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MORAVSKÝ KRUMLOV, SITE IV. THE RECONSTRUCTION OF THE SZELETIAN REDUCTION STRATEGY ON THE BASIS OF REFITTINGS

A new Palaeolithic open-air site Moravský Krumlov IV, situated in the Krumlov forest region, 40 km south-west of Brno (South Moravia, the Czech Republic) was discovered in 1999 and was excavated in 2000–2004, (Fig. 1). Archaeological excavations uncovered three Middle Palaeolithic layers (Krumlovian and Micoquian) and one Early Upper Palaeolithic layer associated with the Szeletian on the basis of typology and technology of the lithic industry. This paper represents a short overview of a previously published synthesis (NERUDA, NERUDOVÁ 2009; 2010).

Character of the lithic industry

The assemblage of chipped stone industry from the Szeletian layer at Moravský Krumlov, Site IV has a distinctly “workshop” character. The spatial distribution of artefacts shows the diversification of the archaeological layer into spots with the low number of debitage but with the deposition of big cores, and places of production with the high presence of debitage and splinters (NERUDOVÁ 2009: fig. 18). The space with the highest concentration of chipped stone industry was located in Square Metre 11/R, where more than 200 objects were found, including fragments of leaf points. It is just this place where most of the refittings come from. Broken primary pebbles of raw material appear here, along with cortex debitage and cores. During the excavation of the archaeological layer two, respectively three places were registered where the chipped industry of small and bigger size was concentrated. Those places indicate a spot where a prehistoric knapper was

sitting and processing the raw stone material. A border around the concentration in Square Metres 11/Oc and 11/Ra (NERUDOVÁ 2009: fig. 18) suggests that there had to be some kind of barrier, for example a leg or a block, where the knapper was sitting on and which prevented the artefacts from scattering spatially. As performed experiments indicate, the spatial distribution of removals deeply depends on the knapper's position (GAMBLE 1986). Sitting on a bench, which is approximately 45 cm high, produces a low artefact scattering, around 20 to 50 cm², while standing shows a distribution up to 6 m² (GAMBLE 1986: 252). The artefact position also helps to presume the location of the bench. The experiments also demonstrated differences in the concentration appearance depending on the used technology and the chipping target: a closed round concentration is left after a hatchet processing, while a blade reduction strategy results in a concentration split in half (the obstacle is the knapper's leg) and supports for further use are piled on one side (GAMBLE 1986: fig. 6:1).

Generally, the lithic industry has been markedly damaged by cryogenic processes, as is attested by the large number of refittings of frost-damaged artefacts. In spite of those fractures, one scheme of a refitted core attracts one's attention: its components were dispersed across 5 m² as if someone was exploiting this core while walking. A part of another refitting, distributed in a similar way, is connected with one industry accumulation located in Square Metre 11/R and its surroundings.

The composition of the lithic industry corresponds to the site character, where the majority of the debitage is represented by preparation flakes, often also

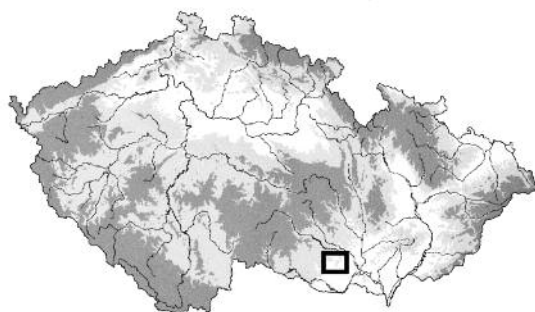


Fig. 1. Location of the site on the map of the Czech Republic (Digitalisation Z. Nerudová).

Ryc. 1. Lokalizacja stanowiska na mapie Republiki Czeskiej.



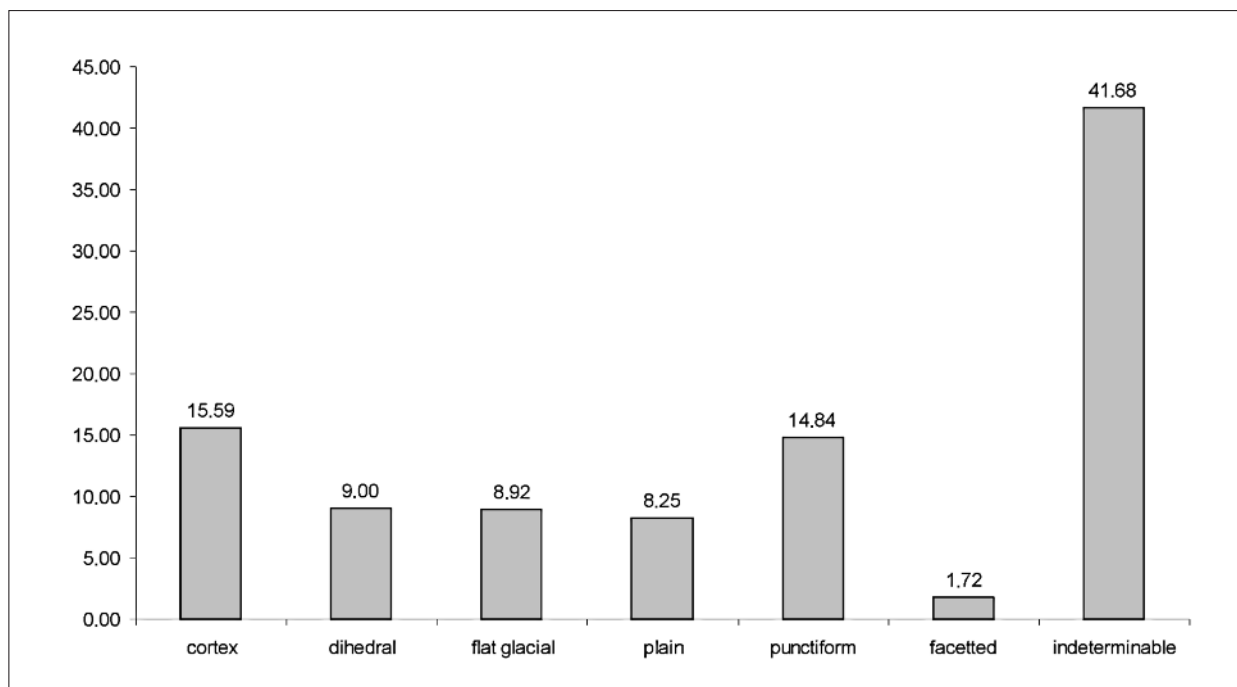


Fig. 2. Types of platform remnants (in %).

Ryc. 2. Rodzaje pięt szczątkowych (w %).

coming from the fassonage of bifacial flakes. Minimally there are preserved cores and their fragments, pebbles used as hammerstones and a retoucher with use-wear marks (NERUDA, NERUDOVÁ 2010: table 1).

The majority of the classified pieces are small, sized up to 4 cm of length, followed by artefacts no longer than 6 cm. Besides those two abundantly present size categories, there were also several items of abnormal dimensions in the collection. A 16 cm long bifacial thinning flake, which misses its distal part, clearly shows an exceptional size of the original raw material. Cores were in the size range between 6 and 14 cm. Platform remnant types correspond to the core preparation; almost one quarter is represented by platform remnant supports with cortex (15.6%) or with a flat glacial surface (8.9%) (Fig. 2). Another abundant group is formed by a punctiform platform remnant (14.8%) which is related to the fassonage of leaf points as well as the supports category of faceted platform remnants (1.7%). Almost a half of all artefacts did not allow to determine a platform remnant type (Fig. 2).

The tool group, which makes 5.7% of the set, is dominated by leaf points (Table 1). They are preserved in various forms; initial stages of shaping may resemble the preparation of Middle Palaeolithic elongated cores and sometimes it is difficult to distinguish strictly those two categories. The final stages of fassonage are represented by fine prepared bifacial tools.

End scrapers are more rare type of tools with just two pieces present. The side scraper group shows not only straight side scrapers but also side scrapers with bifacial retouch, which could originally be, in one or two cases, a leaf

point. The tool group is completed with notch and denticulate ones, where use-wear was found by the use-wear analysis, indicating that there might have been done some household activities (ŠAJNEROVÁ-DUŠKOVÁ 2009: 174). We also have to mention flakes with local marks of use-wear, where retouch is rather a result of their use than an intention to modify them to a certain tool. As far as it was possible to determine, most flakes, one piece of a pebble and a core were used as a support for the retouched tools. It was impossible to find out the original support in one third of all cases.

Table 1. The overview of all tool types (in pcs.).

Tabela 1. Rodzaje odkrytych narzędzi.

end scraper on retouched piece	2
retouched flake	1
leaf point	33
side scraper	3
side scraper with bifacial retouch	3
side scraper on ventral face	2
side scraper déjeté	1
notch dorsal	11
denticulate dorsal	3
local use-wear	17
Total	76

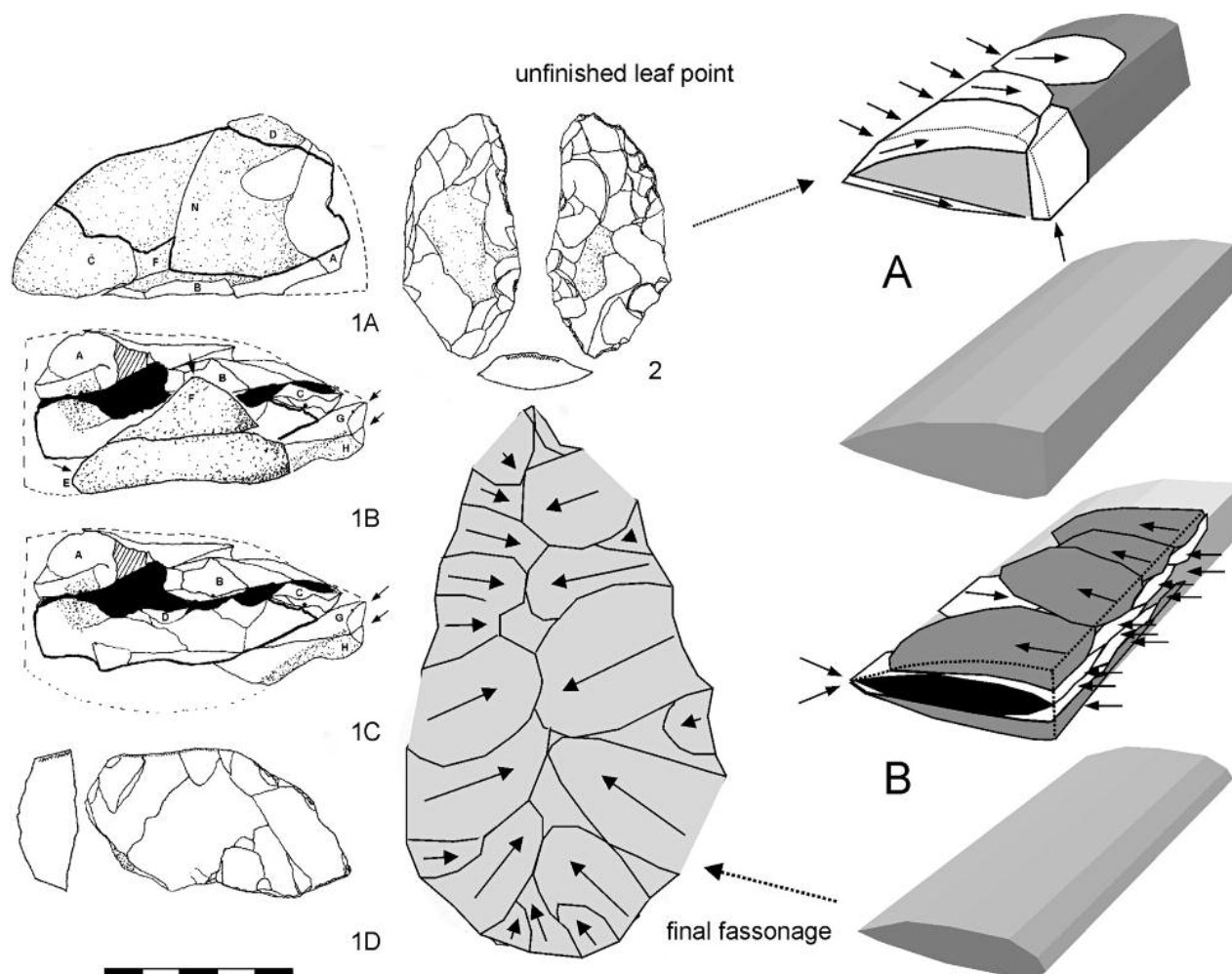


Fig. 3. Scheme of the direct forming of artefacts (Drawing Z. Nerudová and P. Neruda).

Ryc. 3. Schemat bezpośredniego formowania artefaktów.

The Szeletian artefacts are made of a local type of chert – the Krumlovský Les type. The chert is mineralogically classified as local silicite originating from the Bohemian Massif. Raw materials were secondarily transported to Miocene marine sediments from waste of Jurassic and probably Cretaceous rocks, which were located by the eastern edge of the Bohemian Massif (PŘICHYSTAL 2009: 72). There were described three basic forms of silicite in the classical territory of Krumlovský Les which differ by their colour, quality and primary form (nodules, pebbles, fragments).

Based on the character of stone raw material found in all archaeological layers at Moravský Krumlov IV, it seems that humans used chert of different quality. The concrete place of its exploitation is not known, although it is abundantly present in a form of pebbles in the Miocene sand in the site vicinity. Due to the repeated erosion activity, the sand was exposed in some spots and the raw material was thus commonly available. Such situation has been

recently observed in the vicinity of the site. Apart from those pebble sources, at least in one case, the Palaeolithic hunters and gatherers extraordinarily acquired chert breccia, which represented a quality variety and an interesting colour option. Sources of chert breccia, especially those of light violet or yellowish shades, are not known, though they sporadically appear in different sets of chipped artefacts in the region of Krumlovský Les.

Reduction strategy

In addition to frost fractures, it has been possible to put together the entire *chaîne opératoire*, whether of individual flakes or in relation to residual cores.

Three approaches to manufacture may be distinguished from the refittings of chipped stone artefacts carried out:

- the direct forming of artefacts (fassonage of leaf points) (Fig. 3);

- the “discoid” method (Fig. 4);
- the sub-prismatic method (Fig. 5) (NERUDA, NERUDOVÁ 2005).

Generally, studies on the Szeletian reduction strategy may be divided into two main directions: the production of leaf points by direct fashioning (*fassonage*) and the exploitation of simple cores of either the sub-prismatic method or essentially similar to Middle Palaeolithic discoid cores.

The sub-prismatic method of reduction strategy is based on the creation of simple striking platforms by striking of the first cortical flake from the raw material in pebble form. This is followed by a series of flakes from the striking platform, which in some cases match blades and which are separated from the core by direct blows by a hard hammerstone.

The second method – *debitage* – exploited raw materials in a manner comparable to Middle Palaeolithic discoid cores. Certain divergences appear in the existence of multiply reoriented cores, and in the existence of a series

of struck blanks. Both approaches yielded more or less standardised blanks that were used to manufacture retouched tools (including leaf points or bifacial side scrapers from the first preparatory flake of the future core).

These methods of a simple exploitation of Szeletian cores have been described several times (most recently: NERUDOVÁ 2003) and it is presumable that they reflect the original form and quality of the raw material; it means rather low quality chert of the type Krumlovský Les (Fig. 6). The Moravian Szeletian assemblages are characterised by “dissipation” of non-quality local raw materials, which are usually represented by nodules, various fragments and remains, pieces of the raw material tested by one or two percussions and exploited cores. On the contrary, many Szeletian collections offered cores exploited to their limits by the prismatic reduction strategy (up to tiny, non-exploited forms), including crested blades and core tablets, which are always reduced to imports (erratic siliceous, radiolarite) or a very high quality type of local raw material (NERUDOVÁ 2003: 81).

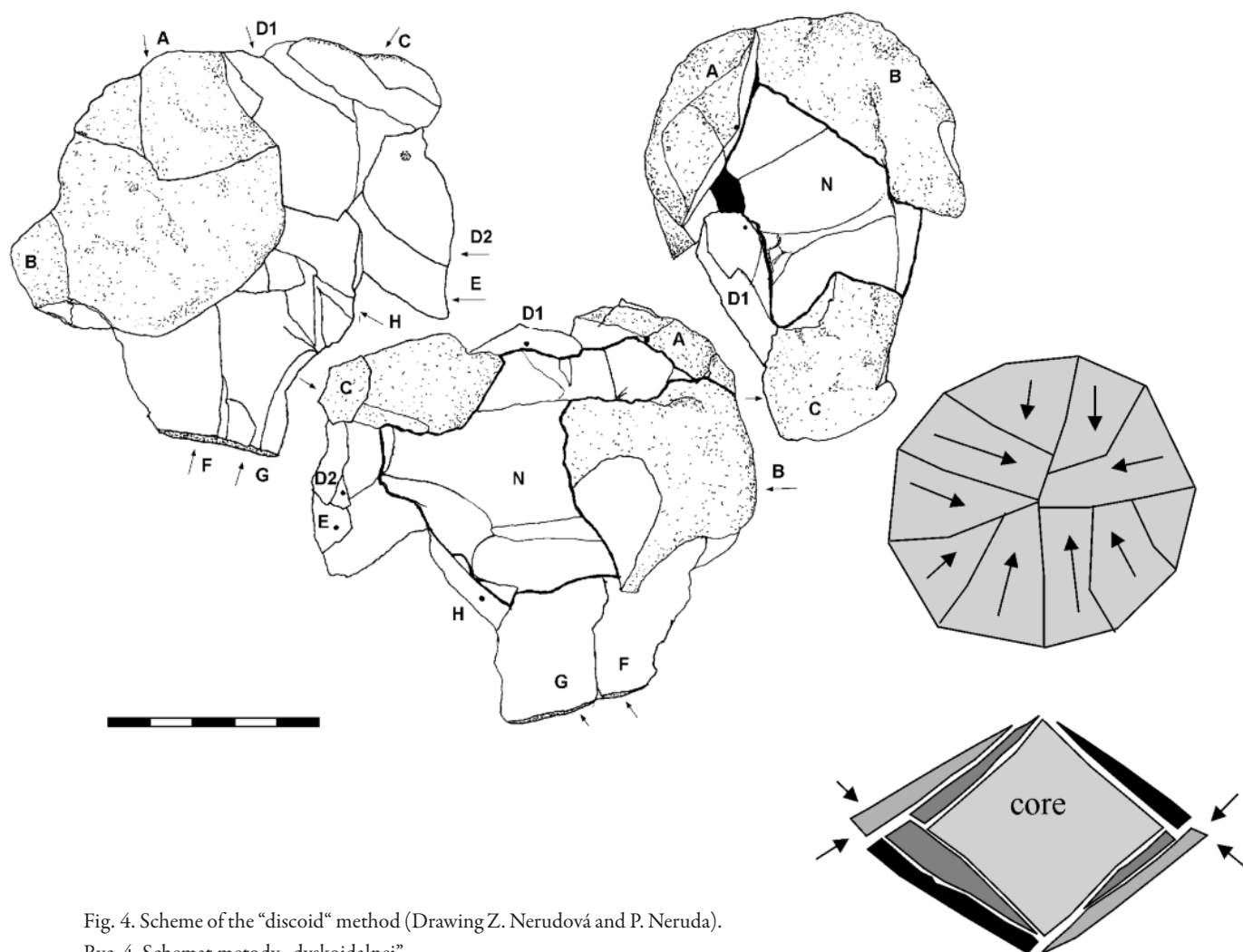


Fig. 4. Scheme of the “discoid” method (Drawing Z. Nerudová and P. Neruda).

Ryc. 4. Schemat metody „dyskoidalnej”.

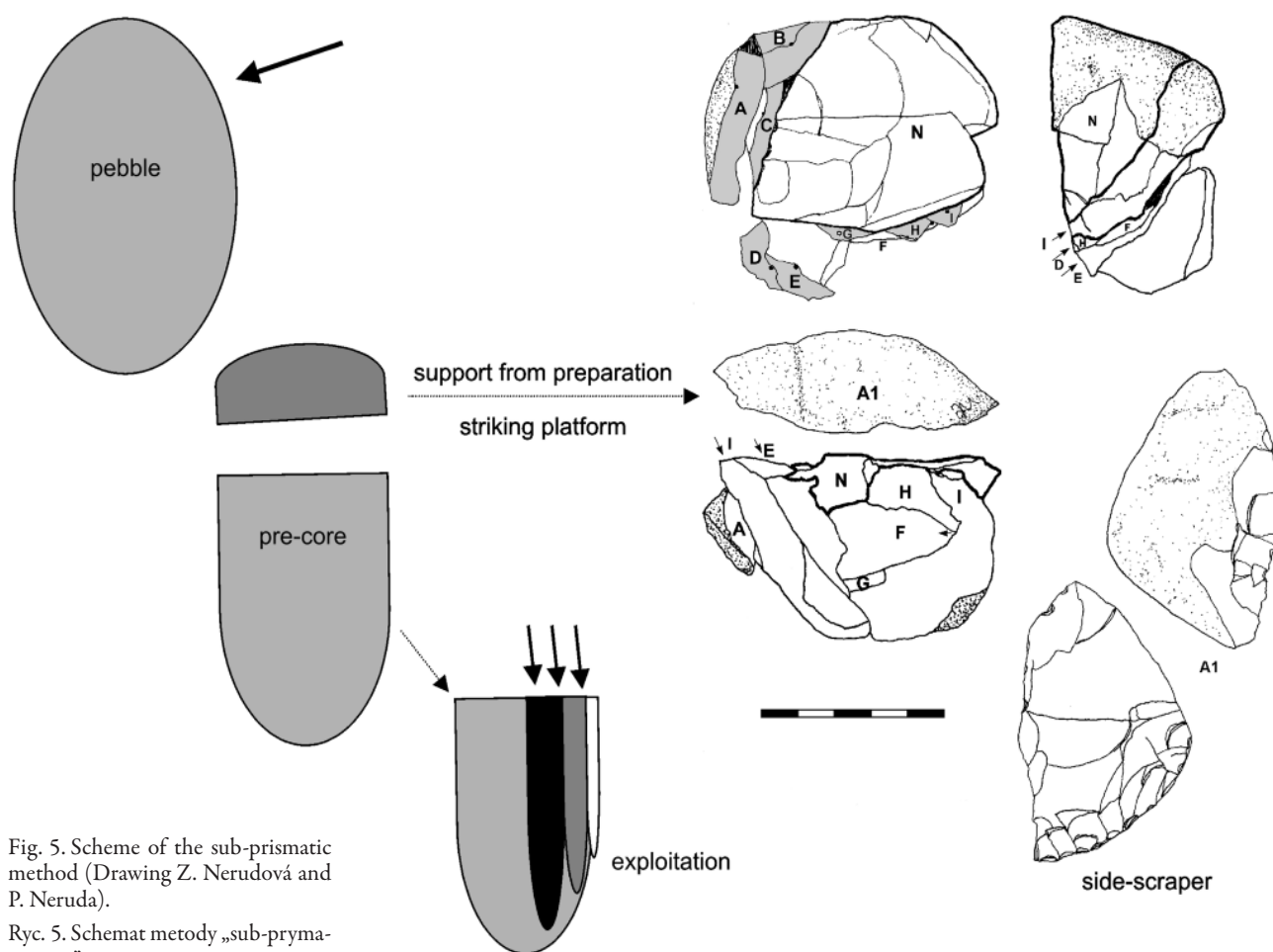


Fig. 5. Scheme of the sub-prismatic method (Drawing Z. Nerudová and P. Neruda).

Ryc. 5. Schemat metody „sub-prymatycznej”.

The existence of the sub-prismatic and “discoid” methods in the Szeletian may be taken as a fairly common phenomenon, which we must connect to the possible origin of this culture in the Micoquian (NERUDA, NERUDOVÁ 2009: 206). The existence of the method of the direct fashioning (fashionage) of bifacial artefacts is again a general trait that is moreover a primary of definition.

The production of leaf points by direct fashioning has also been described on the basis of refittings from Moravský Krumlov, Site IV. This concept is represented by bifacial production. For a support massive flakes of the local chert were used. A massive flake was reduced from the suitable edge, and the back was prepared as the striking platform (NERUDA, NERUDOVÁ 2010: fig. 10:A). The thickness of the leaf points was thinned from the back, the technical errors were repaired from the opposite edge. During this process the morphology of the unfinished pieces looks like a Micoquian backed knife (NERUDA, NERUDOVÁ 2010: fig. 10:B). Nevertheless, in the final stage of bifacial point fashionage it looks like symmetrical biconvex tools (NERUDA, NERUDOVÁ 2010: fig. 10:D).

Discussion

The sub-prismatic method was also applied on the artefacts originating from the site at Brno-Bohunice, Site II (the “Družba” settlement). There have been found several concentrations with lithic artefacts. Several small refittings were successfully done from artefacts coming from the so-called “cretaceous chert atelier.” The most interesting of them is a sequence of three massive preparation flakes, which resemble parts of a core decortification (NERUDOVÁ 2005: fig. 3:1).

The similar reduction strategy was identified at Vedrovice, Site V. There were attempts at making refittings too. From this site we had more than 20 thousand pieces of chipped artefacts but the results are not very representative because we could document only 15 newly made refittings, mostly on broken pieces (NERUDOVÁ 2011). Nevertheless we can describe the same “schema opératoire” of bifacial tools at both sites Vedrovice, Site V and Layer 0 at Moravský Krumlov, Site IV. This schema is documented at Vedrovice, Site V by various bifacial supports corresponding to previously described Szeletian leaf point production (NERUDOVÁ 2011).

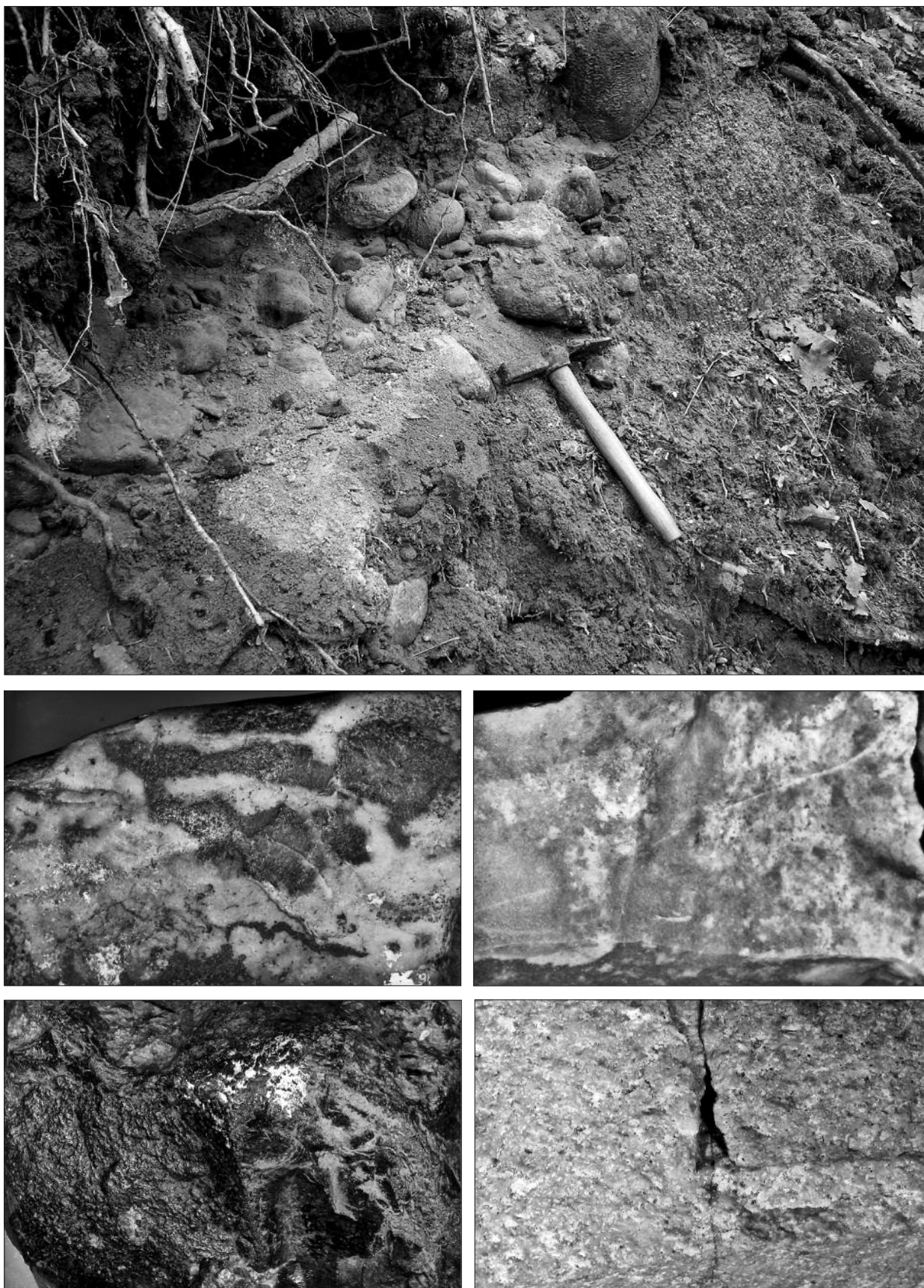


Fig. 6. Raw material source and variability of the chert (Photo P. Neruda).

Ryc. 6. Źródła surowców i ich zróżnicowanie.

Conclusion

The Szeletian is a Central European culture with a strong appearance in the territory of Moravia, western Slovakia and the nearby Kraków area in southern Poland; there are also isolated findings of leaf points in Bohemia, Germany and Austria. In Hungary, the presence of the Szeletian is limited to the north-east of the country.

The main Moravian Szeletian settlement units are the Krumlovský Les area (NERUDOVÁ 2008), the River Bobrava basin near Brno and the area around Prostějov. Although to this time over 100 Szeletian sites are known (NERUDOVÁ, NERUDA, SADOVSKÝ 2011: 30), only four have been archaeologically excavated: Vedrovice, Site V (VALOCH 1993), Moravský Krumlov, Site IV (NERUDA, NERUDOVÁ 2010), Maršovice (VALOCH, SEITL 1988) and Rozdrojovice (VALOCH 1955). Although the disproportion between the number of known and excavated sites is evident, based on techno-typological studies we propose a model of the Szeletian development. We consider the early Szeletian, represented by ¹⁴C dates at Moravský

Krumlov, Site IV and Vedrovice, Site V, as a final stage of the Micoquian (NERUDA, NERUDOVÁ 2009: 206; NERUDA, NERUDOVÁ 2010: 171). It is represented by the above mentioned three models of reduction strategy, the low or null presence of blades and the low share of Upper Palaeolithic tool types. The Levallois technique is not present (NERUDOVÁ 2003). During the Szeletian development the share of Upper Palaeolithic elements increases (NERUDOVÁ 2003).

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ZDENKA NERUDOVÁ

MORAVSKÝ KRUMLOV IV. REKONSTRUKCJA SZELECKIEJ TECHNOLOGII NA PODSTAWIE SKŁADANEK

W latach 2000–2004 na paleolitycznym stanowisku Moravský Krumlov IV (**Ryc. 1**) przeprowadzono badania wykopaliskowe (NERUDA, NERUDOVÁ 2010). W ich trakcie odkryto trzy środkowopaleolityczne warstwy i jeden poziom wiązany z wczesnym okresem górnego paleolitu. Górnopaleolityczny materiał krzemienisty należy łączyć z kulturą szelecką. Zespół pozyskanych artefaktów o pracownianym charakterze odznacza się niskim odsetkiem narzędzi i wysokim udziałem produktów debitażu, w tym odłupków z zaprawy i kształtowania form bifacjalnych (**Tab. 1; Ryc. 2**). Licznie występują także fragmenty ostrzy liściowatych oraz narzędzi dwuściennych, pochodzących z różnych etapów ich obróbki (NERUDA, NERUDOVÁ 2010: tab. 1). Większość z pozyskanych w trakcie badań fragmentów odznacza się niewielkimi rozmiarami, do 4 lub 6 cm długości. Artefakty wiązane z kulturą szelecką ukształtowane zostały z lokalnej odmiany czerutu o zróżnicowanej jakości (typu Krumlovský les; por. **Ryc. 6**).

Przy zastosowanej metodzie składanek możliwym było ukazanie *chaîne opératoire* związanego z procesem rdzeniowania na stanowisku, a także połączenie ze sobą okazów spękanych mrozowo, co umożliwiło zaprezentowanie relacji pomiędzy poszczególnymi artefaktami.

Wyróżniono trzy sposoby obróbki surowca:

- bezpośrednio formowanie artefaktów (kształtowanie ostrzy liściowatych) (**Ryc. 3**);
- metodę „dyskoidalną” (**Ryc. 4**);
- metodę „sub-pryzmatyczną” (**Ryc. 5**) (NERUDA, NERUDOVÁ 2005).

Zjawisko powszechnego występowania w kulturze szeleckiej dwóch ostatnich z wyróżnionych sposobów obróbki wskazuje na możliwość wiązania owej jednostki z mikokieniem (NERUDA, NERUDOVÁ 2009: 206). Na tej podstawie można wyróżnić wczesny szeletien, będący finalnym etapem mikokieny, reprezentowany na stanowiskach Moravský Krumlov IV i Vedrovice V (NERUDA, NERUDOVÁ 2009: 206; 2010: 171).