Lithic Workshops and Depots/Hoards in the Early/Middle Neolithic of the Middle Danube Basin and of the Northern Balkans

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Abstract: In the earliest horizon (Karanovo I-Starčevo-Körös), the workshops where blanks were produced were situated close to the raw material deposits. Lithic production within settlements was very limited, and blanks produced off-site were used. With the Early Neolithic expansion to the middle Danube basin, some part of production gradually moved to settlements. Depots of cores or blades appear in settlements, which can be linked with itinerant specialists-knappers. In the eastern linear complex (ALP) lithic production took place within special areas of the settlements or households. Depots discovered in settlements and containing cores and blades usually made from local raw materials were a supply available for the inhabitants of a given settlement. In the western linear complex (LBK) one can notice the wide circulation of various meso- and extra-local raw materials processed on-site but not in separate zones. The depots of blades and tools comprise artefacts made of extra-local rather than local materials.

Keywords: Karanovo I-Starčevo-Körös, Alföld Linear Pottery (ALP), Linear Band Pottery Culture (LBK), raw materials, depots, workshops

Introduction

The aim of this study is to analyse specific aspects of lithic production and distribution: the relation between places of production and settlements, and the occurrence of 'depots' of the knapped artefacts. These depots contain objects representing various stages of lithic processing along with complete products. The presented analysis aims to reconstruct the socio-economic context of lithic production as well as its ideological and symbolic aspects.

The scope of our discussion encompasses the northern Balkans and the middle Danube basin in the Early and beginnings of the Middle Neolithic. This is an area of fundamental importance for understanding the formation of the Neolithic cultures in Europe. In terms of taxonomy, the study includes the Karanovo I-Starčevo-Körös-Criş complex and both complexes of Linear cultures – eastern and western (Fig.1).

Karanovo I-Starčevo-Körös-Criş complex

In the chronological horizon predating the Karanovo I-Starčevo-Körös-Criş complex the predominant mode, in Thessaly in particular, was off-site production based on extra local raw materials (Perlès 2001). Further to the north, in Macedonia, some part of production based on local or meso-local materials took place within settlements.

The workshops providing Early Neolithic settlements with extra-local raw materials such as 'silex blond' and obsidian have not been identified as yet. Obsidian workshops might have functioned in Melos and possibly Ghiali islands, but there are insufficient grounds for their chronology to be reliably established (Kaczanowska and Kozłowski 2013).

From the Early Neolithic horizon only two finds are known, both from territories north of Thessaly, which can be interpreted as hoards of some kind: the find of 400 standardised blades discovered in the Nea Nicomedea site in Macedonia, within a structure regarded by some researchers as a 'temple' (Perlès 2001; Rodden and Rodden 1964a, 1964b), and the collection of waste material from the preparation and repair of 4 cores, recovered from one pit in the Mavropigi site in Macedonia (Karamitrou-Mentessidi *et al.* 2015: Fig.2). If the first depot points to the off-site production of blades, the second is evidence for the on-site core reduction and deposition of the resulting waste. In Macedonia, other changes in the lifestyles of Early Neolithic communities can also be noticed, such as for example the appearance of cooking pots (Perlès 2001).

Moving on to the description of the Karanovo I-Starčevo-Körös-Criş complex, one can notice that in certain units, e.g. Karanovo I, in the eastern part of the Starčevo culture, and in the southern Körös range, the bulk of lithic production relied on meso- and extra-local raw materials. Of particular importance in that period was 'Balkan flint' originating from Mesozoic outcrops of the Moesian Platform. The localisation and differentiation of these outcrops have in recent years been the subject of a debate in literature (Šarić 2002;

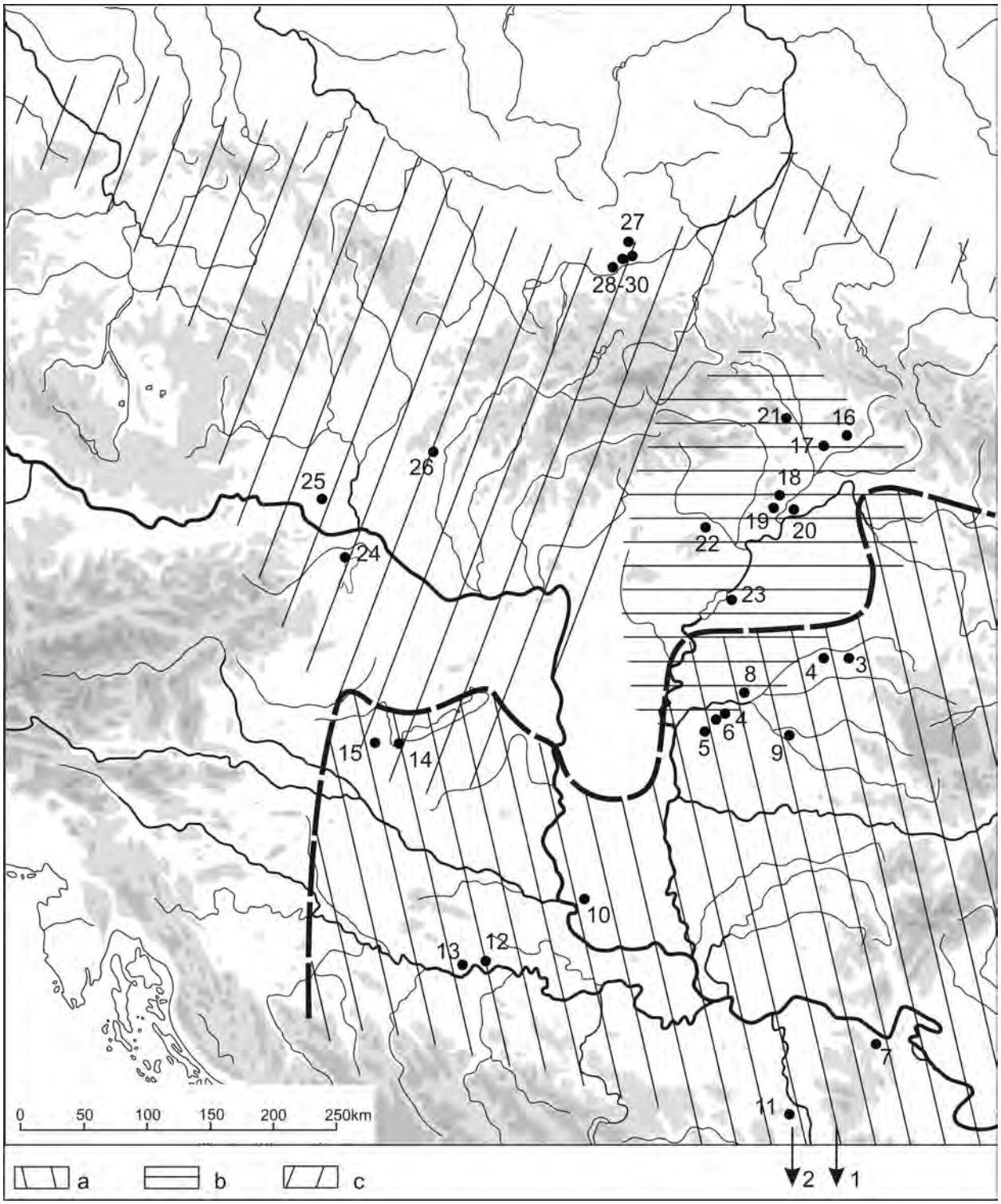

Fig 1. Map of the analized territory: a) Karanovo I – Starčevo – Körös- Criş, b) Eastern Linear Pottery (ALP), c) Western Linear Pottery (LBK). Sites mentioned in the text: 1. Nea Nikomedea (Central Macedonia), 2. Mavropigi (Western Macedonia), 3. Szentpeterszeg-Körtvélyes (Eastern Hungary), 4. Endröd 119 (Eastern Hungary), 5. Szarvas 23 (Eastern Hungary), 6. Endröd 39 (Eastern Hungary), 7. Lepensky Vir (Serbia), 8. Ecsegfalva (Eastern Hungary), 9. Mehtelek (Northeastern Hungary), 10. Donja Branjevina (Vojvodina, Serbia), 11. Grivac (Serbia), 12. Zadubravlje (Eastern Croatia), 13. Galovo (Eastern Croatia), 14. Vörs (Transdanubia) 15. Gellénháza (Transdanubia), 16. Humenné (Eastern Slovakia), 17. Moravany (Eastern Slovakia), 18. Kašov (Eastern Slovakia), 19. Velka Trna (Eastern Slovakia), 20. Slavkovce (Eastern Slovakia), 21. Šarišské Michal'any (Eastern Slovakia), 22. Boldogkőváralja (Northeastern Hungary), 23. Polgár Ferencihát (Eastern Hungary), 24. Brunn II (Lower Austria), 25. Vedrovice (Southern Moravia), 26. Borovce (Western Slovakia), 27. Modlnica 5 (Lesser Poland), 28. Kraków-Nowa Huta-Bieńczyce 12,15, 29. Kraków-Nowa Huta-Mogiła 62 30. Kraków-Nowa Huta-Mogiła 1.

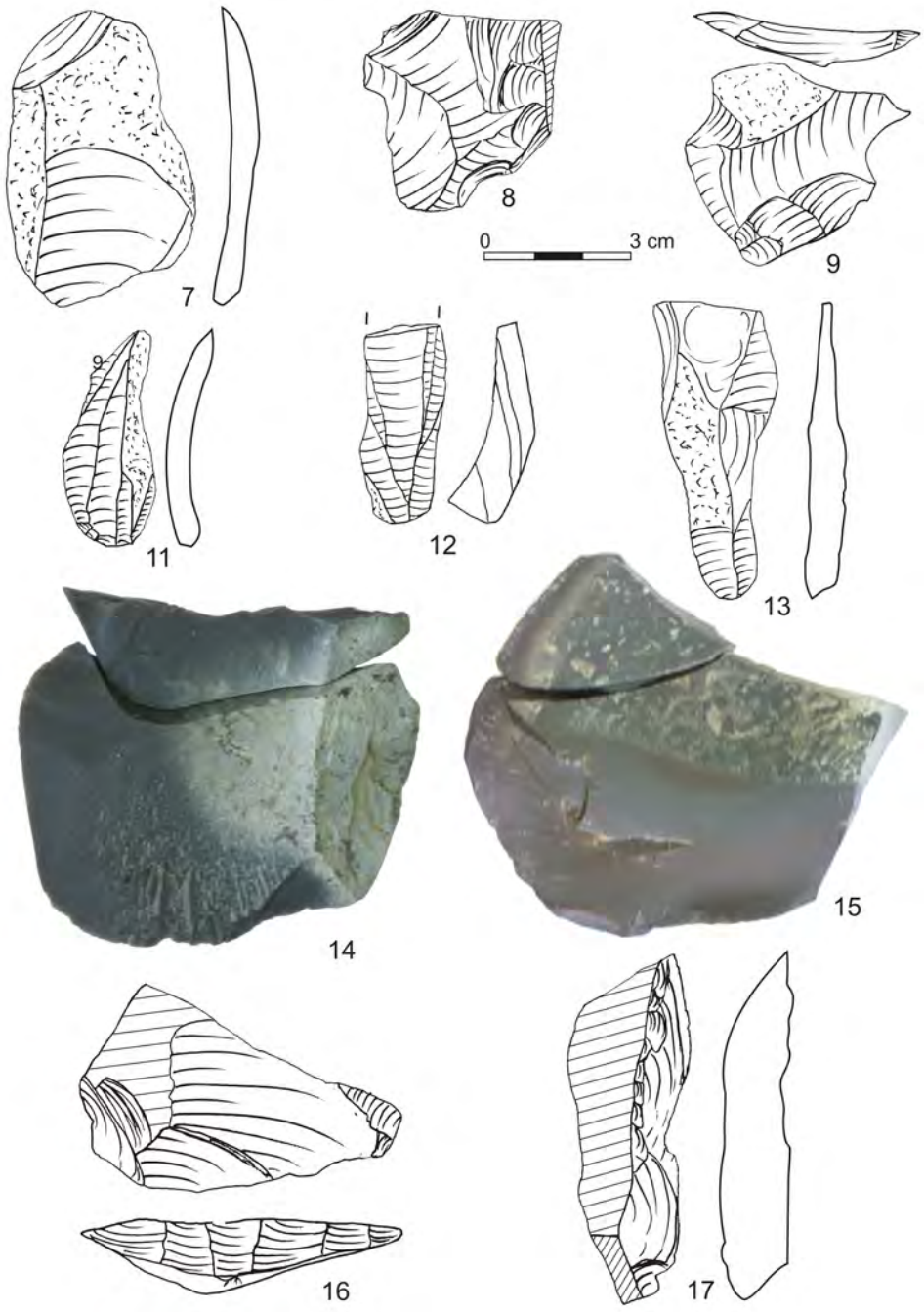

Fig. 2. Mavropigi (Western Macedonia, Greece). Stratum 1, pit 37: Depot of lithic waist (selected artifacts).

Bogosavljević-Petrović 2004;Gurova and Natchev 2008; Bonsall *et al*. 2010; Gurova 2011). Off-site production was clearly predominant in the discussed territory, hence the known inventories range from a few up to more or less hundred artefacts (Szentpeterszeg-Körtvélyes – 34 pieces, Endröd 119 – 51 pieces, Szarvas 23 – 108 pieces). The inventories from these sites contain no cores and a very small number of flakes. The acquisition of ready artefacts did not rule out the production of blanks within settlements, e.g. by highly specialised itinerant knappers. This can be evidenced, for example, by a deposit of waste (100 pieces) originating from the reduction of 3 cores (Fig.3), found in a ceramic vessel in Endröd 39 (Kaczanowska *et al*. 1981).

Two deposits hidden in typical vessels from a Starčevo layer in Lepenski Vir site (IIIb) are of a different nature. One of the vessels contained four single-platform

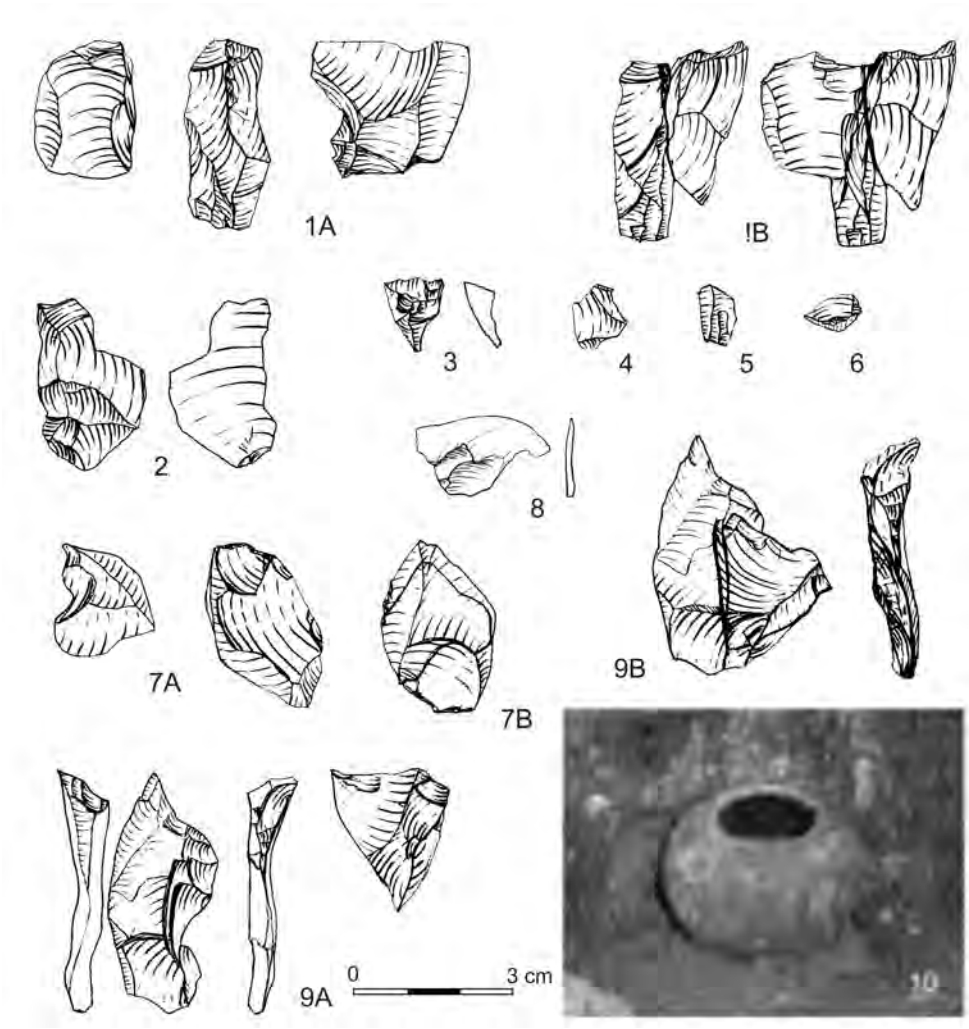

Fig. 3. Endröd 39 (Eastern Hungary). Depot of lithic waist (1–9) in Körös Culture vessel (10).

Fig. 4. Lepensky Vir (Serbia). Layer IIIb Cores depot (after D. Srejović).

Fig. 5. Lepensky Vir (Serbia). Layer IIIb Depot of blades (after D. Srejović).

macroblade cores in the stage of full reduction (Fig.4), and the other one 52 blades and their fragments (Fig.5; Srejović 1969). From the same layer also come other 'hoards' in vessels, of which one contained four flat, miniature axes, and another – a string of beads made from *Spondylus* shell and other materials. The diversified composition of deposits allows for varying interpretations: in commercial-utilitarian or symbolic-prestigious terms.

The lithic raw material supply relied in the Karanovo I-Starčevo-Körös-Criş complex on the deposits of Balkan flints situated in the areas occupied by Early Neolithic groups representing the discussed complex, with the Danube and Tisza rivers being a convenient route of communication and distribution. The Carpathian obsidian outcrops exploited in that period were situated outside the range of Earliest Neolithic occupation. Workshops were identified near the outcrops of both obsidian and Balkan flint, but linking them with the Early Neolithic poses difficulties. Despite the objections repeatedly raised by Maria Gurova, the Early Neolithic attribution seems the most likely for the Balkan flint workshops discovered on the Osam river by Paolo Biagi and Elisabetta Starnini (2010).

With the spreading of the Körös culture to the north of the middle and upper Tisza basin, the systems of lithic production began to change. Balkan flint clearly drops in frequency in these areas, being replaced by limnoquartzites and obsidian. This can be seen in such assemblages as Ecsegfalva (Mateiciucová 2007), where the total number of artefacts rises to 465, and even to approx. 1000 in the sites further to the north (Mehtelek – Kaczanowska and Kozłowski 2012). This proves the increasing role of on-site production, with specialised workshops losing their previous importance.

In the western ranges of the Starčevo culture, between the Drava, Danube and Sava rivers, the systems of lithic production also underwent significant modifications. Production gradually shifted from specialised workshops to settlements, and the role of specialists knappers was then taken by residents of particular households. The Balkan flint, still processed in specialist workshops and brought to settlements in the form of ready products, was gradually replaced in lithic production with local and meso-local materials. The pace of this process differed in particular regions; for instance, in Donja Branjevina, opposite the place where the Drava joins the Danube (Šarić 2002, 2005), blade production took place in many stages, which refers to the Balkan traditions. The high technical skills of the knappers should also be noticed. On the other hand, in Grivac in the middle Morava basin (phases I– III; Bogosavlievi ć-Petrović 2004) flakes greatly outnumber blades, testifying to the greater role of local production, based on local, lower-quality raw materials. The discussed processes are more strongly marked in Croatia, in the western fringes of the Starčevo culture. This is reflected in the rise of the local production based on meso-local materials such as radiolarites from the Slavonian Mountains (Zadubravlje – Karavanić *et al.* 2009) or cherts from northern Bosnia (Galovo – Bunčić 2009). This rise of local production is accompanied by its concentration in selected zones of settlements, with some of the features containing more than 500 artefacts.

Similar processes can be observed in Transdanubia, although the Starčevo culture settlement is less intensive there. In this area one can also notice changes in subsistence patterns, manifesting themselves, as in the upper Tisza basin, in the increasing role of fishing and hunting, for waterbirds in particular. It was in that period that the exploitation of radiolarites started in the Bakony and Mecsek Mountains, which was subsequently continued by LBK communities (Vörs – Biró 2001, 2002; Gellénháza – Biró and Simon 2003). Numerous workshops are known from these radiolarite-bearing areas (Biró and Regenye 2003), but none of them can be reliably linked with the Early Neolithic. Transdanubia became the core area of the western linear complex (LBK; Bánffy 2004), exactly as the upper Tisza basin was where the eastern linear complex (ALP) formed.

Eastern linear complex (ALP)

In the northern part of the ALP range, the deposits of raw materials for chipped stone production could be found, among which the most important role was played by obsidians: Carpathian 1 (Slovakia), Carpathian 2 (Hungary), and Carpathian 3 (Transcarpathian Ukraine). One should also mention abundant deposits of limno- and hydro-quartzites, and the radiolarite outcrops in the Klippen Belt. Apart from obsidian, these raw materials generally did not spread over longer distances, while obsidian reached as far as nearly 200 km to the south (Szarvas 8/23 in Southeastern Hungary, Alföld– Proto-Vinča phase).

Chipped stone inventories known from ALP settlements confirm the tendencies recorded in the northern and western parts of the Starčevo-Körös complex, with the production gradually shifting from off-site workshops to settlements or even particular households. The discussed tendency is particularly clearly noticeable in the territories close to the deposits of obsidians, limnoquartzites, and radiolarites, first of all in the upper Tisza basin. Lithic production becomes more and more a mass phenomenon, which creates a picture in which some parts of settlements played the role of workshops. The changes in the organisation of lithic production, reflected by the occurrence of workshop

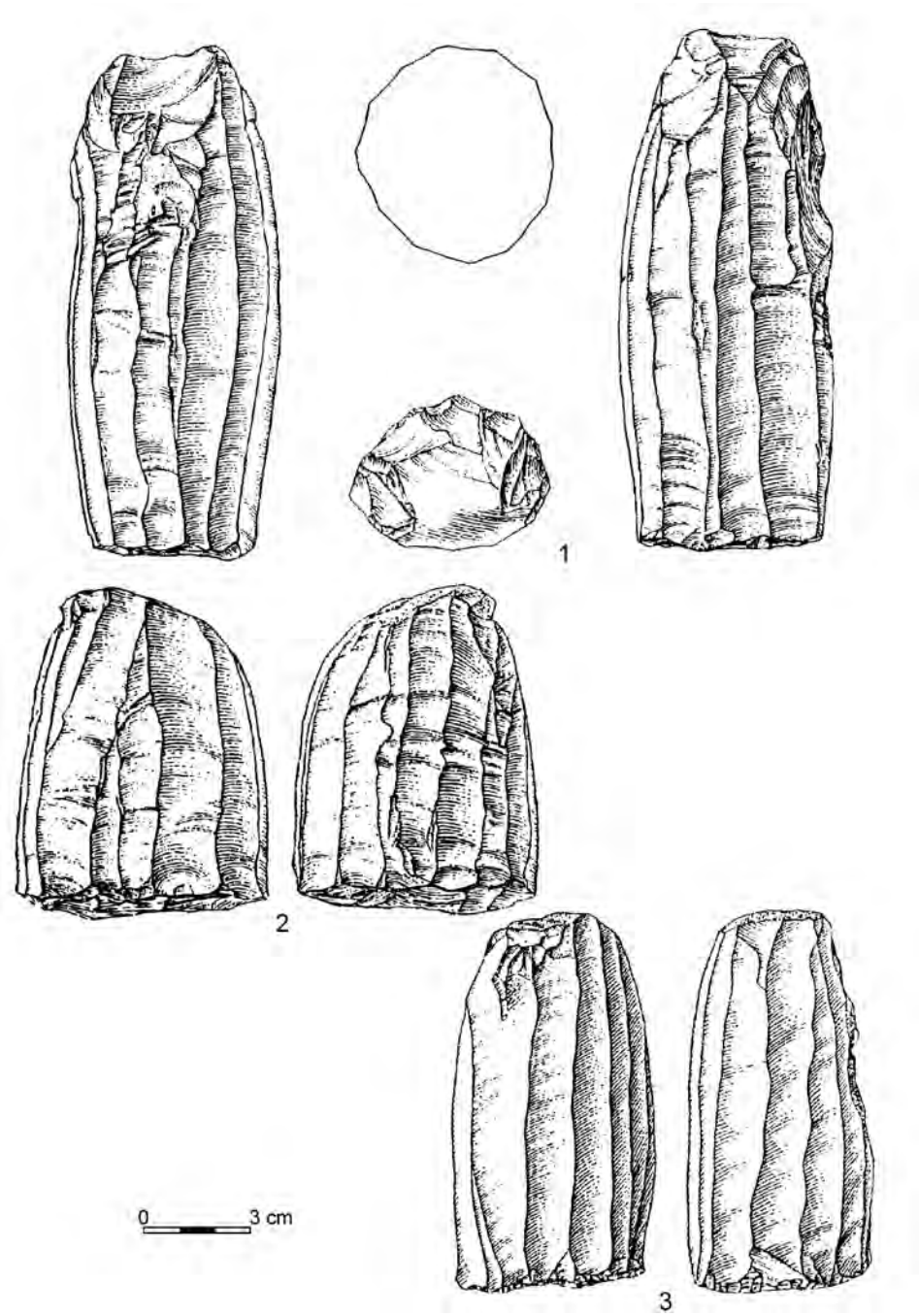

Fig. 6. Kašov (Eastern Slovakia). Concentration of cores in the humic layer (after L. Bánesz).

zones and the phenomenon of depots, will now be presented on the example of particular raw materials.

In some of the settlements situated within a 50 km radius from the deposits of obsidians, first of all Carpathian 1, the share of on-site processed obsidian reaches 90%. To this group belong settlements in Eastern Slovakia, such as Humenne (Kaczanowska and Kozłowski 2002), Moravany (Kaczanowska *et al.* 2015), or Kašov (Bánesz 1991).

In Kašov an elongated, oval feature 700 x 200cm wide was discovered, oriented along an NE–SW axis. Four concentrations of debitage products were discovered in this feature, which Ladislav Bánesz interpreted as belonging to separate workshops. In total, the feature yielded about 4000 debitage products (flakes, blades, single tools, core fragments). In the ceiling part, 13 large, single-platform blade cores with carefully prepared striking platforms were found (Fig. 6). The upper part of the pit also yielded fragments of daub with

Fig. 7. Slavkovce (Eastern Slovakia). Feature E/88. Depot of obsidian nodules.

the imprints of a wooden construction and fragments of Bükk culture pottery (Šiška 1991). The limited extent of the excavation makes the interpretation of the feature difficult, although its size, shape, and filling characteristics suggest it was a long pit running parallel to a wall of an above-ground structure, perhaps filled back when clearing the surface after the destruction of the house (probably in a fire).

The debitage concentrating within the four 'workshops' identified by Bánesz (1991) may correspond with places where individual knappers worked in, or more likely near, the house. After the pit was filled, the cores were deposited in the ceiling part of the filling. Their stylistic homogeneity, similar sizes (up to 15cm in length), and the low degree of reduction indicate that the cores might have been deposited deliberately as a kind of a hoard.

The site of Velka Trna, Eastern Slovakia, mentioned in the literature as where 620 obsidian artefacts were discovered in a single pit having the diameter of 1 m, can perhaps be seen as a kind of workshop. The assemblage contained no cores, and only one obsidian nodule weighting 1.9kg (Janšak 1935).

Another possible workshop was discovered at Humenne, Eastern Slovakia (Kaczanowska and Kozłowski 2002). In a large, relatively shallow pit 859 x 680cm wide more than 1700 artefacts were found, most of them made from obsidian. The workshop was focused on the production of blades, which were used or processed into tools somewhere else. The high representation of retouched tools indicates that, apart from lithic production, the feature also contained finds connected with the every-day life of the settlement's residents. The workshop was oriented on meeting the needs of people living in a specific part of the settlement, maybe even in a single household. Similar features were discovered in the Moravany settlement, linked with the early phase of ALP (Kozłowski *et al.* eds 2015), where chipped stone production also concentrated in several large pits most likely accompanying above-ground dwellings.

Some of the finds from the ALP range were typical hoards, a prime example being Slavkovce, Eastern Slovakia, where one of the features produced 34 obsidian nodules with no traces of processing or bearing only single scars (14 pieces). The total weight of the nodules was 8.76kg. The largest nodule, 20 x 11.5 x 8.6cm in size, weighted 2.9kg, while the smallest one, 4.6 x 6.0 x 2.3cm, merely 0.1kg (Fig.7). Three of the nodules bore traces of a red mineral pigment on the surface which was interpreted as resulting from the nodules having been used as pigment grinders. However, one cannot rule out a symbolic nature of the pigment's presence in the assemblage. The pit also produced fragments of thick-walled pottery with plastic decoration, as well as painted sherds and lumps of daub. It is worth noticing that some of the sherds were secondarily burnt. Thus, the obsidian nodules were deposited in a large pit, most likely used as a place from where the clay needed for house construction had been extracted. The pit was backfilled with the destruct of the house after it burnt down. Regrettably, no information is available about the depth at which the nodules were found, so we cannot determine whether the deposition took place before or after the house destruction.

In the northern zone of the ALP range, obsidian loses its leading role to radiolarites, which were local to that region. The organisation of radiolarite processing can be shown on the example of the Sarišske Michal'any settlement, Eastern Slovakia (Kaczanowska *et al.* 1993), dated to Lichardus (1974) phases AB and B. There was no separate workshop zone in this settlement, but 6 depots were found (Fig.8). Two of them were discovered in a dwelling, one in a pit, and the others, originally placed in organic containers or bunched, were found in the lower parts of the topsoil. Four of the depots comprised of cores. These were pre-cores or cores in the early phases of reduction. Only one of the depots contained cores in a more advanced stage of reduction, but which still qualified for further blade exploitation (Fig.9). The depots contained from 5 to 17 pieces. All bar one were made of local radiolarite, which in the entire Bükk culture inventory made up approx. 50%. The depots should most likely be seen as raw material stocked for the needs of particular households. The depots of blades contained 20 and 11 pieces, respectively (Fig.10). Blades in the depots could be refitted together, which indicates they were produced by a single knapper. On some of the blades, traces of their use as knives and scrapers can be macroscopically identified, which allows these

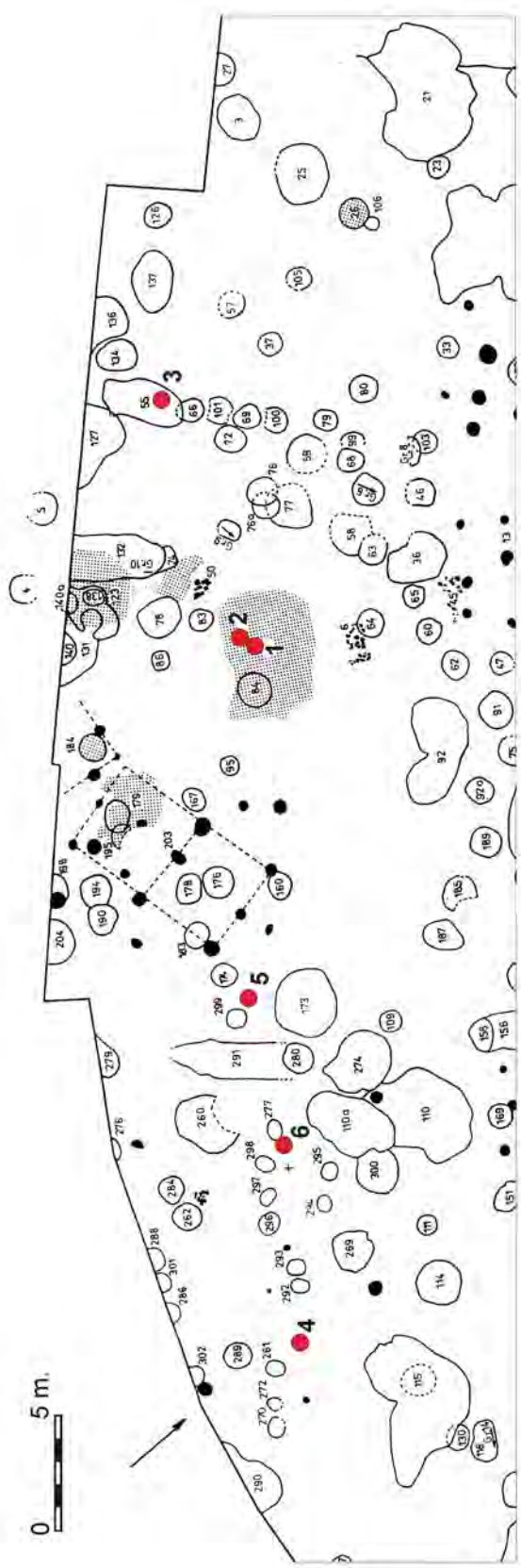

Fig. 8. Šarišské Michal'any (Eastern Slovakia). Map of the northern part of the site with position of lithic depots 1–6.

artefacts to be interpreted as tools belonging to the inhabitants of a given household. The unique nature of these assemblages is emphasised by the fact that some of the blades were 8–10cm long, which is notably longer than in the entire Bükk culture settlement, where the majority of blades fall within the range of 2–5cm in length.

To the west of the Zemplin mountain range, in the Hornad valley, and even further to the west in the Cserhat range, local limnoquartzites (limnosilicites) played a role analogical to obsidians and radiolarites. The hoard of 566 blades (Fig. 11) made from local limnoquartzite and deposited in a vessel was found near a dwelling in a Bükk culture settlement at Boldogkőváralja, Northeastern Hungary (Kemenczei and Végh 1964; Vértes 1965; Mester and Tixier 2013). The blades are 50–90mm long and 15–30mm broad. They were removed from single-platform cores using the indirect percussion technique. Some of the blades can be refitted. The blades were most likely produced in workshops situated within the settlement and, according to the interpretation proposed by Mester and Tixier (2013), kept in a vessel available for all the members of the community. Such an approach assumes individual specialisation, the presence of one or several specialists – knappers in a settlement, who worked for the needs of local community rather than long distance exchange. An argument in support of this model is the discovery in many settlements of separate places dedicated to chipped stone production. The production probably took place in workshops situated near the dwellings.

Summarising the above discussion, the raw material supply and chipped stone production in ALP is marked by the following:

1. The important role of obsidian, especially in older phases. Obsidian was transported to settlements in the form of nodules (Slavkovce depot), probably brought as a result of expeditions to the outcrops. In the obsidian distribution to the both south and north, major role was played by the routes running along rivers. The supply zone, which according to the definition by C. Renfrew *et al.* (1966, 1968) is the area from where the expeditions were undertaken directly to the sources, reaches 80–90km from the outcrops. In this area the percentage of obsidian was at least 80%.
2. In younger phases of ALP development the role of obsidian slightly decreases to the advantage of other, local and possibly easier accessible raw materials, namely limnoquartzites and radiolarites.

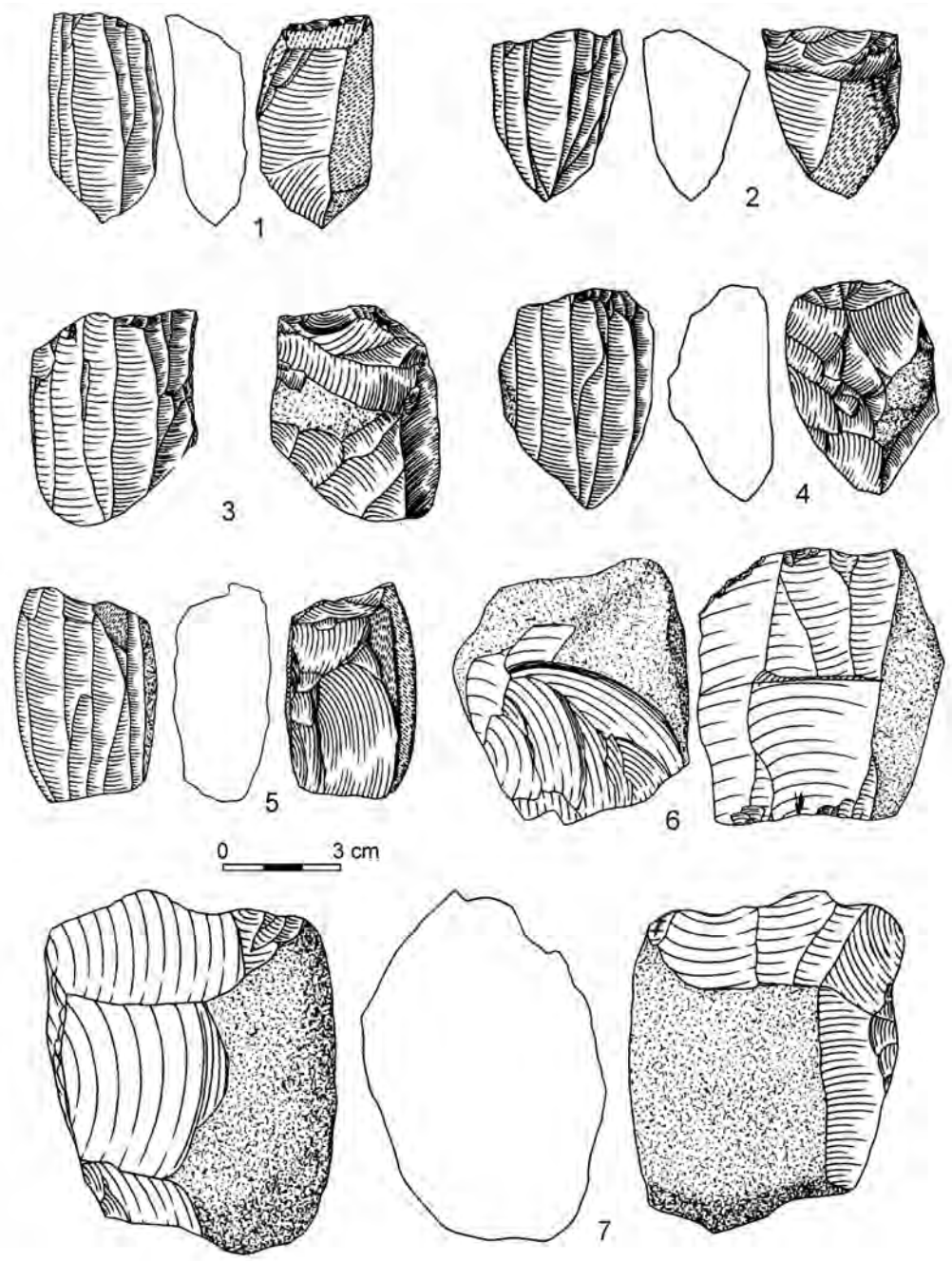

Fig. 9. Šarišské Michal'any (Eastern Slovakia). Depots of cores in house 1 (selected speciments): 1–5 depot 1; 6, 7 depot 2.

3. At the same time, some obsidian artefacts, e.g. large cores, produced in workshops by specialists – knappers and discovered in graves, may have played the role of prestige objects (Polgár–Ferencihát, middle Tisza basin, Eastern Hungary).

Linear Band Pottery Culture (LBK)

The model of lithic production in the earliest phase of LBK development continues the tendencies known from the north-western fringes of the Starčevo culture. This is reflected by the production moving to the level of settlements and households. In the earliest LBK horizon, in the materials from Brunn 2 settlement in Wienerwald, lithic production was carried out on-site, although raw materials were mostly imported. Among the 2500 artefacts analysed by Mateiciucová (2008) more than half were made from raw materials originating from Transdanubia (150–160km away), while approx. 1/3 were radiolarites from the Vienna region. As LBK spread to the north, to the middle Danube basin,

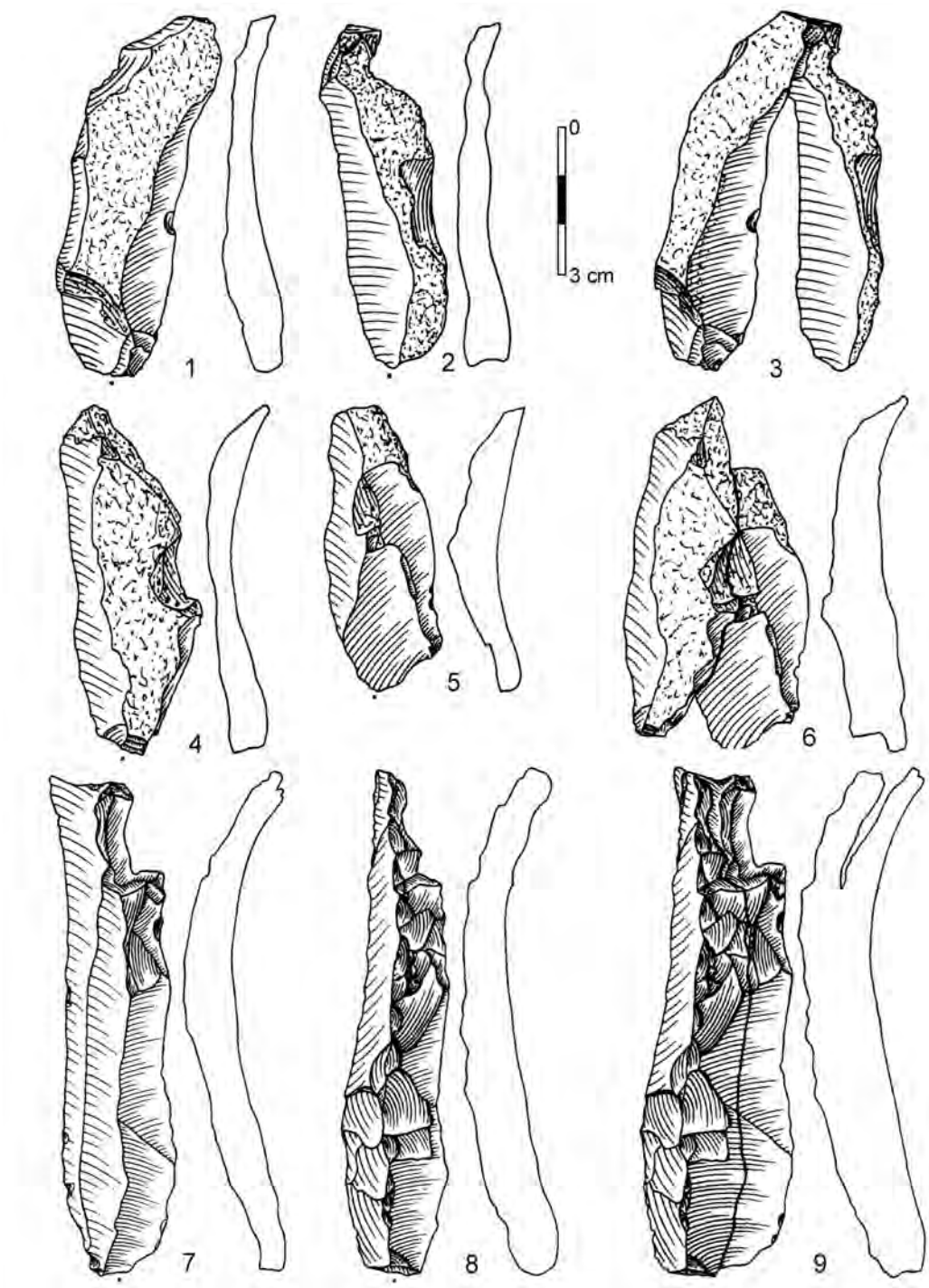

Fig. 10. Šarišské Michal'any (Eastern Slovakia). Depot of blades including refitted pieces (depot 5 in sector 6).

Transdanubian radiolarites were replaced with raw materials originating in Lower Austria and Moravia (Mateiciucová 2008; Kaczanowska and Kozłowski 2014). In Moravia, in the earliest phase the full processing cycle took place within settlements described by Mateiciucová (2008) as 'producer settlements'. Along with a variety of local cherts raw material from distant places also appear, such as flints from the Kraków-Częstochowa Upland, for instance. The planigraphic analyses of LBK settlements in Moravia indicate that, despite the evidence for full lithic processing, no separate production zones can be distinguished. There are sites, however, where the finds were made which are interpreted as depots (Ondruš 1975–1976; Lech 1982; Mateiciucová 2008). These are deposits of blades, e.g. from pit 037/1966 at Vedrovice, Southern Moravia,

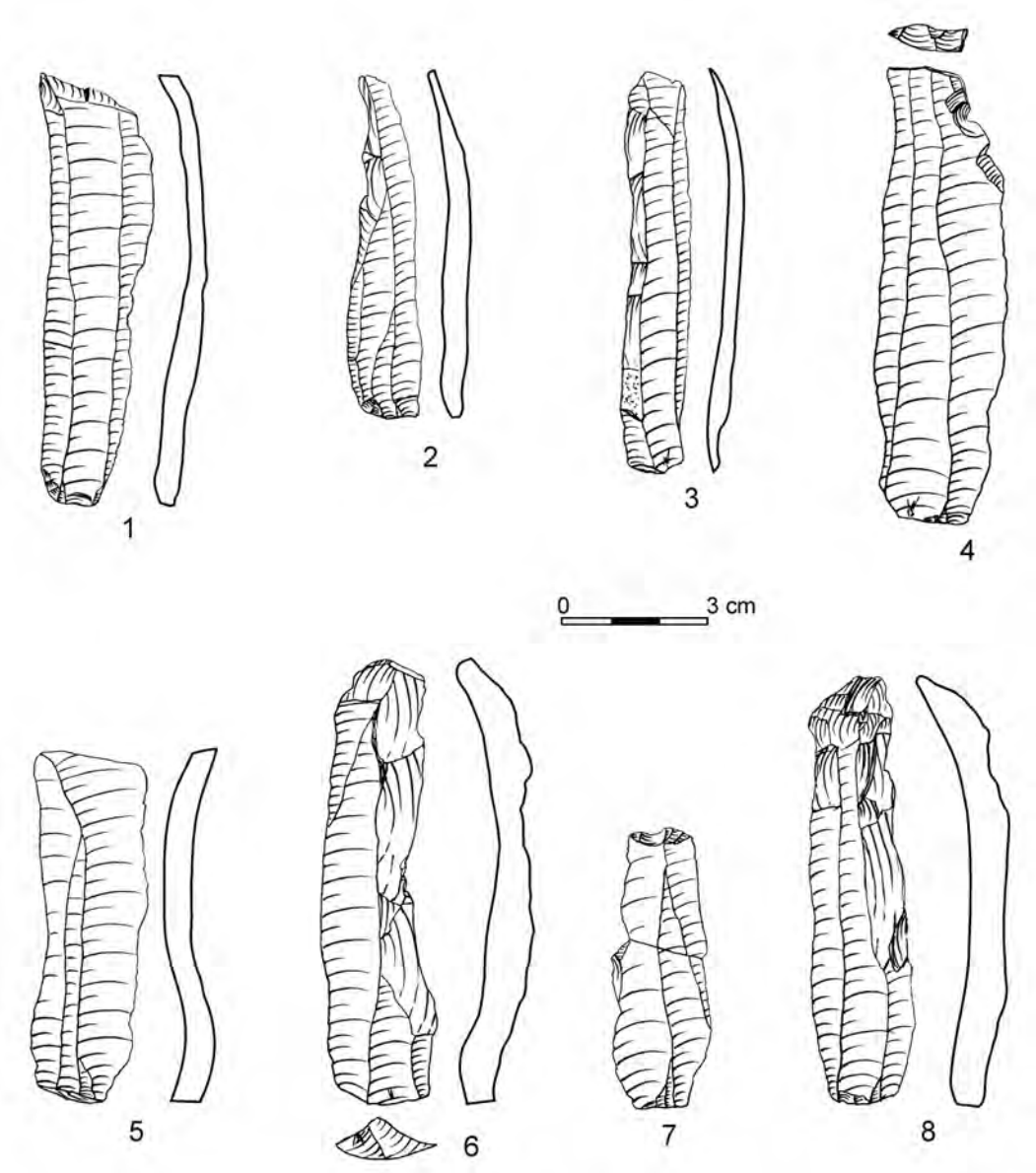

Fig. 11. Bolgogkováralya (Northeastern Hungary). Depot of blades (selected specimens).

where 9 blades removed from two Jurassic flint cores were found, and possibly from pit 098/1966 where 26 perforators were discovered, of which 20 were made from Jurassic flint (Fig.12). It should be noted that the 'depots' from Moravia contained artefacts made from extra-local raw materials, which makes them different from ALP depots which comprised of objects from local materials. Analogical situation was recorded in western Slovakia, where a depot of 35 blades (Fig. 13) was discovered in a Želiezovce phase pit in the Borovce site, Western Slovakia of which all but one were made from flint originating from Polish Jura (Kolnik and Paulik 1957).

Further expansion of LBK to areas rich in lithic raw materials (e.g. to Lesser Poland) resulted in the inflow of these new types of raw materials over considerable distance, up to hundreds of kilometres, e.g. to Moravia (170–180km) or Bohemia (200–210km). The raw materials were sometimes transported in the opposite direction to LBK expansion, i.e. towards LBK core areas. The exploitation of local sources of Jurassic flint, both from weathered clay and alluvial deposits, already played an important role in the early phase of LBK in Lesser Poland. Because in Lesser Poland the deposits, especially those of alluvial origin, occurred in areas marked by the high settlement potential for Early Neolithic farmers, lithic production concentrated in settlements from Lesser Poland such as for example Modlnica 5, (Kaczanowska and Kozłowski 2014), Kraków-Nowa Huta-Bieńczyce 11, 15, or Kraków-Nowa Huta-Mogiła 62 (Kaczanowska *et al*. 1987). The presence

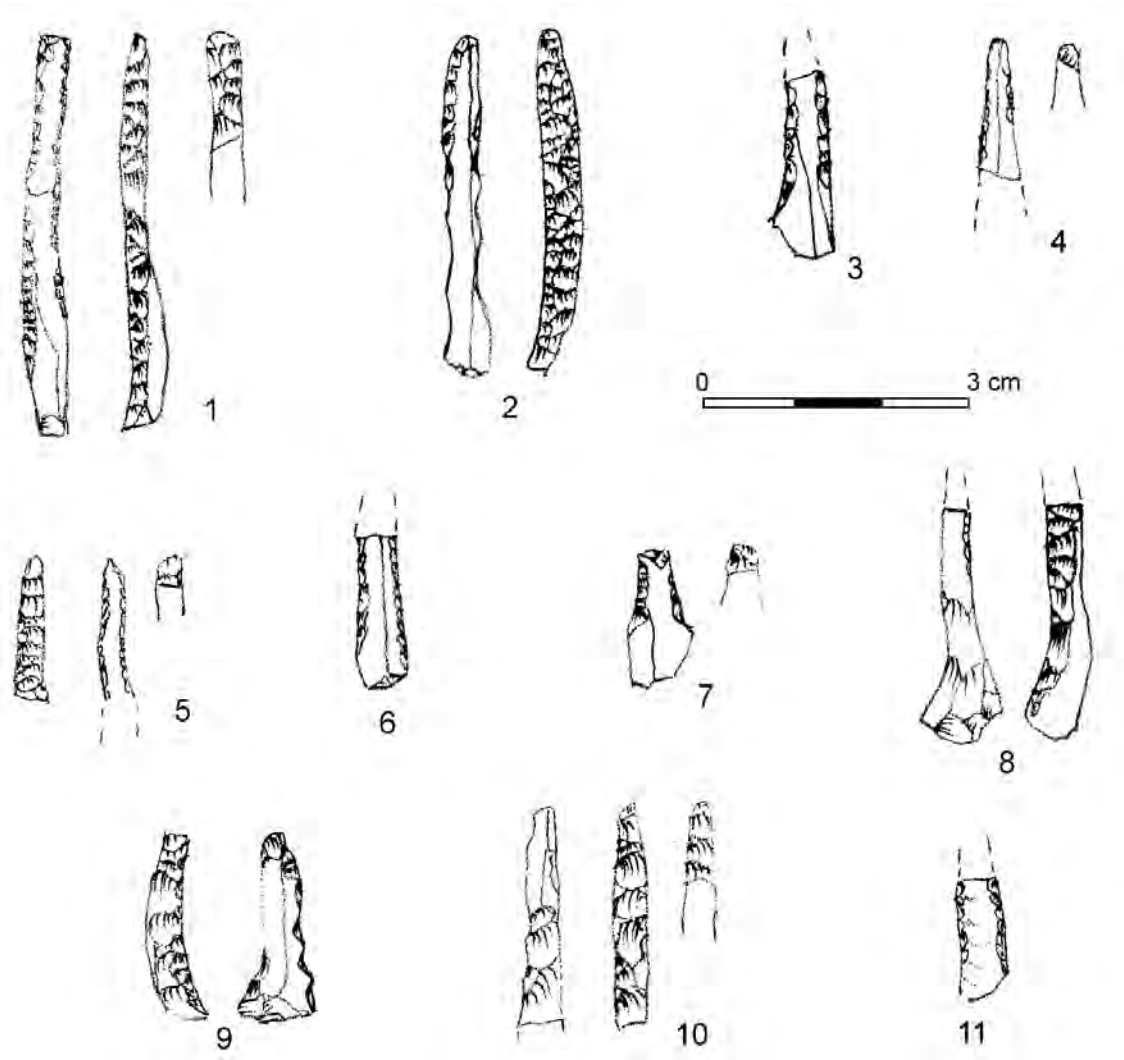

Fig. 12. Vedrovice (Moravia). Hoard of perforators (selected specimens).

of groups linked with early LBK in Kraków-Częstochowa Upland is confirmed by cave finds (Rook 1980), which may be the relics of short-term camps of knappers exploiting flint from weathered clay deposits. Thus far, no workshops outside settlements are known that could be attributed to LBK. In the Kraków-Nowa Huta-Mogiła 1 site four hoards were discovered: two of cores (Kaczanowska 1981) and two of blades (Kozłowski 1961). They were initially linked with LBK, but today such an attribution seems questionable. Now, they seem much more likely to be connected with the Lengyel culture.

On-site production is clearly predominant in LBK, even though basic raw materials are those of meso- and extra-local origin. Discovering new deposits coincides with subsequent stages of expansion from the Danube basin to the north. Some raw materials, e.g. Transdanubian radiolarites, spread with the direction of the expansion, while others, e.g. Jurassic flint, were transported in the opposite direction, i.e. towards the core areas.

Fig 13. Borovce (Western Slovakia). Depot of blades (after Kolnik and Paulik 1957).

Conclusion

In the earliest horizon analysed here, the workshops where blanks were produced were most likely situated close to the raw material deposits, although they remain virtually unknown. Thus, lithic production within settlements was very limited, and blanks produced off-site were used. With the Early Neolithic expansion to the middle Danube basin, some part of production gradually moved to settlements. Depots of cores or blades appear in settlements, which can be linked with itinerant specialists-knappers. The small-scale on-site production of blanks is perhaps reflected by depots containing waste, being the evidence of single episodes of on-site core reduction.

Moving the production to settlements or even households can be observed in the north-western range of the Starčevo culture and in the northern peripheries of the Körös culture. The phenomenon is connected with the discovery and exploitation of local or meso-local sources of raw material in the middle Danube basin, and the same tendency continues in the communities of the eastern and western Linear complex.

In the eastern linear complex (ALP) there is evidence for special areas within settlements, perhaps even within households, where lithic production took place. This production, performed by specialised community members, was oriented to meet local needs. Depots discovered in settlements and containing cores and blades usually made from local raw materials were a supply available for the inhabitants of a given settlement. The situation recorded in ALP suggests the existence of individual specialisation among the members of a given community.

In the western linear complex (LBK) one can notice the wide circulation of various meso- and extra-local raw materials processed on-site but not in separate zones. The depots of blades and tools comprise artefacts made of extra-local rather than local materials. In flint-bearing areas, settlements associated with its exploitation and processing are known, although it cannot be unequivocally claimed that this production was aimed at exchange.

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