
Vera Bogosavljević Petrović

Belgrade

mail@mail.com

TANGED ARROWHEADS AND THE PROBLEM OF THEIR ORIGIN IN THE EARLY ENEOLITHIC IN THE CENTRAL BALKANS

Abstract: Rare finds of tanged chert arrowheads in Late Neolithic and Eneolithic horizons in the Central Balkans, unearthed from the sites of Vinča-Belo Brdo, Divlje Polje, Jela-Benska bara, Beljin, Pločnik and Petnica, most often lack context, primarily due to the small scale of the excavations. Currently, only tanged arrowheads from closed archaeological units, for example pits, can be analysed and compared. So far, little work has been done in the Serbian literature to unravel their use, given that the reports have mainly been focused on typological features and the choice of raw materials. This paper presents an overview of findings from the Late Neolithic and Early Eneolithic horizons, with special emphasis on the identification of areas that could indicate their manufacture as well as their potential role in the life of prehistoric communities.

Keywords: tanged arrowhead, Late Neolithic, Early Eneolithic, Central Balkans, white chert, stone raw materials.

Introduction

Tanged arrowheads are not common among the chipped stone assemblages in the Late Neolithic settlements on the territory of the Central Balkans. Moreover, previously published studies by other scholars suggest that their occurrence in Vinča culture layers is highly unusual. In most cases, we are dealing with isolated, individual finds, which is one of the main reasons why there is a lack of broad-based analysis. However, when found, they were considered special finds, bearing in mind the applied technology and the energy invested in their production compared to the manufacture of standardised blades using the pressure technique. Do they occur in response to hunting-related activities in the areas where this practice represents an apparent component of the community economics and diet? Do they represent imported types of projectile points made for occasional use? Or, do the special circumstances during the previous research become a decisive factor in the creation of interpretative data?

In the Serbian literature, only a few finds of tanged arrowheads that originate from archaeo-

logical excavations have been published: from M. Vasić's excavations at the site of Vinča-Belo Brdo (Radovanović et al. 1984: 52); from Petnica (Radovanović 1988: 99–100, Plate I/15); from the Divlje Polje site on the bank of the West Morava river (Богосављевић Петровић 1992: 23, 27, sl. 35), (Fig. 1); and from the Jela-Benska bara site settled in the Šabac city area (Стојић и Церовић 2011: 437, Ф 344; Šarić 2005: Pl. II/11, 14). It is widely known that in the western areas, such as the territory of the Hvar-Lisičići (Benac 1958: 3; Batović 1979: 586), and the Butmir culture (Benac 1979: 425), as well as in the northwest, within the Sopot III phase of the Sopot culture (Dimitrijević 1979: 290), arrows form a significant part of the lithic technology collections. However, since this group of artefacts has not been analysed in more detail, our information is reduced to general descriptions and statistical quantification.

The occurrence of larger groups of tanged arrowheads on the territory west of the Vinča culture area pose the question of the origin of individual finds from central and western parts of Serbia. The need for further research came after an arrow from Divlje Polje made of white opal, which repre-

sents the main raw material used for production in this settlement, was published (Bogosavljević Petrović 2001: 36). The closest confirmed exploitation of this raw material comes from magnesite and white opal outcrops, found in the upper course of the Ribnica river, which are 7–10 km from the settlement (Bogosavljević Petrović and Marković 2014; Bogosavljević Petrović 2018: 93). With these results, the local aspect of arrow production in the settlement of Divlje Polje was confirmed, but the assumption about the import of arrows from the west at the sites of Vinča, Jela–Benska bara and Petnica remains current. On the other hand, a group of arrows from the site of Ripanj (Perišić 1984), accidentally discovered, raised the question of the local provenance of the raw materials, but also the question of import, as reported by J. Šarić (1987).

Arrows with a concave base, a wide group of points that could not be attributed to projectile points without the application of use-wear analysis, and arrows with pronounced wings of later provenance were not taken into account for this type of analysis. At this stage of the research, the most basic question is not the typological consideration of a small sample, but rather the function of tanged arrowheads in the community, their origin, and whether they were the result of knowledge transfer or the experience of predecessors.

Sample and archaeological context

The one of the first published finds of this type of arrow comes from the site of Petnica in western Serbia. An example of an arrow with a 4.5 cm long thorn belongs to the Vinča phase B layer (Fig. 2/2), while another example, with a 2.3 cm long concave base, belongs to the Vinča C phase (Radovanović 1988: 99–100, Plate I/11). The chronological division of the artefacts was made according to Milojčić's (Milojčić 1949) periodisation of the Vinča culture.

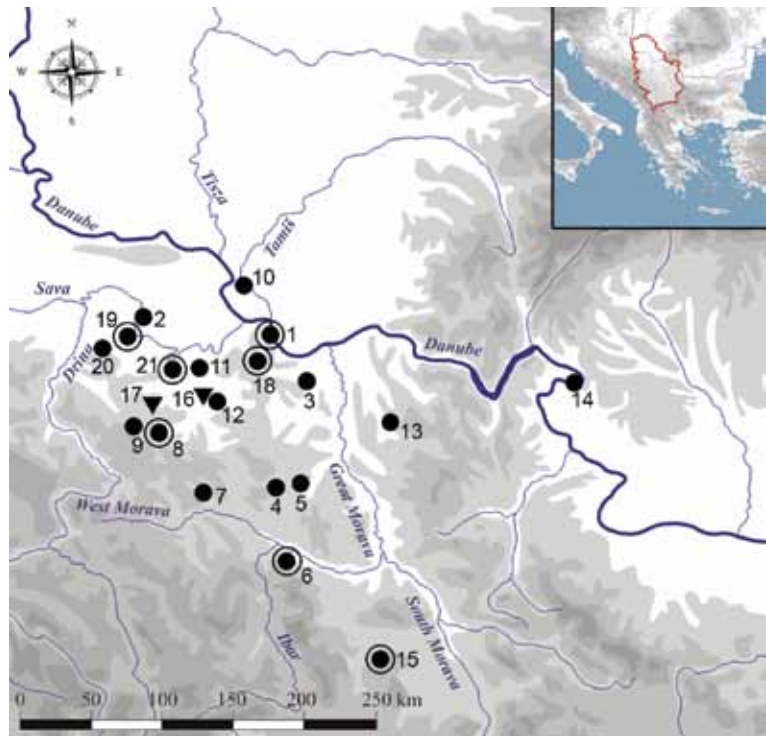


Fig. 1. Late Neolithic and Early Eneolithic sites in the Central Balkans with the published chipped stone assemblages (●, ▼) and finds of tanged arrowheads (⊙) (after Bogosavljević Petrović 2015; Šošić–Klindžić and Tripković 2018): 1 Vinča – Belo Brdo; 2 Gomolava; 3 Selevac; 4 Grivac; 5 Divostin; 6 Divlje polje; 7 Trsine; 8 Petnica; 9 Anatema; 10 Opovo; 11 Crkvine–Stubline; 12 Crkvine–Mali Borak; 13 Belovode; 14 Zbradila; 15 Pločnik; 16 Livade; 17 Bodnjik; 18 Ripanj hoard; 19. Jela–Benska bara; 20. Šanac–Izba; 21 Graduština–Beljin (adapted by Đ. Radonjić and S. Tripković).

The second arrow, made in the same manner as the tanged arrowhead from Petnica, originates from Miloje M. Vasić's excavations at the site of Vinča-Belo Brdo, from a depth of 6.7 m. It is attributed to the Vinča-Tordoš IIb phase, according to the chronology of M. Garašanin (Radovanović et al. 1984: 52, fig. 34a; Garašanin 1979). This is the only published find of an arrow from the eponymous site of the Vinča culture. During the Vinča excavations carried out between 1999 and 2005, in the collection which consisted of 5700 artefacts, this type of projectile has not been confirmed. The tanged arrowhead was made on a blade with parallel edges that are wider than 20 mm (Fig. 2/1). Considering their high occurrence on the territory of Hvar-Lisičići, Danilo III and Smilčić cultures compared to the Vinča culture, and the research being on a relatively small scale, the tanged arrowhead was characterised as an import (Radovanović et al. 1984: 52).

In the settlement of Divlje Polje, which is located on the southern border of the Šumadija region, a

white opal arrow with a length of 5 cm was found within unit B, in the secondary fill of a pit-house. The arrow represents a bifacially retouched specimen. It was made on a blade more than 20 mm wide. The edges and the top are covered with arranged lamellar, with occasional scalar semi-steep and semi-raised retouch. The thorn is steeply retouched along the edges that meet on the ventral side and cover a narrow surface (Богосављевић Петровић 1992: 23), (Fig. 2/3). The fully investigated pit-house was filled with three layers of waste material from Vinča culture stone and ceramic production. Unit B belongs to the early phase of Vinča phase C or, as it was characterised by S. Valović, who investigated the site, as the Early Pločnik phase of the settlement, with houses that had a sub-structure of timber floors (Valović 1983).

An elongated deltoid arrow of opal lustre chert with a thorn 6.8 cm long, 2.2 cm wide, and 1 cm thick comes from the Jela-Benska site (hereinafter: Jela). It was found in Square I/7 in the fifth mechanical layer (Стојић и Церовић 2011: 160, F. 344; cf. Šarić 2005: Pl. II/14), Fig. 3. There is no information that the arrow was petrologically determined, so we cannot discuss the origin of the raw material. The chronology of this settlement was determined based on the analogies with finds from the Vinča-Belo brdo site at the beginning of the Vinča B phase, through the Eneolithic with the intertwining of the Sopot, Lendel and Butmir cultures, and abiding through the Bronze and Iron Ages (Stojić and Cerović 2011:152-153). Another specimen from the same museum, an arrow with a thorn, was acquired by purchase. It was found at the site of Graduš(t)ina, in the village of Beljin, southeast of Šabac (Fig. 4). It is made of red chert, and its length is 4.5 cm.¹ In the publication on knapped projectiles from the territory of Serbia in prehistory, this specimen has been published as a find from the Jela-Benska bara site (Šarić 2005: Pl. II/11).

The sixth, unpublished, arrow comes from the site of Pločnik, and it was not recovered during archaeological excavations. It was found in 2016, during the revision of the archaeological material from The National Museum in Serbia (Fig. 2/4;

5). In 1974, at the time of the fieldwork led by B. Stalio, the left bank of Toplica was destroyed by a huge torrential flow, revealing a soil profile, with the remains of buildings, charcoal and ash (Fig. 6). In the process of the preparation of the profile for photo documentation, a tanged arrowhead was found, at the floor level of an unearthed house. This specimen was similar in shape to the above-mentioned examples, with an invasive retouch that covers both ventral and dorsal surfaces. The preserved length of the tanged arrowhead, which is missing a few millimetres of the point,

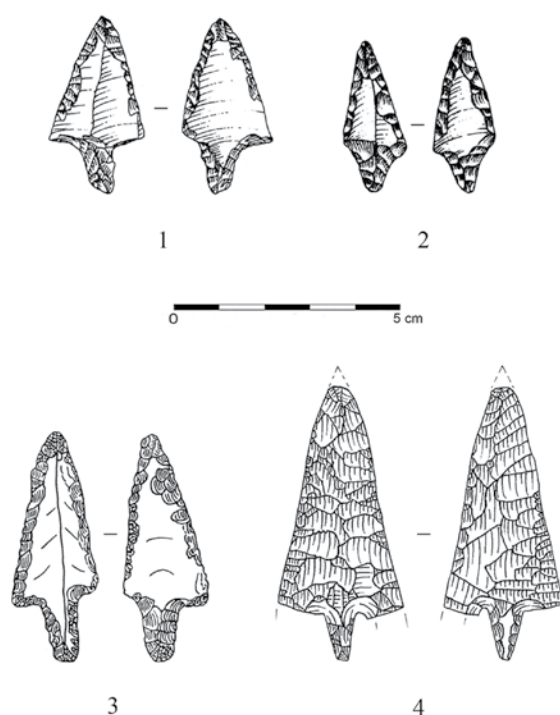


Fig. 2. Tanged arrowheads from Vinča (1) after Radovanović et al. 1984; 2. Petnica (2), after Radovanović 1988; Divlje Polje (3) after Богосављевић Петровић 1992, Pločnik (4). Drawing by P. Popović, adapted by S. Tripković).

with an indication of wings, is 5.7 cm. A small number of tanged arrowheads in Vinča settlements are disproportionate in relation to the documented mixed type of diet, consisting of domestic and wild species (Orton 2012). For example, at the site of Opovo, where although a significant share of wild species has been recorded, arrows of this type are not represented in the collection (Tringham et al. 1985:440-441). The perception of tanged arrowheads in the role of projectile points found inside settlements can also be a way of defining activities on a wider scale.

¹ The data was obtained from the curator of the National Museum from Šabac, Momir Cerović, to whom I would like to express my warm thanks for providing the data and clarifying the context of the arrows already published.



Fig. 3. Tanged arrowhead from Jela-Šabac (Documentation of the National Museum, Šabac; adapted by S. Tripković).

The main reasons for conducting a more detailed study of this tool type are their rare occurrence in settlements, the large amount of energy needed for their production and the type of retouch that covers the majority of their surface. The long transformation of the Vinča settlements after 5000 BC was marked by the expansion of stone tools and copper artefacts. The flat invasive retouch became the dominant retouch type of chipped stone industries in the period of the developed phases of the metal ages, especially at the transition from the Late Eneolithic to the Early Bronze Age (Shea 2013: Fig. 7.19; Rosen 1997).

Manufacture and chronology of tanged arrowheads

Arrows were made on primary flakes with parallel negatives, with an average width of 20 mm. They are characterised by detailed processing of edges, thinning of the base and the top, a slightly pronounced dorsal and plate ventral side, and trimming in the area where the thorn is planned for hafting. This technological aspect is achieved with notching to obtain an angle of the tanged blade type. The newly formed edges are modified by continuous semi-steep retouch on the dorsal side, while simple retouch is most often applied on the ventral side. To produce the mentioned arrows, blades with parallel edges made from quality raw

materials were selected that would, additionally, require some final modification by retouching. It was necessary to possess certain knowledge about the blanks. This way the desired shape could be extracted before the final retouch was executed. These operations indicate the artisan's effort and skill (Whittaker 1994: 127-176, 219-242). Unlike the tanged arrowheads from Divlje Polje, Jela, Beljin and Petnica where greater energy was invested in the production, the example from Vinča was made with less effort. The type of finishing on these samples is both the result of the quality of the specific raw material and of gained experience through manufacture of various materials for specific needs. The most careful implementation and completely different approach to the processing of raw materials can be seen on the arrow from Pločnik. Shallow invasive lace-like retouching covers the surface, achieving the desired quality for a specific purpose.

A tanged arrowhead from Petnica B layer, which is analogous with the example from Vinča – Belo Brdo that is attributed to the end of the Vinča – Tordoš period, and the example from Divlje Polje, which is associated with the transitional period from Vinča-Tordoš II to Vinča-Pločnik I, are more phenomena in a series of similarities among the sites of this production circle. To the south of the two major rivers, the Danube and the Sava, some settlements such as Divlje Polje were specialised for standardised blade production or, like Belovode, focused on acquiring experience of early copper metallurgy. These production centres were developed to meet their own needs, and to facilitate exchange with others (Bogosavljević Petrović 2018). Six examples found on six different sites derive from the horizon of the transition from the early to late phase of the Vinča culture, when settlements were built on river terraces, or on terraced hillsides, often surrounded by ditches, like Belovode, Oreškovića or Stubline (Borić et al. 2018). There are no significant typological differences in the choice of raw materials among examples from Petnica, Divlje Polje and Vinča, therefore, they represent a characteristic type in the Late Neolithic of the Central Balkans. They are dated approximately to the time of the transition from phase B to phase C of the Vinča culture, according to the chronology of V. Milojević. Subsequently, the latest absolute dates from Vinča-Belo Brdo site,

provided from a profile at depth of 6.7 m, are related to the transition from the 6th to the 5th millennium BC, i.e., the last decade of the 6th millennium BC (Tasić et al. 2016: Tab. 2, Fig. 14).

The specimens from the Jela and Beljin sites are of two different types in terms of the form and shaping of the dorsal and ventral surfaces. The specimen from Beljin is very similar in terms of production to the samples from Petnica and Divlje Polje. Indirectly, therefore, it could be related to the transition period from the Vinča B phase to the Vinča C phase of the Vinča culture. Observing the elongated spindle-shaped arrow from the Jela site, whose wings, unlike the previous examples, are not particularly emphasised, and the surface is completely covered with combined types of retouches, it can be roughly dated to the Eneolithic period because it was found together with Vinča and Baden pottery. Probably, it represents a younger find in relation to the homogenous set of arrows from Petnica, Beljin, Vinča and Divlje Polje.



Fig. 4. Tanged arrowhead from Graduština, Beljin (Documentation of the National Museum, Šabac; adapted by S. Tripković).

As for the example that was found at the site of Pločnik, in the profile of the Toplica river, there is no reliable archaeological context, except that it might belong to the house whose floor has not yet been excavated (Fig. 6). It can be roughly dated to the late Vinča–Pločnik phase, considering the archaeological material unearthed from the nearby trenches. The retouch is spread over the entire surface of the artefact, which is not the case with previous examples. Bearing in mind that shallow invasive retouching represents one of the most recognisable aspects of late Vinča culture stone production, which is largely of the Eneolithic charac-

ter, then it can be assumed that this specimen must be younger than the samples from Divlje Polje, Vinča and Petnica. An arrow finished this way, with its surface covered with detached micro flakes, belongs to the end of the Vinča culture phase at the Pločnik site, during the Eneolithic (Bogosavljević Petrović 2001: 42). It is a prototype of an artefact that, in terms of surface treatment, would be more represented later, in the Early Bronze Age period.

Discussion

Although individual finds made from local raw materials, related to the mentioned sites, are not a sufficient starting point for complex analyses, they are indicative of the problem of their origin. The Late Neolithic settlements of Vinča–Belo Brdo and Pločnik have been excavated and studied for many years and, thus, one example of these specific arrows found on each site is an indisputable fact. The dating, except for the samples from Jela and Pločnik, is quite uniform and is related to the peak of the Vinča culture and the transition to the late phase, the Pločnik period (after M. Garašanin) or Phase C and D (after V. Miložčić). The absolute dating for the timeframe of their production is around 5000 BC (Tasić et al. 2016).

Bifacial retouching and thinning of the proximal part into a thorn are common attributes of all the finds published so far. Tanged arrowheads from local raw materials in regions close to forested areas currently represent the first information for studying their origin. A large number of arrows found in Ripanj² were made from the most widely used group of opal cherts, type 1-C, according to the characterisation of M. Babović. It is a group of raw materials of whitish, greyish-white, greyish-brown and honey-coloured cherts of opal lustre (Perišić 1984: 166-167).

Leaving aside the variants of arrows from the period of the Early and Middle Neolithic in the region of the Starčevo culture, and overlooking for a while the partial study of projectile points in prehistory (Šarić: 2006: 16, 17; Šarić 2005), the groups of arrows from Polimlje from the Late Neolithic sites of Potkućnica and Beran Krš on the territory

² One part of the hoard is part of the inventory of The Belgrade City Museum, the other part is in private ownership.

of Montenegro (Дерикоњић 1996: 48-51, Fig. 37 / 32-37; Fig. 39/25, 26, 33-38) and a collective find from the site of Ripanj in the vicinity of Belgrade (Perišić 1984: 60-61; T. 42; Šarić 1987) remain to be considered and discussed here in detail.

The arrows from Ripanj were found in a grey, conical ceramic vessel, with a rough surface and inclusions of crushed shells. Presumably, tanged arrowheads represented an important component of the daily life of the inhabitants of nearby Neolithic settlements, such as the Čaršija in Ripanj (Ђорђевић, Радић, Цвјетићанин 2005). If these finds represent projectile points used in hunting activities, the majority of such hoards could easily have been lost during the shooting of the prey. This could be one of the explanations for the small number of arrows found in settlements.

According to this data, a group of arrows from Ripanj could represent a good example of the organisation of hunting and the preparation of the necessary equipment, only a small amount of which, inevitably, has been found. An additional look at the problem leads to the conclusion that the production of arrows shows a well-thought-out concept and, as a rule, careful processing, and, therefore, a significant expenditure of time and energy. The deposition context of the arrowheads is very important because it implies they were carefully preserved tools before they were used in some subsequent task. In that sense, it is important to correctly detect the products of knapping in the workspace, and to reconstruct daily routines, which, until recently, represented a sporadic practice in the archaeological literature.

In the context of broader analogies, in the settlement of Lisičići in western Bosnia and Herzegovina, published drawings of tanged arrowheads show that the raw material is different compared to the published scrapers and blades (Benac 1958: 38, Table IV / 8-15). The artefacts are similar in shape to the arrows from Polimlje. S. Derikonjić reported that during the Late Neolithic, flaked tools were made of whitish chert and that the expression “fairy’s bone” has been preserved among the people, which Č. Marković also mentioned (Дерикоњић 1996: 51; Marković 1985: 62). Based on this observation, it can be assumed that the raw material “fairy’s bone” is a counterpart to white chert and white opal from archaeological sites in Central Serbia, as was petrologically iden-

tified (Bogosavljević Petrović and Marković 2014; Bogosavljević Petrović 2015: 259-312). A direct comparison of tanged arrowheads from the collections from Vinča settlements and from the region of Late Neolithic and Eneolithic manifestations on the territory of Bosnia and Herzegovina is necessary in order to identify the origin and development of this type of artefact. Finds of arrowheads recovered in workshops at the site of Okolište are a new contribution to the problems of tanged arrowheads, their relationship with the settlement of Obre II, and trade relations with settlements of the Vinča culture (Hofmann et al. 2008/2009: 95, Fig. 66 /10-12).

As an indicator for recognising the type of economy of settlements at higher altitudes, such as Potkućnica, Beran krš and the circle of settlements of the Butmir culture with the latest finds from the site of Okolište are brought into connection with a group of arrows found near sources of stone raw materials from the Ripanj area on the slopes of Avala. Petrological research in the vicinity of Ripanj indicated stratified grey chert sediment in the olistolites near the Minel company, an outcrop of marl with Upper Jurassic strata of chert near the Railway Station, and smaller fragments of cherty rocks bearing radiolarian assemblages of the Middle Triassic in the area of Ripanj village (Bragin et al. 2011: Fig. 2). In the spring of 2018, petroarchaeological excavations with M. Toljić at the new location of Ladna Voda identified ochre cherts and potential artefacts that need to be separated from modern pieces³. The results of complete petrological analyses of cherts from Ripanj are known from the mentioned research of M. Toljić and colleagues, while the samples of arrows from The Belgrade City Museum were determined macroscopically. So far, they have not been directly paralleled with samples obtained in recent years.

³ As part of the project of The National Museum in Belgrade “Interpretation, origin and distribution of stone raw materials during the Neolithic and Eneolithic in Serbia” (led by V. Bogosavljević Petrović), a petroarchaeological survey with geologist M. Toljić (The Faculty of Geology in Belgrade), D. Janković (The Belgrade City Museum) and A. Starović (The National Museum of Serbia) was conducted in late 2017 and early 2018.

Tanged arrowheads and the problem of their origin on the territory of the Vinča culture

The local origin of raw materials for the production of four arrows, white chert and white opal (Belo brdo, Petnica and Divlje Polje), although stressed on several occasions does not imply the manufacture of these finds at the given sites. At this level of research, we can assume that tanged arrowheads could have been exchanged between settlements as projectile points that were required occasionally. Production centres are potentially localised where white, grey and amorphous cherts of light brown colour and white opal are represented in quantities that enable serious production. Import of a direct type from the region of the Butmir culture deep into the inner core of Vinča culture settlements such as Divlje Polje, with the current degree of knowledge, seems to be a somewhat irrational practice and a poorly sustainable scenario.



Fig. 5. Tanged arrowhead from Pločnik
(Photo V. Ilić, adapted by S. Tripković).

The manufacture of the other tools, such as endscrapers, points, denticulated blades, was established based on the needs of the community and the intended functional role, further determined by the shape, quality of raw materials and artisan's skill. The type of procurement of raw materials shows how complex the activity of making knapped tools was, which is one more in a series of important prerequisites that significantly defined the type of production. For example, there is a higher presence of scrapers at the Gomolava and Divlje Polje sites compared to other types of tools (Kaczanowska, Kozłowski 1990: 43; Богосављевић Петровић

1992: 27). Gomolava represents a site whose inhabitants were mainly consumers who procured raw materials from greater distances within the local radius of 35 km, while Divlje Polje is an example of local acquisition and production of standardised blades of the main raw material – white opal (Bogosavljević Petrović 2018). Debitage products indicated the final production of tools in the settlements. However, for now, there is no concrete data available for the identification of waste in the production of tanged arrowheads.

The manufacture of tanged arrowheads within the Butmir culture involved another type of raw material and somewhat different finishing, often completely covering the dorsal and ventral sides with a shallow/flat retouch, which is not often the case among examples from the Vinča culture, except from Pločnik. In line with the observations from the site of Okolište, that the commercial aspect of the community could relate to the procurement of ground stone porcellanite tools from Vinča culture settlements in the Central Balkans (Hofmann et al. 2008/2009: 95), we hypothesise that the stone resources south of the Sava and the Danube could have been greater than the Vinča community's needs. This could be related to the results of the raw material and knapped stone artefact studies from the sites of Divlje Polje, Crkvine-Mali Borak, Trsine or Grivac, where it has been confirmed that the communities exceeded the production for their own needs (Богосављевић Петровић 1992; Богосављевић Петровић 2011; Bogosavljević Petrović 2016). It should be pointed out that the whitish raw materials, which were widely used in the area of the Vinča culture, have been petrologically identified as tuffs, and groups of rocks containing magnesite as well as numerous allotropic modifications of magnesite.

To date, there has been no comprehensive study on arrows and other projectile points exclusively from the Late Neolithic and Eneolithic periods in the Central Balkans, apart from a review of projectile points over a longer time span (Šarić 2005), which provided a starting point on which to focus future research. At the same time, there is a lack of published studies on the origin of the raw materials for the Butmir culture arrows. According to researchers at the settlement of Okolište, the source for one component of knapped tools is linked to the mountain of Trebačko brdo, at a distance of 110 km

from the site, as well as the possible origin of raw materials from the Bosna river and its tributaries (Hofmann et al. 2008/2009: 95).

The preliminary results of the research on the settlement organisation at Okolište provide a solid basis for understanding this specific problem. Documented activity areas for the processing of stone raw materials, deposits of unretouched and retouched blades, and zones of concentration of arrowheads represent indicative contexts that are expected to be published in the future (Hofmann et al. 2008/2009: 65-66, 95-106). This study could take its results a step further by evaluating the main aspects of the manufacturing process of tanged arrowheads, and, at the same time, serve as an inspiration for new research on the territory of the Central Balkans. Shallow, invasive retouch is one of the characteristic markers of the transformation of Late Neolithic production towards to the Eneolithic and Metal Ages (Bogosavljević Petrović 2001: 42).

An tendency towards the use of local raw materials, noted in the Sopot culture, as well as the proximity of raw material sources could have been the reason for the construction of the settlements near the aforementioned outcrops (Balén and Burić 2006: 36). A significant collection of obsidian finds, produced in the Samatovci site, originates from a Carpathian I source, the centre that supplied the inhabitants of both the Vinča and Sopot culture settlements. Regarding the local concept, the similar repertoire of tools, rare finds of tanged arrowheads and a statistically respectable collection of obsidians of the same origin as in a number of Late Neolithic and Early Eneolithic settlements from the territory of Serbia (Tripković and Milić 2009), the situation can be described as a general trend and as a representation of the similar needs of these communities.

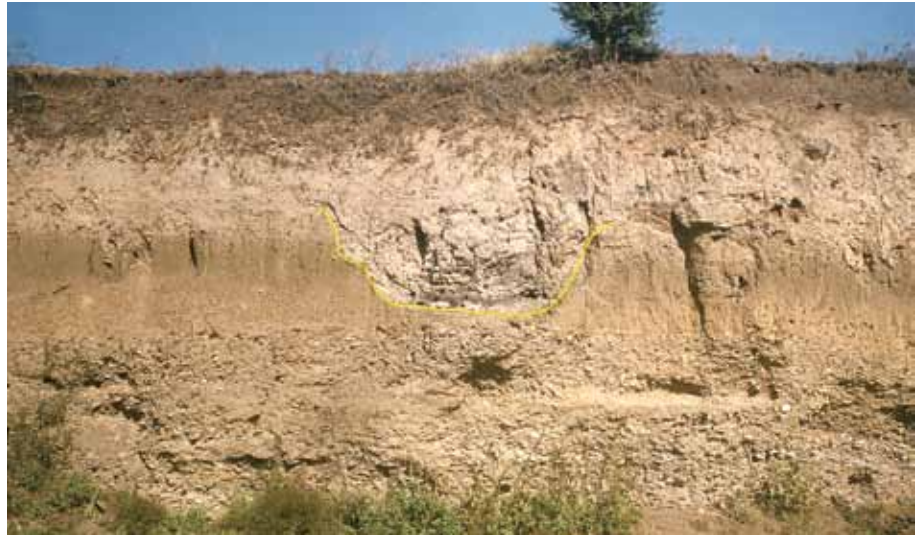


Fig. 6. Riverbank of Toplica with building layers after the flood in 1974. (Photo B. Stalio, adapted by S. Tripković).

In a broader geographical context, a study of lithic technology after the Stone Age in the Levant by Steven Rosen is illuminating, where arrows of the same type also lack context, and where a certain isolation of finds from the rest of the assemblages is also documented (Rosen 1997: 43, 44; Fig. 3.3). Typologically identical examples (Fig. 3.3/3-6: Harparsa points), as well as other types shown in Fig. 3.3, generally disappear during the Late Neolithic in the Levant, when typological changes on the tanged arrowheads become apparent and can be regarded as chronological indicators. In a paper that deals with typological suggestions regarding Early Neolithic arrows in the southern Levant, part of the discussion revolves around the functional resolution of whether they represent points, borers, awls, or projectile points, based on the preserved wear traces (Nadel et al. 1991). The most similar types to our tanged arrowheads are arrows from the sites in the Jordan Valley 2 and 4, as well as from Salbiya 6 (Nadel et al. 1991: Fig. 3/16-21). It is also anticipated that the influence in their production was based on the model seen from artisans from the north in the developed network of relationships of the 9th millennium BC in the southern Levant. However, given the chronological difference in absolute dates, these analogies are conditional, meaning they should be regarded more as a basis for future extensive studies about the projectile points in the Late Neolithic of the Central Balkans.

Conclusion

Tanged arrowheads occur at the transition from the 6th to the 5th millennium BC, when great changes took place in the organisation of Late Neolithic communities, from daily routines to gaining experience in copper metallurgy. Individual finds from the settlements of Vinča, Beljin, Petnica, and Divlje Polje, and a group find from Ripanj that has the characteristics of a hoard, are chronologically close and belong to the Early Eneolithic period. The arrowhead from Pločnik and from the Jela site in Šabac represent chronologically younger finds that could be linked to contacts, influences and stylistic differences observed in Vinča settlements. The long transformation of these settlements in changed regional conditions does not necessarily mean a change in the population. The arrow from Pločnik is made of local amorphous chert, from which a large part of the knapped tools were produced.

The isolation of this type of projectile point in the settlements, along with the uniformity in the choice of raw materials, are the first observed characteristics that suggest an import into the territory of the Vinča culture from the western and north-western areas. The choice of raw materials, however, refutes the possibility of import, considering the local manufacturing concept of several communities such as Divlje Polje, Trsine, and Crkvine in Mali Borak. These settlements achieved independent production on white chert, white opal, tuffs and magnesite, the surplus of which they exchange with others. New elements in the development of the arrow with a thorn from Pločnik represent an indication of new times. If we assume the increased production and use of copper objects in relation to the already known production around 5000 BC, it would be a natural continuation and prelude to the long development of the community during the transition to the early Bronze Age. Since traces of use on the arrows from Divlje Polje, Petnica and Vinča have not been registered, it is not possible to say more about their actual use. However, the morphological characteristics - shape, thorn and production method, indicate their usage as projectile points, and we can assume that they were not used for drilling or boring. This assumption is confirmed by the find of an example from Pločnik, which lacks a tip rejected by a burin

blow that occurs during hunting (Lombard 2005). Although use-wear and residue analysis would clarify the function of the considered arrows, in conclusion, we hypothesise that these artefacts were locally produced on the territory of the Vinča communities, with raw materials that are typical for the production of knapped tools at the transition to the Early Eneolithic phase. Considering the combined type of diet of the Late Neolithic population, their isolated occurrence can be interpreted in accordance with hunting activities.

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