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Metallurgical activity in the Early Bronze Age period on the hilltop settlement of Pod near Bugojno

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Ljubljana

Abstract: In the present article attention is drawn to several finds from the Early Bronze Age period, which in our opinion represent clear indications for a bronze casting workshop at the hilltop settlement of Pod near Bugojno, situated in the valley of the river Vrbas. These represent ceramic cylindrical objects, which we associate with identical finds from the workshop of a bronze founder in the Early Bronze Age phase at the settlement of Feudvar near Mošorin in Vojvodina. They can be interpreted as clay core supports, used as a casting instrument during the production of bronze objects.

Key words: Bosnia, hilltop settlement Pod near Bugojno, Early Bronze Age, metallurgical activity, casting instruments.

The prehistoric settlement of Pod near Bugojno is situated in the valley of the river Vrbas, within the mountainous region of central Bosnia with rich ore deposits and along one of the main traffic routes, connecting the Carpathian or Pannonian Basin with the Adriatic Sea (Fig. 1, 1).¹ The site has a dominant position with visual command over the valley of river Vrbas, which surpasses distance of 10 km both up- and downstream, while the views encompass also the surrounding mountain ranges and passes. It is positioned at the very point, where the route towards the Adriatic Sea divides. One path leads along the river Vrbas and crosses the Makljen mountain pass to the valley of river Rama and further to the valley of river Neretva, while the other way goes over the mountain pass Kupreška Vrata and continues either across the fields of Kupreško polje, Duvanjsko polje and Imotsko polje in the direction of the valley of river Neretva or, alternatively, across the fields of Livanjsko polje and Sinjsko polje towards Split or central Dalmatia region.²

The hilltop settlement of Pod near Bugojno represents one of the best investigated prehistoric archaeological sites in Bosnia and Herzegovina and was more or less continuously occupied from the Eneolithic period and all the way up to the end of the Iron Age.³ The archaeological excavations were conducted between 1958 and 1983 by the National Museum of Bosnia and Herzegovina (*Zemaljski muzej*) and led by Borivoj Čović, an outstanding scientist and the best expert in his time for the prehistory of the Balkan Peninsula.⁴ Čović regularly reported about his excavation results, above all in the main Yugoslav scientific journal, such as the *Arheološki pregled*, and in the *Glasnik Zemaljskog muzeja u Sarajevu* (*Herald of the National Museum in Sarajevo*),⁵ but also on various other occasions, such as at conferences and on congresses both in his homeland and abroad.⁶ In the fourth volume of *Praistorija jugoslavenskih zemalja* he then presented a synthetic overview of results from the research at Pod near Bugojno settlement, which he used as a basis for description of cultural phenome-

¹ The article was translated into English by Miha Kunstelj (Vrhnika), figures and maps (Fig. 1-6) have been prepared by Manca Vinazza (University of Ljubljana), to both I would like express my sincere thanks.

² Čović 1991, 7, Map 1.

³ Čović 1965, 48-65, Appendix 1; 1991, 10.

⁴ Cfr. Marić 1997; Škegro 1997.

⁵ Čović 1959; 1961b; 1963; 1964; 1965a; 1965b; 1966; 1967; 1968; 1972; 1974a.

⁶ Čović 1975; 1986, 60-62; 1990; 1995.

na in the western Balkans during the Bronze and Iron Ages.⁷ Due to the outbreak of pointless and disastrous civil war, which resulted in the tragic disintegration of Yugoslavia, Čović regrettably did not manage to finish the planned series of monographic publications about his excavations at the hilltop site Pod near Bugojno, the only exception being the first volume, dedicated to the Early Bronze Age settlement.⁸

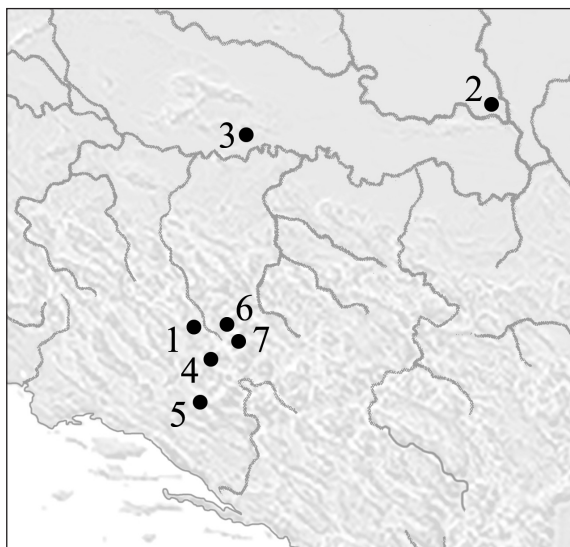


Fig. 1. Map with indicated sites mentioned in the article: 1 – Pod near Bugojno, 2 – Feudvar near Mošorin, 3 – Alilovci Lipje, 4 – Varvara, 5 – Sovići, 6 – Mračaj near Gornji Vakuf, 7 – Maškara

Sl. 1. / Fig. 1. Zemljevid z označenimi kraji, ki so omenjeni v članku: 1 – Pod pri Bugojnu, 2 – Feudvar pri Mošorinu, 3 – Alilovci Lipje, 4 – Varvara nad Ramo, 5 – Sovići ob Imotskem polju, 6 – Mračaj pri Gornjem Vakufu, 7 – Maškara

Despite the existent Čović's manuscripts⁹ and documentation, the work of his successors at the National Museum unfortunately has not resulted in the conclusion of his epochal research and publication of further volumes on Pod near Bugojno settlement. The only exception is Mario Gavranović, who offered a basic overview of the research as a part of his master's and doctor-

al work.¹⁰ However, in his studies of Pod near Bugojno settlement he focused primarily on the periods of Late Bronze and Early Iron Age,¹¹ what served him as a starting point for the research on the wider region of western Bosnia, comprising the river basin areas of Vrbas, Sana and Bosna.¹²

In the present contribution we would like to draw attention to several finds from the Early Bronze Age period, for which we believe they represent clear indications that there was a bronze casting workshop on the hilltop settlement of Pod near Bugojno. These are the ceramic cylinder-shaped objects, which were interpreted by Čović as oversimplified representations of anthropomorphic idols (Fig. 2, 1-3).¹³ In view of the analogies from the prehistoric settlement of Feudvar near Mošorin in Vojvodina, that is, from its likewise Early Bronze Age phase, there can be no doubt that these objects, rather than being the enigmatic idols, represent clay core supports, which were in use as casting instruments during the production of bronze artefacts.

At Feudvar, large-scale archaeological excavations were conducted between 1986 and 1990 under the leadership of Bernhard Hänsel and Predrag Medović, comprising the fortified settlement as well as the topographic research and smaller trial excavations in the surrounding area. The settlement, placed on the edge of the elevated Titel Plateau, overlooks the main river Tisza and the surrounding, wide-open plain, while the location offers a practically boundless panorama with views as far as the eye can see. Such favourable position assured the settlement a central role and made it an important junction on the communication routes along the main waterways of the Carpathian Basin – the Tisza and Danube rivers, the confluence of which lies in the immediate vicinity, to the south of the present-day town of Titel (Fig. 1, 2). Unfortunately, the archaeological excavations have been disrupted on account of the Serbian military aggression and the subsequent breakup of Yugoslavia and

¹⁰ Gavranović 2011/2, 89-123.

¹¹ Gavranović 2004; 2011/2, 109-123, Pls. 29-73 (Unfortunately, the National Museum of Bosnia and Herzegovina permitted Gavranović to inspect and later publish only the finds from excavations conducted in 1963).

¹² Gavranović 2011/1-2.

¹³ Čović 1983a, 177, T. 26, 3; 1991, 16, 23, 41, 48, T. 4, 18-20.

⁷ Čović 1983a; 1983b. Cfr. also Čović 1976, 198-209.

⁸ Čović 1991.

⁹ According to the verbal communication with sadly now also deceased Branka Raunig, the Borivoj Čović's manuscript for his next volume was practically finished.

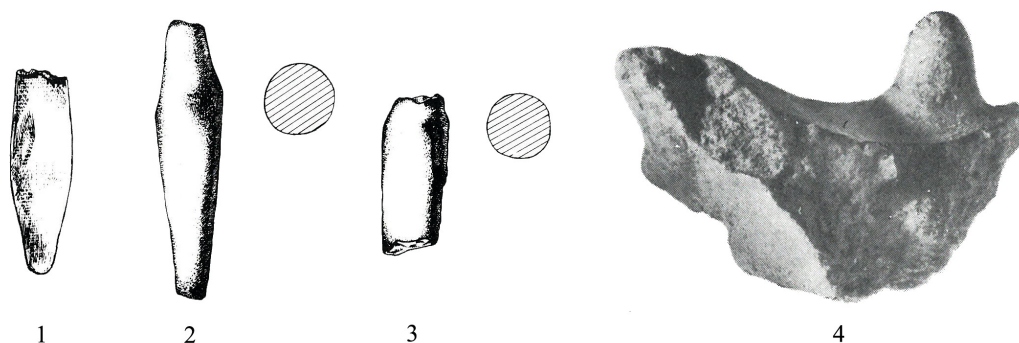


Fig. 2. Pod near Bugojno, clay core supports – casting implements and fragment of crucible with knobs on the bottom (after Čović 1991, Pl. 3, 4; 4, 18-20)

Sl. 2. / Fig. 2. Pod pri Bugojnu, glinasti zatiči – livarski pripomočki in fragment livarskega lončka s tutuli (po Čović 1991, T. 3, 4; 4, 18-20)

remain incomplete, what is also the reason why they have not yet been fully published.¹⁴

The settlement of Feudvar represents, similarly as the Pod near Bugojno settlement, a site with a very prolonged period of occupation, ranging from the Eneolithic and all the way up to the Late Iron Age or Sarmatian period. Relevant for the present discussion is, though, the highly significant discovery of a metallurgical workshop from the Early Bronze Age. The latter was situated in the middle of the settlement, characterised by the rectangular layout of dwelling houses and narrow lanes. The buildings were fairly equal in size with the exception of the workshop building, which showed somewhat smaller dimensions (Fig. 3).¹⁵ Regardless of its distinctive size, the workshop did not deviate in main from the regular settlement layout, as the space before its front as well as its rear wall had been left empty, what augmented the distance to the neighbouring dwelling units. In this way the workshop was surrounded on both sides with smaller courtyard where the metallurgical activities were carried out, but at the same time a shift in the spatial arrangement could be understood also as a deliberate security measure because of the use of fire during the casting process and the consequent danger of flying sparks setting fire to neighbouring buildings.

Both in and around the workshop numerous remains of various tools and casting instruments have been discovered, what points to the fact that at the settlement of Feudvar a specialised craftsman or founder had been active, equipped with abundant and varied set of tools and thus capable of producing a wide range of products. His set of implements included mould models or male moulds (patrices) and numerous diverse mould types for the manufacture of bronze objects (one-piece moulds, two-part or bivalve moulds, multipart moulds (*mehrschalige Gußformen*) and so-called lost moulds (*Gußtechnik der "verlorenen Form"*), which were shattered after use. In regard to the preservation of the mould forms, it can be said that the founder manufactured various types of bronze products, such as weapons (spears, axes, daggers), tools (knives/sickles, chisels, awls), jewellery (ribbed bracelets) etc. In addition to casting moulds, also crucibles and remains of bronze droplets from casting at high temperatures have been discovered, as well as the fairly large collection of variously sized clay core supports (Fig. 4). The latter were needed when casting hollowed parts of bronze objects, such as for example the sockets of spearheads, socketed chisels, socketed and shaft-hole axes and the like.

In addition, stone plates and grindstones were also found. These had been used for the finishing of the bronze objects, such as for example the removal of casting seams and the like. Traces of metal have been still preserved in the scratches and cuts of these grinding plates.¹⁶ The work-

¹⁴ Hänsel / Medović 1991; 1998 (Feudvar I); Falkenstein 1998 (Feudvar II); Kroll / Reed 2016 (Feudvar III).

¹⁵ Hänsel / Medović 1991, 66-69, 72-77, Abb. 7; 11; 2004, 88-91, Abb. 2; Hänsel 2009, 112-113, Abb. 117.

¹⁶ Hänsel / Medović 2004, 88-102, Abb. 2; 6-14.

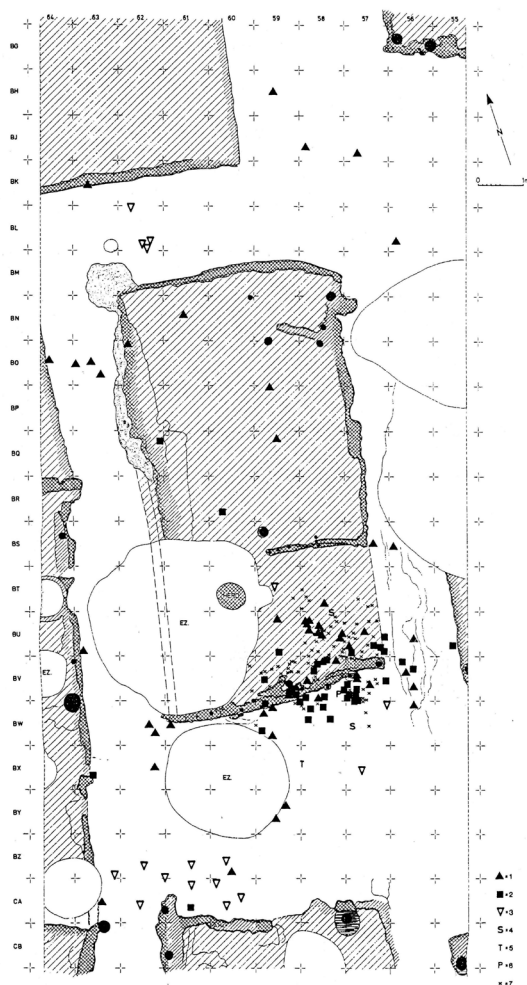


Fig. 3. *Feudvar near Mošorin (Vojvodina), ground plan of the metallurgical workshop from the Early Bronze Age: ▲ – clay core supports, ■ – two- and multi-part moulds, △ – remains of the fragmented lost moulds, S – stone plates and grindstones, T – crucibles, P – fragments of male moulds, x – pottery fragments, EZ – outlines of storage pits from the Iron Age settlement phase, which destroyed parts of the workshop (after Hänsel / Medović 2004, 89, Abb. 2).*

Sl. 3. / Fig. 3. *Feudvar pri Mošorinu (Vojvodina), prikaz situacije najdb v in v okolici metalurške delavnice iz zgodnje bronaste dobe: ▲ – glinasti zatiči, ■ – dvo- in večdelni kalupi, △ – ostanki razbitih kalupov izgubljenih oblik, S – kamnite plošče in brusni kamni, T – livarski lončki, P – fragmenti patric, x – fragmenti keramike, EZ – obrisi shrambenih jam od vkopov iz železnodobnega naselbinskega sloja naselbine, ki so uničili dele delavnice (po Hänsel / Medović 2004, 89, Abb. 2)*

shop is attested in the middle phase of the Early Bronze Age settlement, attributed to the Vatin culture, and can be dated in the Br A2-B1 period

(according to the chronological scheme of Reinecke) or to the Early Danubian period FD III-MD II (according to the chronological scheme of Hänsel), what corresponds more or less with a time span between 1900 and 1500 BC.¹⁷

The clay core supports from the metallurgical workshop in Feudvar are thus completely identical to examples from Pod near Bugojno (Cfr. Figs. 2, 1-3. 4) and are also contemporaneous with them, consequently there can be no doubt that they served the same purpose and were used in a likewise manner. Regrettably, it remains unclear where the core supports were found in the Pod near Bugojno site and as a result the area of metallurgical activity within the settlement cannot be exactly located. However, from the published ground plans of excavated areas with depicted postholes, indicating the building constructions, it can be inferred that in this case as well the buildings had been arranged in a relatively regular rows, while between them the larger or smaller empty spaces together with lanes/paths had been located,¹⁸ what is somewhat reminiscent of the settlement organisation at Feudvar. Moreover, like in the case of the metallurgical workshop from Feudvar, also at Pod near Bugojno settlement a rectangular structure, differing noticeably from the remaining buildings, can be observed. This structure measured approximately 5.2 x 4 meters and contained in its interior also a well-preserved stone-lined hearth (Fig. 5),¹⁹ the particular construction of which could potentially indicate that the building might be associated with the metallurgical activity. In addition to the above presented clay core supports, metallurgical implements discovered at Pod include as well fragments of crucibles with knobs on their bottoms (Fig. 2, 4), which were mentioned already by Čović. Such crucibles are known also from other Bronze Age sites in Bosnia.²⁰

At this point, we would like to draw attention to several ceramic vessels from the Early Bronze Age phase at the hilltop site of Pod near Bugojno, which point to relations with the northern areas in the Pannonian Basin. Quite a few fragments of

¹⁷ See Ibid., 86; Hänsel 1968, 19-23, Abb. 2.

¹⁸ Čović 1991, 14-15, 37-39, Appendix 7; 8; 9.

¹⁹ Ibid., 14, 37-38, Appendix 7; 9.

²⁰ Čović 1983a, 178; 1984a, 128-129; 1991, T. 3, 4; see also Radimsky 1894, 503, T. 3, 42; Curčić 1901, 58-59, Fig. 45; 1908, 84-85.

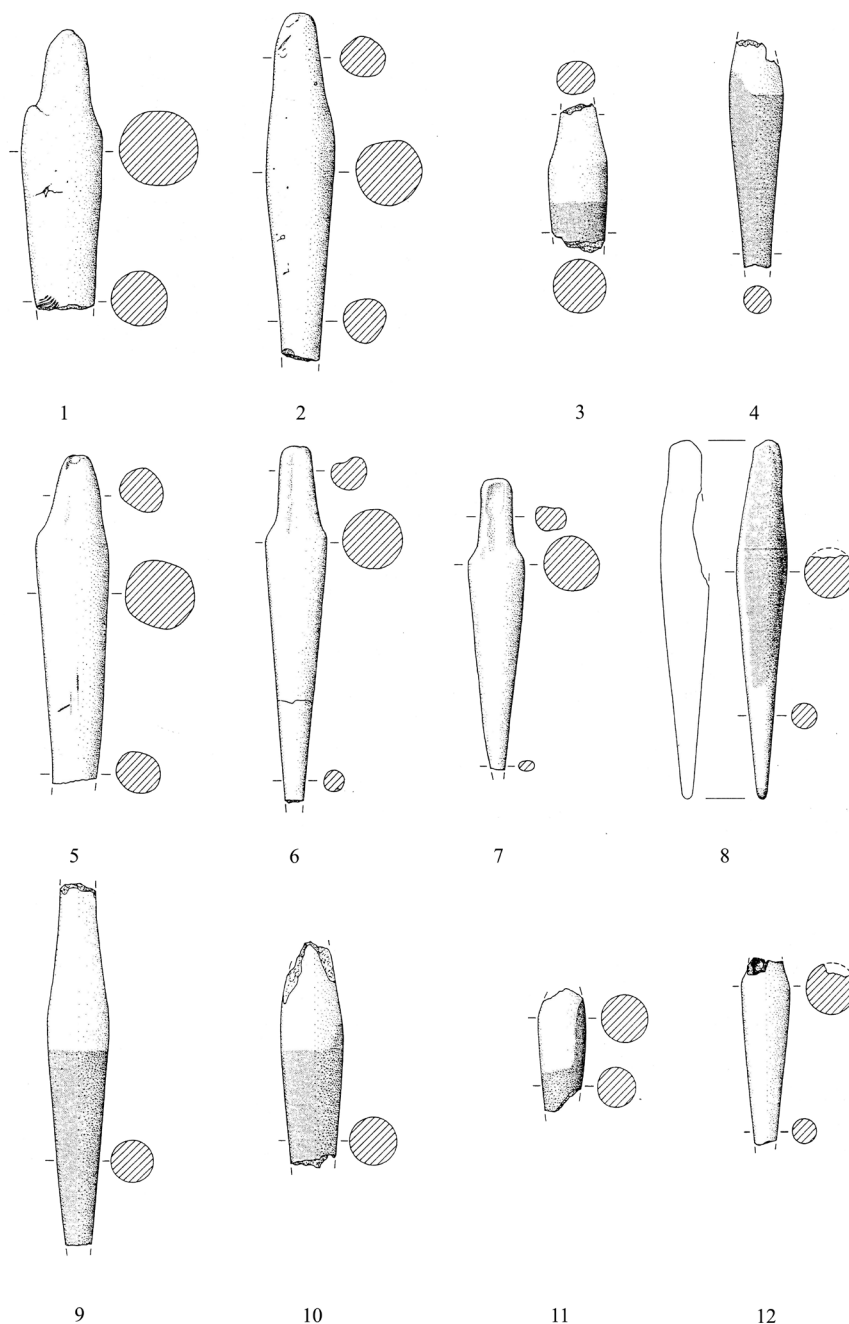


Fig. 4. *Feudvar* near *Mošorin* (Vojvodina), clay core supports – casting implements
(after Hänsel / Medović 2004, Abb. 11-12)

Sl. 4. / Fig. 4. *Feudvar* pri *Mošorinu* (Vojvodina), glineni zatiči – livarski pripomočki
(po Hänsel / Medović 2004, Abb. 11-12)

vessels – jugs or amphorae – have been discovered, which can be compared with typical vessel forms of the Vatin culture²¹ and which therefore

²¹ Čović 1983a, 172, Pls. 22, 1; 23, 3. Here we should stress that the dating of the early Vatin culture had been significantly corrected and that its beginning can be placed already in the period of Early Bronze Age, that is, in the Br A2

seem to support the above-mentioned links and similarities concerning the metallurgical knowledge and activities. Moreover, at the Pod near Bugojno settlement also examples of the so-

period – see Hänsel / Medović 1991, 62, Abb. 4; 1992; Roeder 1992; Görsdorf 1991; Falkenstein et al. 2016, 7-10, Fig. 3.

called cord-impressed or Litzen pottery (*Litzenkeramik*)²² have been found, which can be related with the aforementioned communication route between the Pannonian Basin and the Adriatic region. This type of pottery is namely attested on the hilltop settlement sites of the Posušje culture in the Herzegovina and neighbouring Dalmatia region, as for example on the Sovići at Imotsko polje,²³ while on the other hand its best analogies can be found in the region of Slavonia, such as for example at the settlement Alilovci Lipje in the Požega Valley.²⁴

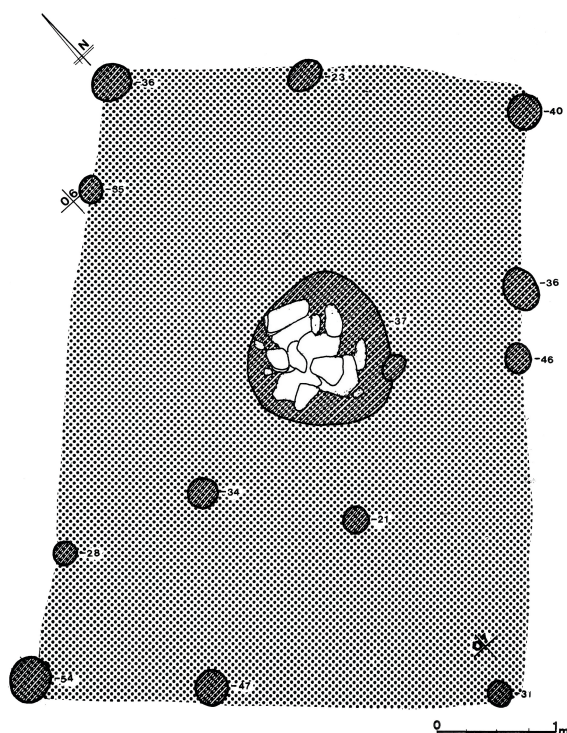


Fig. 5. Pod near Bugojno, building with a stone-lined hearth from the Early Bronze Age period (after Čović 1991, Appendix 9).

Sl. 5. / Fig. 5. Pod pri Bugojnu, stavba s kamnitim ognjiščem iz zgodnje bronaste dobe (po Čović 1991, Prilog 9)

The Litzen pottery was, however, distributed on a much wider territory of the Pannonian Plain, comprising the margins of the Eastern Alps,

from the Ljubljana Marshes (Ljubljansko barje) pass the Prekmurje region to the Burgenland, Lower Austria and all the way to the Southern Slovakia. Precisely because of such a broad distribution there exist various local groups, which can be differentiated according to the diverse execution of ornament. Thus, it seems relevant that Ana Kruh, who re-examined the phenomenon of the Litzen pottery on the entire territory of its distribution, correlated vessel examples, especially one of the dishes from Pod near Bugojno, with her second group of cord-impressed or Litzen pottery, which is characteristic of the north-eastern Pannonian Basin area, above all of sites in the eastern parts of present-day Austria.²⁵ The hilltop settlement of Pod near Bugojno was therefore incorporated into the communication network that stretched from the Adriatic region all the way to the Eastern Alps and the area of Middle Danube basin. The reasons for such relations could potentially be sought in the rich ore deposits of the Bosnian Ore Mountains and in the primary copper trade as well as in the metallurgical knowledge and activities.

The studies by Aleksander Durman,²⁶ Borivoj Čović²⁷ and recently also by Mario Gavranović,²⁸ on the metallurgy of the western Balkan Peninsula, above all of Bosnia, have demonstrated that numerous deposits of copper, copper-antimony and copper-arsenic ores are present in the very area of the north-western and central Bosnia. Unfortunately, the traces of mining activities in prehistory remain meagre. Among them we should mention two examples of mining pits discovered in the area of the upper Vrbas river, at sites of Mračaj and Maškara (Fig. 1, 6-7), and Slatina upon river Rama, which, however, are dated according to the preserved finds to the Late Bronze Age period, whereas earlier mining on the two places cannot be excluded.²⁹ The finds of copper and bronze objects are of course much earlier. One of the earliest copper objects represent the finds from the settlement in Gorn-

²² Čović 1983a, 173, 177, 181, Pl. 24, 12; 1991, 20, Pls. 14, 8; 25, 1-4.

²³ Čović 1983a, 139-143, Pl. 18, 9-10; 1989, 77-78, Fig. 16, Pls. 10-11; Kruh 2019, 177-179, Fig. 38.

²⁴ Mavrović Mokos / Pavličić 2015, 10-16, Fig. 7, 1-2; 8, 1; 12, 3; 13.

²⁵ Kruh 2019, 168, Appendix 1. For the radiocarbon dating of the Litzen pottery in the territory of Slovenia see also Črešnar / Teržan 2014, 674-676, Fig. 14-16.

²⁶ Durman 1983, 9-11, 54-56 Map.

²⁷ Čović 1984a, 122-127; 1995, 103-110, Abb. 4.

²⁸ Gavranović 2011, 6-13, Maps 3-4.

²⁹ Čović 1984a, 133; 1995, 108-109, Abb. 5; Gavranović 2011, 10-11, Map 7. See Curčić 1908, 86-90, Fig. 1-5.

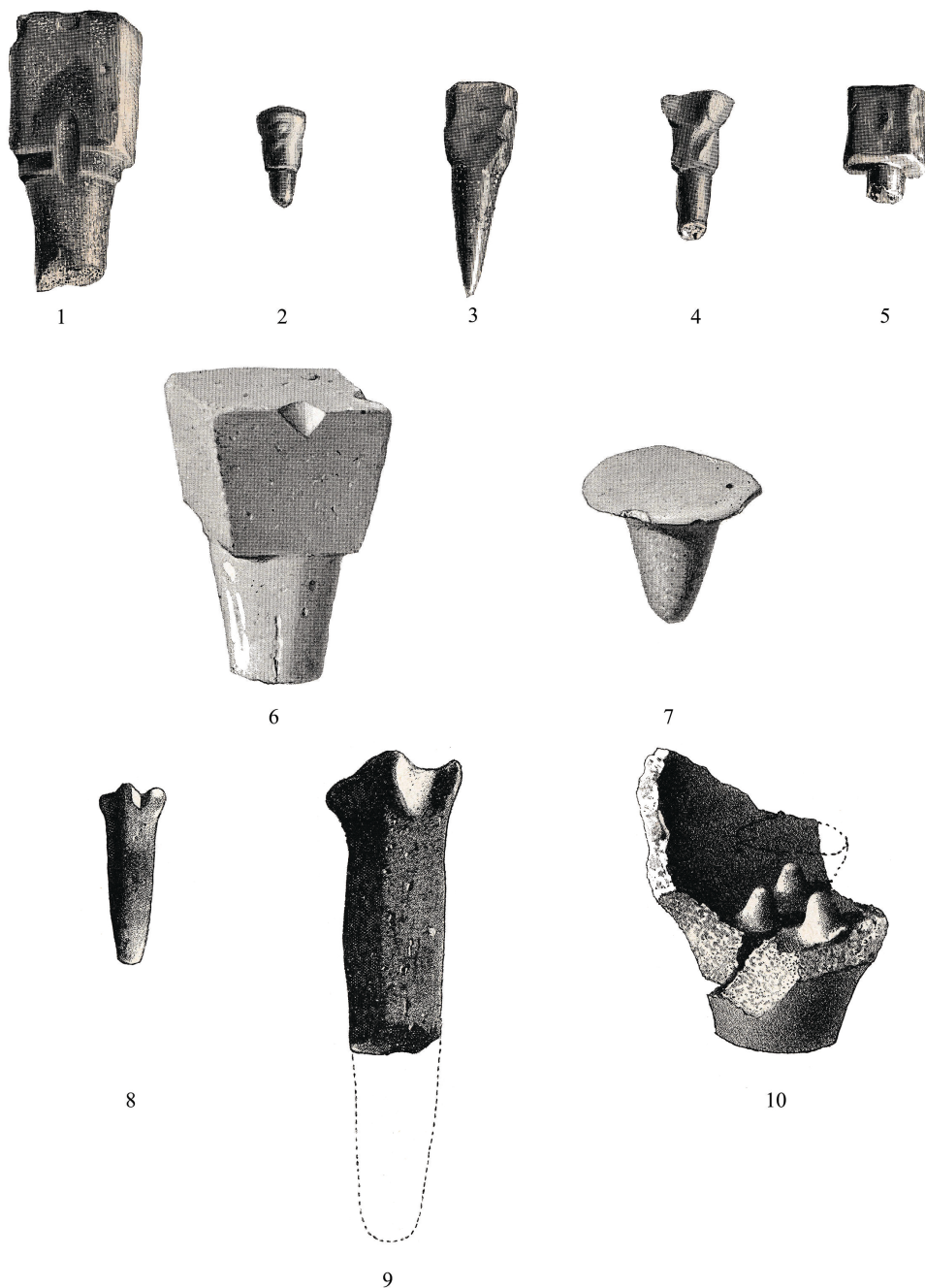


Fig. 6. Clay core supports – casting implements from the settlements of the Late Bronze Age period: 1-5 Čungar near Cazin (after Radimsky 1894, Pl. 5, 63-67), 6-7 Ripač near Bihać (after Radimsky 1897, Pl. 24, 122-124), 8-10 Varvara – Velika gradina (after Curčić 1901, 59, Figs. 46-47).

Sl. 6. / Fig. 6. Zatiči – livarski pripomočki in livarski lonček iz naselbin pozne bronaste dobe: 1-5 Čungar pri Cazinu (po Radimsky 1894, T. 5, 63-67), 6-7 Ripač pri Bihaću (po Radimsky 1897, T. 24, 122-124), 8-10 Varvara – Velika gradina (po Curčić 1901, 59, Fig. 46-47)

ja Tuzla, stratum III, which can be dated already in the time of Vinča culture.³⁰ Growth in copper products in Bosnia, above all of tools such as dif-

ferent types of axes, is characteristic of the time of Vučedol culture.³¹

As was shown by Čović on the basis of the Stuttgart spectral metal analyses (SAM), these

³⁰ Čović 1961a, 102-103, Fig. 16; Durman 1983, 12.

³¹ Durman 1983, 23-58; Čović 1984, 119-128; 1995.

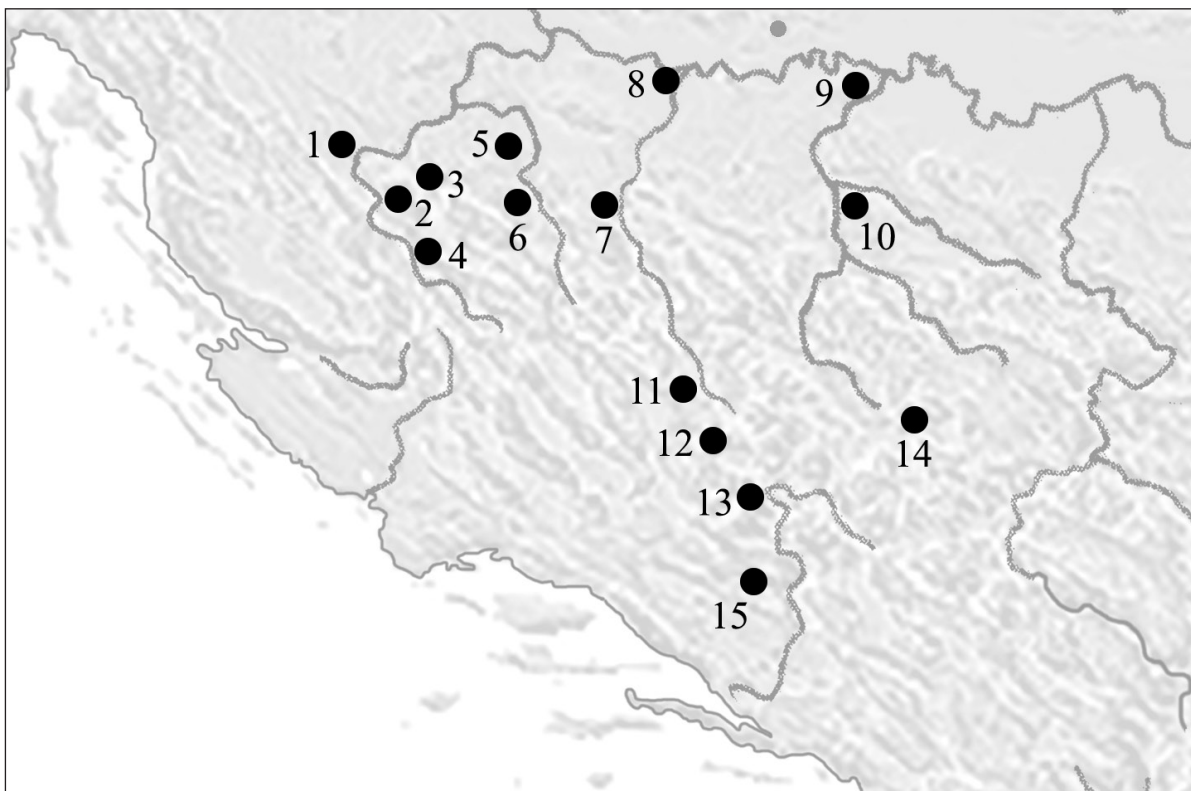


Fig. 7. Map of the Late Bronze Age settlements, where finds indicating metallurgical activity have been discovered (after Čović 1984a, Map 1): 1 Čungar, 2 Ripač, 3 Kekiča Glavica, 4 Bjelaj, 5 Zecovi, 6 Hrustovača, 7 Radmanići, 8 Donja Dolina, 9 Pivnica, 10 Crkvina – Makljenovac, 11 Pod near Bugojno, 12 Velika gradina in Varvara, 13 Vihovica, 14 Debelo brdo, 15 Gradac – Mokro near Listica

Sl. 7. / Fig. 7. Karta naselbin iz pozne bronaste dobe z najdbami, ki kažejo na metalurško dejavnost (po Čović 1984a, Karta 1): 1 Čungar, 2 Ripač, 3 Kekiča Glavica, 4 Bjelaj, 5 Zecovi, 6 Hrustovača, 7 Radmanići, 8 Donja Dolina, 9 Pivnica, 10 Crkvina v Makljenovcu, 11 Pod kod Bugojna, 12 Velika gradina v Varvari, 13 Vihovica, 14 Debelo brdo, 15 Gradac v Mokrem pri Listici.

artefacts were made out of different types of copper (native copper, oxide, carbonate and sulphide ores). This fact indicates different ore deposits, which could potentially nevertheless be sought in Bosnia,³² although the recent chemical³³ and isotopic analyses³⁴ of copper and bronze artefacts do not yet allow a more evident answer. The same is true also for the bronze artefacts from the Late Bronze Age, as in this period an exceptional flourishing and a peak of metallurgical activity in Bosnia can be observed, not only in view of the very numerous bronze artefacts of high quality, which are clearly local products,³⁵ but also as regards the recurrent finds of bronze moulds

and other casting implements, including clay core supports (Fig. 6),³⁶ from many archaeological sites, also from Pod near Bugojno.³⁷ Illustrative in this sense is Čović's map, presenting Late Bronze Age settlements with attested traces of metallurgical activities. This map demonstrates that the metallurgical activities were conducted above all in the area of western Bosnia, on the territory from the Pounje region to the valleys of Vrbas and Rama region (Fig. 7),³⁸ what accordingly would imply that the copper ore had been mined at the nearby ore deposits. Regardless of

³² Čović 1984a, 122-128, Tab. 1-3; 1995, 103-109, Tab. 1-4.

³³ Govedarica et al. 1995.

³⁴ Schmitt-Strecker / Begemann 2005, especially pgs. 62-63.

³⁵ Cfr. e.g. Čović 1983b; 1984b; König 2004; Gavranović 2011.

³⁶ Interestingly, the core supports from the Late Bronze Age differ in the rather massive handles, which can be square, cylindrical or flattened oval in their forms – see e.g. Radimsky 1894, T. 5, 63-67; 1897, T. 24, 122. 124; Curčić 1901, 59, Fig. 46-47; Ludajić 1991, 62, T. 4, 4.

³⁷ Čović 1984a, 129-135, Map 1; Gavranović 2016, 89-91.

³⁸ Čović 1984a, Map 1 with the list of sites.

the fact that a new project of archaeometric research on the Late Bronze Age bronze artefacts from Bosnia is under way, the studies published till now make clear that the chemical analyses more or less still remain in the dark about such questions.³⁹

This contribution has shown that on the hill-top site of Pod near Bugojno metallurgical activities took place in the Early Bronze Age period. Significant is also the location of the settlement, in the immediate vicinity of copper ore deposits and close to aforementioned prehistoric mine pits at the upper course of Vrbas river (Fig. 1).⁴⁰

The importance of the Pod near Bugojno settlement therefore lies not only in its strategic position on the main trade route, along the river Vrbas and at the crossroad or bifurcation of the roads towards Adriatic region, but also in its role of central place, the relevance of which had been obtained also through metallurgical activities. The metallurgical workshop, which must have been similar to the one from Feudvar near Mošorin, most likely did not fulfilled with its products only the demands of the inhabitants from the Pod near Bugojno settlement, but rather a larger area. However, the radius of the workshop's influence remains still undetermined due to the rare bronze finds from the Early Bronze Age on the territory of Bosnia and in its surrounding area. It is hoped that the present contribution will help to stimulate further archaeological research of metallurgy and mining in this ore-rich country.

Sažetak

Metalurška dejavnost v zgodnji bronasti dobi na gradini Pod pri Bugojnu

V goratem osrčju Bosne z bogatimi rudnimi bogastvi in ob eni izmed glavnih prometnih žil, ki povezuje Karpatsko kotlino oz. Panonsko nižino z Jadranskim

morjem – v dolini reke Vrbas, je bila locirana prazgodovinska naselbina na Podu pri Bugojnu (Sl. 1, 1). Gradina, ki s svojo dominantno lego vizualno obvladuje dolino reke Vrbas v dolžini več kot 10 km tako nizvodno kot vzvodno ter ima hkrati pregled nad okoliškimi planinskimi masivi in prelazi, leži prav na mestu, kjer se komunikacija proti Jadranu razcepi, saj se ena pot nadaljuje vzdolž reke Vrbasa in nato preko prelaza čez Makljen v dolino reke Rame in od tod dalje do doline reke Neretve, medtem ko druga prečka Kupreška vrata in se nadaljuje preko Kupreškega, Duvanjskega in Imotskega polja prav tako v smeri doline Neretve, ali pa preko Livanjskega in Sinjskega polja v smeri proti Splitu oz. srednji Dalmaciji.

Gradina Pod pri Bugojnu, ki je bila poseljena bolj ali manj kontinuirano od eneolitnega obdobja do vključno železne dobe, sodi med najboljše raziskana prazgodovinska arheološka najdišča v Bosni in Hercegovini. Arheološka izkopavanja, ki so potekala od 1958 do 1983 s strani Zemaljskega muzeja v Sarajevu, je vodil Borivoj Čović, vrhunski strokovnjak in najboljši poznavalec prazgodovine na Balkanskem polotoku svojega časa. Čović je o svojih izkopavanjih sproti poročal, predvsem v osrednjem jugoslovanskem strokovnem glasilu, kot je bil *Arheološki pregled* in v *Glasniku Zemaljskega muzeja*, pa tudi na različnih strokovnih srečanjih in kongresih tako v domovini kot tudi v tujini. V četrtem zvezku *Praistorije jugoslovenskih zemalja* pa je podal sintetični pregled izsledkov raziskav na Podu pri Bugojnu, ki so mu služile za osnovo orisa kulturnih fenomenov bronaste in železne dobe na zahodnem Balkanu. Zaradi izbruha nesmiselne in katastrofalne državljanske vojne, ki je pripeljala do tragičnega razpada Jugoslavije, žal ni uspel dokončati v več zvezkih načrtovane monografske objave svojih izkopavanj na gradini Pod, razen prvega zvezka, ki je posvečen naselbini iz zgodnje bronaste dobe. Žal njegovi nasledniki in naslednice v Zemaljskem muzeju niso zmogli, da bi na osnovi že obstoječih Čovićevih rokopisov in dokumentacije dokončali njegovo epohalno raziskovalno delo ter objavili še naslednji zvezek oz. zvezke o Podu pri Bugojnu. Izjemo predstavlja Mario Gavranović, ki je v okviru svojega magistrskega in doktorskega dela podal osnovni pregled raziskovanj, a se je pri svojih raziskavah posvetil obdobju pozne bronaste in starejše železne dobe na Podu pri Bugojnu, kar mu je bilo izhodišče za proučevanje širšega območja zahodne Bosne – porečij Vrbasa, Sane in Bosne.

V našem prispevku želimo opozoriti na nekaj najdb iz zgodnje bronaste dobe, za katere menimo, da predstavljajo jasne indikatorje za metalurško-livarsko delavnico na gradini Pod. Gre za keramične valjaste predmete, ki jih je Čović opredeli kot drastično pohenostavljene antropomorfne idole (Sl. 2, 1-3). Glede na analogije iz prazgodovinske naselbine Feudvar pri

³⁹ Gavranović / Mehofer 2016.

⁴⁰ Durman 1983, 9-11, Map; Čović 1984a, 133; 1995, 107-109; Gavranović 2011, 7-8, Maps 3-4.

Mošorinu v Vojvodini, in sicer iz njene faze, datirane prav tako v čas zgodnje bronaste dobe, pa ni dvoma, da le-ti predmeti niso bili zagonetni idoli, temveč glinasti zatiči, ki so služili kot livarski pripomočki pri izdelavi bronastih predmetov.

V Feudvaru so pod vodstvom Bernharda Hänsela in Predraga Medovića v letih med 1986 in 1990 potekala velikopotezna arheološka izkopavanja utrjene naselbine in topografske ter manjše sondažne raziskave njene širše okolice. Naselbina na robu visokega Titelskega platoja se je dvigovala nad mogočno reko Tiso in obdajajočo prostrano ravnino, pogled z nje se je širil v nedogled. Takšna lega ji je dajala pečat osrednje naselbine in hkrati pomembnega komunikacijskega stičišča ob glavnih žilah Karpatskega bazena – Tise in Donave, katerih sotočje je v neposredni bližini, južno od današnjega kraja Titel (Sl. 1, 2). Žal so bila arheološka izkopavanja zaradi srbske vojaške agresije in razpada Jugoslavije prekinjena in so ostala nedokončana, zaradi česar tudi še niso v celoti objavljena. Naselbina Feudvar je bila podobno kot gradina Pod pri Bugojnu poseljena skozi zelo dolgo časovno obdobje, od eneolitika pa vse do mlajše železne dobe oz. sarmatskega obdobja. Za našo razpravo pa je pomembno epohalno odkritje iz zgodnje bronaste dobe, namreč metalurške delavnice. Le-ta se je nahajala tako rekoč sredi naselbine, ki jo odlikujejo v pravilnem rastru razporejene stanovanjske stavbe dokaj enakih velikosti in ozke uličice, le stavba delavnice je bila nekoliko manjša od ostalih (Sl. 3). Čeprav se je razlikovala od drugih, pa ni bistveno odstopala od uličnega rastra, kajti pred njenim pročeljem kot tudi za njeno zadnjo stranjo je obstajal prazen prostor, s čemer se je povečal razmak do naslednjih stanovanjskih enot. Na ta način je bila delavnica na obeh straneh obdana z manjšim dvoriščem, kjer so se odvijale metalurške dejavnosti, a hkrati bi lahko razumeli prostorski odmik od sosednjih stavb tudi kot premišljen varnostni ukrep zaradi uporabe ognja pri livarskih delih in nevarnosti preskoka iskre na sosednje objekte. V delavnici in tudi okoli nje je bilo odkritih mnogo ostankov različnih orodij in livarskih pripomočkov, kar kaže, da je v Feudvaru deloval metalurg-specialist, opremljen z bogatim in raznolikim repertoarjem orodja, torej ponudbo širokega spektra izdelkov. Posedoval je modele – patrice za kalupe ter kalupe za različne načine izdelave bronastih predmetov (enodelne, dvodelne oz. večdelne kalupe (*mehrschalige Gußformen*) in kalupe tako imenovanih izgubljenih oblik (*Gußtechnik der "verlorenen Form"*)). Glede na ohranjenost oblik kalupov se kaže, da je izdeloval različne vrste bronastih izdelkov, kot so orožje (sulice, sekire, bodala), orodje (noži/srpi, dleta, šila), nakit (narebrene zapestnice) itd. Poleg kalupov pa so bili najdeni tudi livarski lončki in ostanki bronastih kapljic od vlivanja pri visokih temperaturah ter zelo velika zbirka različno velikih

glinastih zatičev (Sl. 4). Le-ti so služili pri vlivanju za izvotljene dele bronastih predmetov, kot so n.pr. tulci suličnih osti, tulasta dleta, tulaste in uhate sekire ipd. Za dodelavo bronastih predmetov, kot je n.pr. brušenje livarskih šivov ipd., pa so služile kamnite plošče in brusni kamni, na katerih so se v risih in vrezih ohranili še sledovi kovine. Delavnica je datirana v srednjo fazo zgodnjebronastodobne naselbine, ki je pripisana Vatinški kulturi, t.j. bronasti dobi Bd A2-B1 (v smislu Reineckejevega kronološkega sistema) oz. zgodnje podonavski stopnji FD III-MD II (v smislu Hänselovega kronološkega sistema), kar odgovarja približno času med 1900-1500 pr.n.št.

Glineni zatiči iz metalurške delavnice v Feudvaru so torej povsem enaki primerkom iz Poda pri Bugojnu (primerjaj Sl. 2, 1-3. 4) in so jim tudi sočasni, zato ni dvoma, da gre za njihovo identično namembnost in uporabo. Žal iz objave ni razvidno, kje v gradini Pod so bili zatiči najdeni, zato mesto metalurške dejavnosti na Podu ni možno natančno locirati. Vendar pa je iz objavljenih tlorisov izkopanih površin z vrisanimi stojkami za nosilne stebre konstrukcij stavb možno sklepati, da so bile tudi tu stavbe razporejene razmeroma pravilno v vrstah in da so med njimi obstajali večji ali manjši prazni prostori in pa uličice/poti, kar nekoliko spominja na ureditev naselja v Feudvaru. Podobno kot metalurška delavnica v Feudvaru odstopa med stavbami na Podu objekt pravilnega pravokotnega tlorisa, velikosti približno 5,20 x 4m, z dobro ohranjenim ognjiščem, obloženim s kamni (Sl. 5), katerega bi morda lahko prav zaradi tako posebno grajenega ognjišča povezali z metalurško dejavnostjo. Poleg pravkar predstavljenih glinenih zatičev na Podu ni bilo odkritih drugih metalurških pripomočkov z izjemo fragmentov talilnih lončkov s tutuli na dnu (Sl. 2, 4), kot jih omenja že Čović. Takšni so znani tudi z drugih bronastodobnih najdišč v Bosni, kjer jih povezujejo s taljenjem kovine.

Zdi se nam omembe vredno opozoriti na nekaj keramičnih posod iz zgodnjebronastodobne faze na gradini Pod, ki kažejo na povezave s severno ležečimi kraji v panonskem prostoru. Najdenih je bilo kar nekaj fragmentov posod – vrčev ali amforic, ki jih lahko primerjamo s tipičnimi oblikami posod Vatinške kulture, kar podpira predstavljene povezave in podobnosti glede metalurškega znanja in dejavnosti. S Poda pa izvira tudi nekaj primerkov tako imenovane pramenaste oz. licenske keramike (*Litzenkeramik*), ki jo lahko povežemo z omenjeno komunikacijsko žilo med Panonijo in Jadranom, saj je na eni strani zastopana tudi na gradinah Posuške skupine v Hercegovini in sosednji Dalmaciji, kot n.pr. v Sovičih ob Imotskem polju, na drugi strani pa ima najbližje primerjave v Slavoniji, n.pr. na naselbini Alilovci Lipje v Požeški kotlini. Vendar pa je bila licenska keramika razširjena na mnogo širšem območju Panonske nižine vse do

obronkov vzhodnih Alp, od Ljubljanskega barja preko Prekmurja pa do Gradišanske, Spodnje Avstrije in južne Slovaške. Prav zaradi tako široke razširjenosti pa obstajajo tudi različni lokalne skupine, predvsem glede na izvedbo ornamentike. Pomenljivo se zdi, da povezuje Ana Kruh, ki je na novo obdelala fenomen licensne keramike na celotnem področju njene razširjenosti, primerke posod, še posebej eno izmed skled iz Poda pri Bugojnu s svojo drugo skupino pramenaste oz. licensne keramike, ki pa je značilna predvsem za področje severozahodne Panonske nižine, zlasti za najdišča v vzhodnih predelih današnje Avstrije. Gradina Pod je bila torej povezana v komunikacijsko mrežo, ki je segala od Jadrana pa vse do vzhodnih Alp in srednjega Podonavja, pri čemer je morda vzroke za te povezave iskati prav v rudnem bogastvu bosanskega rudogorja, v trgovini s surovinami bakra ter v metalurškem znanju in dejavnostih.

Kot so prikazali v svojih študijah o metalurgiji na zahodnem Balkanu, še posebej v Bosni, Aleksander Durman in Borivoj Čović, pred nedavnim pa tudi Mario Gavranović, se številna rudišča bakra, bakra-antimona in bakra-arzena nahajajo prav na območju severozahodne in osrednje Bosne. Žal je sledov, ki bi neposredno dokazovali rudarjenje v prazgodovini zelo malo. Med njimi so gotovo omembe vredna najdišča rudarskih jam v Mračaju in Maškari, obe na območju gornjega toka reke Vrbas ter v Slatini na Rami (Sl. 1, 6-7), ki pa so glede na ohranjene najdbe datirane v pozno bronasto dobo, čeprav ni izključeno, da se je tam rudarilo tudi že prej. Najdbe bakrenih in bronastih predmetov pa so seveda mnogo starejše. Med najstarejše bakrene predmete sodijo najdbe iz naselbine v Gornji Tuzli, stratum III, ki je datiran že v čas Vinčanske kulture. Razmah bakrenih izdelkov v Bosni, zlasti težkega orodja, kot so različni tipi sekir, je značilen za čas Vučedolske kulture. Kot je pokazal Čović na osnovi Stuttgartskih spektralnih metalnih analiz (SAM), so bili le-ti predmeti izdelani iz različnih vrst bakra (samorodnega bakra, oksidnih, karbonatnih in sulfidnih rud), kar kaže na različna rudišča, ki pa jih potencialno vendarle lahko iščemo v Bosni, čeprav novejša kemijske in izotopske analize bakrenih in bronastih artefaktov še niso dale rezultatov s konkretnim odgovorom. To velja tudi za bronaste predmete iz pozne bronaste dobe. V pozni bronasti dobi je namreč metalurška dejavnost v Bosni doživela izreden razcvet in svoj višek, kar ne kažejo le izredno številni in kvalitetni bronasti izdelki nedvomno lokalne izdelave, temveč tudi pogoste najdbe bronastih kalupov in drugih livarskih pripomočkov, tudi glinastih zatičev (Sl. 6) iz številnih arheoloških najdišč, tudi iz Poda pri Bugojnu. Pri tem se nam zdi indikativen Čovićev zemljevid s kartiranimi naselbinami iz tega obdobja, v katerih so bili odkriti sledovi livarskih dejavnosti. Iz njega je razvidno, da je bila metalurška

dejavnost vezana predvsem na območje zahodne Bosne, t.j. od Pounja do doline reke Vrbas in reke Rame (Sl. 7), kar posredno govori za to, da so črpali bakrovo rudo iz bližnjih rudišč. Čeprav je v teku nov projekt arheometričnih analiz bronastih predmetov pozne bronaste dobe iz Bosne, pa dosedanje objave kažejo, da kemijske raziskave še tavajo v neznankah.

Naj zaključimo z naslednjo ugotovitvijo: na gradini Pod pri Bugojnu se je v zgodnji bronasti dobi odvijala metalurška dejavnost. Pomenljivo se zdi, da leži v neposredni bližini bakrovih rudišč in omenjenih prazgodovinskih rudarskih jam ob zgornjem toku reke Vrbas (Sl. 1). Pomembnost naselbine na Podu torej ni obstajala le v njeni strateški legi ob glavni prometni žili vzdolž Vrbasa in na stičišču oz. ob razkrižju poti proti Jadranu ali obratno, temveč gre za osrednjo naselbino, katere vlogo v širšem prostoru opredeljujejo tudi metalurške dejavnosti. Livarska delavnica, ki je morala biti podobna tisti v Feudvaru pri Mošorinu, verjetno s svojimi izdelki ni zadovoljevala le potrebe prebivalcev gradine kot take, temveč neko širše področje. Vendar pa radij njenega delovanja zaradi skromnih najdb bronastih predmetov iz zgodnje bronaste dobe na območju Bosne in v njenem sosedstvu ostaja še neopredeljen. Naj bo pričujoč članek vzpodbuda za nadaljnje arheološke raziskave metalurgije in rudarstva v tej na rudah bogati deželi.

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