valentina	115	Milks, Annemieke	247, 479	Moutafi, Ioanna	390	Nicosia, Cristiano	465	Oksanen, Eljas	22, 156
Manea, Bogdan	207	Matuszewska, Agnieszka	688	Millan-Pascual, Rafael	249	Moutsiou, Theodora	441	Niebieszczanski, Jakub	337, 688	Olalde, Iñigo	231
Manem, Sebastien	269, 351	Maudet, Ségolène	16, 49	Miller Bonney, Emily	515	Mozer, Jonathan	256	Nieto-Espinet, Ariadna	456, 513	Olesti, Oriol	277, 279
Mangas-Carrasco, Elvira	149	Mauritsen, Esben	523	Miller, Sarah	97	Mödlinger, Marianne	180, 318	Nikita, Efthimia	35	Olet, Lilly	217
Manigda, Olga	273	Mavromati, Antigoni	207	Millot-Richard, Clara	16	Mukhametdinov, Vadim	518	Nikita, Kalliopi	115	Olevska, Irina	180
Mannermaa, Kristiina	475, 529	Mavrovic Mokos, Janja	368	Milosavljević, Monika	178	Muller, Axel	144	Nikitin, Alexey	470	Olivé-Busom, Júlia	149
Mansrud, Anja	418	May, Keith	382	Mina, Maria	100	Munawar, Nour A.	164	Nikolova, Veronika	545	Oliveira, Cláudia	249
Marangou, Christina	514	Mayer, Simone	281	Minnich, Alexander	388	Mundo, Ignacio	143	Nilhamn, Bonnie	370, 480	Olivier, Adrian	265
March, Ramiro	207	Mayfield, Andrew	165, 347	Mino, Martin	202	Mundt, Courtney	438	Nilsen, Andrine	268	Olsen, Dag Erik	388
Marchand, Suzanne	521	Mazzilli, Francesca	202, 334	MinskyRowland, Jocelyn	462	Mungari, Pasquale Mirco	152	Nilsson Stutz, Liv	230, 341, 497	Opris, Vasile	351, 395
Marchenko, Daria	445	Mazzucato, Camilla	171	Miralda, Joaquim	365	Munoz Cosme, Gaspar	520	Nilsson, Urban	140	Oras, Ester	149
Marciniak, Arcadiusz	165	McAlister, Vicky	268	Miranda, Amy	440	Murgulia, Nikoloz	101	Nimura, Courtney	48	Ordóñez, Alejandra	505
Margarit, Monica	440	McAtackney, Laura	544	Mircea, Cristina	235	Murphy, Eileen	438	Niskanen, Markku	509	O'Regan, Hannah	188
		McClain, Aleksandra	473	Misterek, Kathrin	373	Murray, Emily	97	Nitzschke, Diana	294	Orellana Figueroa, Jordy	205, 445
		McClatchie, Meriel	278, 435	Mittnik, Alissa	511						

SESSION		SESSION		SESSION		SESSION		SESSION			
Orendi, Andrea	359	Paulos-Bravo, Rodrigo	377	Piper, Stephanie	479	Psonis, Nikolaos	504	Reitmaier-Naef, Leandra	368	Romaniszyn, Jan	362
Orfanou, Vana	114, 115	Paulsen, Charlotte	165, 347	Pirata, Vânia	206	Puppo, Paola	691	Relvado, Cláudia	346	Romankiewicz, Tanja	355
Orlando, Andrea	46	Pawleta, Michal	178	Pisanu, Laura	34	Pustovoytov, Konstantin	456	Remise, François	273	Romanowska, Iza	487
Orlowska, Justyna	300	Pazienza, Annamaria	350	Pizzato, Fedra Alessandra	521	Pümpin, Christine	319	Rendu, Christine	179	Romero Mayorga, Claudina	152
Oross, Krisztián	330	Pazos García, Rocío	690	Pizzuti, Elisa	504	Pydyn, Andrzej	244	Renette, Steve	528	Ronin, Marguerite	192, 453
Orsini, Celia	214	Peake, Rebecca	432	Plankajs, Eduards	492	Pyrgaki, Marie	341	Rennwanz, Joanna	354	Rose, Alice	149
Ortega, María Jesús	681	Pearce, Mark	245	Plavinski, Mikalai	273	Pyzel, Joanna	221	Reppo, Monika	515	Rose, Helene	411, 492
Ortman, Oscar	244	Pears, Ben	179, 427	Plekhov, Daniel	179	Pyzewicz, Katarzyna	205	Ressel, Christian	379	Rose, Nicole	287
Ortman, Scott	202	Pecci, Alessandra	681	Plumb, Oisín	214			Reuter, Tobias	269	Rose, Thomas	245, 318
Orton, David	21	Pedersen, Jesper	269, 297	Plutniak, Sébastien	267, 269, 382			Revelles, Jordi	427	Rosenstock, Eva	21, 221, 428
Ospina, Juan	497	Pedersen, Patrick	300	Podenas, Vytenis	273, 359			Ribeiro, Artur	119, 120, 341	Roshem, Irmine	97
O'Toole, Karen	217	Peeters, Susan	500	Poehler, Eric	281			Ricardo, Sarah	256	Rosso, Daniela	360
Out, Welmoed	143, 246, 251	Peinetti, Alessandro	207, 313	Pohl, Per-Ole	273			Ricci, Andrea	528	Rouco Collazo, Jorge	85
Ozbal, Rana	480	Pelisiak, Andrzej	337	Poigt, Thibaud	16, 417, 520			Rice, Mnemosyne	440	Rouse, Lynne	549
Ögüt, Birgül	246, 365	Pellinen, Hanna-Maria	339	Poland, Ged	281			Richards, Julian	476	Roushannafas, Tina	278
		Penton, Sharon	318	Polányi, Tamás	546			Richardson, Philip	294	Roxburgh, Marcus Adrian	501
		Pera, Cristina	480	Polet, Caroline	509			Richter, Tobias	171	Roy, Amber	300
		Pereira, Paula	435	Polkowski, Pawel	238			Riede, Felix	269, 297	Röding, Carolin	500
		Pereira, Telmo	500	Pollini, Airton	298			Ries, Marie-Claire	547	Rönn, Magnus	140
		Perelló Mateo, Laura	417	Polo-Díaz, Ana	277, 319, 342			Riesenber, Martin	418	Röser, Christian	284
		Pereskokov, Mikhail	537	Ponkratova, Irina	415			Riethus, Anna	490, 500	Ruf, Kim	691
		Pérez González, Jordi	445	Ponomarenko, Elena	537			Riis Andresen, Jens-Bjørn	544	Ruhl, Erika	440
		Pérez-Aguilar, Luis-Gethsemaní	295	Ponomareva, Irina	361			Rimkus, Tomas	415	Ruiz, Joaquim	207
		Perez-Juez, Amalia	207	Pope, Rachel	348			Rindlisbacher, Laura	533	Ruiz-Giralt, Abel	359
		Perna, Simona	440	Popescu, Gabriel	470			Ringbauer, Harald	511	Runge, Mads	233
		Perrin, Thomas	382	Popovici, Mariana	149, 690			Rinne, Christoph	428, 691	Ryabogina, Natalia	282, 537
		Peruzzi, Bice	298	Porr, Martin	479, 684			Rios-Garaizar, Joseba	247	Ryan-Despraz, Jessica	171, 235
		Petan, Aurora	344	Portat, Émilie	438			Rivers, Ray	377	Rybin, Evgeny	415
		Peters, Manuel J.H.	318, 681	Portillo, Marta	207, 277, 279, 319			Rivollat, Maïté	5, 468	Rzepiela, Michał	463
		Peterson, John	495	Porto, Nuno	517			Roalkvam, Isak	144		
		Petiti, Emmanuele	428	Posch, Caroline	206, 684			Robak, Zbigniew	116, 352		
		Peto, Ákos	319, 340	Posth, Cosimo	412			Robb, John	149		
		Petraru, Ozana-Maria	359, 390	Potrebica, Hrvoje	545			Robertson, David	143, 249		
		Petrauskas, Gediminas	469	Poulain, Maxime	244			Robin, Vincent	249, 337		
		Petridou, Chryssi	359	Power, Robert	246			Robinson Wild, Esther	489		
		Petschko, Irene	520	Praet, Estelle	167			Robinson, Rhonda	204		
		Petzschmann, Ulf	284	Prassolow, Jaroslaw Aleksei	188, 339			Robinson, Ted	298		
		Peyroteo Stjerna, Rita	497	Pravidur, Andrijana	545			Rocha da Silva, Thais	313		
		Pfeiffer, Annalena	688	Predovnik, Katarina	284			Rodil, Kasper	500		
		Phillips, Reanna	546	Preoteasa, Constantin	470, 514			Rodinkova, Vlasta	537		
		Piccardi, Eliana	375, 427	Prew, George	348			Rodler, Alexandra	511		
		Pichler, Sandra L.	390	Price, Henry	235			Rodrigues, Felipe	300		
		Pichon, Blaise	279	Prijatelj, Agni	465			Rodríguez del Cueto, Fernando	362		
		Pickel, David	350	Prištáková, Michaela	520			Rodríguez, Alice	300		
		Picornell-Gelabert, Llorenç	143	Proctor, Lucas	281			Rodríguez-Antón, Andrea	46		
		Piezonka, Henny	479, 486	Profantová, Nadezda	510			Roesler, Katja	445		
		Pigiére, Fabienne	529	Proffitt, Tomos	300			Rogers, Dylan	440		
		Piliciauskas, Gytis	418	Prusaczyk, Daniel	375			Rogers, John	152		
		Piliciauskiene, Giedre	188, 509	Pruvost, Melanie	5, 468			Rohiola, Ville	156		
		Pilkauskas, Mindaugas	144	Przybyl, Agnieszka	354			Rohland, Hendrik	379		
		Pincé, Possum	296	Psallida, Maria	546			Romagnoli, Francesca	500, 543		

SESSION		SESSION		SESSION		SESSION		SESSION		SESSION	
Samuels, Jeffrey	513	Schreiber, Tanja	486	Silva, Filipa	390	Speciale, Claudia	313, 418, 498	Syrbe, Daniel	379	Toreld, Christina	244
Sánchez García, Agustín	508	Schreurs, José	249	Silva-Sánchez, Noemí	337, 453	Spencer, Helen	473	Syrovatko, Alexander	537	Torfin, Tobias	5
Sánchez Moral, Carmen María	377	Schulting, Rick	48	Silver, Minna	370	Spiteri, Cynthianne	365	Szczepanik, Pawel	141	Tornero, Carlos	21
Sánchez Muñoz, Daniel	152	Schulrich, Sebastian	392, 493	Simcenka, Edvardas	529	Spros, Rachèl	35	Szécsényi-Nagy, Anna	468	Torres Gomariz, Octavio	236
Sanmark, Alexandra	214	Schumacher, Mara	491	Simmons, Charles	5	Srivastava, Aayush	179	Szeverenyi, Vajk	115, 546	Torv, Mari	412, 492
Santeramo, Riccardo	228	Schunk, Lisa	300	Simões, Sara	471	Stafseth, Terje	214	Szigli, Kinga	222	Tóth, Boglárka	116
Santiago-Marrero, Carlos	491	Schuster, Jan	469	Sinclair, Anthony	153, 521	Stagno, Anna Maria	179, 277, 279, 508	Szilagy, Kata	120, 330	Tóth, Peter	276
Santos da Rosa, Neemias	360, 361	Schülke, Almut	486	Sindbæk, Søren	442	Stäheli, Corinne	520	Szilágyi, Márton	330	Tottman, Walker	167
Santos, Cátia	340	Schwarzberg, Heiner	368	Sirkin, Annika	339, 389, 416	Stamataki, Elisavet	497	Szmyt, Marzena	482, 688	Toulouse, Catherine	213
Saorin, Carme	207	Schwenzer, Gerit	330	Sisa-López de Pablo, Joaquim	207	Stamatopoulou, Vasiliki	525	Szocs, Peter Levente	22	Trapero Fernández, Pedro	295, 690
Saridaki, Niki	377	Scopacasa, Rafael	298	Sitdikov, Ayrat	85	Stamerra, Laura	202	Szubska, Magdalena	509	Trautmann, Bernd	428
Saripanidi, Vasiliki	348	Scott Cummings, Linda	326, 359	Šitnerová, Ivana	179	Stamnes, Arne	144	Szubski, Michal	143, 362	Travé Allepuz, Esther	445, 530
Sasse-Kunst, Barbara	409, 521	Scutt, Win	373	Sjöblom, Rolf	273	Standley, Eleanor	230			Trein Salgado, Eduardo	340
Sastre, Inés	228	Seferidou, Eleni	505	Sjögren, Karl-Göran	523	Staniuk, Robert	120, 432	T		Tremeaud, Caroline	348
Saura Gil, Pedro José	231	Segschneider, Martin	523	Skeates, Robin	277	Stanton, Emily	348	Taloni, Maria	49	Trentacoste, Angela	282, 513
Save, Sabrina	144, 453	Séguy, Isabelle	428	Skoglund, Peter	48	Stark, Karen	22	Tambets, Kristiina	412	Trimmis, Konstantinos	179, 505
Savic, Ružica	690	Seland, Eivind	202	Skorna, Henry	232	Stark, Sarah	505	Tapavicki-Ilic, Milica	476	Trinder, Ermelinda	49, 691
Sawicki, Jakub	22	Selsvold, Irene	691	Skourtanioti, Eirini	511	Starski, Michal	22, 284	Taranto, Sergio	480	Trinks, Immo	144
Sayer, Faye	347	Seppänen, Liisa	542	Škrkulja, Rosana	547	Staubli, Thomas	152	Tarbay, János Gábor	232	Trolle, Tine	389
Scaffidi, Beth	315	Serbe, Benjamin	504	Sleptsova, Anastasiia	35	Stead, Stephen	260	Tarlow, Sarah	230	Troncoso, Andres	361
Scaro, Agustina	359, 377	Serin, Ufuk	467	Sliesariiev, Yevhenii	205	Steel, Louise	440	Tarongi, Miguel	359	Tsakanikou, Peny	297
Scarsella, Elena	35, 315	Serino, Marco	298	Sloane, Barney	94	Stefan, Ivo	352	Tasca, Giovanni	207	Tsouparopoulou, Christina	525
Schaefer-Di Maida, Stefanie	381, 411, 432, 445	Serra, Anna	691	Slusarska, Katarzyna	222	Stefanski, Damian	500	Taylor, Barry	486	Tuovinen, Saara	87
Schaer, Andrea	233	Serrano Aranda, Claudia	690	Smallman, Rebecca	141	Steinforth, Dirk	687	Teetaert, Dimitri	276	Turek, Jan	343, 392
Scharl, Silvine	418	Servera-Vives, Gabriel	427	Smid, Katarina	687	Stepanova, Ksenia	415	Teira-Brión, Andrés	453	Turley, Cameron	355
Schattke, Constanze	517	Seuru, Samuel	297	Smith, Elizabeth	267, 341	Steuri, Noah	346, 379	Teixeira, André	530	Turnbull, Molly	246
Schauer, Michaela	489, 690	Sevara, Christopher	179, 402	Smith, Kevin	268	Stiles, Elena	340	Teräväinen, Helena	140	Turner, Daniel	273
Schepers, Mans	219	Shalapinin, Anton	546	Smith, Michele Hayeur	365	Stobbe, Astrid	537	Terna, Stanislav	470, 514	Turner, Sam	179
Scheyhing, Nicola	236	Shatilo, Liudmyla	470, 514	Smith, Stefan	418	Stobiecka, Monika	153	Tescione, Teresa	321	Türkcan, Ali Umüt	171
Schimerová, Eva	445	Shay, Talia	120	Smuk, Ana	178	Stockhammer, Philipp	468, 511	Teska, Sebastian	688	Twomey, Carolyn	438
Schirmmacher, Julien	231	Shcherbakov, Nikolai	282, 409	Smyth, Jessica	217	Stoddart, Simon	315, 367	Thaler, Ulrich	300	Tykot, Robert	206, 498
Schirru, Davide	34	Sheridan, Alison	388	Snape, Lisa	179	Stolpnikova, Ekaterina	537	Tharandt, Louise	297	Tys, Dries	214, 473
Schlegel, Valery	525	Shindo, Lisa	143	Sne, Andris	522, 524	Stomberg Lund, Cajsa	95	Theodor Aurelian, Ignat	164	Tyson, Rebecca	473
Schlicht, Jan-Eric	231, 245	Shingiray, Irina	85, 86, 510	Snoeck, Christophe	497	Strang, Sheridan	533	Theodoraki, Danai	144		
Schmid, Magdalena	462	Shiroishi, Tetsuya	359	Sobkowiak-Tabaka, Iwona	354	Stratigos, Michael	219	Theodoridou, Maria	130	U	
Schmidt, Isabell	5, 297	Shiroukhov, Roman	389, 492	Soddu, Ottaviana	373	Strehlau, Hannah	416, 687	Theodoroudi, Eleftheria	505	Uchiyama, Junzo	462
Schmidt, Jens-Peter	469	Shishlina, Natalia	287, 549	Sola, Giulia	265	Strobel, Michael	249	Theune, Claudia	57	Uhl, Regina Anna	514
Schmidt, Sophie	156	Shnaider, Svetlana	549	Solodeynikov, Alexey	360, 361	Strohm, Steffen	130	Thilakanayaka, Vidusanka	340	Uhlig, Tobias	359
Schmidtova, Dominika	130, 533	Shriver-Rice, Meryl	453	Sommella, Virginia	530	Stromberg, Caroline	251	Thomas, Ben	436	Uleberg, Espen	476
Schmidts, Thomas	16	Shumilovskikh, Lyudmila	143, 337	Sommer, Ulrike	330	Strózyk, Mateusz	482	Thomas, Suzie	156	Ulguim, Priscilla	497
Schmölcke, Ulrich	188	Shydlovskiy, Pavlo	479	Sørensen, Casper	228	Ströbl, Regina	452	Thurston, T L	524	Unsain, Dianne	359
Schmölzer, Astrid	471	Sieckmeyer, Kristina	525	Sorensen, Marie Louise Stig	48	Stümpel, Anna-Elisa	510	Tierney, John	294	Unt, Agnes	326
Schneeweiß, Jens	232, 273	Siegenthaler, Sarah	119	Sosic Klindzic, Rajna	330	Sudol-Procyk, Magdalena	205	Timonen, Riia	5	Uribe Chinen, Claudia	517
Schneidhofer, Petra	296	Siennicka, Malgorzata	365, 432	Sotgia, Agostino	282, 297	Suméra, Franck	279	Tkach, Evgenia	685	Usadel, Marie	313
Schoenenberg, Jonathan	297	Sierra, Alejandro	21	Søvsvø, Morten	523	Sutiagina, Natalia	522	Tkachova, Mariya	394, 685	Uytterhoeven, Inge	491
Scholz, Roman	330	Sigari, Dario	360	Sozer Kolemenoglu, Selma	692	Sutton, Robert	164	Tkalcec, Tatjana	22		
Schoop, Ulf-Dietrich	171	Sigl, Johanna	402	Sörman, Anna	417	Svensson, Andreas	16, 49	Tollefsen, Emma	390	V	
Schotsmans, Eline	390	Sikk, Kaarel	487	Spangen, Marte	442	Svensson, Eva	339	Tomanova, Pavla	463	Väisänen, Teemu	691
Schön, Frerich	34	Sikora, Jerzy	22, 273	Spanou, Nikolia	691	Swallow, Rachel	463	Tomczak, Sonia	153	Vadillo Conesa, Margarita	462
Schreg, Rainer	228	Silva Gago, María	543	Spataro, Michela	351, 394, 395	Sweeney, Luke	344	Tomé, Laura	465		
Schreiber, Finn	549	Silva, Fabio	46	Spatzier, Andre	368	Swift, Jillian	359				

SESSION		SESSION		SESSION	
Valdez-Tullett, Joana	503	Videiko, Mykhailo	94, 470	Werther, Lukas	473
Valente, Rossana	491	Vila, Oriol	277, 453	Weski, Timm	547
Valenzuela-Lamas, Silvia	513	Vilarinho, Gil	295, 463	Wessman, Anna	156, 230
Valiulina, Svetlana	86	Vilmercati, Melissa	222	West, Catherine	355
van den Berg, Mathilde	230	Vincent, Vaiana	284	Westmont, V. Camille	233, 265, 347
van den Berghe, Kasper	326	Vindrola Padros, Bruno	167, 377	Whatley, Stuart	441
van den Dries, Monique	294	Vintar, Anja	544	White, Hilary	141
van der Jagt, Inge	94	Vis, Benjamin	245	White, Jessica	149
van der Meulen-van der Veen, Berber	318	Visocka, Vanda	273	White, Sina	344
van der Stok, Janneke	318, 501	Vitezovic, Selena	171, 518	Whitefield, Andrew	521
van Dijk, Joyce	359	Vlach, Marek	5, 487	Whitehouse, Nicki	48, 278, 282
van Helden, Daniël	235	Vlachou, Aphrodite	691	Whitford, Brent	520
van Leusen, Martijn	179, 295	Voisin, Jean-Luc	500	Wholey, Heather	97
Van Londen, Heleen	165	Vokotopoulos, Leonidas	179	Wickler, Stephen Kent	427
Van Maldegem, Elliot	344	Von Rüden, Constance	313	Wieckowska-Lüth, Magdalena	296
Van Schaik, Katherine	428	Vondrová, Hana	149	Wiethold, Julian	337
Van Staevel, Jean-Pierre	279	Voronova, Ariadna	268	Wigg-Wolf, David	469, 471
van Zon, Marleen	337	Voss, Hans-Ulrich	469	Wild, Markus	547
Vandam, Ralf	295, 296	Vostrovská, Ivana	354	Wilk, Stanislaw	330
Vander Linden, Marc	344, 516	Voulgari, Evangelia	351	Wilkes, Fynn	228
Vandkilde, Helle	114, 115	Voutsaki, Sofia	35	Wilkins, Brendon	153, 427
Vanzetti, Alessandro	34, 115	Vrettou, Irene	381	Willems, Annemarie	495
Vaquero, Pablo	153, 313	Vrydaghs, Luc	251, 319	Wilson, Lucy	206
Varalli, Alessandra	456, 513	Vukovic, Jasna	436, 496	Wilton, Antje	373
Väre, Tiina	87, 452	Vyazov, Leonid	232, 537	Windle, Morgan	486, 541
Vařeka, Pavel	165	Vybornov, Alexander	394, 462	Wink, Sarah	383
Vargha, Mária	22			Winter, Rachel	525
Vasile, Diaconu	273	W		Winter-Schuh, Christine	456
Vasile, Gabriel	346	Wadyl, Sławomir	389	Wirth, Stefan	417
Vasiliauskaite, Asta	318	Wager, Emma	690	Witcher, Robert	230
Vautrin, Adeline	528	Waldhart, Elisabeth	167, 172	Witte, Frauke	284
Vazquez Fiorani, Agustina	690	Walker, Samuel	141	Wittenberger, Mihai	432
Vegh, Emese	390	Walsh, Kevin	179, 219	Wittmann, Sarah-Julie	509
Veiga-Rilo, Clara	149, 171	Walsh, Matthew	172	Wiznura, Adam	334
Velios, Athanasios	260	Wang, Xiaoran	221	Wojnar, Joanna	143
Vendome-Gardner, Charlotte	503	Wärmländer, Sebastian	501, 693	Wojtecki, Jakub	509
Verbrugghe, Geert	473	Warren, Graeme	479, 684	Wollentz, Gustav	294
Verdellet, Cécile	377	Wathen, Crista	505	Woloszyn, Marcin	375
Vergidou, Chryssa	497	Watson, Sadie	94	Wouters, Barbora	441, 465, 542
Verhagen, Philip	5, 487	Wawrzieniuk, Joanna	362	Wright, Holly	476
Verhegge, Jeroen	144, 296	Wazny, Tomasz	143	Wright, Joshua	549
Vermeersch, Shyama	282	Weber, Mara-Julia	462	Wright, Parrish	298
Verschuur, Marjolein	94	Webley, Robert	473	Wroth, Kristen	319
Vesakoski, Outi	412	Webster, Lyndelle	114	Wu, Rubi	169
Veselka, Barbara	428	Wehren, Helena	206	Wunderlich, Maria	120
Veys, Fanny	517	Weiberg, Erika	114	Wynne-Jones, Stephanie	281
Vicens-Saiz, Laura	480	Weide, Alexander	278		
Vicenzutto, David	344	Welty, Shannon	497	X	
Victor, Megan	355	Wennberg, Tom	284	Xanthopoulou, Vayia	496
Vidal Lorenzo, Cristina	95, 236	Werra, Dagmara H.	205	Xiradakis, Polyna	111, 370
Videiko, Mariia	214, 463				

Y

Yamasaki, Mari	525
Yang, Xun	337
Yasur-Landau, Assaf	114, 115
Yaworsky, Peter	297
Ylimaunu, Timo	693
Ystgaard, Ingrid	144

Z

Zágorhidi Czigány, Bertalan	116
Zagurskyte, Aurelija	188
Zak, Claire	334, 511
Zamelska-Monczak, Kinga	690
Zaneri, Taylor	350
Zanina, Oksana	256
Zapolska, Anna	389
Zarzuela, Paloma	327, 522
Zastrozhnova, Evgenia	690
Zavagno, Luca	530
Zavodny, Emily	529
Zavyalov, Vladimir	501
Zear, Asem	86
Zelentsova, Olga	116
Zeman, Piotr	114, 315
Zeman-Wisniewska, Katarzyna	383
Zeviani, Camilla	315, 513
Zeyfer, Vladimir	86
Zhao, Pengzhi	179
Zhou, Junjie	440
Zhushchikhovskaya, Irina	394
Ziegler, Michael	529
Zimina, Oksana	537
Zimmermann, Andreas	228
Ziólkowski, Mariusz	46, 548
Zissu, Boaz	438
Živaljevic, Ivana	48
Živkovic, Jelena	86
Zotkina, Lydia	360, 361
Zotti, Georg	46
Zubrow, Ezra	341, 521
Zurkiewicz, Danuta	482
Zscheschang, Christian	375