

# VIVERE MILITARE EST

FROM POPULUS TO EMPERORS - LIVING ON THE FRONTIER  
VOLUME I

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## **CRAFTSMANSHIP ON THE MIDDLE DANUBE LIMES\***

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### **ABSTRACT**

*The Roman army required large quantities of different objects for daily-use and it was an important consumer and producer of diverse craft goods, such as everyday tools, clothing items, vessels for storage, cooking and consumption, luxury personal items, and many more.*

*The Limes regions in Pannonia Inferior and Moesia Superior had an important role in the economic and political life of these provinces, because of the permanent presence of the Roman army and state administration, and also thanks to the convenient geographical position and numerous natural resources. Along with the establishment of the Roman government in the Pannonia Inferior and Moesia Superior, diverse goods from different parts of the Empire began to arrive, and craft production by Roman standards was established in the borderland areas as well. At the same time, autochthonous, traditional techniques of production were not neglected. In this paper, we will offer a brief overview of the archaeological and epigraphic evidence for craft production of objects made from clay, stone and bone raw materials, related to the Limes on the present-day territory of Serbia (Roman provinces of Pannonia and Moesia Superior).*

**KEYWORDS: CRAFT PRODUCTION, WORKSHOPS, CRAFTSPERSON, CERAMIC TECHNOLOGY, STONE OBJECTS, BONE TECHNOLOGY, ROMAN PERIOD, LATE ANTIQUITY**

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\* This paper results from the projects: Romanisation, urbanisation and transformation of urban centres of civil, military and residential character in Roman provinces in the territory of Serbia, no. 177007 and Archaeology of Serbia: cultural identity, integrational factors, technological processes and the role of the central Balkans in the development of the European prehistory, no. OI 177020, funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

## INTRODUCTION

The Limes regions in *Pannonia Inferior* and *Moesia Superior* had an important role in the economic and political life of these provinces, because of the permanent presence of the Roman army and state administration, and also thanks to the convenient geographical position and numerous natural resources.<sup>2</sup> Main economic activities of the provinces formed along the Danube on the territory of the present-day Republic of Serbia (*Pannonia Inferior*, *Moesia Superior*) were agriculture, craftsmanship, woodworking, exploitation of stone quarries and metal mines, and most prominently trade on the navigable Danube, along with its tributaries, which enabled transport (inflow and outflow of different products) into numerous parts of the Roman Empire.

The process of building the Limes on the Middle Danube began in the end of the 1<sup>st</sup> century BC, with Roman domination being established in *Pannonia* and with the integration of autochthonous tribes of *Breuci*, *Amantini*, *Scordisci*, *Cornacatae*, and others, into the new system of economic, political and religious life.<sup>3</sup> Along with the establishment of the Roman rule on the territory of *Moesia*, from the time of the Julio-Claudian dynasty, the processes of adaptation of autochthonous Celtic, Daco-Mysian and Illyrian tribes began. At the same time, populations from different parts of the Empire settled in the area. Works on the infrastructure and the construction of the security points for the defence of the Empire in the vulnerable areas, such as the Iron Gates region, were particularly extensive and demanding. Numerous army troupes from *Moesia* and other provinces were enlisted here under the patronage of Roman emperors, especially Claudius, Tiberius, Domitian and Trajan. There are numerous literary and pictorial testimonies on these events (tables of Tiberius and Claudius about the road construction in the Iron Gates, Table of Trajan, Column of Trajan, etc.).

With the establishment of the Roman government in *Pannonia Inferior* and *Moesia Superior*, diverse goods from different parts of the Empire started to arrive to the area of the Danubian valley. Also, craft production by Roman standards began in the borderland areas, either by bringing experienced craftsmen among

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<sup>2</sup> Korać et al. 2014, 87.

<sup>3</sup> Dautova Ruševljan, Vujović 2006, 4, map I.

the locals, or when local craftsmen tried to copy high-quality Roman products. At the same time, autochthonous, traditional techniques of production were not neglected, judging by ceramic and other products.

The province of *Moesia Superior* was known first and foremost for mining activities, but also agricultural production and diverse crafts, given the diversity and richness of the raw materials available. Within large urban centres there were *collegia*, organisations of different craftsmen who took care of guild development, employees' status, and also took care of their members and their families in the case of death or poverty.<sup>4</sup> On the territory of the legionary cities of *Singidunum* and *Viminacium*, a smaller number of *collegia* is confirmed by epigraphic record.<sup>5</sup> In the vicinity of *Singidunum*, in the mining area of the mountain Kosmaj, during the 2<sup>nd</sup> – 3<sup>rd</sup> century, organisations of artisans or artists (*collegium fabrum*)<sup>6</sup> existed and also an organisation of workers who collected and recycled old materials (*collegium centonariorum*).<sup>7</sup> According to preserved monuments, these were richer members of the Romanised population. A fragment of a votive sculpture is known from *Viminacium*, probably dedicated to the goddess Annona, on which a *collegium* from the territory of the city is mentioned,<sup>8</sup> most probably linked with sailors (*nautae, navicularii*), who took care of supplies for army.

The limited epigraphic corpus gives us information about the existence of some crafts, i.e., about the activities of artisans and craftsmen along the Danube limes. A certain *Aurelius Crescentio, lapidarius*, is known to us, from *Singidunum*, who practised stone working in the end of the 3<sup>rd</sup> and early 4<sup>th</sup> century.<sup>9</sup> In the end of the 4<sup>th</sup> century, in Guberevac, a cloth merchant, *lentiararius Theodulus* was

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4 Joshel 1992.

5 A total of four *collegia*, three from the territory of *Singidunum* and one from *Viminacium* – which is the consequence of insufficient research of the sites in *Moesia*. In comparison, numerous organisations (economic and religious) were registered at certain sites in *Asia Minor*: 78 in *Ephesos*, 52 in *Saittai*, 79 in *Smyrna*, 24 in *Miletos*, etc. Cf. Arnaoutoglou 2002, 29-30.

6 Dušanić 1976, 123-124, no. 95; S. R. Joshel assumes that the general term *fabrum* refers mainly to masons and carpenters (Joshel 1992, 177).

7 Dušanić 1976, 136-137, no. 121; Joshel 1992, 177 - patchwork maker, ragman.

8 This monument was found in the village of Kličevac, to the east from *Viminacium*, in 1960. Mirković 1986, 85, no. 49.

9 Mirković 1976, 50, no. 11.

active.<sup>10</sup> In Smederevo – *Vinceia* or in *Viminacium*, a freed slave *C. Refidius Euty-chus* produced silver objects (*faber argentarius*) in the first half of the 2<sup>nd</sup> century,<sup>11</sup> while a certain *P. Aelius Valerianus* made clothes (*vestiarius*) for the local market during the 2<sup>nd</sup>–3<sup>rd</sup> century.<sup>12</sup> The presence of masons active on the territory of *Viminacium* is confirmed by an incised inscription on a large brick, mentioning a group of *artifices*, who did their work in the glory of God.<sup>13</sup> Those were probably builders who worked on the construction of the *domus ecclesiae* in *Viminacium* in 4<sup>th</sup>–mid 5<sup>th</sup> century, at an unknown location.<sup>14</sup>

In this paper, we will analyse aspects of the local production of ceramic, stone and bone objects, for which there are testimonies along the Limes in *Pannonia Inferior* and *Moesia Superior*.

## PRODUCTION OF CERAMIC OBJECTS

Production of diverse clay objects – vessels, lamps, toys, cult objects, weights and other utensils – was very important in the Roman times in the areas of the Danubian valley and lower parts of the valley of the river Sava. Roman ceramic production represented one of the most important economic activities, which was in expansion and reached high technological level.<sup>15</sup>

During the first phase of the government establishment, the Romans did not force the Romanisation of the local inhabitants, especially in peregrine communities. Perhaps the best example for this would be the case of Stari Slankamen – *Acumincum*, which was administrative *civitas peregrina* for a long time, all the way to the 2<sup>nd</sup> century, as shown by an inscription by *Titus Flavius Proculus*, who was *princeps praefectus Scordischorum*.<sup>16</sup> In the archaeological sense, the finds of ceramic vessels from the 1<sup>st</sup> century from *Acumincum* show that the Romanisation

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10 Dušanić 1974, 93-105; *Idem* 1976, 152-153, no. 156.

11 Mirković 1986, 121-122, no. 93.

12 Mirković 1986, 74, no. 29.

13 Mirković 1986, 177, no. 216.

14 More about this inscription *cf.* Jeremić, Ilić, this volume; Gargano 2016, 18.

15 Brukner 1987, 27.

16 Brukner 1987, 29, note 11.

process in the first decades of the Roman rule did not take prevail, because both autochthonous and imported pottery can be found, without transitional Roman forms – such as the ones from Romanised communities like *Sirmium*.<sup>17</sup> As a leading city, *Sirmium* had reached a high level of Romanisation already in the mid-1<sup>st</sup> century, mainly thanks to the regulation of the water flow and organisation of navigation on the Sava river. This enabled safe and cheap transport of ceramic products from distant markets.<sup>18</sup> Commerce and transport were, therefore, tightly linked with the development of the ceramic production. The distribution of the ceramic vessels provides data not only on the directions of the commercial flows, but also on food habits that were adopted or inherited from previous periods.<sup>19</sup>

The finds of numerous ovens provide information on the craft production of ceramic vessels in *Sirmium*. They were registered on three locations near the stream of Čikaš, in the area of city necropoles. To the earliest horizon comprehends kilns where vessels were made in late LaTène traditions and those were mainly storage vessels (*pithoi*, *dolia*). Since the Flavian period, there is evidence of the production of the forms in the LaTène tradition (S-profiled bowls, bowls with inverted rim) and early Empire forms (bowls with thin walls decorated with barbotine technique, Romanised early Empire bowls) (Fig. 1).<sup>20</sup> Within this horizon, 19 kilns were discovered, dug into virgin soil, with circular base, diameter of 1,0-2,0 m, with latticed bracket and clay calotte (Fig. 2-3).

Single or multiple ceramic kilns have been discovered along the Danube Limes, suggesting local production, on the territories of *Singidunum*, *Margum* and *Viminacium*. Workshops that produced luxurious examples of table pottery of *terra sigillata* type were identified with certainty in *Margum* and *Viminacium* by the presence of moulds. These workshops also produced vessels for everyday use, as well as diverse popular forms of lamps. Kilns from *Singidunum* were producing everyday ceramic vessels of the standard Roman typological repertoire.

The production of ceramic and brick items at *Singidunum* played an important role in the economy of the city and the region. The finds of a larger number of kilns indicate the presence of several workshops, perhaps even a large municipal

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17 Brukner 1987, 29-30.

18 Brukner 1987, 33, Pl. 1.

19 Brukner 1987, 28.

20 Brukner 1987, 33, Pl. 10, T. XI, 1, 2, 4; Pl. 2; Premk 1991, 364, fig. 2.



Fig. 1. *Sirmium*, pottery vessels from the kiln (after Brukner 1987, T. 10).

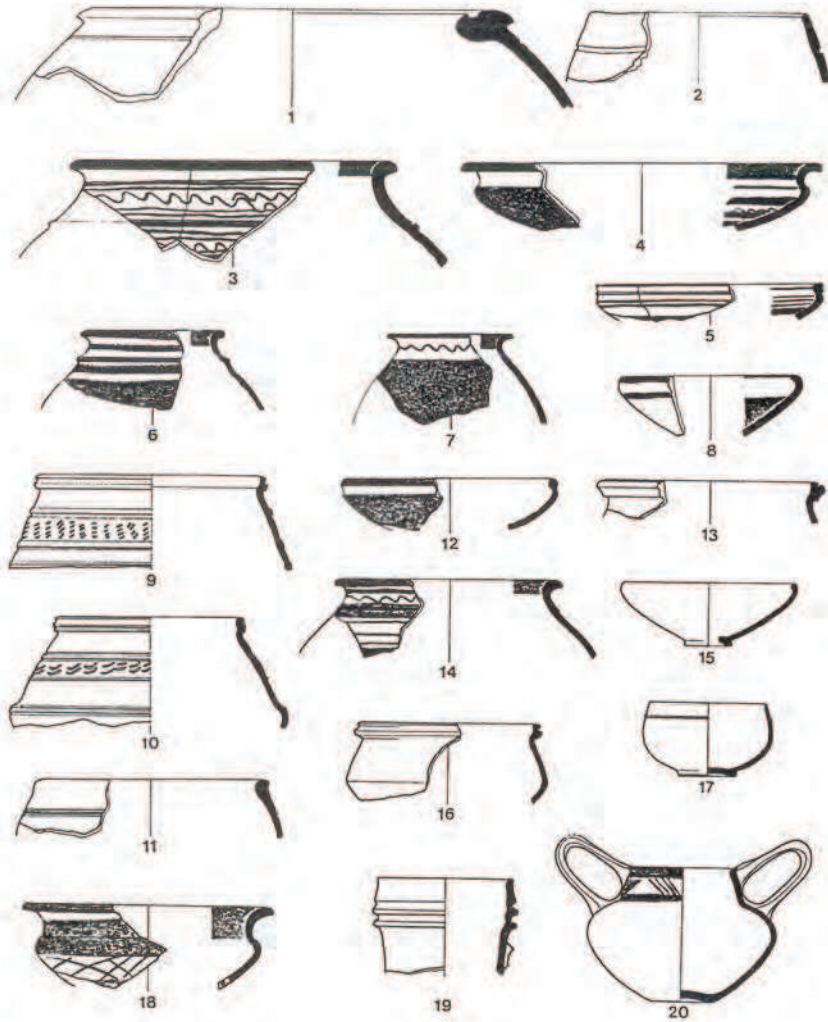
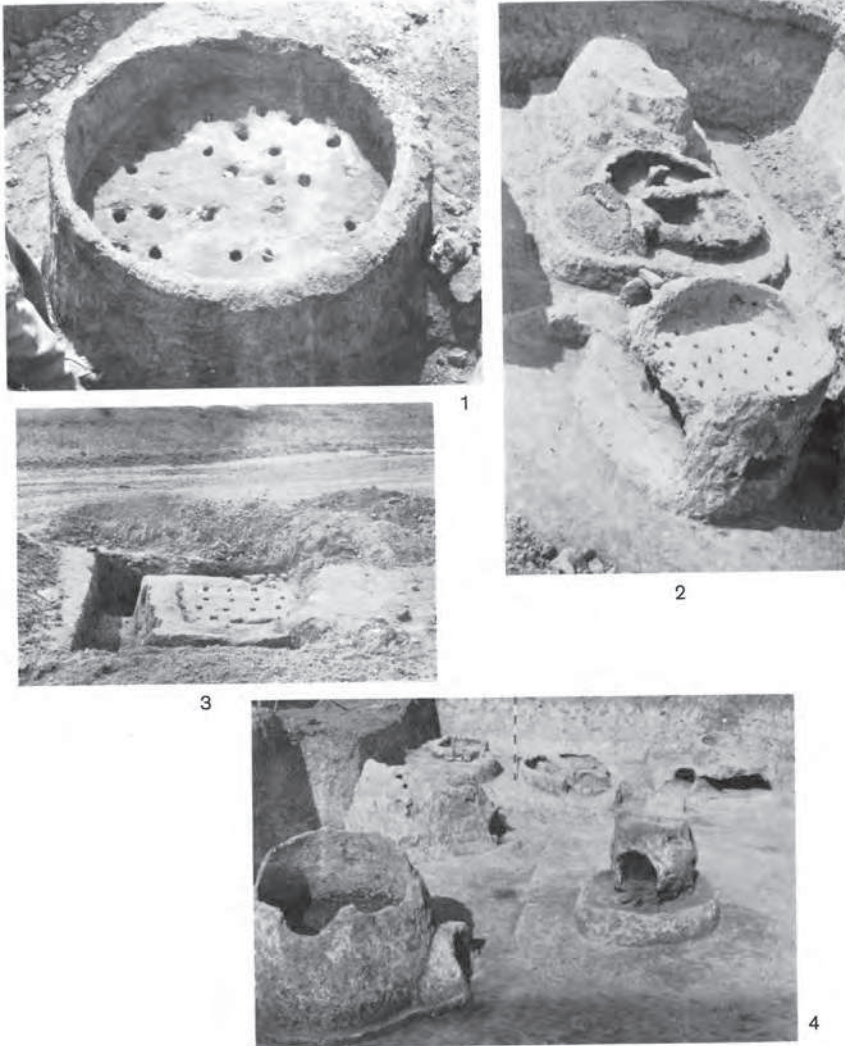


Fig. 2. *Sirmium*, ceramic kilns, photo (after Brukner 1987, T. XI).



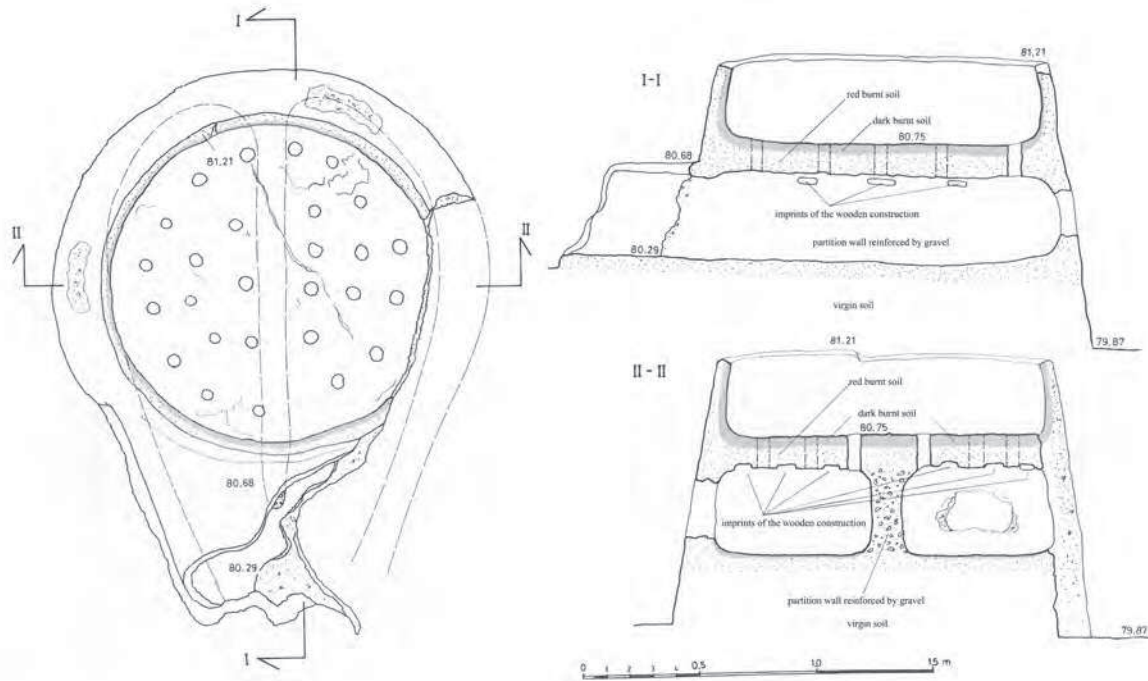


Fig. 3. *Sirmium*, circular ceramic kiln (after Brukner 1987, Pl. II).

workshop centre. In the second half of the 19<sup>th</sup> century, in an unknown location in Belgrade, one *tegula* was discovered with the stamp of a *Singidunum* ceramic workshop, thus providing an unambiguous evidence for the existence of such an organisation on the city territory: *Figlina Singi/dunensium*, which belonged to the civil, not legionary production in the city.<sup>21</sup> Archaeological researches on several locations confirmed workshops that could have fulfilled the needs of the local market (Fig. 4).<sup>22</sup> In the surroundings of the National Theatre in Belgrade six ceramic kilns and one pit with discarded pots were registered in 1987.<sup>23</sup> These kilns had different constructions and chronology.

Kiln no. 1 was semi-dug-in, with a circular cross-section, and diameter of ca 1,40 m; it had a clay heating channel on the eastern side, 0.70 m wide. It is possible that it had a latticed floor surface. It belongs to the type of circular kilns with pilas-

21 *CIL* III, no. 6328.

22 Cvjetičanin 2000, 245, note 2.

23 Cvjetičanin 2000, 245-250. It wasn't possible to determine the type nor the function for two ovens.

ters, typical for the 1<sup>st</sup>-2<sup>nd</sup> century (Fig. 5). These kilns were in use until the mid-2<sup>nd</sup> century and, on the basis of types represented, it is associated with supplying the army.<sup>24</sup> Kiln no. 2 had a rectangular base, made from clay. It was only partially examined and it most likely belongs to the type of kilns with side supporters or central longitudinal pilaster (Fig. 6).<sup>25</sup> These kilns are typical for the 1<sup>st</sup>-2<sup>nd</sup> century, and the typological repertoire of vessels found in them indicates supplying for the army or urban communities of military origin.<sup>26</sup> They had large capacities and were convenient for production of large quantities for military needs or for large vessels, such as *mortaria*, *dolia*, *amphorae* or pitchers.<sup>27</sup> The find of this kiln from *Singidunum* is dated into the 2<sup>nd</sup> century. Kiln no. 3 had the diameter of 1.20 m, but its shape is unknown. Kiln no. 4 was semi-dug-in, its inner diameter was 1.46 m, and it had an elevated latticed floor and a clay channel of semi-circular cross-section (Fig. 7). The kiln no. 4 was discovered in the upper level, and probably belonged to a later horizon. Bronze coins of Trebonianus Gallus, minted in *Viminacium* in 251/252, discovered within the construction, confirm this chronology.<sup>28</sup> The construction of this kiln is of the circular base type and massive or freely standing supporter, typical for the 3<sup>rd</sup> century forms in *Moesia Superior*.<sup>29</sup>

The finds of ceramic kilns from *Singidunum* show that the beginning of these activities falls most likely into mid-2<sup>nd</sup>-mid-3<sup>rd</sup> century, with at least two chronologically distinct groups of workshops (Fig. 8).<sup>30</sup> One of the workshops was located in the immediate vicinity of the early legionary camp, in the area of the necropolis, where well graves were noted. The concentration of well-paid military troupes was certainly very attractive for the potters and they placed their workshops in the vicinity of their customers. With the relocation of the camp and the change of the urban landscape of the city, workshops found themselves in the zone where

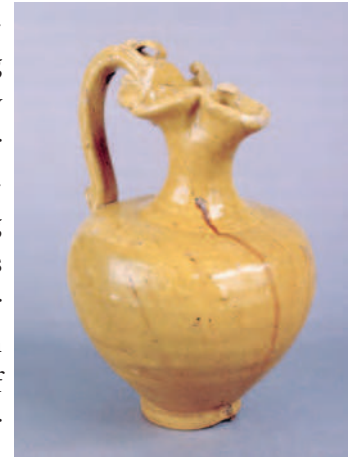


Fig. 4. Early Roman glazed pottery, local Moesian workshop (after Cvjetičanin 2006, photo 4).

24 Cvjetičanin 2000, 247.

25 Cvjetičanin 2000, 247-248. Ovens of this form are mainly interpreted as brick-making ovens; however, ovens for bricks are usually made from more solid materials, stone and brick, and they are generally larger.

26 Cvjetičanin 2000, 248.

27 Cvjetičanin 2000, 248, note 14.

28 Cvjetičanin 2000, 249-250.

29 Cvjetičanin 2000, 250.

30 Cvjetičanin 2000, 253.

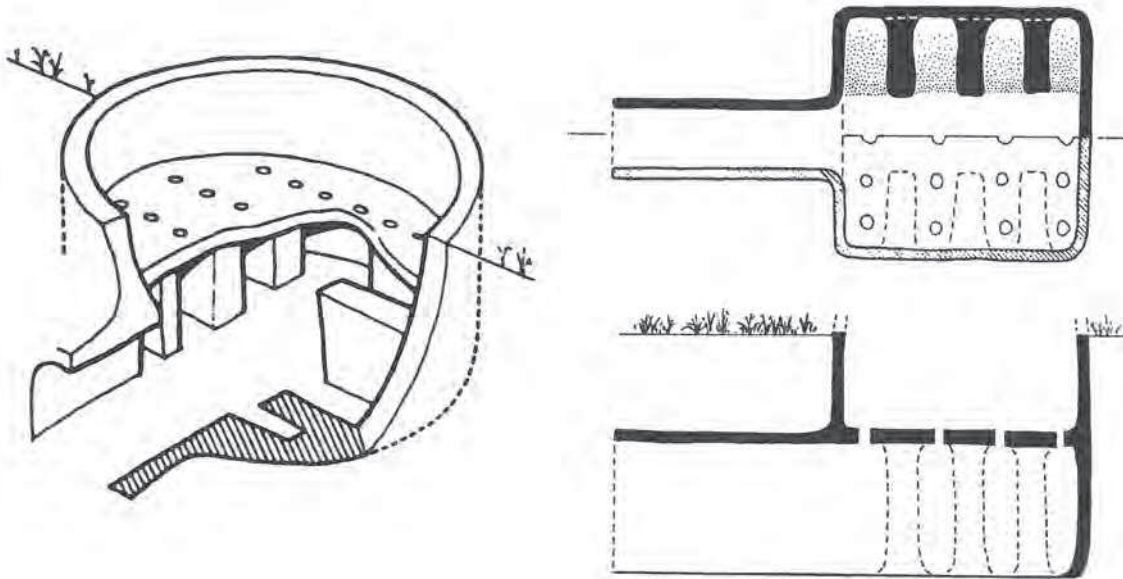


Fig. 5. *Singidunum*, pottery workshop, circular ceramic kiln (after Cvjetičanin 2000, fig. 5a).

Fig. 6. *Singidunum*, pottery workshop, rectangular ceramic kiln (after Cvjetičanin 2000, fig. 5b).

settlement and necropolis overlapped.<sup>31</sup> It is assumed that at the beginning of the 3<sup>rd</sup> century these workshops changed their activities towards the production of vessels for local inhabitants and for funerary purposes.<sup>32</sup>

During the early researches of *Margum*, after the Second World War, the remains of one rectangular oven were discovered, with a latted floor and a sub-structure with hypocaust pilasters. This oven was interpreted as pottery kiln on the basis of its construction and it was dated into the 2<sup>nd</sup>–3<sup>rd</sup> century (Fig. 9).<sup>33</sup> The existence of workshops on the city territory is suggested by the finds of several moulds with reliefs for pottery production in *terra sigillata* technique.<sup>34</sup> The activities of this centre are tightly linked, in technological and commercial aspect, with the near-by metropolis of *Viminacium*.<sup>35</sup> Researchers assumed that the primary centre of production was, in fact, in *Viminacium*, where moulds were discovered on several locations, and that the *officina* in *Margum* was established

31 Cvjetičanin 2000, 253.

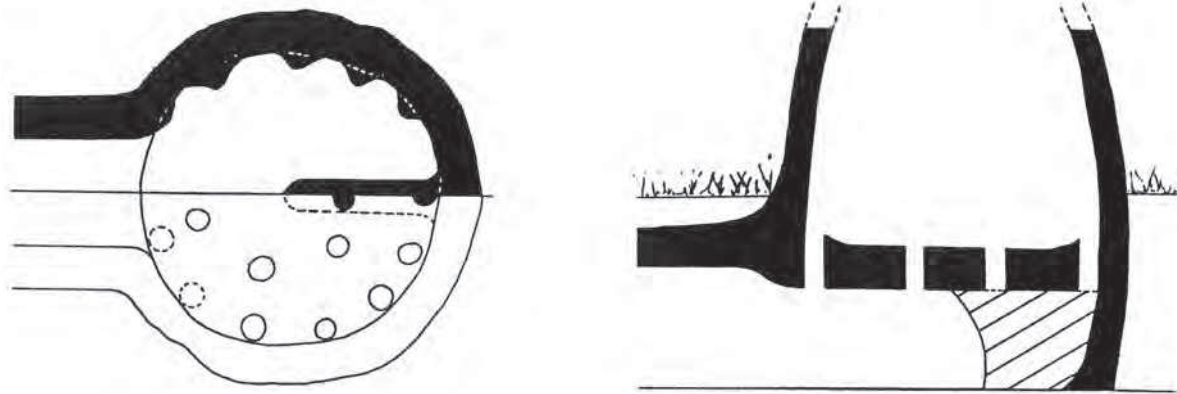
32 *Eadem, loc. cit.*

33 Marić 1951, 121-122; Cvjetičanin 2000, 248.

34 Bjelajac 1990, 143, with literature.

35 Bjelajac 1990, 143-144.





by transferring technology, artisans and moulds, and it used the experience and knowledge of the near-by metropolis.<sup>36</sup> The vessels made in this workshop circle were not of the highest quality, as those made by italic or south-Gallic artisans that those workshops looked up to, but were rather modest in aspect of technological knowledge and production. The clay was softer; the coating layer was not permanent and it would peel off. The most common shape of vessels made in this technique were calotte-shaped bowls in the form Drag. 37 (Fig. 10).<sup>37</sup> Beside *terra sigillata*, glazed vessels were also produced, as a sort of luxurious ceramics, with same ornamental motives (Fig. 11). Analyses of ornamental motives showed there were over 290 different symbols, pointing to the skill and inventiveness of Moesian artisans.<sup>38</sup> Main motives were different egg-shaped, floral and animal motives, while human figures occur rarely. We may encounter scenes of gladiator fights, and also figures of Sylens, masks and Amores playing.<sup>39</sup>

From the territory of *Viminacium*, a unique ceramic mould originates with a figural scene depicting gladiators.<sup>40</sup> A ceramic tile – mould, dimensions 7.6 x 11 x 1.4 cm, was found on the site of Selište in the vicinity of a legionary encampment.

Fig. 7. *Singidunum*, pottery workshop, ceramic kiln No. 4 (after Cvjetičanin 2000, fig. 7).

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36 Bjelajac 1990, 144.

37 Bjelajac 1990, T. 87.

38 Bjelajac 1990, T. 65-77.

39 Bjelajac 1990, 145, T. 67.

40 Vujović 2011, 261, T. V, 1-2.

Fig. 8. *Singidunum*, pottery workshop, vessels (2<sup>nd</sup> c.)  
(after Cvjetičanin 2000, fig. 9).

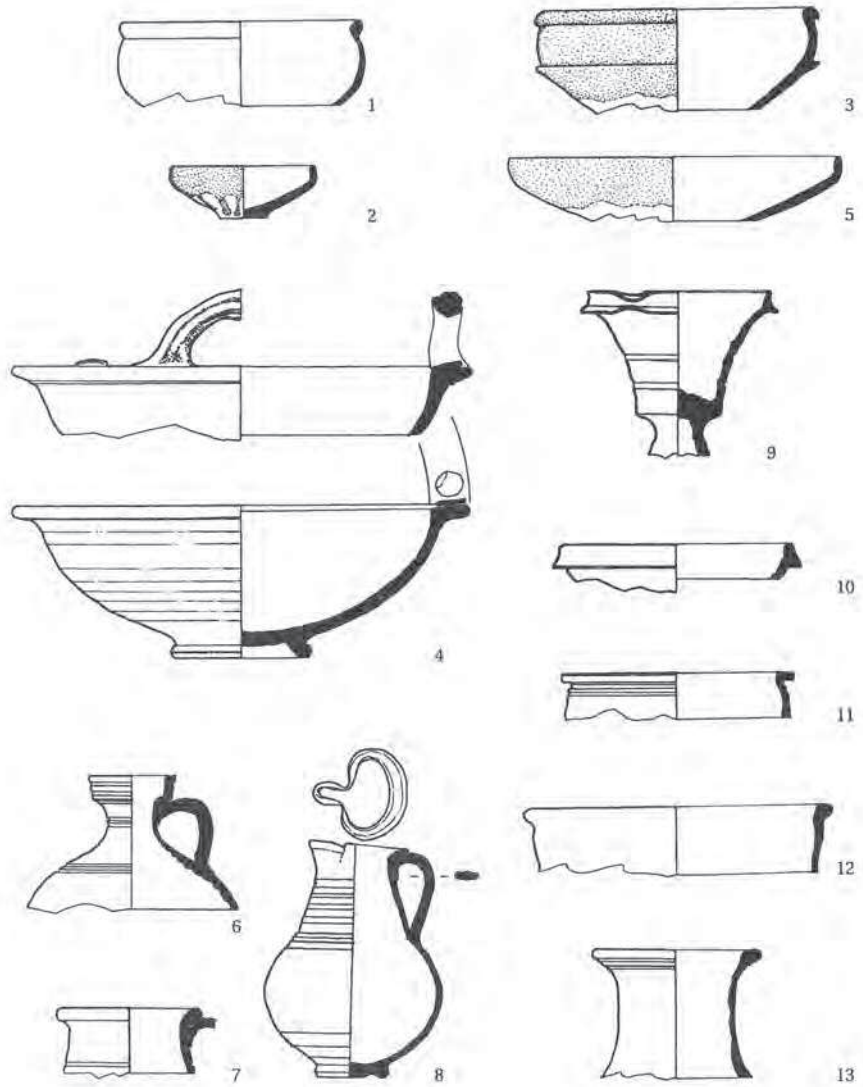
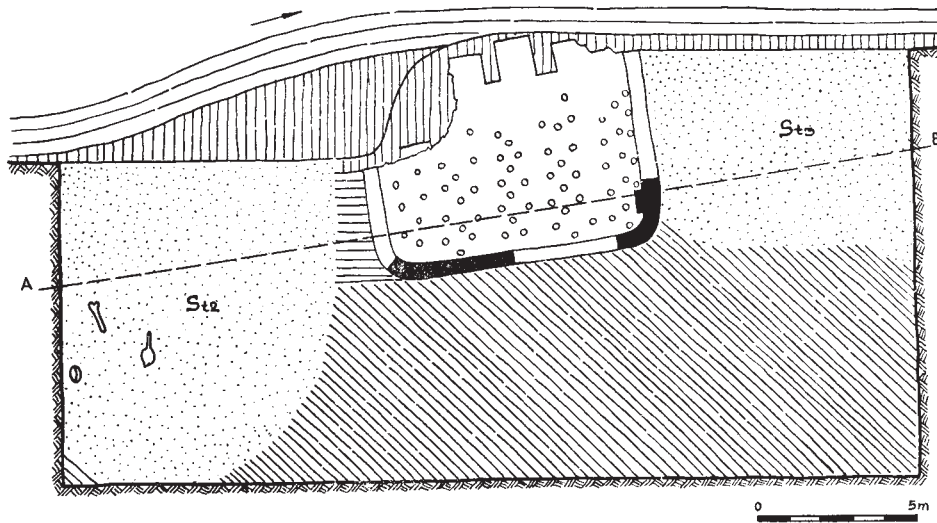
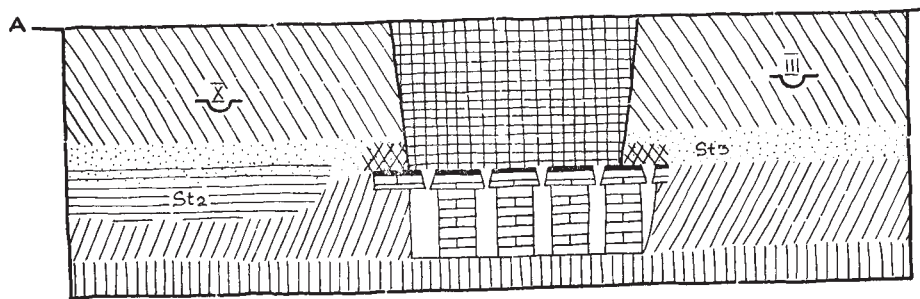


Fig. 9. *Margum*, ceramic kiln (after Marić 1951, fig. 24).



Ground-base of the trench at the level of the floor of the ceramic kiln



The profile of the trench with the ceramic kiln

Fig. 10. Workshop  
*Viminacium-Margum*,  
vessels (after Bjelajac 1990,  
T. 85).

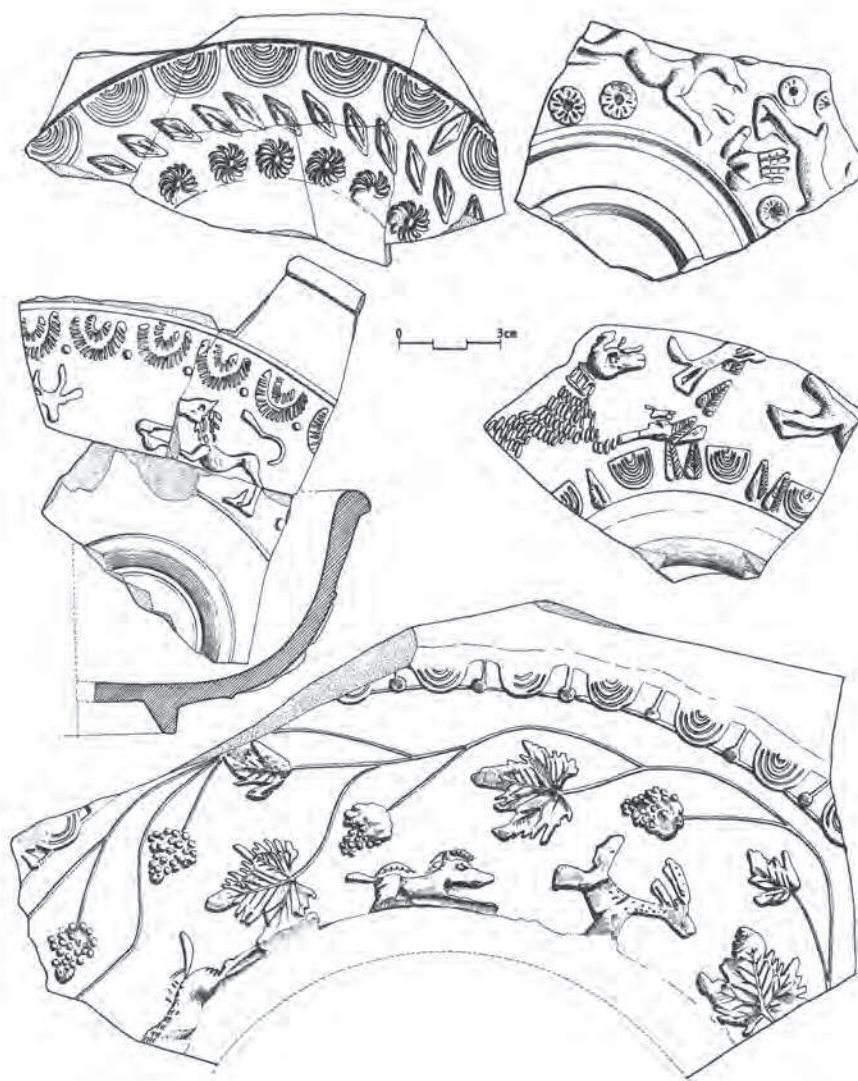
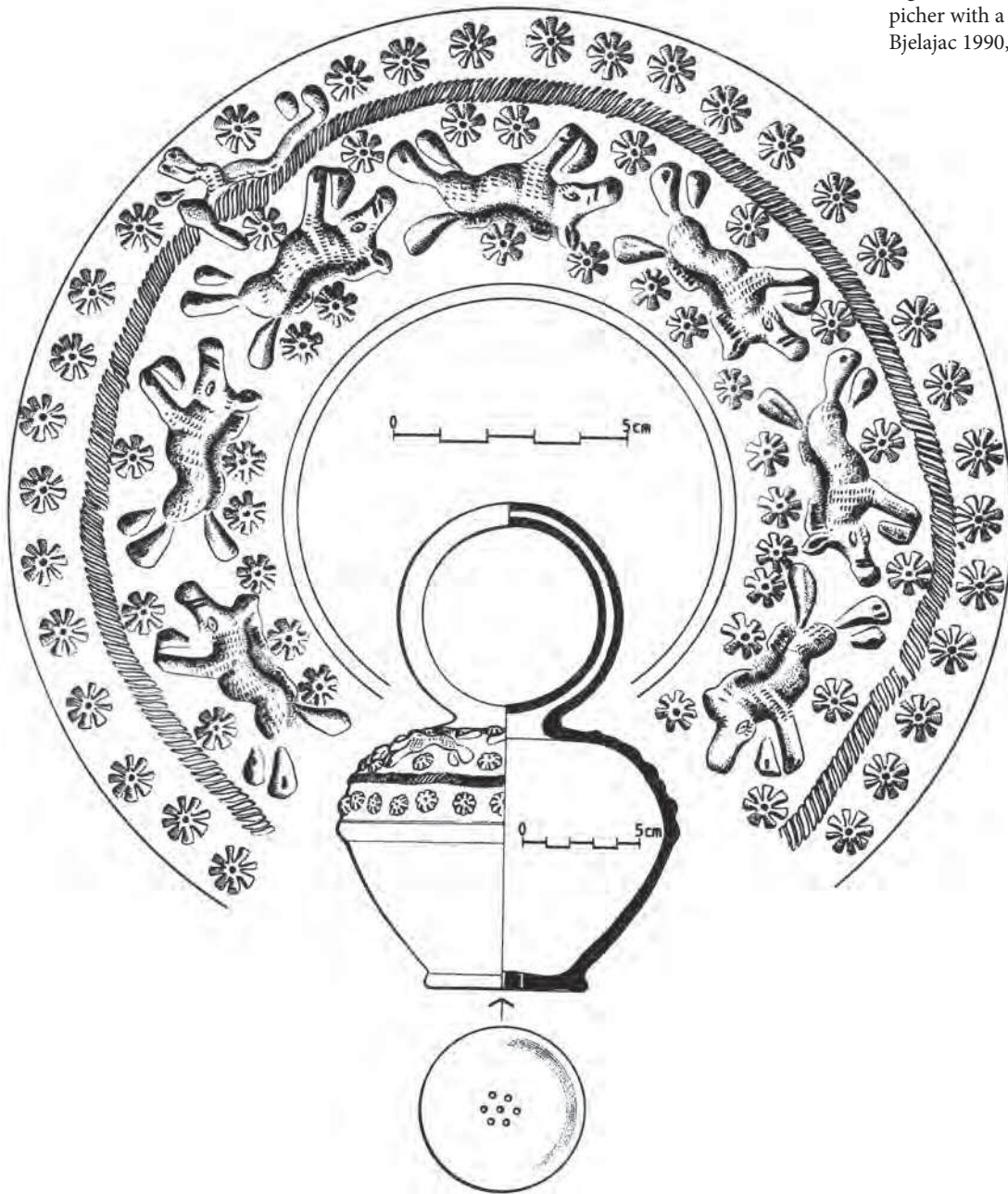




Fig. 11. *Viminacium*, glazed picher with a handle (after Bjelajac 1990, T. 87/38).





It depicts two gladiators, *thrax* on the left, armed with a short sword and *manica*, and a *murmillio* on the opposite side from him, armed with a short sword, shield and helmet (Fig. 12). Beside these figures there are several letters, probably initials of their names, incised into the mould: *MA* (short from *Maximus?*) and *VRSA* / *VRSA* (*Ursicinus, Ursinus, Ursilianus, Ursio* and similar).<sup>41</sup> Furthermore, we cannot rule out the possibility that these abbreviations represent the *editor* of gladiator fights or the owner of the *officina* in which this object was made.<sup>42</sup> Objects with gladiator scenes on moulds and vessels indicate the existence of relations with the *Viminacium* amphitheatre and the users of these objects during the 2<sup>nd</sup> and in the beginning of the 3<sup>rd</sup> century, when the gladiator games were frequently organised within this complex. It is possible that this mould represented *crustullum* – mould for cakes, which were served with honey wine during different celebrations. We may assume that public distributions of food were quite frequent in *Viminacium*, as well as public feasts in occasion of jubilees, emperors' birthdays, important military and construction projects, and also when different games were organised (*munera, ludi*).<sup>43</sup>

Within the *officinae* of *Viminacium*, lamps were also mass produced, used for lighting private, public and funerary areas. Researches uncovered 196 moulds for lamp production so far, dated according to coins from Vespasian until Aurelian. Out of all these moulds, 129 of them belong to the type with one beak, 52 had two or more, while the remaining moulds could not have been determined. Ten moulds bear the names of the artisans whose products were copied or directly imported: *CARIA, C ARM[...], CASSI, CCLOSVC, CERIA, CERALIS, CRESCES, ELPIS, FORTIS* and *PRIMIGENI*.<sup>44</sup>

Being a large city, *Viminacium* had a well-organised production of ceramic items.<sup>45</sup> We have no data on how the space for workshops was assigned, who the owners were and what their status was. The most important prerequisite for workshop development is the availability of raw materials, above all clay, but also the vicinity of water and dry land communications for the transport of goods. On the

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41 Vujović 2011, 259.

42 Vujović 2011, 260.

43 Vujović 2011, 261.

44 Korać 2018, 593.

45 Marrese, Tucci, Raičković Savić 2015, 9-43.

Fig. 12. *Viminacium*,  
ceramic crustullum (after  
Vujović 2011, T. V, 2a, b).



territory of the city, workshops for production of bricks and ceramic vessels were registered, and one of them is located at the site of Pećine, on the area of the southern necropolises of the city. During the rescue excavations in 1982–1985, on an area of approximately 1000 m<sup>2</sup>, a total number of 10 ceramic and three brick kilns were discovered, in the immediate vicinity of one object with a porch, for making and drying of products.<sup>46</sup> Ceramic kilns were made from bricks with the stamp *legio VII Cl(audia)* – whose permanent camp was at *Viminacium*, and then they were covered by a thick layer of clay mixed with chaff.<sup>47</sup> These kilns were used on several occasions, and often just one type of vessels was baked in them, for example lids, as in case of the kiln which collapsed while vessels were still being baked in it.<sup>48</sup> The repertoire of vessels discovered within kilns and appurtenant refuse pits demonstrate well developed workshop activity which supplied the market mainly with eating and cooking vessels.<sup>49</sup> Also, two moulds for production of the vessels of type Drag. 37 in *terra sigillata* technique were discovered, however, they had different ornaments than those from the artisanal centre of *Viminacium-Margum*.<sup>50</sup> The beginning of the craft production within this centre can be dated into the time of Antoninus Pius (138-161), and its peak was during the 3<sup>rd</sup> and the first decades of the 4<sup>th</sup> century.<sup>51</sup>

### **CERAMIC PRODUCTION IN LATE ANTIQUITY**

With the administrative, military and economic reforms during the period of the Tetrarchy, the Late Antique society underwent deep changes that were manifested in all aspects of life, private, public and sacral. The ceramic production in the 4<sup>th</sup> and the 5<sup>th</sup> century, judging from the finds along the Danube Limes, was modest in aspects of forms, production techniques and ornament usage. Although there were some population declines, due to frequent wars, in the period of the

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46 Raičković 2007, 11.

47 Raičković 2007, 48.

48 Raičković 2007, 48.

49 Raičković 2007, *passim*.

50 Raičković 2007, 49.

51 Raičković 2007, 50.

Late Antiquity, there were also numerous arrivals of groups or even entire tribes, from other parts of the Empire or from *barbaricum*. Newly-arrived inhabitants brought with them specific habits in construction of living space, economy and modes of life. Ceramic production in this period did not yield a lesser amount of products, but the quality was certainly much lower in comparison with earlier periods. Ceramic vessels were functional, practical and cheap (Fig. 13). The production was standardized, with traits of middle- and lower-quality workshops, which recognised the needs of their immediate consumers.<sup>52</sup> One of the most frequent groups of the Late Antiquity pottery in the Limes area in the middle Danube valley was glazed ceramics (Fig. 14 a, b). Their wide distribution, limited number of types for this area, as well as traces of glazing practice, point to their local origin. These workshops made standard types of grey and red kitchen ceramics, with were glazed afterwards.<sup>53</sup>

The production of vessels in the Late Antiquity is confirmed by kilns discovered in the section of Limes at the Iron Gates, within auxiliary forts of *Diana* and *Pontes*. Three kilns were discovered at *Diana*: one in the vicinity of the western wall from the second half of the 4<sup>th</sup> century (Fig. 15), another one within the inner tower of the south-western corner of the fort, with *tubulae* bearing traces of spilled glaze, from the 4<sup>th</sup> century, and the third one was noted in the central part of the camp, dated into the first half of the 5<sup>th</sup> century.<sup>54</sup> At *Pontes*, two Late Antiquity kilns of the same type were discovered; and the one labelled G17/1 was published with more details (Fig. 16).<sup>55</sup> The kiln, with the diameter of 1.50 m, had a semispherical calotte and latticed floor supported by a pillar, placed on an extensively burnt floor.<sup>56</sup> It is dated into the *limitanei*-phase II, in the second half of the 4<sup>th</sup> and the first half of the 5<sup>th</sup> century.<sup>57</sup>

Semi-dug in ceramic kilns with circular or elliptical bases were also registered at the sites of Boljetin – *Smorna*, Ravna – *Campsa* and Grabovica-Brzi Prun.<sup>58</sup> A

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52 Cvjetičanin 2013, 209.

53 Cvjetičanin 2006, 160.

54 Cvjetičanin 2006, 160.

55 Garašanin, Vasić 1987, 90-91, fig. 3, 6, pl. X, XI.

56 Garašanin, Vasić 1987, 91.

57 Garašanin, Vasić 1987, 97.

58 Zotović 1984, 220, T. III, 2; Kondić 1966, 98; Kondić 1967, 67; Paprenica 1986, 363 (uncertain



Fig. 13. Late Antique glazed bowls from the Danubian limes zone (after Cvjetičanin 2006, photo 2)







Fig. 14 a-b. Glazed flagons from Ravna-Camps, late 4th century (after Cvjetičanin 2006, photo 6-7)

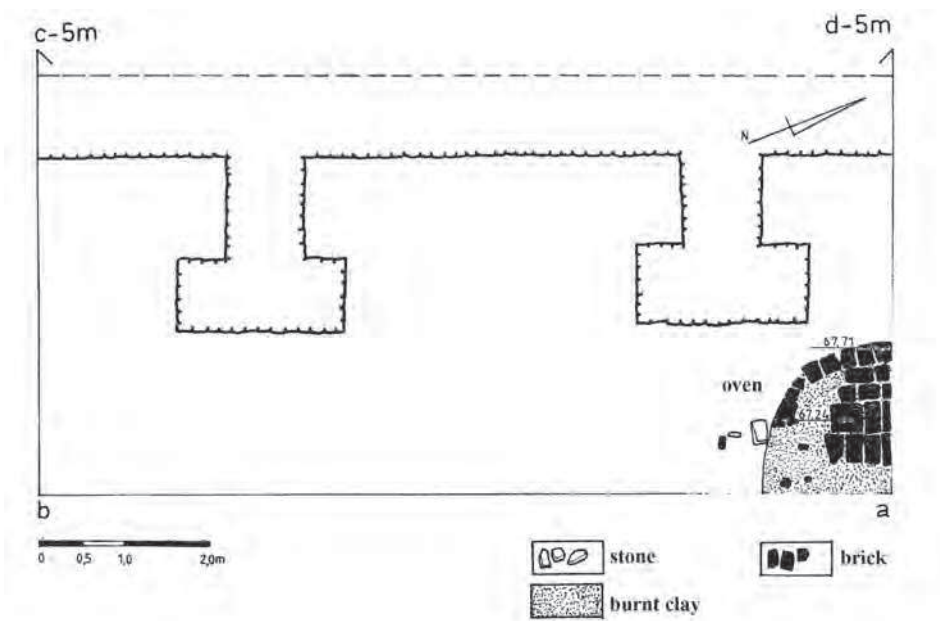


Fig. 15. *Diana*, ceramic kiln (after Rankov 1987, fig. 16).

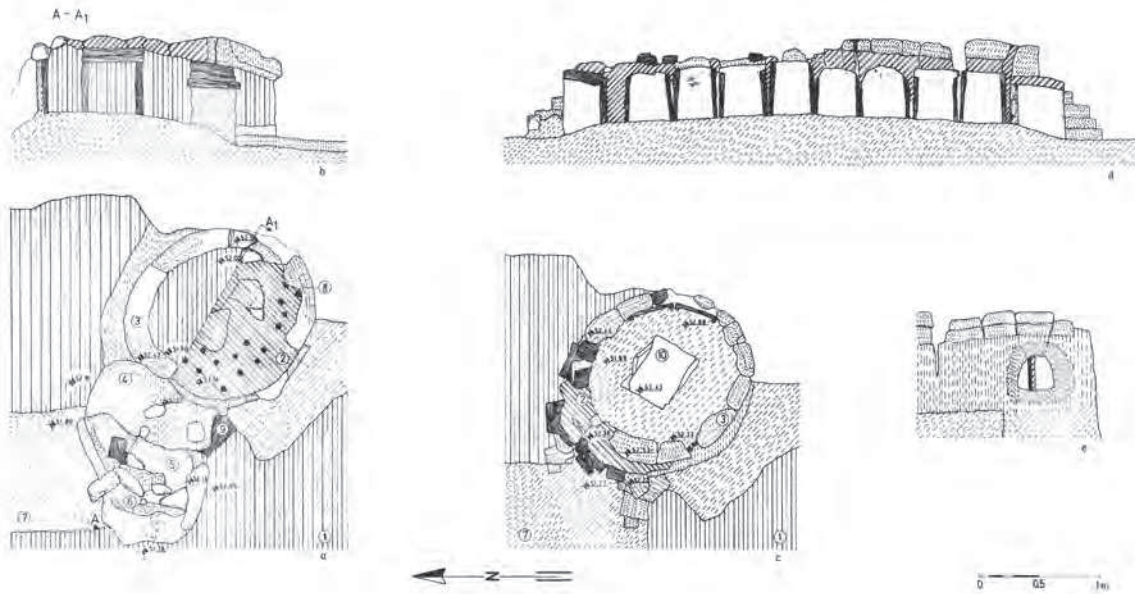


Fig. 16. *Pontes*, ceramic kiln in Sq. G/17 (after Garašanin, Vasić 1987, Pl. X).

Fig. 17. *Smorna*, Eastern tower, kiln (after Zotović 1984, Pl. III, 1).





Fig. 18. *Smorna*, Eastern tower, vessels from ceramic kiln (after Zotović 1984, Pl. III, 2).

ceramic kiln from Boljetin, a small auxiliary camp at Lepena river, was constructed within the eastern tower of the fort (Fig 17), at the time when it was no longer used for defence purposes, perhaps during the time of Constantine I. The kiln was used several times (Fig. 18). At Ravna – *Campsas*, in the central part of the auxiliary fort, remains of a large early Byzantine building were uncovered, with one kiln at each end.<sup>59</sup> These kilns had circular ground bases, they were made of clay, and they were reinforced with a stone rim on the outer side. Calottes and brick floors

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chronology).

<sup>59</sup> Kondić 1966, 98.

remained preserved. Also in this area, remains of an object with several large clay kilns were registered,<sup>60</sup> of unknown dimensions and associated finds, for which T. Cvjetićanin noted that they were most likely used for pottery.<sup>61</sup> At Grabovica, at the site of Brzi Prun, remains of what was most likely a Late Antiquity settlement were partially examined. Within one of the trenches, a circular kiln was discovered, with the diameter of 1,75 m, with a dug-in pre-space and the floor covered by bricks, dim. 38 x 13 x 5 cm, arranged in a mosaic manner, with a partially preserved clay wall and a fragmented calotte-shaped cover. Rare ceramic finds from this object and the entire layer on the site belong to the Late Antiquity production, mostly from the end of the 4<sup>th</sup> and the first half of the 5<sup>th</sup> century.<sup>62</sup>

The most frequent group of ceramic on the Late Antiquity sites along the Limes were kitchen and storage vessels, produced in small individual workshops.<sup>63</sup> A specific group of vessels is grey polished pottery, which occurs in the second half of the 4<sup>th</sup> and first half of the 5<sup>th</sup> century. Its producers and consumers were *foederati*, barbarian tribes which inhabited the borders of the Empire.<sup>64</sup>

The changes which occurred in the ceramic production in the first six centuries AD are the result of changes in technological knowledge and skills, but also in the purchasing power of the consumers, their aesthetic worldviews, as well as food habits.<sup>65</sup> By studying 313 types of vessels from the borderland areas of the Iron Gates, ranging from the end of the 3<sup>rd</sup> until the end of the 6<sup>th</sup> century, it was noted that vessels produced by reduction process were predominant (Fig. 19). The reduction firing process was less demanding and it also required less time and less fuel.<sup>66</sup> Vessels were baked too quickly, sometimes even in the conditions of insufficient oxidation, and they vessels were frequently placed too close one to another, which also reduced the firing qualities.<sup>67</sup> Decorative techniques demanded skills of a craftsperson, but not artistic inspiration. The process of turning changed

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60 Kondić 1967, 67.

61 Cvjetićanin 2006, 160.

62 Cvjetićanin 2016, 130-131.

63 Cvjetićanin 2013, 209.

64 Cvjetićanin 2013, 210, fig. 117.

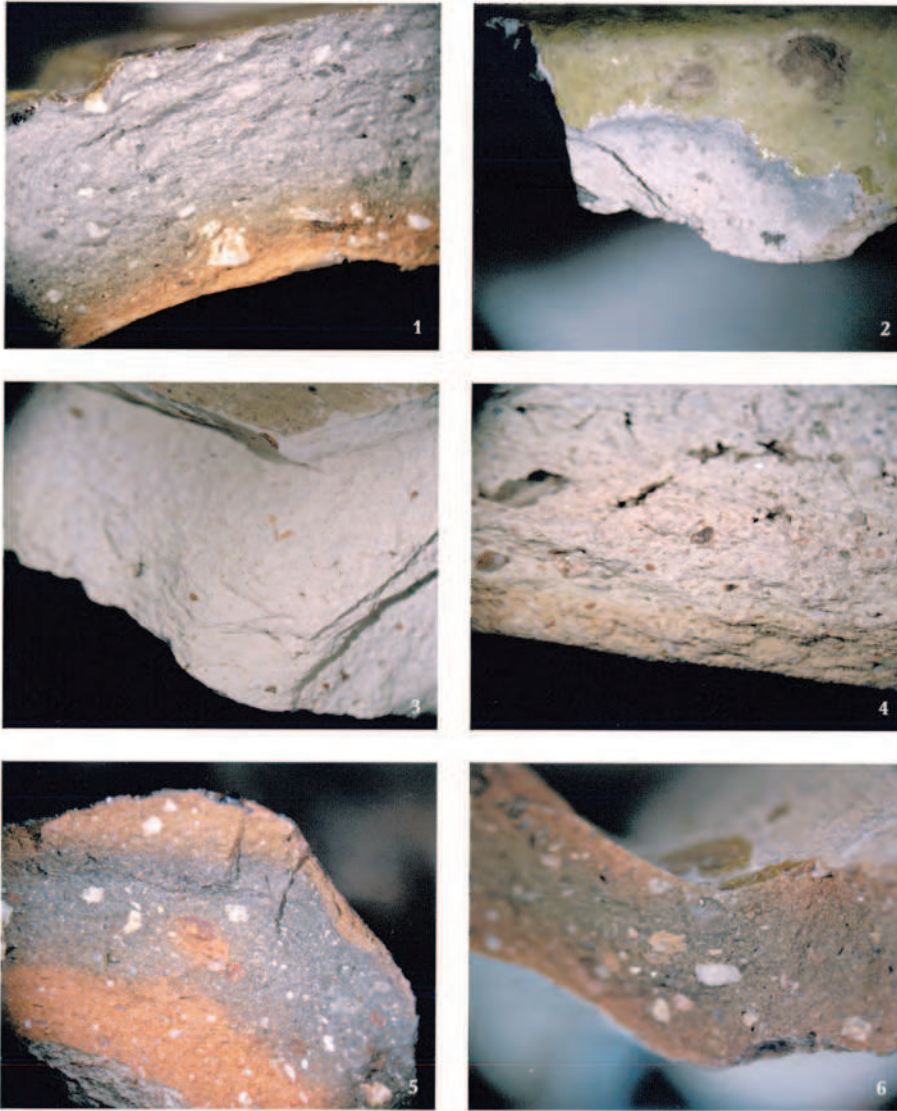
65 Cvjetićanin 2013, 213.

66 Cvjetićanin 2016, 149-153.

67 Cvjetićanin 2016, 153, note 16.



Fig. 19. Ceramics from *Diana* and *Pontes*, macroscopic view (after Cvjetičanin 2006, photo 15)



very little throughout the Roman period, therefore, it is possible that common tools were used for the ceramic production, same as in other workshops. Some of the finds from settlements and forts, such as knives, needles, *spatulae*, could have been used for pottery making.<sup>68</sup> The ornamentation was made by using a limited number of techniques, such as stamping, incising, polishing, and standard tools were used for this, such as bone polishers, awls, clay stamps, etc.<sup>69</sup>

## PRODUCTION OF STONE OBJECTS

One of the particularly interesting and important segments of stone technology in the Roman times are abrasive stone tools. They were used for manufacturing diverse objects, from metal, wood or bone materials. Also, diverse iron tools, used in agriculture and for wood and leather working, demanded constant repairs and sharpening, for which stone abrasive tools were used.<sup>70</sup>

Abrasive stone tools were not frequent on the sites in the Iron Gates area. A small number of items was registered within the fort of Saldum in layers belonging to the late 4<sup>th</sup> century (364–380) and to the 6<sup>th</sup> century.<sup>71</sup> They are most likely linked with metallurgical activities, confirmed by the finds of metal casting moulds and a deposit of metal objects (workshop storage?).<sup>72</sup> Some evidence for a wider use of whetstones come from the youngest layers of the 4<sup>th</sup>–6<sup>th</sup> century fort of Karataš – *Diana*, where examples of rectangular shape were discovered.<sup>73</sup> Similar objects were also noted within the Early Byzantine forts in Ljubičevac and Rtkovo-Glamija.<sup>74</sup>

The largest group find of whetstones discovered so far comes from the hinterland of the Limes, from the site of Gamzigrad – *Romuliana*. During the researches of the southern tower at the western gate of the younger fort (fig. 20) a total number

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68 Špehar 2010, 75-77, T. VIII; Cvjetičanin 2016, 154.

69 Cvjetičanin 2016, 154.

70 Jeremić 2009, 163-178.

71 Jeremić 2009, 168-169, cat. 502-504.

72 Jeremić 2009, 174, cat. 534; 190.

73 Špehar 2010, 124, cat. 659–662, 664–667).

74 Špehar 2010, 124, cat. 659, 663.

of 33 complete and fragmented specimens were discovered. Tower no. 19 served as a workshop after it lost its defensive role and that of a watchtower (fig. 2). Since the middle/second half of the 4<sup>th</sup> and until mid-6<sup>th</sup> century, blacksmith and casting kilns were located here, which could have fulfilled the needs of the local market with products made from metal, or they served for repairing metal tools, weapons, etc.<sup>75</sup>

Whetstones from *Romuliana* represent the link between prehistoric and contemporary whetstones, in the manufacture and in the mode of use. They have typical Late Antiquity shapes, which can be encountered on sites in the present-day Serbia.<sup>76</sup> The majority of examples from *Romuliana* has a more or less regular rectangular shape, with surfaces slightly concave from use (Fig. 21). Examples of elongated, irregular shape also occur, with square cross-section, with narrow ends, of high quality manufacture, as well as double whetstones with two equally used working surfaces.

All the whetstones from the tower represent final objects; semi-finished objects were not registered. Traces of manufacture, visible on their surfaces, enabled the reconstruction of the production process. Smaller segments of stones were obtained by sawing, then they were shaped by fine chipping technique, and the final stage was polishing. Traces of use are visible on all parts of the used tool. Mainly, this was a polished and concave working surface, obtained by use of whetstone for its basic purpose – sharpening of metal blades. One side of a whetstone, the upper one, was mainly used. Damaged whetstones often served as supporters during cutting, sawing, and also as anvils. Basal segments of broken and damaged whetstones sometimes served as hammer.

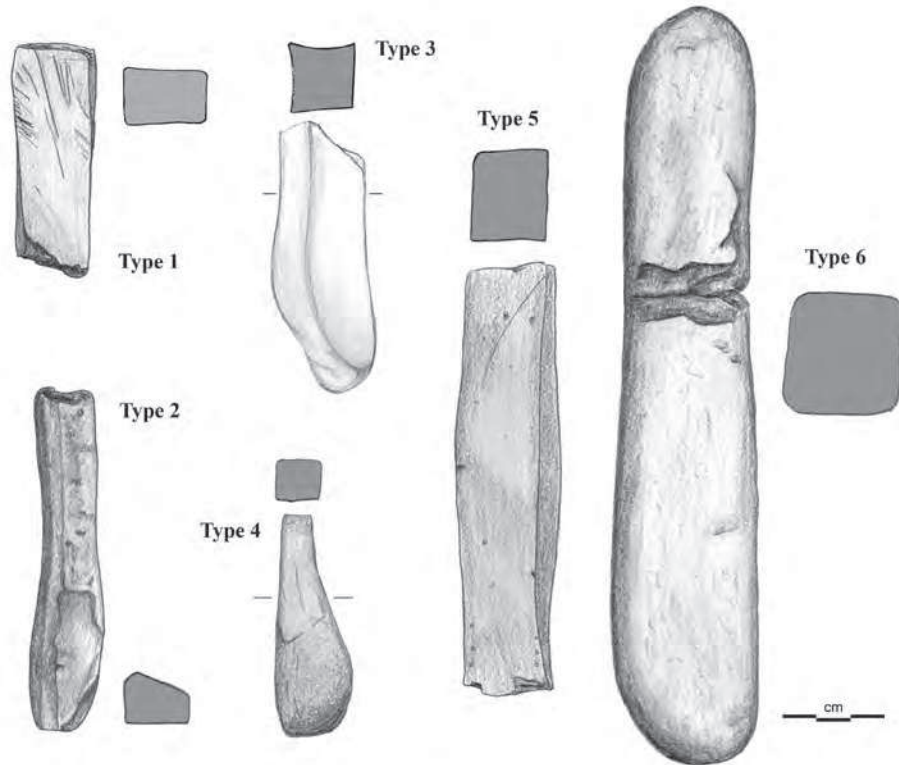
For the production of whetstones at *Romuliana*, fine-grained metamorphosed sandstones were mainly used compact, resilient rocks of weaker abrasive force, therefore convenient for fine polishing and final shaping of objects from solid materials, mainly metal. Somewhat rarer are fine-grained quartz sandstones with silicate, rarely carbonate adhesive and fine-grained igneous rocks – granite and andesite – were only rarely used.

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75 Petković 2004, 129–140; Petković, Živić 2006, 135–140; Petković 2010, 168–176.

76 Antonović 2008, 342. Finds from units from the 4<sup>th</sup> century and layers from the 4<sup>th</sup>-6<sup>th</sup> century at the site of Ras –Podgrade (Popović 1999, 114, fig. 71/1-5; 322-323, cat. 184–188), as well as finds from large regional centres of the 6<sup>th</sup> century, such as Caričin Grad (Špehar 2010, 124, note 126-127) or the site at Mountain Jelica (Milinković 2017, 172–174, cat. 298–305).

Fig. 20. Types of whetstones from *Romuliana*.



Judging by the distribution within tower no. 19 at *Romuliana*, we may note that this was waste – tools that were used secondarily for a while, after damage and breakage, as anvils, hammers and supporters for cutting and sawing. They show that during the Late Antiquity and Early Byzantine period (4<sup>th</sup>–6<sup>th</sup> century) the production of the stone whetstones was standardised. This is visible from regularity in the choice of lithic raw material and in their regular shapes. Late Antiquity lithic tools were never carefully studied, probably because they were not considered attractive and also because they are not particularly abundant. More detailed analyses may offer interesting data regarding quarries in the Roman times, specialised workshops and one, not so common, craft in the Roman times, i.e. production of lithic tools.



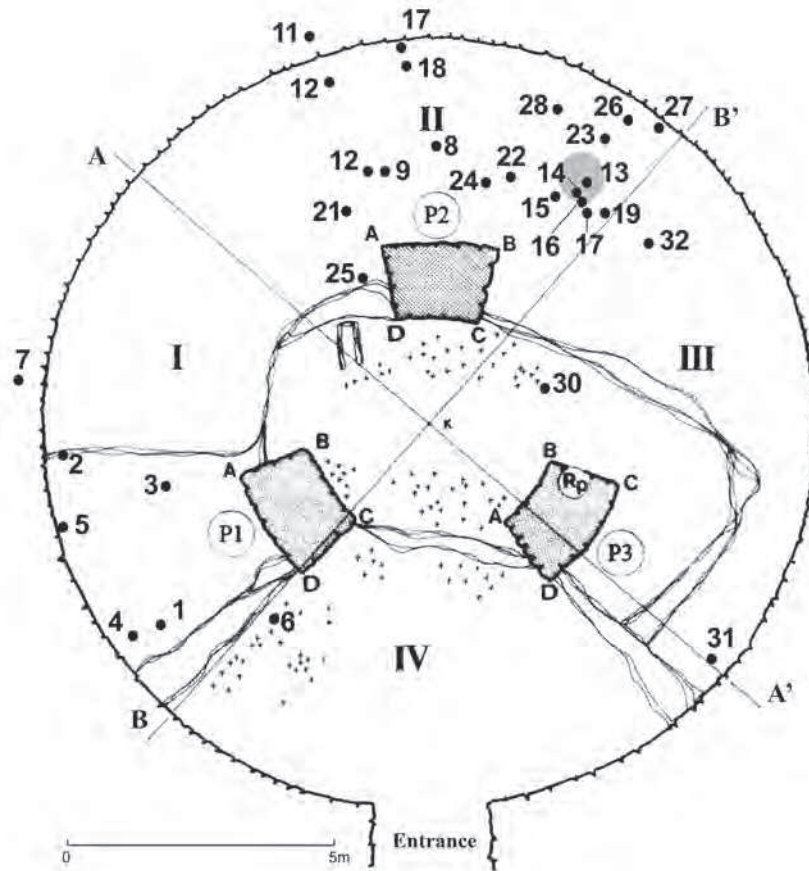


Fig. 21. Distribution of whetstones in the tower no. 19 at Romuliana (plan of tower no. 19, courtesy by Sofija Petković)

## PRODUCTION OF BONE OBJECTS

Objects made from osseous raw materials (bone, antler, mollusc shells, teeth) were very frequent in all aspects of everyday and religious life in Roman times. They were used for producing a variety of objects – for small tools (awls, needles, chisels), for cosmetic purposes and personal decoration (cosmetic and apothecary spoons, hair pins, combs, beads and other parts of composite jewellery), for small utilitarian objects (spindle whorls, needle cases, writing implements – *stilii*), for weapons and military equipment (in particular for parts of reflexive bow, but arrowheads were also produced, handles for knives, etc.), for gaming pieces, musical instruments; also, parts of composite objects were made from these raw

materials – decorations on wooden boxes, on furniture, etc.<sup>77</sup> Bone working is often connected with wood-working; the more or less same tools were used for manufacturing these items and artisans were often the same or they shared the working space. Therefore, the presence of an osseous workshop also suggests the presence of a woodworking workshop.<sup>78</sup>

Identification of a workshops for manufacturing osseous materials, however, is not always easy. Unlike ceramic workshops, for example, the traces they leave are less conspicuous and less straightforward. Bone working does not need a special tool kit or a special, separate place for the production. Furthermore, Roman written sources do not even mention this handicraft; the only written evidence for it refers to ivory sculptors (*eborarii*) who were working in the same building and collegium with carpenters (*citrarii*).<sup>79</sup> Another problem of identifying workshops is connected with archaeological recovering practices in the early and mid-20<sup>th</sup> century, when faunal remains were not collected at all or only selectively, and faunal analyses were not common practice. Because of this, manufacture debris remained unnoticed and thus it was not possible to identify the working areas. Also, it is possible that at least some of the bone workshops were mobile, i.e., that artisans stayed at some place for a certain time and then moved on.

Although there is less data on bone working than for some other crafts, we can still note that the need for bone artefacts was rather important. Some researchers even assume that almost every settlement had at least one workshop producing bone artefacts.<sup>80</sup> So far, bone workshops in South-Eastern Europe were identified in cities, such as *Mursa*<sup>81</sup> or *Apulum*.<sup>82</sup> Furthermore, there were several workshops related to the army; for example, in the province of Dacia, at least three workshops were discovered within auxiliary camps – at *Tibiscum*, *Buciumi*, *Porolissum*, and one within the military fort of *Micia*.<sup>83</sup>

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77 Bíró et al. 2012; Deschler-Erb 1998; Hrnčiarik 2016; Kokabi et al. eds. 1996; Kovač 2017; MacGregor 1985; Petković 1995; Vass 2010.

78 Petković 1995, 13

79 Deschler-Erb 1998, 93; Vass 2010,

80 Vass 2010, 59.

81 Kovač 2017

82 Vass 2010

83 Vass 2010

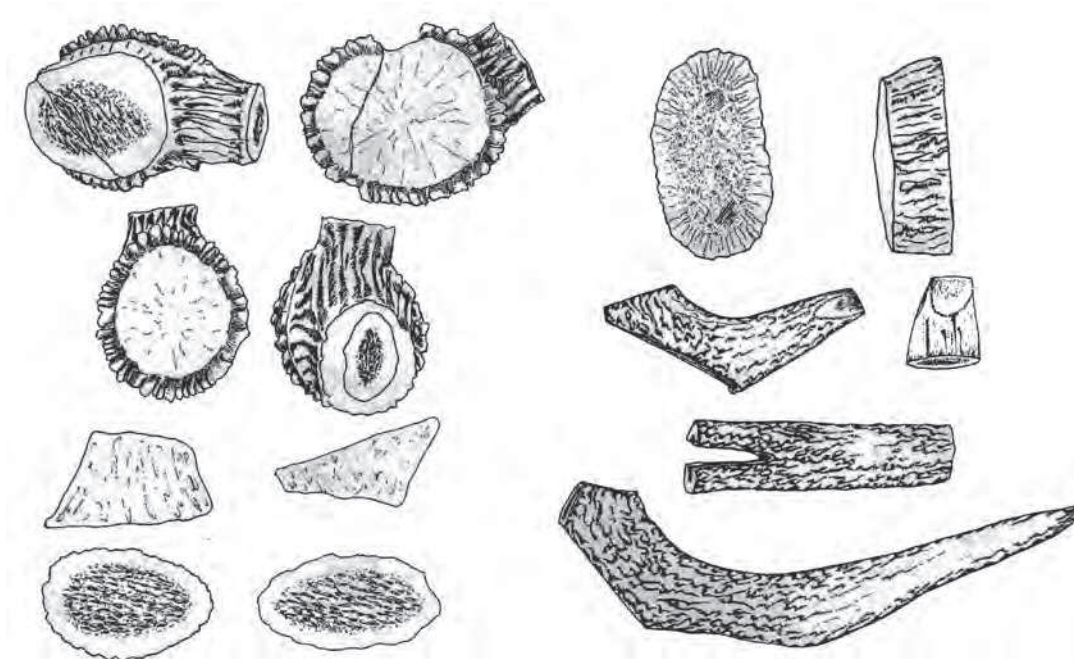


Fig. 22. Manufacture debris from red deer antler, *Singidunum, castrum* (after Petković 1995).

In the Limes area in the middle Danubian valley, we have evidence of bone working in *Singidunum* and in the Iron Gates region, for the time being. These finds are usually linked with Late Antiquity; for earlier phases of the Roman rule, we may assume that workshops existed on the territory of *Moesia Superior*, but we do not have enough data.

At *Singidunum*, a small amount of manufacturing waste was discovered at Veliki Kalemegdan during the excavations in 1980–1984, in the area of the eastern wall of the *castrum* and structures in its interior (Fig. 22). These structures were made from light materials, and had open and semi-dug-in hearths and refuse pits, and are dated into the last quarter of the 4<sup>th</sup> – first half of the 5<sup>th</sup> century. The entire horizon was burnt, probably during the Hun raids in 441. In this workshop, only antler from red deer was worked upon, and only manufacture debris was discovered – there were no finished or semi-finished items.<sup>84</sup> Perhaps this was only a temporary, mobile workshop, from which only waste remained.

In the Iron gates region, a relatively small amount of manufacturing debris from red deer antler was noted on several sites, such as *Diana* and *Pontes*. Very large

<sup>84</sup> Petković 1995, 18.

quantities of semi-finished bone pins were also discovered at these two sites, especially at *Diana*, suggesting intensive production of this, very frequent bone item. Antler waste was also discovered at the site of Mora Vagei. It was assumed that on this site from the end of the 4<sup>th</sup> and the 5<sup>th</sup> century a workshop also existed, which produced calotte-shaped spindle whorls and double combs. This workshop was most likely located within the basement of the tower, where the storage area was.<sup>85</sup>

At the site of Ravna – *Timacum Minus*, more substantial remains of a workshop were discovered in 1998.<sup>86</sup> It was located near the fort wall in the vicinity of the southern gate. One object with several rooms was researched here, made from lighter materials – foundations were made of stone and pebbles, walls from wattle and daub and the roof construction was from *tegulae* and *imbrices*. In room no. 2, within the layers dated into the 4<sup>th</sup> – first half of the 5<sup>th</sup> century several bone artefacts, semi-finished products, manufacturing waste, as well as cervid antler and bovid horn core with traces of working were discovered. It was assumed by the researcher that wood was worked upon in the same room and that the entire complex represented a workshop area, where several craft activities took place<sup>87</sup>.

## DISCUSSION AND CONCLUDING REMARKS

The Limes regions in *Pannonia Inferior* and *Moesia Superior* had an important role in the economic and political life of these provinces, because of the permanent presence of the Roman army and state administration, and also thanks to the convenient geographical position and numerous natural resources. Agriculture and abundant sources of diverse raw materials, such as wood, stone, clay, ores, were important not only for local economy, but also for wider regions. Epigraphic and archaeological evidence available at this moment show that ceramic, brick production, as well as production of lithic, bone and probably wood items were well developed. Several workshops are known on the Limes alone (especially at legionary cities of *Singidunum* and *Viminacium* and on the Limes area in the Iron

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85 Cermanović-Kuzmanović and Stanković 1986, 454-455, Petković 1995, 18.

86 Petković 2001

87 Petković 2001, 70-71.



Gates), which supplied both the army and the borderland areas, and probably also more remote regions. However, an integrative, comprehensive study of arts and crafts in this region is still needed. In particular future researches should focus on the links and relations between different crafts (such as the links between lithic and metal production, bone and wood working, etc.).

*Translated by Jelena Vitezović*

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