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Stará Ľubovňa – Lesopark. Late Palaeolithic site and the problems associated with raw material mining

Maciej Wawrzczak

Institute of Archaeology and Ethnology
Polish Academy of Sciences

Institute of Archaeology
Slovakian Academy of Sciences
Subdivision – OZV Spiš

m.wawrzczak@interia.pl

Zuzana Kasenčáková

376 A.D. Ltd.
Prešov

kasencakova.zuzana@gmail.com

Abstract

A new archaeological site was discovered accidentally in year 2018. A surface survey revealed stone artefacts, which were generally dated to the Late Palaeolithic. Later, archaeological sondages were opened and newly found stone artifacts proved earliest dating. Furthermore, it was confirmed that local radiolarites were exploited by Late Palaeolithic societies.

Introduction

Research in the mountainous areas are undoubtedly one of the most important directions within the archaeological field of study. They indicate that geographically diverse communities were settled since the Palaeolithic. Nowadays, hardly accessible mountainous areas are very interesting places for archaeological works, mostly due to existing dense vegetation.

Before 2018, archaeological works in this area had been only concentrated in the valley of Poprad, where a Palaeolithic site was localized with material dated mainly to the Late Palaeolithic (Epigravettian and Magdalenian cultures). Moreover, Middle Palaeolithic artefacts and Neolithic materials were found there also.[1] However, this site is located in a different landscape zone, than the newly discovered place, described below.

The Stará Ľubovňa – Lesopark site was localized surprisingly during a family trip to a recreational area of the town, where stone materials were found on the surface. After the site was thoroughly surveyed and some material was collected, it was decided to begin archaeological excavations. The purpose of this research was to describe its chronological position. During this works more artefacts were discovered, which are kept together with the documentation in the Museum of Stará Ľubovňa.[2]

Site location

The newly discovered site is located in the northern part of Slovakia *(Fig. 1.1)*, within a recreational zone in the area of Stará Ľubovňa. It is located in Ľubovnianska vrchovina, which is a

1 Valde-Nowak et al. 2007.
2 Kasenčáková – Wawrzczak 2018; Kučerová et al. 2020, 86.

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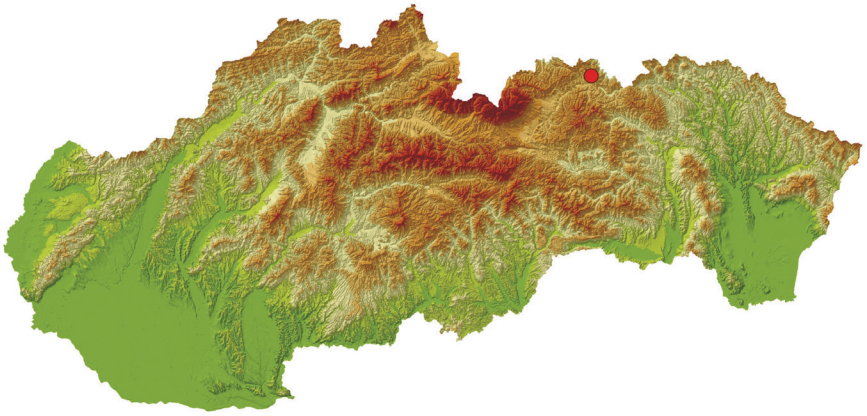
part of the Magura nappe-group of the flysch belt of the Magura unit,[3] made of brown, clayey soil.[4] At this moment the site is covered by meadows, overgrown with grass and nearby forest *(Fig. 1.2)*. It's situated on the southern slope of the hill and also spreads to the relatively flat area of the foothill. The hill extends to a small, unnamed watercourse, which is a left-bank tributary of the Pasterník Stream – a right-bank tributary of Poprad River *(Fig. 1.3)*. The research area is situated at an altitude of 676 m a.s.l.



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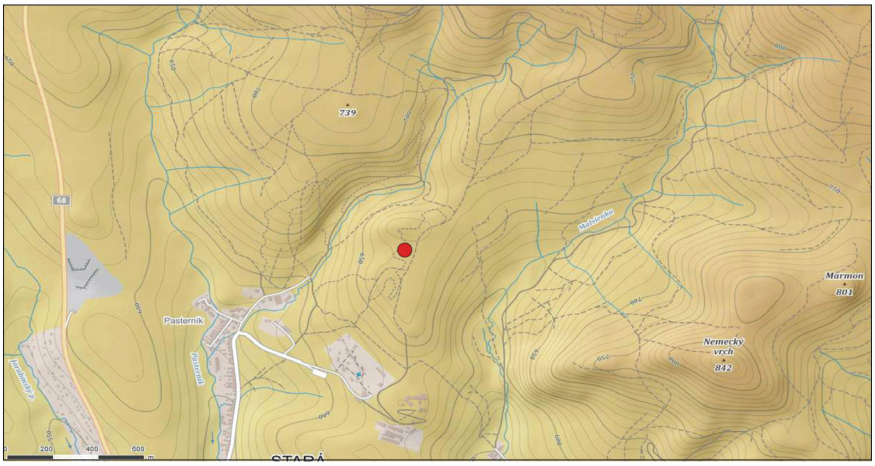

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Fig. 1. The location of Stará Ľubovňa – Lesopark site: 1 – in the area of Slovakia, 2 – site location in terms of vegetation cover, 3 – in the relation to landforms.

3 Nemčok 1990, 52.
4 Kunáková et al. 2016, 340.

Archaeological excavations

As it was mentioned above, the site was accidentally discovered. A flake made of red-green radiolarite was found at the surface in the border zone between the meadow and the forest *(Fig. 2.1)*, while a core made of green radiolarite *(Fig. 2.2)*, a blade *(Fig. 2.3)* and five flakes made of red radiolarite *(Fig. 2.4–8)* were found in the forest. Despite the fact, that blade and flakes are not very characteristic and primarily came from the first stages of the raw material processing, the found core seemed to be dated to the Late Palaeolithic period.[5]

The discovery of the artefacts led to a decision to conduct a small archaeological excavation and two small sondages were established. Sondage 1/2018 (size 2×1 m) was located on the border of meadow and the forest, whereas 2/2018 sondage was situated in the forest *(Fig. 3)*. Works were carried out manually and exploration of levels was done every 5 cm.

Stratigraphy

The stratigraphy revealed during the archaeological works can be summarized as follows (*Fig. 4:* A.1 – W profile, A.2 – N profile, B.1 – N profile, B.2 – W profile): there was a 30–40 cm thick clay layer (2) of brown colour under a few centimetres thick, dark brown humus layer (1); the clay layer was situated directly on barren soil in the form of grey, impermeable layer of loam (3). Furthermore in the 1/2018 sondage, the presence of orange sandy layer (4) with lower (clayey) layer admixture *(Fig. 4.A.2)* was confirmed. In both cases the cultural layer was contemporaneous with layer 2, except that in 2/2018 sondage artefacts were also found in the humus layer (layer 1).

In both sondages stone artifacts were not associated in clusters, but relatively evenly dispersed *(Fig. 5.A,B)*. Also, no clusters were observed in the next exploration levels. The most number of artefacts in cultural layer were between 25–40 cm in sondage 1/2018 and 10–20 cm in sondage 2/2018.

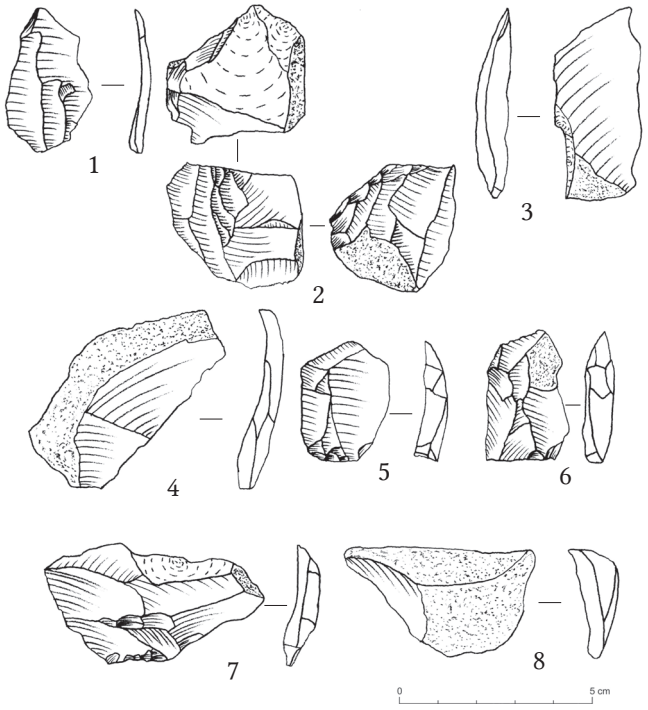

Fig. 2. Stará Ľubovňa – Lesopark site. Stone artifacts found during surface survey: 1, 4–8 – flakes, 2 – core, 3 – blade. Raw materials: 1 – red-green radiolarite, 2 – green radio-larite, 3–8 – red radiolarite.

Fig. 3. The location of sondages (test excavations) in Stará Ľubovňa – Lesopark site.

5 comp. Bańdo et al. 1992, 23. Fig. 12.2.

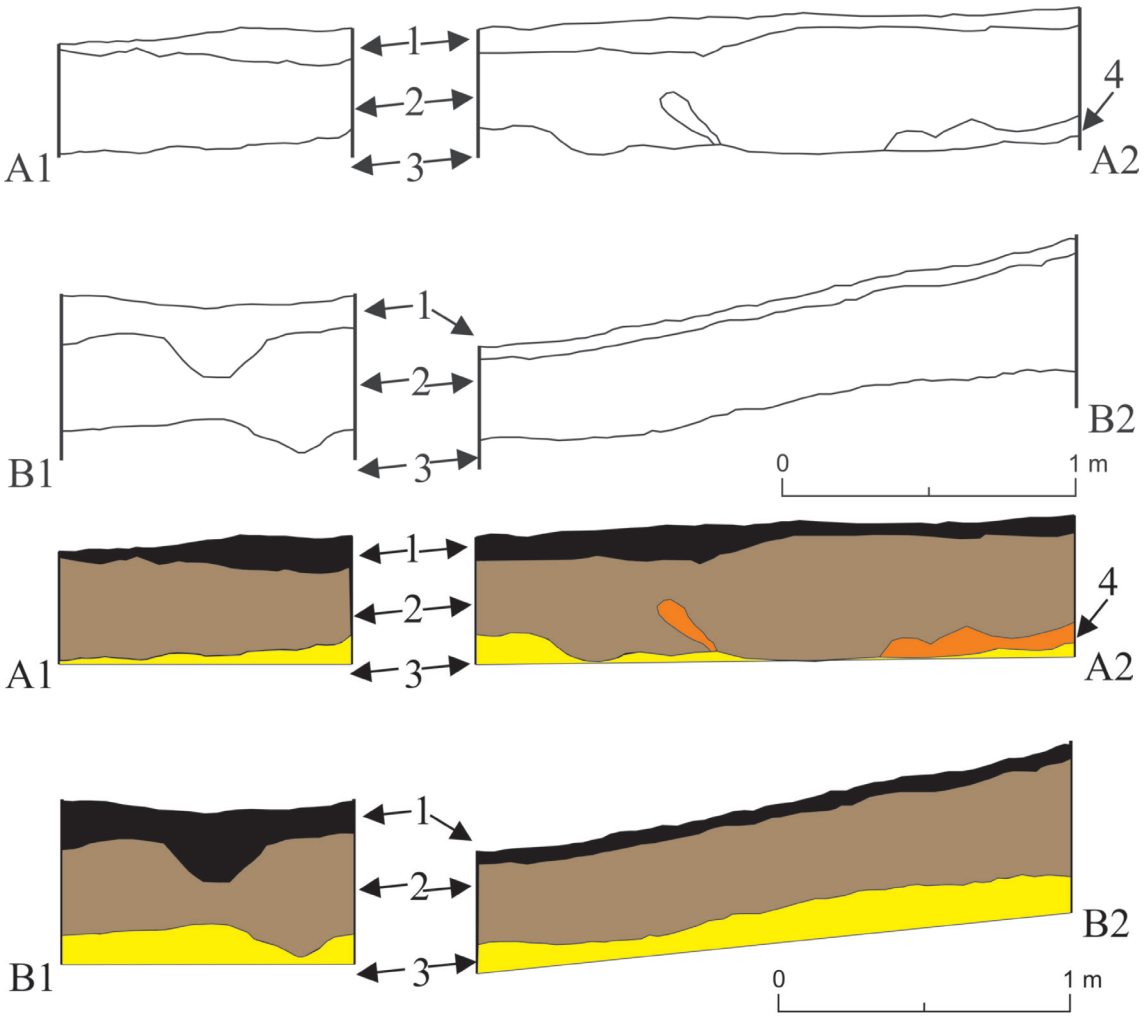

Fig. 4. Stratigraphy of 1/2018 (A) and 2/2018 (B) sondages located in Stará Ľubovňa – Lesopark site. 1 – dark brown hummus, 2 – brown loamy clay (cultural layer), 3 – grey loamy barren soil, 4 – orange sandy-loamy layer.

Stone items

During archaeological works 196 various stone materials were discovered in both sondages: 105 pieces in 1/2018 sondage and 91 pieces within 2/2018 sondage. Some of the items were just natural chunks that didn't show any marks of intentional knapping. This category included 9 objects in 1/2018 sondage and 39 pieces in 2/2018 sondage *(Fig. 6)*. It may indicate differences in intra-site organization.

Stone materials that originated from both sondages can be assigned in 100% as made from local radiolarite. In the nearest area, there are radiolarite outcrops, in example in Jarabina or Litmanová villages,[6] so this raw material have local origin. The most frequent is the red colour variant, represented by 82 items in the 1/2018 sondage and 88 items in 2/2018 sondage. The percentage of radiolarite varieties confirms that certain varieties were much more prefered than the other *(Fig. 7)*. It is worth to mention that varieties of red radiolarite were mainly used also in the site of Stará Ľubovňa – Pod Štokom II.[7]

6 see Biernat et al. 2013, 2 for further reading.
7 see Valde-Nowak et al. 2007, 11. Tab. 2.

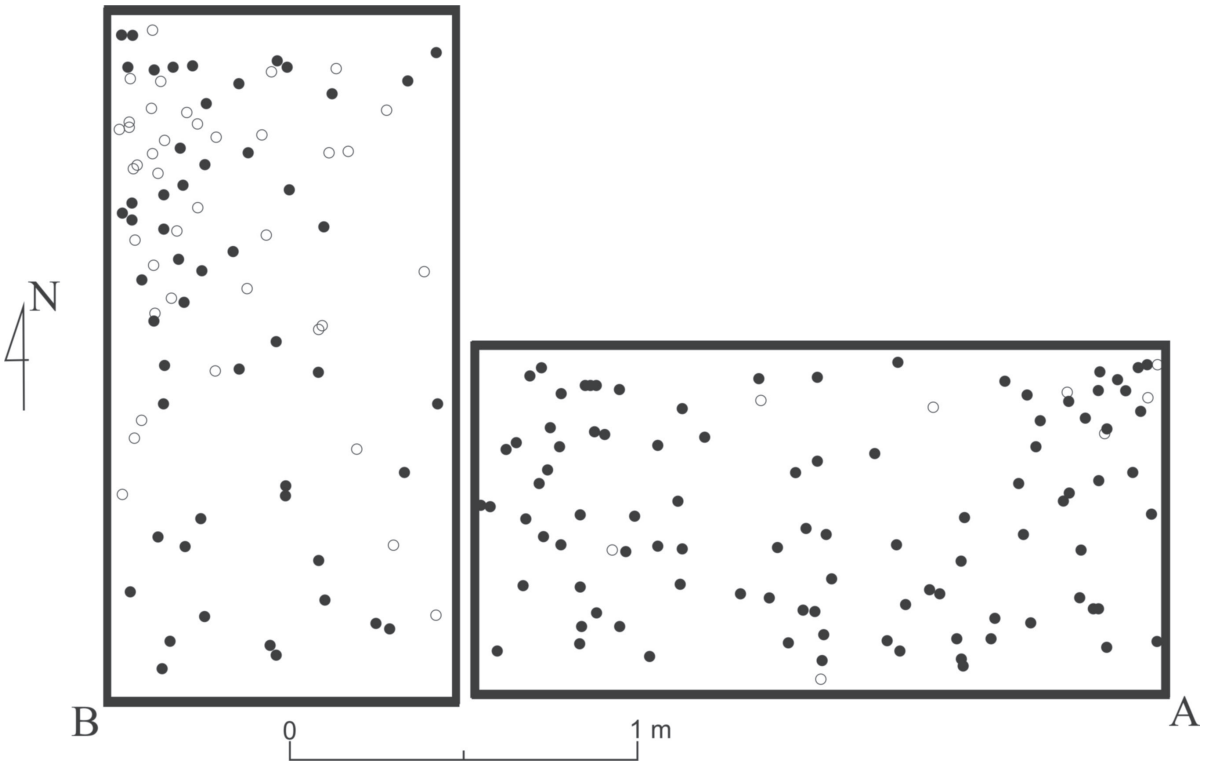

Fig. 5. Planigraphy of stone materials in Stará Ľubovňa – Lesopark site: 1/2018 (A) sondage and 2/2018 (B) sondage. Full rectangle – artifact – empty rectangle – natural raw material.

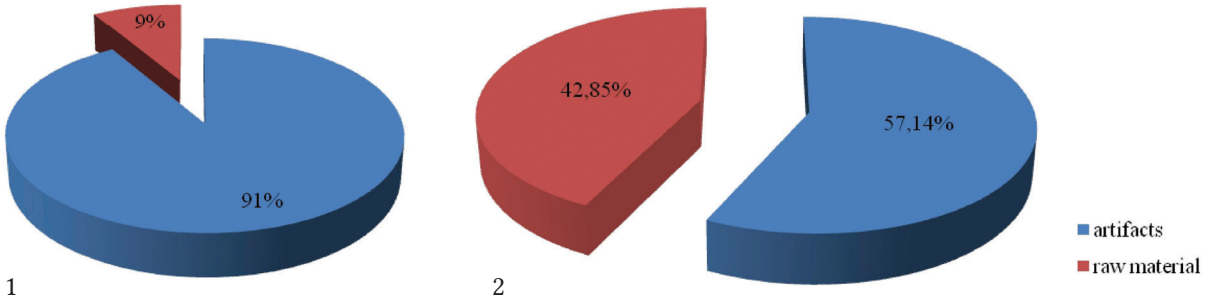

Fig. 6. Differences in stone materials – comparison of artifacts and raw material collected in Stará Ľubovňa – Lesopark site: 1 – 1/2018 sondage, 2 – 2/2018 sondage.

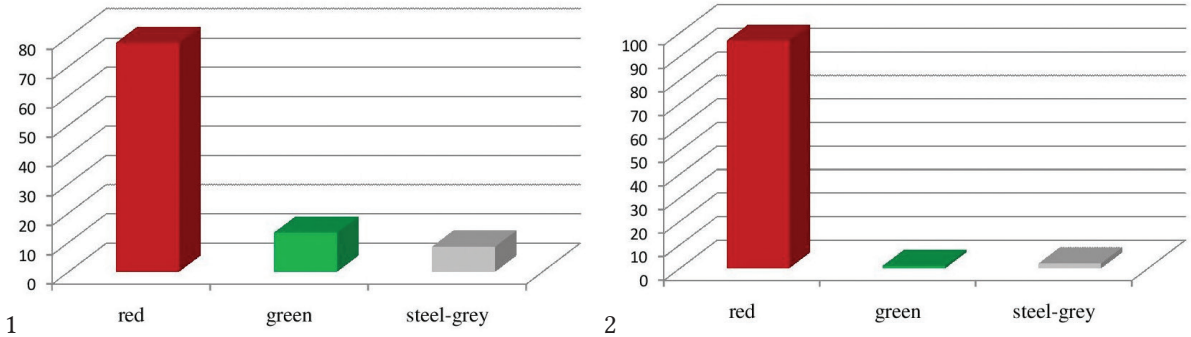

Fig. 7. Diversity of stone materials showing radiolarite colour variations in Stará Ľubovňa – Lesopark site: 1 – 1/2018 sondage, 2 – 2/2018 sondage.

Stone artefacts

During the archaeological excavations further divergence were confirmed between the both sondages. Apart from differences in participation of natural chunks which didn't have any marks of knapping in 1/2018 and 2/2018 (see above), it was noticed that there were also some dissimilarities between both sondages in the structure of the collection. The data is displayed on *Figure 8* and *Table 1*.

The calculation shows, that the largest percentage in 1/2018 sondage is represented by negative chunks, followed by flakes and tools *(Fig. 8.1)*. The most numerous in 2/2018 sondage are flakes, followed by negative chunks, while tools are the third numerous *(Fig. 8.2)*.

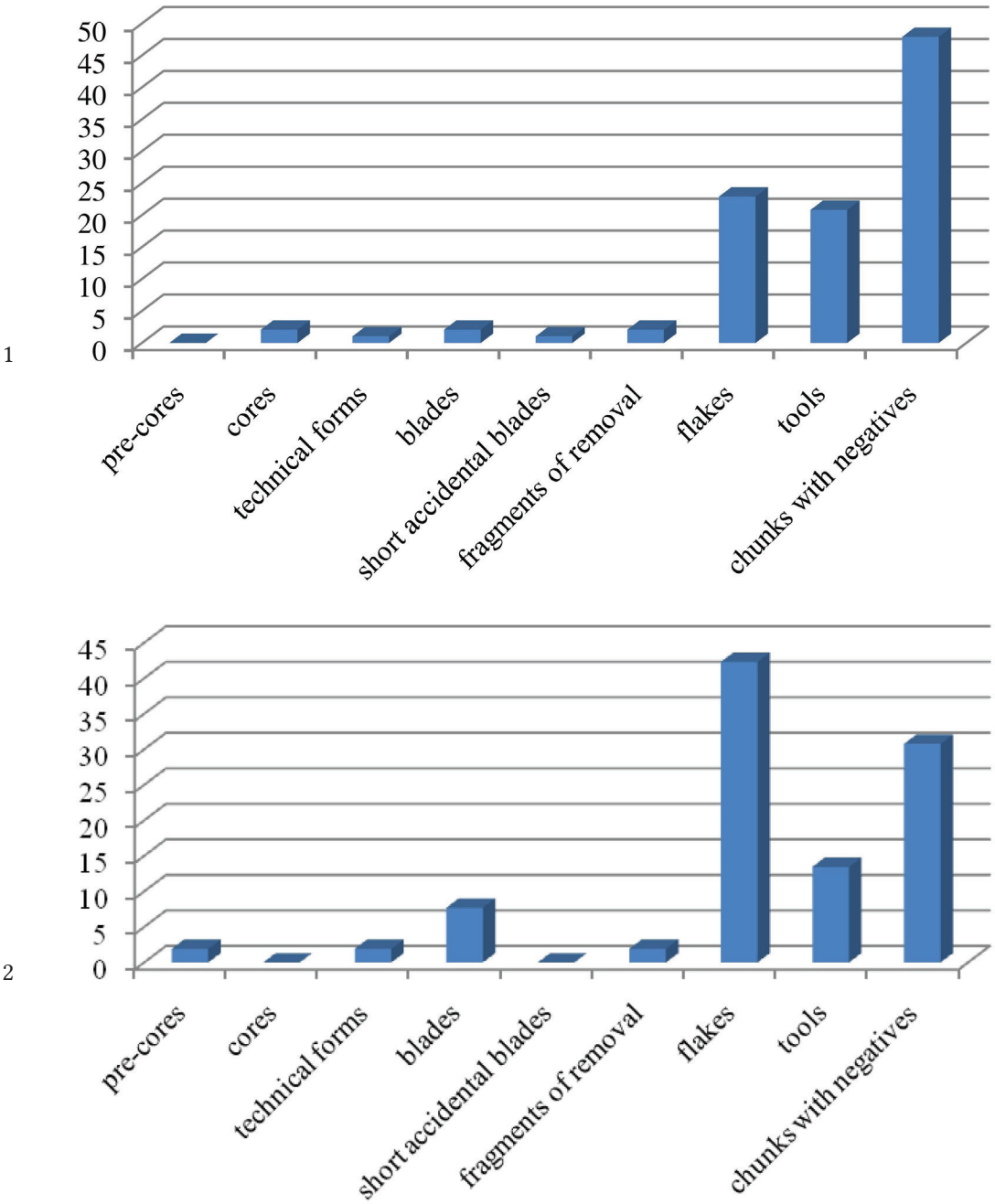

Fig. 8. The types of artifacts collected in Stará Ľubovňa – Lesopark site: 1 – 1/2018 sondage, 2 – 2/2018 sondage.

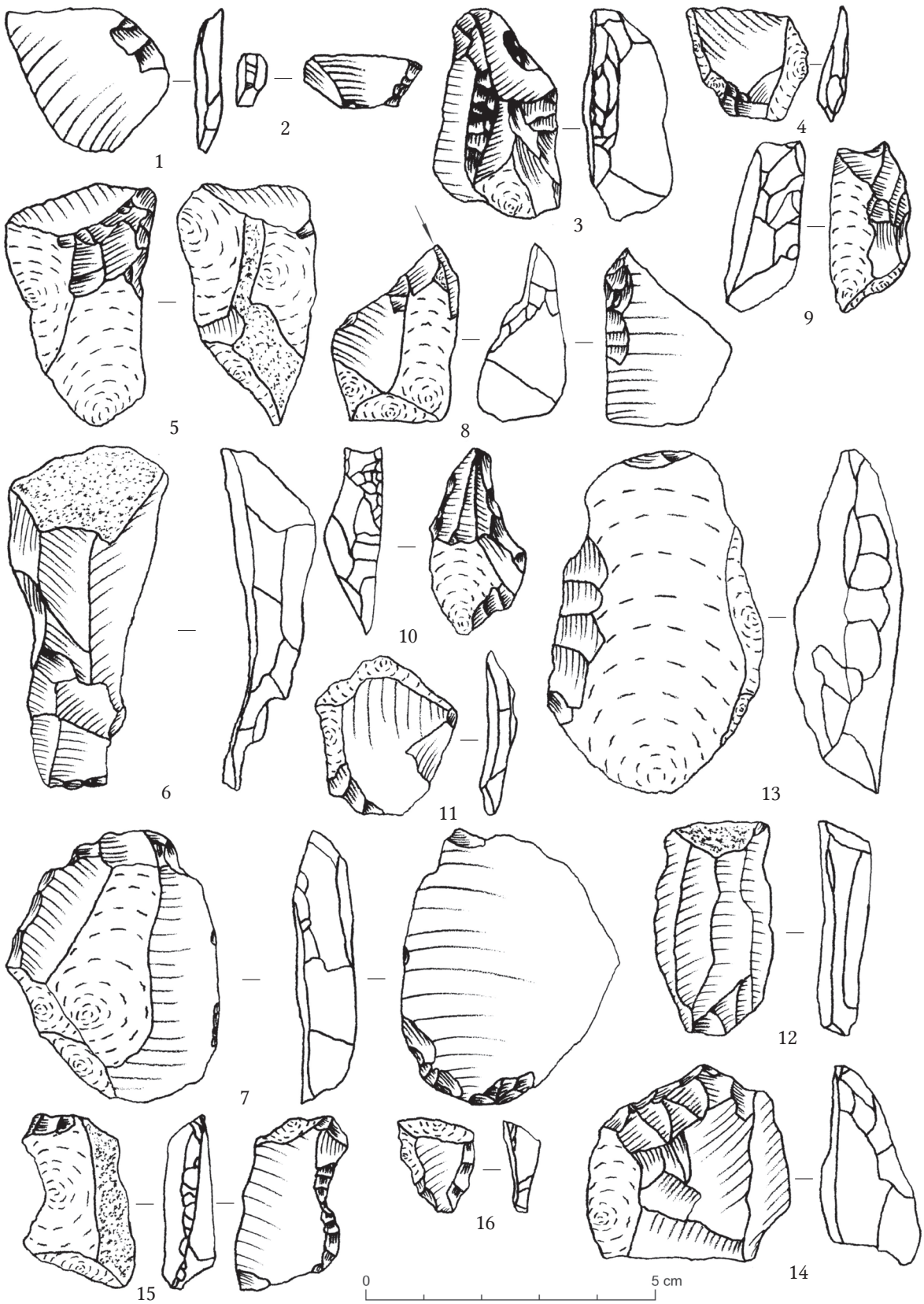

Fig. 9. Stone artifacts from 1/2018 sondage in Stará Ľubovňa – Lesopark site: 1, 4, 11 – flakes, 2, 16 – fragments of retouched blades or flakes, 3, 9, 10 – perforators, 5 – initial core, 6 – crested blade of the second series, 7 – combined tool end-scraper + knife, 8 – medial truncation burin, 12 – accidental blade, 13 – knife (?), 14 – end-scraper, 15 – fragment of retouched flake. Raw materials: 1–11, 15, 16 – red radiolarite, 12 – steel-grey radiolarite, 13, 14 – green radiolarite.

Therefore, the explanation about functional differentiation of these places seems acceptable. Both sondages revealed large percentage of negative chunks. High rate of this kind of artefacts probably resulted from core exploitations or these products are fragments of cores.[8] It is a common feature of both places.

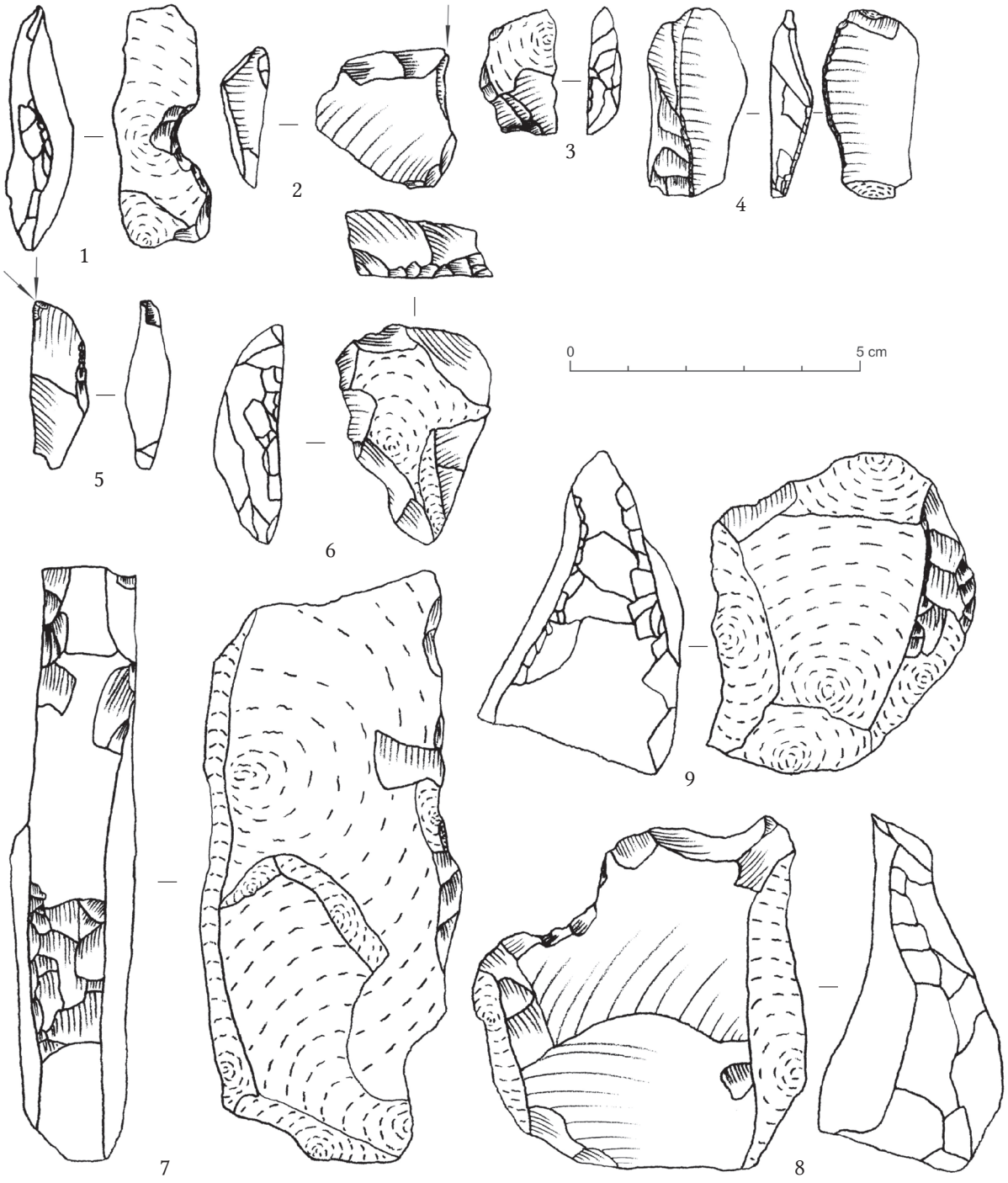

Fig. 10. Stone artifacts from 1/2018 sondage in Stará Ľubovňa – Lesopark site: 1 – retouched natural stone, 2 – truncated burin, 3 – fragment of retouched flake, 4 – fragment of retouched crested blade of the second series, 5 – dihedral burin, 6 – amorphous end-scraper, 7, 8 – mining tools, 9 – a tool in the initial stage of development. Raw materials: 1–6, 8, 9 – red radiolarite, 7 – green radiolarite.

8 comp. Libera 2019, 203.

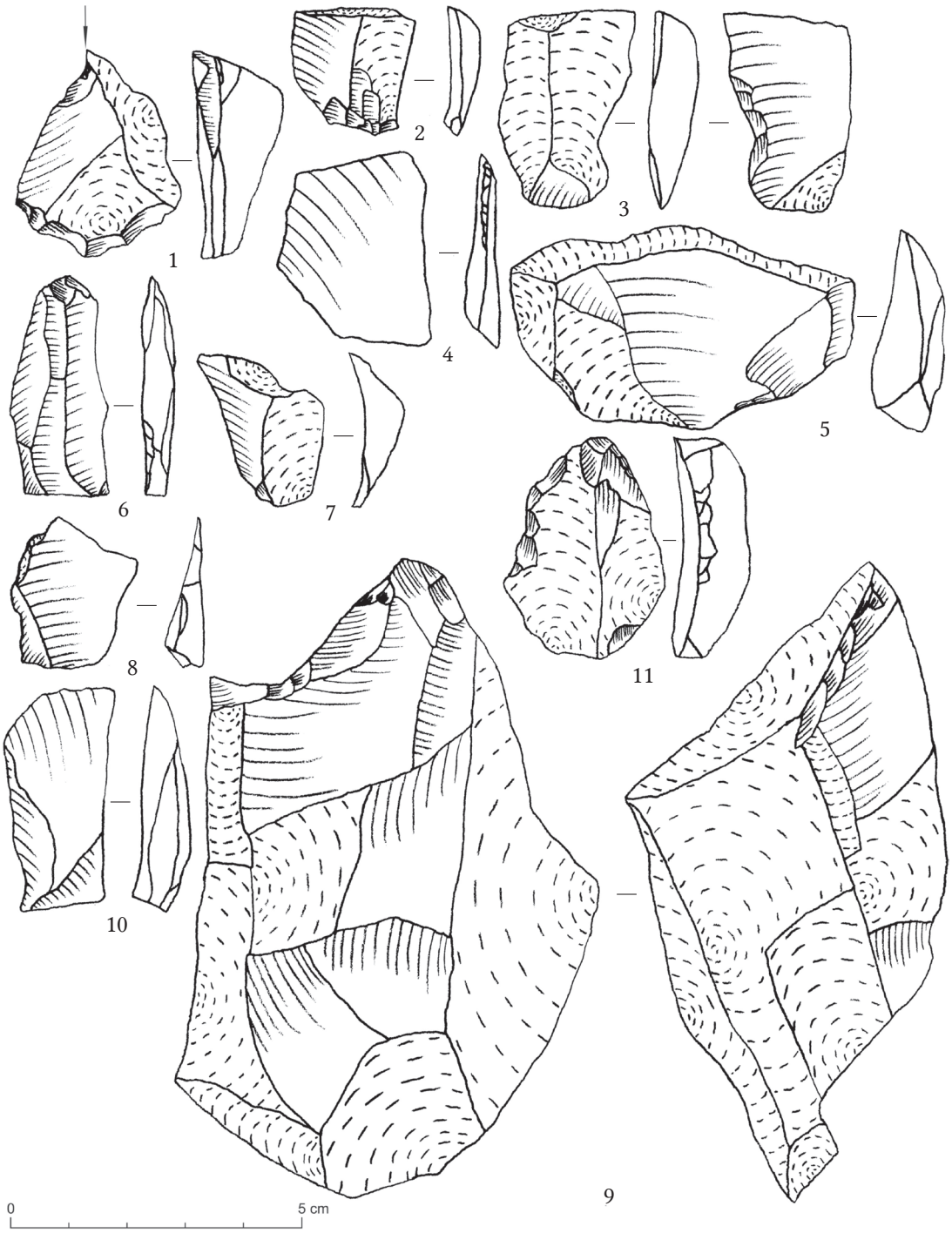

Fig. 11. Stone artifacts from 2/2018 sondage in Stará Ľubovňa – Lesopark site: 1 – single blow burin, 2 – fragment of blade or flake, 3 – fragment of retouched blade, 4, 11 – retouched flakes, 5, 7, 8 – flakes, 6 – fragment of blade from bipolar core, 9 – pre-core, 10 – blade. Raw materials: all made of red radiolarite.

As mentioned earlier, certain divergence appeared at the same time. Statistically, more tools are in 1/2018 sondage, whereas flakes predominate in 2/2018. It may prove the preliminary treatment of raw stone materials that occurred in places covered nowadays with forest, and further act of preparing products (cores, semi-products, tools) in places nowadays dominated by meadows. It is more likely, when we take a look at flakes category from 2/2018 sondage. These are massive cortex forms (cortical flakes), with big bulbs visible *(Fig. 12.2–7,9)*. They

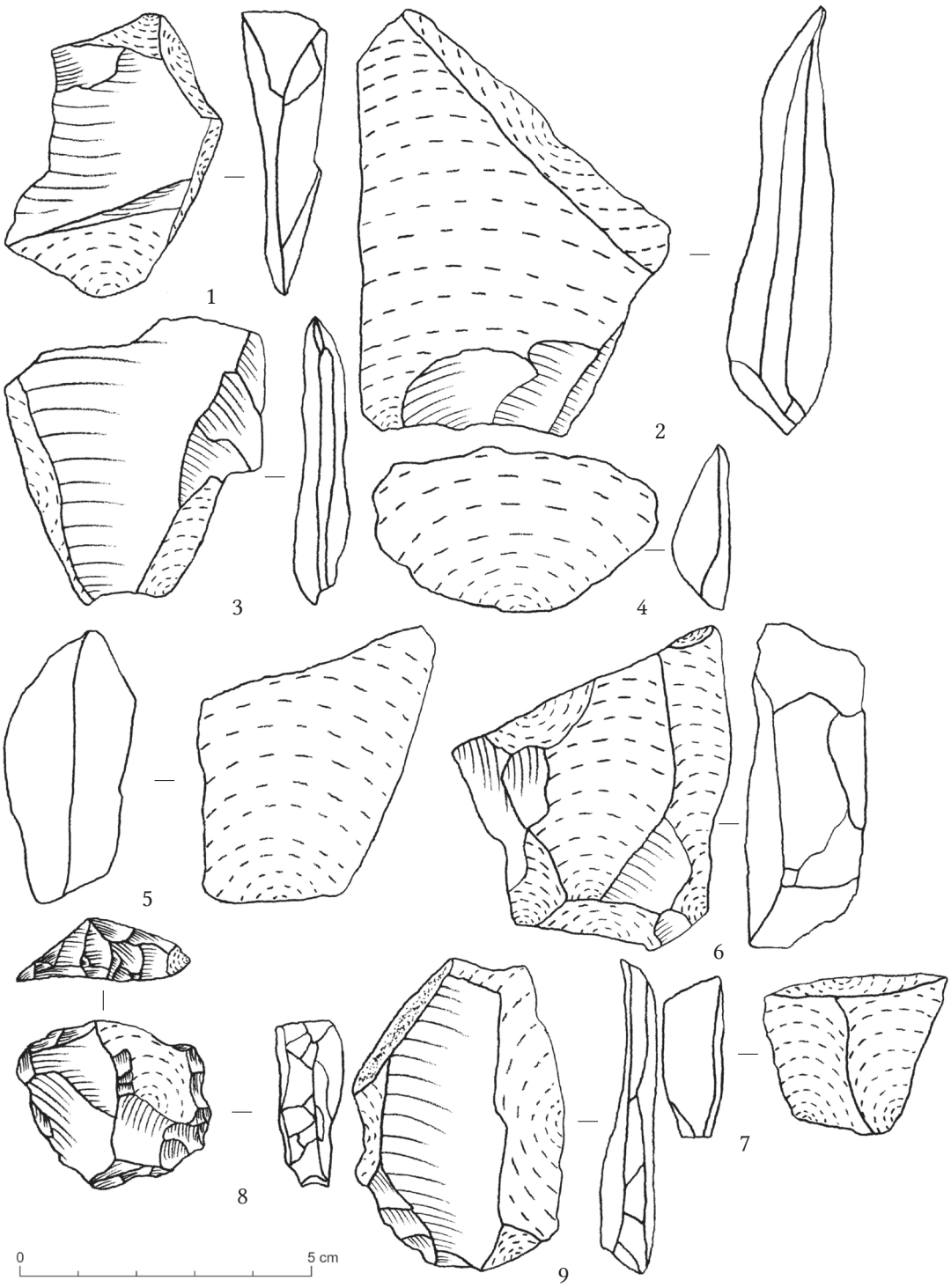

Fig. 12. Stone artifacts from 2/2018 sondage in Stará Ľubovňa – Lesopark site: 1 – over-passed blade, 2–7, 9 – flakes, 8 – end-scraper. Raw materials: 1–5, 7–9 – red radiolarite, 6 – green radiolarite.

resemble forms associated with the initial phase of raw material processing.[9] They can be compared to flake and blade blanks *(Fig. 9.1,4,11,12)*, which seems to be knapped from prepared cores.[10] Certainly, semi-products of prepared character were also found in the 2/2018 sondage *(Fig. 11.6,10)*. Furthermore, two cores were found in 1/2018 sondage, admittedly in an initial

9 e.g. Ginter 1974, 119. Pl. XXXIV; Sobczyk 1993, Pl. XIII; Pl. XIV.

10 see e.g. Rakoca – Rozbiegalski 2015, 416.

form *(Fig. 9.5)*, but the second sondage did not reveal any cores, only a pre-core *(Fig. 11.9)*, which also can be significant. The other categories of findings are occasionally represented. It is also worth to mention the large amounts of natural fragments or blocks in the 2/2018 sondage (see above). This kind of accumulation suggests that the place was used for pre-processing of extracted raw materials, especially near mining areas.[11]

Tools

Tools were distinguished in both 1/2018 and 2/2018 sondages. This kind of items were much more numerous in the area of 1/2018 sondage *(Fig. 8)*.

The sondage 1/2018 revealed, among others, fragments of retouched blades or flakes *(Fig. 9.2,15,16; Fig. 10.3,4)*, perforators *(Fig. 9.3,9,10)*, a knife and end-scraper *combined (Fig. 9.7)*, burins *(Fig. 9.8; Fig. 10.2,5)*, knife-like artifact *(Fig. 9.13)*, end-scrapers *(Fig. 9.14; Fig. 10.6)*, retouched natural fragment *(Fig. 10.1)*, mining tools *(Fig. 10.7,8)* and two products of the mining tool forms, in the form of a hoe *(Fig. 10.7,8)*. The following were found in 2/2018 sondage: burin *(Fig. 11.1)*, fragment of retouched blade and retouched flakes *(Fig. 11.3,4,11)* and an end-scraper *(Fig. 12.8)*. Retouched blades or flakes are common, non-specific forms, typical for communities that used stones as a raw material for tools.[12]

The presence of tools made from natural fragments is also significant *(Fig. 9.13; Fig 10.1)*. This is characteristic of places located near sources of raw material, that could be easily available and where no attention was given to its long transport.[13] This may therefore certify that the site is rich in radiolarite.

However, despite a relatively small series of tools, in the form of end-scrapers, burins and perforators, it is possible to suggest dating within a single period and one taxonomic unit, which is possible due to typological analysis.[14]

Tab. 1. Composition of the archaeological material of Stará Ľubovňa – Lesopark site

Type of artefact	*1/2018 sondage*	*2/2018 sondage*
pre-cores	0	1
cores	2	0
technical forms	1	1
blades	2	5
short accidental blades	1	0
fragments of removal	2	1
flakes	22	22
tools	20	6
chunks with negatives	44	16
Total	*96*	*52*

11 Ginter 1974, 13; Lech – Werra 2013.
12 e.g. Dobrzyński – Piątkowska 2012, 57; Bobak – Połtowicz-Bobak 2009, 138.
13 see e.g. Bargieł – Libera 1996, 37; Ginter 1974, 36; Trela-Kieferling 2017, 51.
14 Ginter – Kozłowski 1990.

Chronological and cultural classification

It seems that the presented finds belong to a single period – Late Palaeolithic. The closest analogies for high massive end-scraper *(Fig. 9.14)*, amorphous form of the same kind of tool *(Fig. 10.6)*, and also short flake form *(Fig. 12.8)* can be found in the Magdalenian sites.[15] Burins of medial truncation form *(Fig. 9.8)*, back truncation form *(Fig. 10.2)* and backed dihedral burin *(Fig. 10.5)* also show connections with the concerned cultural unit.[16] The same note also applies to perforators *(Fig. 9.3,9,10)*.[17] Also the above mentioned core, found in this site *(Fig. 2.2)*, may belong to that culture.[18] At the same time, it should be concluded that these forms do not appear to be analogous to the Epigravettian inventories, although certain connections with this cultural unit cannot be excluded.[19]

It should be noted that a certain settlement type related to the Epigravettian culture occurred along the Poprad river, although on a small scale.[20] However, the Magdalenian culture is more strongly represented in this area.[21] Thus, it should be concluded that at the moment the presented material most likely can be associated with Magdalenian culture.

The question of raw material exploitation

Extremely important finds are two tools made of in the form of a hoe (see above). Therefore, it can be presumed that Stará Ľubovňa – Lesopark site was used to search and extract raw material by Late Palaeolithic community.

As for the artefacts themselves, analogies can be found in the Palaeolithic sites,[22] including those dated to the Late Palaeolithic.[23] However, it seems that the artefacts are universal. Their form was adapted to the function of digging up and the modification was simple and temporary. Such tools are also known from Neolithic sites, for example an artefact discovered in Beskid Niski Range,[24] or also from mining places rich in flint clusters, where the prepared tools were used for mining purposes.[25] Similar forms of mining tool can also be found at sites dating back to the Bronze Age.[26]

Versatility of such artifacts can also be seen in the spread of this kind of materials. Examples from European sites were highlighted previously in the article, whereas examples of similar

15 Ginter et al. 2002, 123. Ryc. 12.1,2; Jastrzębski – Libera 1987, 16. Ryc. 6.2,11; Połtowicz-Bobak et al. 2014, 243. Ryc. 5.7,10; Sobczyk 1993, Pl. XXIII.7; Wiśniewski 2015, 137. Pl. 23.12,18.

16 Ginter 1974, Pl. XXIII.1,3; Jastrzębski – Libera 1987, 18. Ryc. 8.3; Valde-Nowak et al. 2007, 17. Pl. V.5; Wiśniewski 2015, 153. Pl. 39.9,10.

17 Jastrzębski – Libera 1987, 33. Ryc. 20.12; Połtowicz-Bobak et al. 2014, 242. Ryc. 4.8; Przeździecki et al. 2012, Fig. 8.15,17,22; Wiśniewski 2015, 139. Pl. 25.25,28.

18 Alexandrowicz 1992, 73. Pl. III.1; Bobak et al. 2010, 71. Ryc. 8.2.

19 comp. Bánesz et al. 1992; Wilczyński 2006; Valde-Nowak 2008; Kaminská – Nemergut 2014.

20 Valde-Nowak et al. 2007, 9.

21 e.g. Drobniewicz et al. 1997; Valde-Nowak et al. 2007, 9–10; Wawrzczak – Profus 2012, 123, 125; Biernat et al. 2013, 5–7; Wawrzczak – Profus 2016, 188; Valde-Nowak et al. 2018; Wawrzczak 2018, 120; Wawrzczak 2020, 128.

22 Šatavičius 2012, 78. Fig. 13.

23 e.g. Boschian 1995, 38. Fig. 4.

24 Budziszewski – Skowronek 2001, 153. Fig. 9.B.

25 e.g. Borkowski – Migal 1988, 86; Migal – Sałaciński 1997, 106. Fig. 8.

26 see Bargieł – Libera 1996, 46. Ryc. 6.a.

products could be seen also on the African territory.[27] It is therefore possible to establish the universality of mining forms for communities extracting stone raw material, regarding both – territory and chronology. In this case, the 1/2018 sondage determines dating and cultural affiliation of artefacts with Late Palaeolithic materials and probably with Magdalenian culture.

The potential site of extraction should also be indicated. The 2/2018 sondage indicates materials from pre-treatment of raw material (see above). At the same time, in the forest area, where the excavation is located, traces of small ground hollows can be observed. It may be remnants of exploration and mining activities of the Late Palaeolithic societies. Wołowice mining site of Magdalenian culture can be given as a clear example, where pre-processing of artefacts and mining tools were found, whereas no typical living camp materials were present.[28] The above-mentioned site also revealed mining shafts up to 2 m depth, where stone materials of production were found.[29] It is therefore possible that Stará Ľubovňa – Lesopark site could be regarded as a site of mining character. If so, it would be the second prehistoric mine of stone raw materials within present-day territory of Slovakia. Previously, a mining site was discovered in the Biele Karpaty area, where also shafts were used to search for good quality of radiolarite raw material.[30] Furthermore, there are known radiolarite outcrops in Slovakia (Vlara basin), where probably further mines exist.[31] However, in both cases mentioned above, the artefacts were not dated as precisely as in Stará Ľubovňa – Lesopark site. The artefacts found in Sromowce Wyżne (Pieniny) could confirm the possibility of extracting radiolarite from exposed areas, however, this site is dated to the beginning of the Bronze Age.[32]

Of course, it is possible that some of the observed extractions may be dated to later epochs. It seems probable, as raw material used for the manufacture of gunflints, was extracted from these sites in the Modern period.[33] Limnosilicites material were used for production of tiles, necessary for stoves.[34] This raise the possibility of some "destruction" of the Late Palaeolithic site by later modern activities.

Conclusion

In 2018, a new archaeological site Stará Ľubovňa – Lesopark was discovered. It is located in the area north to the town. Small archaeological excavations were carried out in the form of two sondages (1/2018 and 2/2018) in the same year. As a result of this work, artefacts made of local radiolarite were discovered.

Chronologically, the site should be assigned to the Late Palaeolithic. Although it is difficult to affiliate it to an appropriate unit, Magdalenian culture is suggested.

It seems, based on the findings, that this place can be considered as a mine and an occupation located in its close vicinity. This is confirm by different nature of two areas (1/2018 and 2/2018 sondages). The mine was used to extract raw material from exposed surface using the discov-

27 e.g. Christiana Köhler et al. 2017, Fig. 10.
28 see Dagnan-Ginter 1973; Kozłowski – Kozłowski 1977, 165.
29 Dagnan-Ginter 1974; Kozłowski – Kozłowski 1977, 165.
30 see Cheben – Cheben 2014 for further literature; Cheben et al. 2018.
31 Cheben et al. 1995.
32 Wawrzczak 2018, 126.
33 e.g. Simán 1995, 382.
34 Cheben – Illášová 2002, 111.

ered tools *(Fig. 10.7,8)*. Afterwards, it was pre-treated in the nearby area (2/2018 sondage), and used for making blanks and tools (1/2018 sondage).

The archaeological site Stará Ľubovňa – Lesopark appears to be incredibly interesting and opens new perspective to learn about the activities of the Late Palaeolithic societies in the Carpathian area.

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