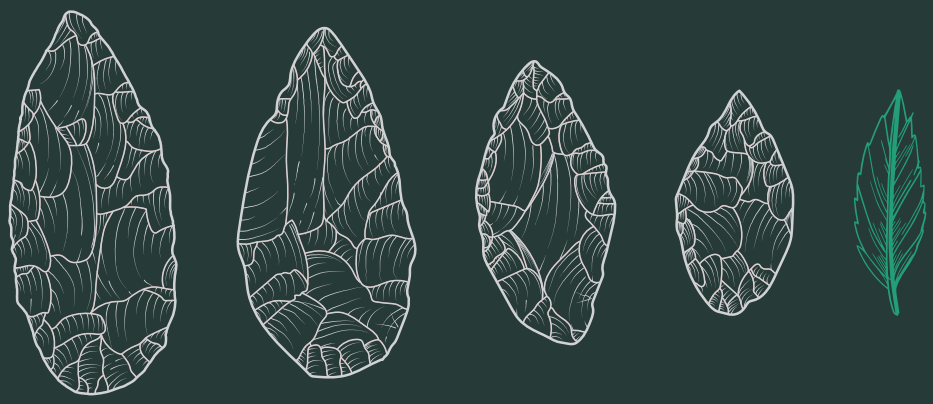
From tea leaves to leaf-shaped tools

STUDIES
IN HONOUR OF ZSOLT MESTER
ON HIS SIXTIETH BIRTHDAY



LITIKUM KÖNYVTÁR 2

EDITED BY
ATTILA KIRÁLY

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Editor:

Attila Király

ELTE
EÖTVÖS LORÁND
UNIVERSITY

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ELTE EÖTVÖS LORÁND UNIVERSITY,
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2023

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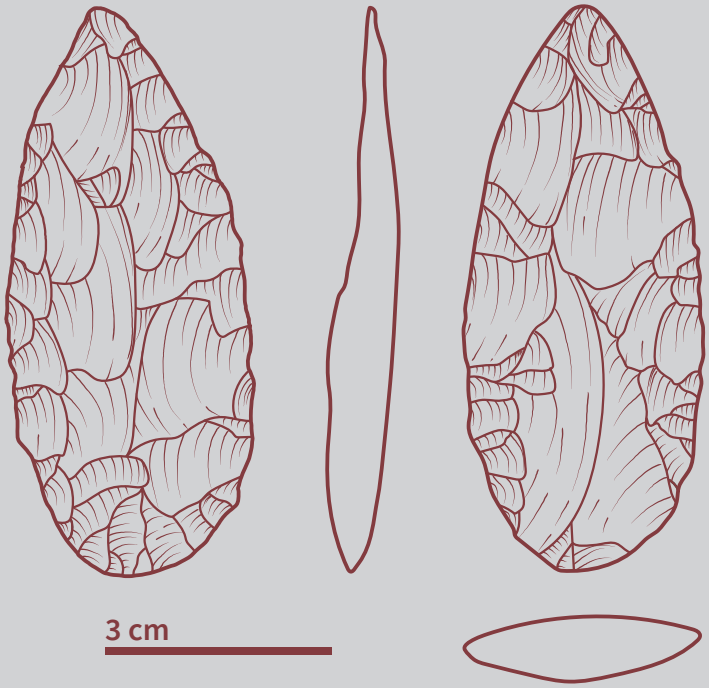
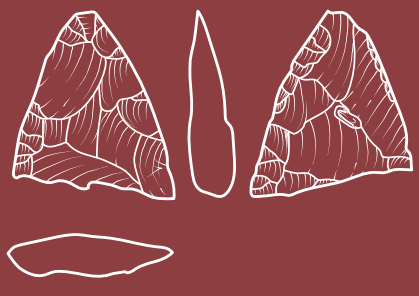


Szeletian leaf-shaped tool.
After Kozłowski *et al.*, 2009, Planche 11.

June 1, 2021, Zsolt Mester's greeting in the library of the Institute of Archaeological Sciences, Faculty of Humanities, ELTE Eötvös Loránd University, Budapest, Hungary. Zsolt is posing in a shirt made as a gift by his son. Facing him are the audience (l–r): Tivadar Vida, Pál Raczky in the back, Alexandra Anders, György Lengyel, István Kristóf Szegedi, Gábor Kalla, Dávid Bartus. *Photo: Attila Király; drawing: after Kozłowski* et al.*, 2009.*



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Mesolithic and Neolithic finds from Zbehy-Dolné lúky site, sectors A0–M10

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Abstract. Rescue excavations in the Nitra industrial park at the Zbehy-Dolné lúky site in 2017 revealed occupations from the Mesolithic, Neolithic, Eneolithic, Early Bronze, early medieval and modern periods. The Mesolithic remains are remarkable, as no settlement has been recorded previously from that period in Nitra and its vicinity. In the eastern part of the site, in sectors A0–M10, a cultural layer contained assemblages of mostly lithic artefacts from the Mesolithic and Neolithic periods, confirmed by ^{14}C dates on animal bones from the lower part of the cultural layer, 5910 ± 40 uncal. BP and 7790 ± 60 uncal. BP.

Keywords: Mesolithic, Neolithic, Slovakia, Nitra, Rescue excavation, Lithic industry, ^{14}C dating

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1. Introduction

The Institute of Archaeology of the Slovak Academy of Sciences carried out extensive rescue excavations as part of a road infrastructure construction in the Nitra industrial park in 2017 (Vojteček *et al.,* in press). A multi-period settlement was discovered at the interface of the Lužianky and Zbehy cadastral areas (Fig. 1). The site itself was located outside the urban area, in a field used for farming. The site today looks almost flat, but in the past, small elevated areas scattered over the floodplain of nearby water streams. These elevations were later transformed, probably as a result of agricultural activity. North of the site, the terrain becomes hilly. The settled area is located between two water streams, the Nitra river in the southwest, just next to the site, and the Dobrotka stream in the northeast. The Nitra river had meandered in the wide floodplain, evidenced by still visible meanders which were artificially filled in the course of the river's regulation in the 1930s and 1960s.

2. Archaeological excavation

Machinery removed the topsoil down to the underlying loess in the western part of the area. Pits were identified there (Fig. 2). The eastern part of the area was only partially removed, as a dark cultural layer with pits was identified just below the humus topsoil. Therefore, a different excavation method was applied using sector-based deepening in 3 × 3 m squares (Fig. 2). The manual deepening in the cultural layer by subsequent individual levels allowed us to obtain finds which did not come exclusively from the pit features. The concentration of lithic artefacts in sectors F5–7, G6 (Fig. 3; 4), where finer sediment removal was carried out, proved to be the most interesting feature. Unfortunately, due to the character of the rescue excavation and lack of time, the sediment from the sectors was not sieved. However, a rather

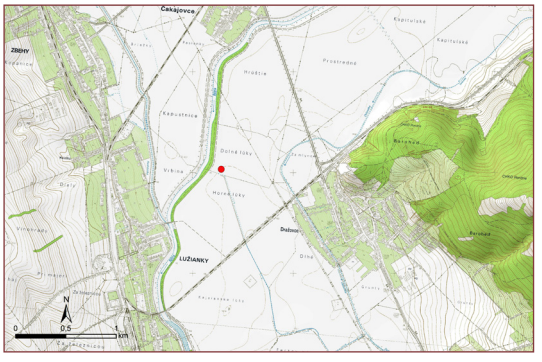

Figure 1. Location of the Zbehy-Dolné lúky site. Prepared by the authors.

numerous lithic assemblage was obtained; the *in situ* find location of the pieces has been recorded by geodetic means (Fig. 4; 5). A soil profile sample had also been taken from sector F7 (Fig. 6), which was macroscopically evaluated in detail in the State Geological Institute of Dionýz Štúr in Bratislava.

3. Find context

3.1. The site

The occupation of the investigated area was concentrated on elevated loess sites. 328 pits from the Neolithic (Linear Pottery culture), Eneolithic (Lengyel and Baden cultures), Early Bronze Age (Únětice culture), early Middle Ages, and the modern era were investigated within the site. Apart from the pit features of the settlements, the skeletal remains of seven individuals have been discovered. Three of them were burials in settlement features and four skeletons were found in grave pits. Based on the accompanying finds, the burials were dated to the Eneolithic and the Early Bronze Age. Despite the existence of settlements from several periods, only one residential feature from the early Middle Ages was identified (Daňová & Cheben, 2021).

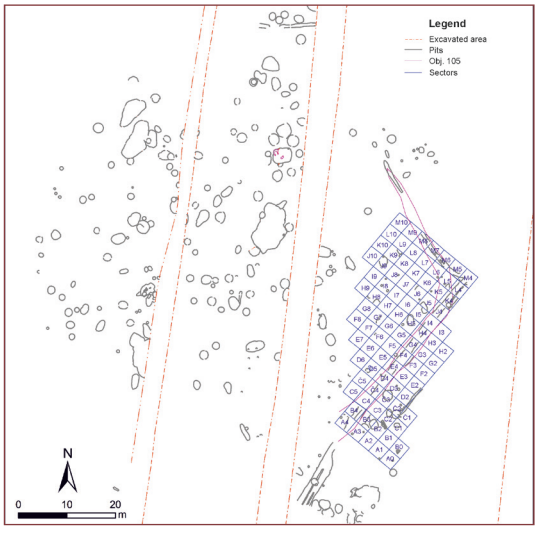

Figure 2. Plan of the Zbehy-Dolné lúky site. Prepared by the authors.

3.2. Sectors A0–M10

The cultural layer in the eastern part of the site was up to 30–50 cm thick. It was detected over approx. 20 × 40 m area (Fig. 2). Several pits dated from the Early Bronze Age (feature 134) to the modern era were sunken in its upper part. Thus, the cultural layer must have been deposited before the Bronze Age. It is also suggested by the find material which contained mostly pottery fragments, lithics and animal bones. The largest find concentration, lithics in particular, occupied sectors F5–F7, G6, G8 and I10 (Fig. 3). In other sectors, more than 5 lithics were found only occasionally. There were even no stone artefacts in some of them.

3.3. Sectors F5–7, G6

Most lithic finds, 56 items, have been recorded in sector F6. The neighbouring sectors F7 (27 items) and G6 (24 items) were also rich. In sector F5, only 7 examples were found. The exact location of 40 stone artefacts, three animal bone fragments and a pottery sherd were recorded in this concentration. The finds were detected in the lower level of the dark brown cultural layer which gradually changed to a transitional pale brown sediment and finally to an archaeologically sterile yellow loess layer. *In situ* finds were recovered in various depths (Fig. 5). Most of them were lying horizontally in the sediment, an inclined position was exceedingly rare. The restricted vertical distribution, the considerably dense concentration as well as the number of conjoining items suggest that if the finds were not in their original positions, they were only slightly moved. The difference in find distribution, e. g., their vertical dispersion, between sector F7 and sectors F5, F6 and G6 is remarkable. The finds in sector F7 were lying within the altitude interval 142.3–142.4 m a. s. l. in an approx. 10 cm-thick concentration. In sectors F5, F6 and G6 they were situated a bit lower, approx. between 142.15–142.3 m a. s. l. and within a slightly thicker arrangement, approx. 15–20 cm (Fig. 5). The differences might have been caused by a minor terrain depression leading from sector F6, through F5 and further southeastwards.

The soil sample from the profile of sector F7 (Fig. 6) contains recent soil, carbonate fluvisol, and anthrosol. The humus horizon is 0–32 cm thick with fine structure and loam texture (granularity), with 10YR4/2 colour. The transitional horizon (A/C) is 5 cm thick (32–37 cm), followed by carbonated alluvial soils with fine structure and loam to clay loam texture – soil-making substrate (C horizon), horizon colour 10YR6/3. The soil profile bears features of hydromorphic influence expressed by hydrous ferric oxide stains. Such macroscopic features indicate that the soil profile was not systematically flooded by inundations but the chemical composition of the soil was and is influenced by groundwater seeping up by capillary action. It follows from the morphology of the soil profile that the soil-making substrate (C horizon) was deposited by fluvial processes followed by pedogenesis with the development of a

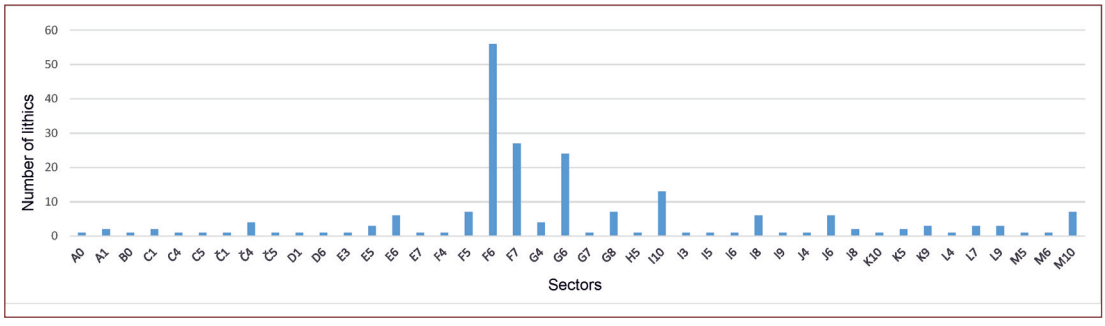

Figure 3. Zbehy-Dolné lúky. Frequency of lithic finds in sectors A0–M10. Prepared by the authors.

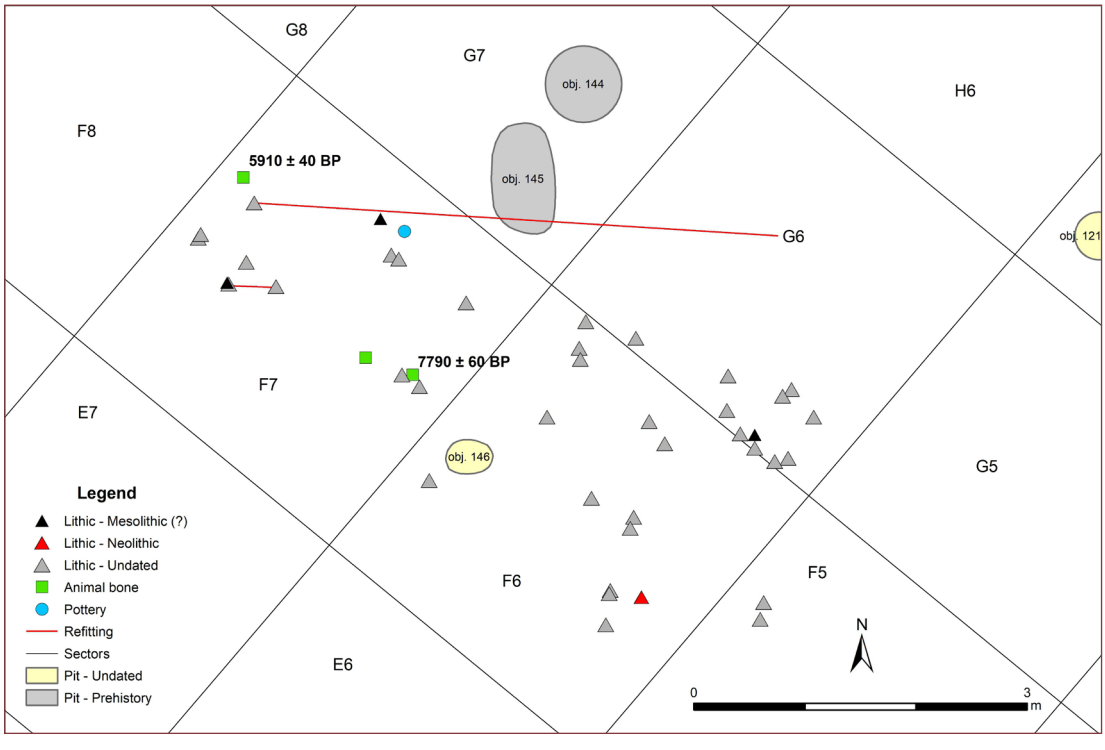

Figure 4. Zbehy-Dolné lúky. Plan of finds distribution in sectors F5–7, G6. Prepared by the authors.

humus horizon (A horizon). The humus horizon indicates that this area was not inundated and the river – water stream – was diverted to another part of the investigated area. The investigated profile can be chronologically divided into two development stages:

A – start of pedogenesis (bottom of the A horizon) to recent (surface part of the A horizon influenced by human activity)

B – end of sedimentation of the soil-making substrate (C horizon).

Table 1. Zbehy-Dolné lúky. Major lithic groups and raw materials.

		Radiolarite	Tevel flint	Limnosilicite	Jurasic flint*	Obsidian	Patinated silicite	Burnt silicite	Unknown	Total
Cores		12	-	3	-	-	-	-	-	15
Debitage	Blades, bladelets	21	-	2	1	3	-	-	3	30
	Flakes	32	-	5	-	1	-	1	1	40
	Chips, flake fragments	58	-	5	-	2	-	8	6	79
Retouched & used tools	Blades, bladelets	19	1	3	2	-	2	2	1	30
	Flakes	8	-	-	-	-	-	1	2	11
Total		150	1	18	3	6	2	12	13	205

* – Jurassic flint from the Cracow-Częstochowa Upland

4. The lithic industry from sectors A0–M10

The assemblage of 205 lithic artefacts comes from the cultural layer in the eastern part of the site (Table 1). Most of the artefacts were made from various types of radiolarites, mainly the Hungarian Szentgál type with typical dark red or brown colour and the so-called "porcelain cortex". Limnosilicite, obsidian, Jurassic flint from the Cracow-Częstochova Upland and Tevel flint were considerably less frequent. Some unspecified pieces were burnt or patinated.

Most of the 15 cores in the assemblage are fragmentary, we were able to restore some of them (Fig. 7: 13). As for the preserved examples, they are mostly pyramidal or flat cores (Fig. 7: 6, 13). They are exclusively unipolar cores usually with striking platforms created by one strike, from which blades and bladelets were knapped.

Unretouched blades, bladelets and their fragments are rather frequently represented both among debitage and tools (Table 1). Most of them are blades and bladelet fragments (23 examples); only 7 complete artefacts have been preserved. The length of the complete examples varies between 20.8 and 46.2 mm, they are 4.2–20.7 mm wide and 1.3–8.5 mm thick. Identification of techniques was difficult, direct percussion, probably with a soft organic hammer is present. Two cases can represent indirect percussion with a punch and one example shows remarkably regular edges (Fig. 7: 9), implying pressure technique or indirect percussion.

40 unretouched flakes were identified, but they were considerably less frequently used for the production of tools (Table 1). They are mostly products of raw material block and core decortication or rejuvenation. The length of the flakes varies between 56.5–9.6 mm, they are 33.3–4.4 mm wide and 22.5–2.8 mm thick. The smallest flakes, chips and flake fragments were included in a separate group, which was the most numerous of all, comprising 79 examples (Table 1).

Tools are the second most numerous group of lithics. Besides retouched tools, this group includes used pieces and artefacts with sickle gloss. Blades, bladelets and their fragments were used to make 30 of them, flakes were used 11 times. Retouched tools contain three endscrapers on radiolarite blades, an endscraper on a bilaterally retouched radiolarite blade, an atypical endscraper on a patinated silicite blade with lateral sickle gloss and an atypical endscraper on radiolarite

blade. The assemblage also contains two short endscrapers of radiolarite (Fig. 7: 3), one miniature (Fig. 7: 1), two endscrapers on flakes, one radiolarite, and one burnt silicite item (Fig. 7: 11). Two burins were also identified – a multiple dihedral burin of an unidentified raw material and a burin of a radiolarite blade or flake fragment. Retouched blades consist of a truncated radiolarite blade with partially ventral bilateral retouch (Fig. 7: 12), a truncated radiolarite blade fragment, possibly a trapeze fragment (Fig. 7: 4), two truncated blades with lateral sickle gloss, one of them is made of Jurassic flint from Cracow-Częstochova Upland (Fig. 7: 14) and the other, a fragment, is of radiolarite (Fig. 7: 15). Retouched blades are also included two truncated blades (of limnosilicite and an unidentified raw material) and two laterally retouched blades from radiolarite. Geometric microliths are represented by a limnosilicite scalene triangle retouched on all edges (Fig. 7: 16), a radiolarite isosceles triangle retouched on all edges with a burin facet (Fig. 7: 7), three trapezes, one limnosilicite (Fig. 7: 2), one radiolarite (Fig. 7: 8) and also a radiolarite item, but with sickle gloss and burin facets on its ends (Fig. 7: 10). A further microlith is a backed piece made on the cortex part of Szentgál radiolarite (Fig. 7: 5). Two retouched flakes are made on radiolarite and an unidentified raw material. As for used pieces, there was one laterally partially used radiolarite blade, four bilaterally partially used blades, three radiolarite and one patinated silicite, and three used radiolarite flakes. Sickle gloss has been identified on three blades and blade fragments, their raw material is radiolarite, Jurassic flint from Cracow-Częstochova Upland and Tevel flint.

5. Absolute dating

Three bone samples provided important data for the absolute dating of the cultural layer, the find context and finds themselves (Fig. 8). As we have already mentioned, several pits were dug in the cultural layer which were younger than the lithics from this layer. The pit thought to be the earliest is feature 134 (sector Č3–D3), which was dated to the Early Bronze Age based on the archaeological material. In its upper part, human skeletal remains were recovered in anatomical position; their identified age was 3515 ± 35 uncal. BP (Poz-143458). The absolute age of the upper – the youngest – part of the cultural layer is thus older than this date. Two other dates are also important, they were recovered from animal bones in sector F7, discovered in the lower – the oldest – part of the cultural layer. Their datation was aimed to earn a more secure chronology of the find context containing the lithic concentration. Based on technology and typology, the industry can be dated roughly from the Mesolithic to the final Neolithic. Unfortunately, they were not deposited in separate layers. The vertical distribution of the finds in sector F7 partly corresponds with their *in situ* deposition within the horizontal stratigraphy. Chronologically, a single Neolithic pottery fragment was found at the highest point, above the concentration of the lithic assemblage (Fig. 5). This applies also to the deposition of dated animal bones. Traces of processing by humans, e. g. hunting, portioning, cooking, etc., were not found on any of them. The sample deposited higher is a mandible fragment, probably belonging to *Sus scrofa* and it is dated to 5910 ± 40 uncal. BP (Poz-97083). The lower and older Mesolithic sample consisted of antler fragments probably belonging to *Cervus elaphus* and it is dated to 7790 ± 60 uncal. BP (Poz-97056). The third fragment, currently undated, may belong to *Bos* sp. or *Cervus* sp. Unfortunately, the recovered microliths were not found in their original positions and their exact geodetic measuring was not carried out. Only a few stone artefacts with questionable Mesolithic classification (Fig. 4; 5) were found in sectors F6 and F7. In sector F6, a fragment of a sickle-blade from Tevel flint has been identified; it was locat-

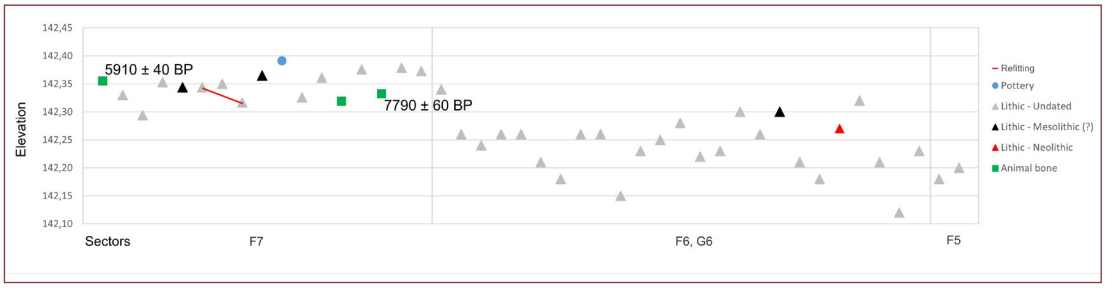

Figure 5. Zbehy-Dolné lúky. Elevation a.s.l. of finds in sectors F5–7, G6. Prepared by the authors.

Figure 6. Zbehy-Dolné lúky. Photo profile of sector F7 with the location of the geological sample. Prepared by the authors.

ed lower than the miniature endscraper probably classified in the Mesolithic (Fig. 7: 1). It is most probably associated with post-depositional processes of sediments mixing with finds.

6. Discussion

The discovery of Mesolithic finds in the course of archaeological excavation at the site of Zbehy-Dolné lúky is rather rare in the larger region. The Mesolithic occupation from this period in Nitra and its vicinity is currently not known.

The nearest Mesolithic site was discovered and investigated by J. Bárta in 1953–1955 (Bárta, 1957) in Sereď-Mačianske vŕšky. The extensive assemblage of retouched tools (Bárta, 1957, tab. XV–XXI) is dominated by endscrapers, micro-endscrapers, retouched bladelets, retouched flakes, backed bladelets, scalene and isosceles triangles usually

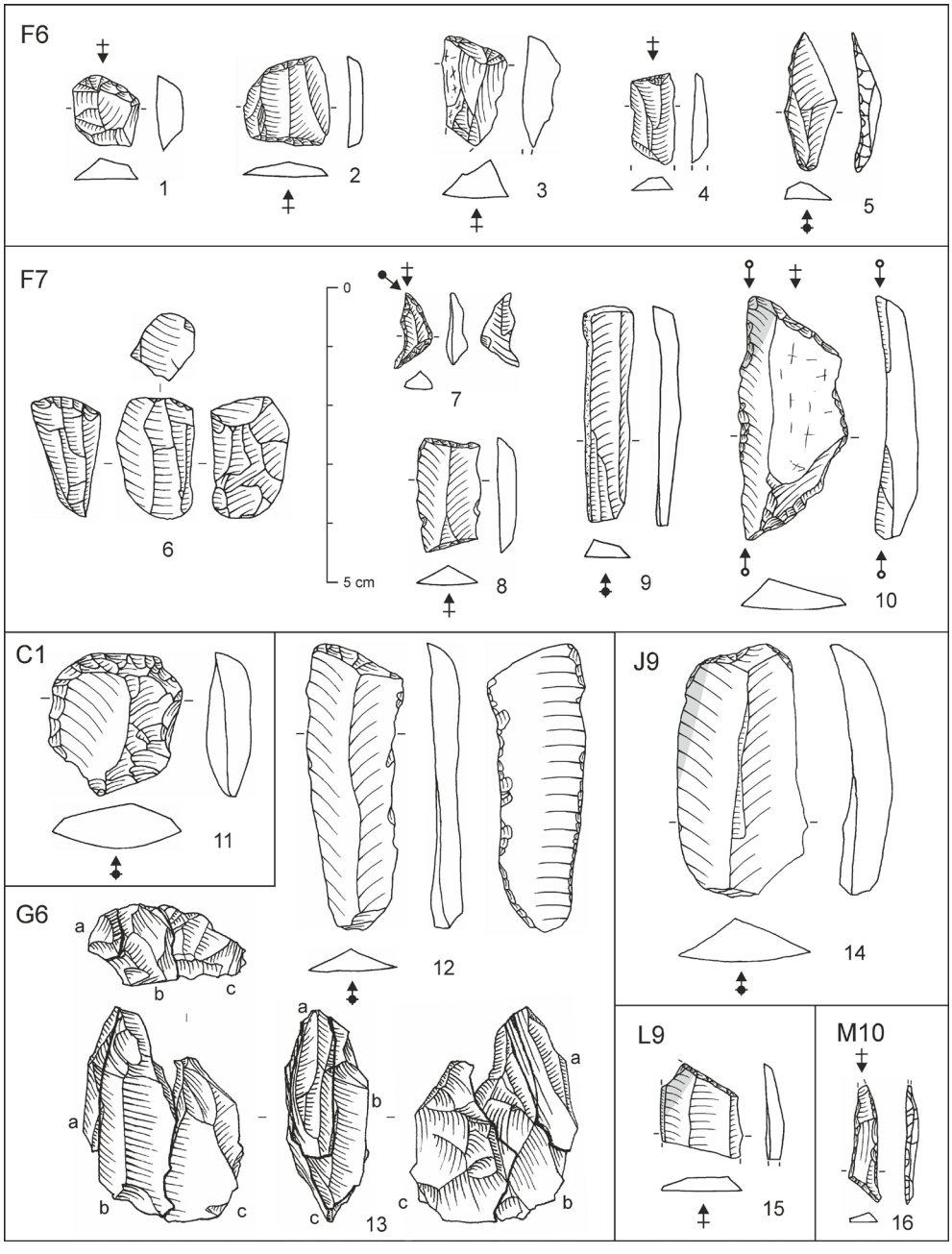

Figure 7. Zbehy-Dolné lúky. Selected lithic industry by sectors. 1, 3–10, 12, 13, 15 – radiolarite; 2, 16 – limnosilicite; 11 – burnt silicite; 14 – Jurassic flint from the Cracow-Częstochowa Upland. Prepared by the authors.

retouched on two edges, segments and few trapezes. In the context of results from the analysis of flora and fauna, J. Bárta classified the assemblage to the end of the Boreal and the beginning of the Atlantic (Bárta, 1957, p. 36). The latest results of 14C dating of animal bones from the site place the age of the occupation to the Boreal period. Other assemblages from the region of Sereď are from Dolná Streda (Bárta, 1959), Mostová (Bárta, 1960) and Tomášikovo (Bárta, 1955) most probably belonging to the same period.

The frequent occurrence of the Szentgál-type radiolarite in Zbehy suggests remote contacts with western Hungary, the Transdanubian Mountains. The Páli-Dombok site was investigated in the NW part of Hungary in 2014. The assemblage from this site was preliminarily dated to the turn of the Epipalaeolithic-Early Mesolithic (Mester *et al.,* 2014, p. 353). The lithic industry consists of radiolarite from the Bakony Mountains, the source of the Szentgál type as well. Retouched tools include several endscrapers, bifacially formed pieces, triangles, backed points, truncated blades and burins.

Vác-Sződliget II is another site in northern Hungary. In 1967, M. Gábori recorded there an area paved with pebbles of 9 m^2 and two hearths which were probably used simultaneously (Gábori, 1968). The paved area can be interpreted as a base for a dwelling with light construction (Kertész & Király, 2021, p. 169). Based on the find typology (especially the presence of trapezes), stratigraphy, and taphonomy of the site, the settlement can be most probably dated to the Late Mesolithic, the final Boreal or early Atlantic period. Key information regarding the Mesolithic occupation of the northern part of the Carpathian Basin comes from the Jászság region. In the 1990s, the sites of Jászberény I and Jásztelek I were investigated there (Kertész *et al.,* 1994). Chronologically older finds were identified at Jászberény I. Three radiocarbon dates are known from this site (Fig. 8): 8030 ± 80 uncal. BP was obtained from *Cepaea vindobonensis* mussels, 7350 ± 80 uncal. BP and 7154 ± 62 uncal. BP come from the "sediment carbonate of the matrix of the Mesolithic culture-bearing layer" (Kertész, 2002, p. 290; Kertész *et al.,* 1994, p. 28). A more recent settlement was discovered at the site of Jásztelek I, where a dwelling with a circular ground plan was found. It was "built around a framework of posts" (Kertész, 2002, p. 288). Assemblages in this region are dominated by microliths including backed points, and together with the occasional straight and oblique backed types, arched pieces were the most frequent. Backed pieces, obliquely truncated backed bladelets and retouched truncations are represented as well. The Microburin technique was recognized there. Geometric microliths are represented by crescents, isosceles and scalene triangles as well as trapezes (Kertész *et al.,* 1994, pp. 21, 29). They were divided into two groups. The early phase is characterized by smaller types, while larger pieces belong to the later phase (Kertész, 2002, p. 288).

Last but not least, there is the site of Barca I in eastern Slovakia. The lithic assemblage is made of obsidian and it is typologically dominated by short scalene and isosceles triangles, backed bladelets, atypical trapeze and microburins (Prošek, 1959, pp. 146, 147). The finds were deposited in a layer together with charcoals. Below, there was a pit from the Palaeolithic (Prošek 1959, p. 145). The latest ^{14}C on birch (*Betula* sp.) charcoal is 7820 ± 50 uncal. BP (Fig. 8). Another similar date was obtained from the site by other colleagues (W. Chu, Ľ. Kaminská, pers.comm.). The date is almost identical to the one from Zbehy and it is similar to the absolute age of Jászberény I (Fig. 8). The typological picture of Barca I and Jászberény I, together with Jásztelek I, is remarkable, which has been pointed out before (Kertész, 2002, pp. 289, 294, 296; Kozłowski, 2001, pp. 268, 269).

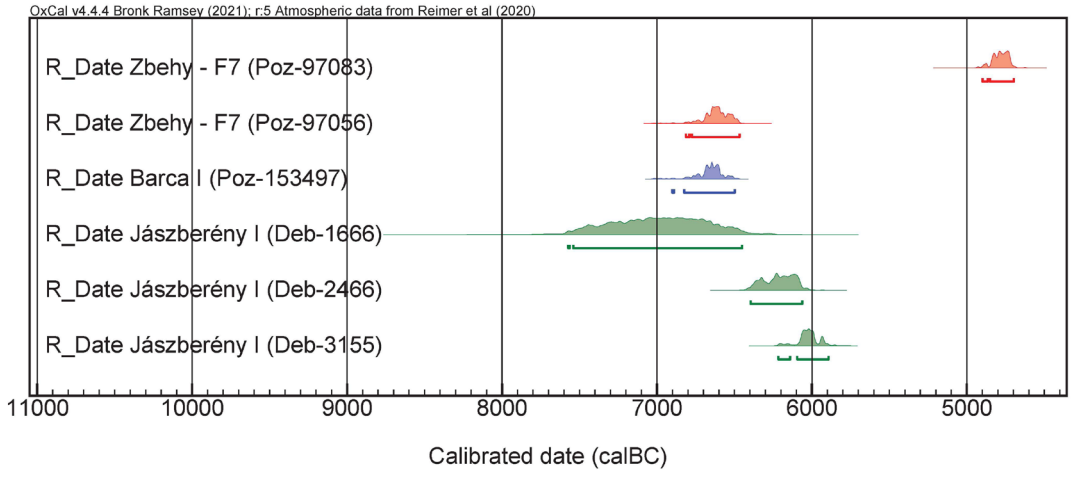

Figure 8. Calibrated radiocarbon dates from the sites Zbehy-Dolné lúky (red), Barca I (blue) and Jászberény I (green) using the atmospheric calibration curve Intcal20 (Reimer et al. 2020). Prepared by the authors.

7. Conclusion

The analysis of the lithic industry from sectors A0–M10 in Zbehy as well as the results of radiocarbon dating of animal bones from sector F7 suggests that the assemblage of finds from the bottom of the cultural layer was not homogeneous and it does not come from one chronological stage of the settlement. The finds are stone artefacts from the Mesolithic and Neolithic, possibly Eneolithic. According to the absolute dates from animal bones, the chronological difference between these components is approx. 2,000 years. We are aware that the selected samples for 14C dating were not ideal and animal bones do not necessarily reflect human agency, as they probably come from wild species, without any traces of processing by humans. On the other hand, their age confirms the classification of the lithic industry. However, the two assemblages dated to different periods were not deposited in different layers, well distinguishable in the sediments. As for post-depositional processes, sector F7 displays the minimum vertical distribution in find deposition (max. 10 cm), a considerably dense concentration, and some pieces that could be refitted or conjoined. These factors suggest that if the finds were not in their original position, they were only slightly moved, which is also corroborated by the frequent horizontal position of longer finds with minimal inclination. The situation was different from sector F7 in sectors F5, F6 and G6, where the finds were deposited a little lower, and more dispersed (15–20 cm). This position is probably associated with post-depositional displacement within the sediments along a depression leading from sector F6 through sector F5 and further in the SE direction. In the rather small lithic collection, Mesolithic microliths can be clearly distinguished; they are represented by a backed piece (Fig. 7: 5) and two small atypical triangles retouched on all edges (Fig. 7: 7, 16), which sometimes occur in other European assemblages. A micro-endscraper could also be dated to the Mesolithic (Fig. 7: 1). The microburin technique was not identified in the assemblage. Occurrence of trapezes without sickle gloss (Fig. 7: 2, 8) or truncated pieces

(Fig. 7: 4) might be associated with the Mesolithic as well as the Neolithic periods. Tools with sickle gloss (Fig. 7: 10, 14, 15) or other larger lithic artefacts, such as endscrapers on blades, etc., were most probably also associated with the Neolithic.

Despite the difficult and probably mixed context, the above-mentioned finds are interesting and they are associated with the last Mesolithic hunter-gatherers and Early Neolithic farmers. In the western part of the site, several pits from the Neolithic and Eneolithic were investigated. They will be analysed in near future and they bring a more complex picture of the settlement. The frequent occurrence of Szentgál radiolarite and Tevel flint point to intense contact with the territory of today's Hungary. Regarding the uniqueness of the finds, more attention should be paid to elevations near water streams in further field activities in the studied region and the methodology of investigation should be adapted appropriately.

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