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Svetlana Nestorović

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RUŽANA-NEW BRONZE AGE METALLURGICAL CENTER IN NORTH EASTERN SERBIA

Aleksandar N. Kapuran¹, Igor M. Jovanović²

¹*Institute of Archaeology, Beograd*

²*Muzej rudarstva i metalurgije, Bor*

Abstract

During excavations of the Ružana site near Bor last summer archaeologists discovered the new centre for copper ore smelting dating back to the Middle and Late Bronze Age in the prehistory in North Eastern Serbia. The investigated horizons indicate considerable slag remains (around 30 kilograms were collected). The slag composition shows the presence of copper and iron. In certain locations activities continued into the Iron Age, the La Tène and the Late Roman periods. The oldest horizon definitely belongs to the Bronze Age and contains the largest fragments of slag and pottery used in smelting process.

Keywords: North Eastern Serbia, Bronze Age, copper smelting.

1. INTRODUCTION

In the summer of 2013 the first archaeological excavations took place of the Ružana site near Banjsko polje, 8 km west of Bor. Ružana is the name of the creek which is the tributary of Brestovačka river, on whose right bank is located a multi-layered archaeological site with horizons dating back to Prehistory and late antiquity (4th century AD). The site belongs to the group of sites from the middle/late Bronze Age, which was formed on the eastern slopes of the Kučaj mountains, from Zlot to Bor. Unfortunately, the position of the prehistoric settlement is located in the modern urban suburbs of Bor, so that we are forced to excavate free areas of small dimensions that the owners of houses allow us to excavate.

2. RESULTS AND DISCUSSION

The multiculture-layered site of Ružana is located on a gentle slope, several kilometers below the Bronze Age necropolis discovered at the Trnjane site [1-7] (Map 1). The volcanic rock base contributes to poor water drainage and significant erosion, resulting in deposits of archaeological materials, ceramics and wall plaster from various periods of prehistory, such as the Bronze Age Paraćin group, the Basarabi and Zlotska group from the late Iron Age, the La Tène period from the early Iron Age and finds from late antiquity. A large quantity of ceramic fragments and the remains of prehistoric dwellings and stoves is concentrated in layers that descend toward the Ružana creek (Fig. 1).

The upper cultural layers contain predominantly fragmented and culturally mixed archaeological materials, both from prehistory and antiquity, from which we single out as most interesting the find of two bronze coins which indicate the existence of a Roman settlement from the late 3rd and early 4th centuries AD. Below it is a horizon with materials from all Iron Age periods, Basarabi (8th-7th centuries BC), Zlotska group (6th-4th centuries BC) and La Tène period (from 1st century BC to 1st century AD). This horizon was also created from deposits from higher elevations of the

settlement, and beneath it is observed a layer with loose, sandy soil in which mixed materials from the early Iron Age and the Bronze Age were discovered. The last and the oldest cultural horizon presents a layer with compacted soil and soot containing homogenous finds of only Bronze Age ceramics.



Figure 1 - Trench 3



Figure 2 - Slag

Of the Bronze Age ceramic materials we single out a large number of pyraunos, double vessels, for which it is considered that they played a role in the metallurgy process, where ore was smelted in them [8]. On one fragment there are even traces of slag (Fig. 3), signifying proof of the role of these vessels in the process of metallurgy. Other finds belong to various types of ceramic vessels, pots, pythos, bowls and cups, with ornamentation that is characteristic of the Paraćin culture of the middle and late Bronze Age on the territory of the central Balkans.

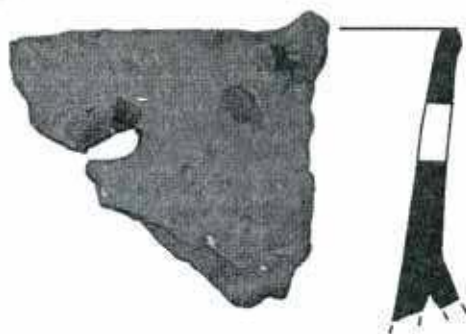


Figure 3 - Pyraunos

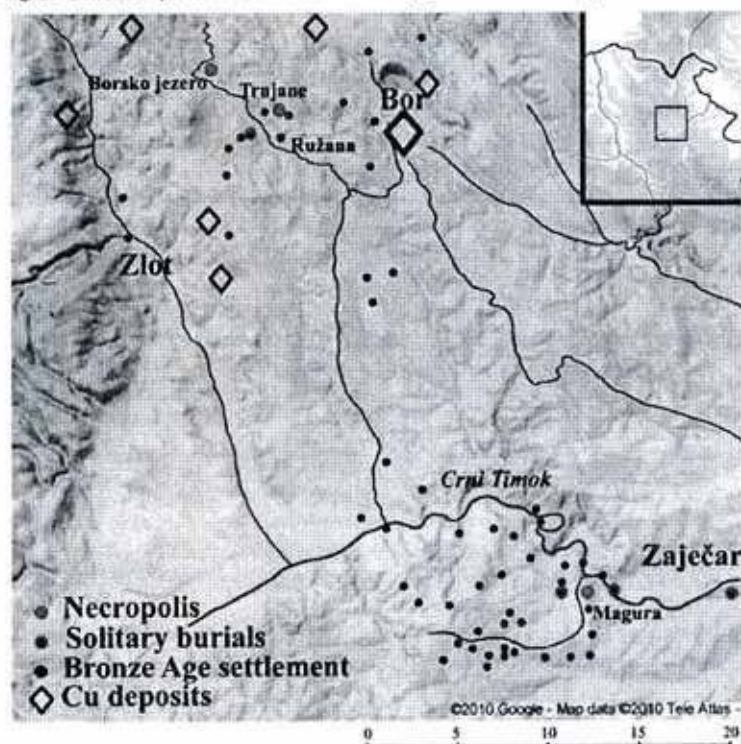
The discovered slag is found in the higher cultural layers of settlements created through deposits of smaller fragments, while in the culturally homogenous layer from the Bronze Age slag remains are of larger dimensions (from 3.5kg)(Fig.2). The types of slag that are observed include tap slag, amorphous slag and bowlshape slag (Fig.2). At this stage of our investigation we can assume that at this location the only process that was carried out was one of separation of copper from ore, where we have no proof of the production of bronze. Physical and chemical analysis of slag is currently conducted at the Mining and Metallurgy Institute Bor, as well as at the Institute in University of London.

3. CONCLUSION

Owing to the analysis of material culture, slag and topographic characteristics of settlements and necropolises in the Bor area, we can conclude that this area was settled in the Bronze Age exclusively by communities of miners and metallurgy workers. In the same period in the ore rich areas of the Alps it has been observed that the seasonal exploitation of copper took second place with respect to agricultural production, although this contributed more to the creation of

divisions within these communities [9]. At the same time, in the fertile planes in the foothills of the Alps communities developed that were exclusively devoted to agriculture. If the distribution and density of settlement in Central Europe is taken into account, it can be seen that during the middle and late Bronze Age a demographic increase of the population occurred, accompanied by a change in the landscape through increase in fertile land areas owing to deforestation [10-11]. Investigations in the area of metallurgical processes indicate that the mining process engaged craftsmen specialized in ore extraction, production of supporting structures and ore separation (*Ibid.*). The logistics for feeding such narrowly specialized communities would have engaged fairly large numbers of individuals for producing food and supplying them with staple foods, for which metallurgy workers neither had the time or the means (judging by the pedology of the areas in which they lived). Such a model of interaction was also observed in the example of Bronze Age communities in the areas around Bor and Zaječar, and the lower part of the Crni Timok river. To the north of Bor are concentrated communities of metallurgy workers, while to the south a system was formed of settlements that were primarily engaged in agriculture and whose material culture is more similar to the Verbicioara cultural group [6-7](Map. 1).

The finds uncovered at the Ružana site once again point to the metallurgical activities of prehistoric communities within metallogenic areas of south-eastern Kučajske mountains, which are visible both in the way that settlements were formed, and in the finds of material culture that point to the metallurgical processes in this region. Continued investigation of the Ružana site in the future should provide new elements for reconstructing metallurgical processes in prehistory and for giving us a clearer picture of the economic logic of mineral exploitation in the Bor basin.



Map 1 - Distribution of the Bronze Age sites and Necropoles.

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