MORAVANY-DLHÁ:
A PHENOMENON OF THE POPLAR-LEAF SHAPE POINTS

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Abstract
The Szeletian site of Moravany-Dlhá was excavated in several campaigns: by Lothar Zotz in 1943, Karel Absolon in 1946, and Juraj Bárta in 1963 and 1990. Most of the artifacts from these excavations and from surface surveys at the site were made predominantly from White Carpathian radiolarite obtained from nearby outcrops. Poplar-leaf shaped leafpoints (known as Moravany-Dlhá-type leaf point in the literature) make these collections typologically significant. Recently, a series of test pits dug at the site confirm previously published stratigraphic observations. A charcoal sample collected during Zotz’s excavation dated at Poznań Laboratory to 33 600±300 14C BP confirms the Upper Szeletian age of this site. Besides the eponymous site of Moravany-Dlhá and other sites in Váh valley, the only individual occurrences of Moravany-Dlhá-type points were documented in neighboring regions but in different cultural contexts.

Keywords: Slovakia, Váh valley, Szeletian, Moravany-Dlhá-type leaf point

INTRODUCTION

One of the more controversial problems of the Upper Palaeolithic is the classification and chronology of industries with leaf-points (Červinka 1927; Prošek 1953; Valoch 1956, 1993, 2000a, 2000b; Kozłowski 1964; Allsworth-Jones 1986, 2004; Oliva 1995; Svoboda 2001; Nerudová and Neruda 2004; Kaminská et al. 2011). There are three periods in Central Europe when leaf-points occur: the Middle Palaeolithic, the early phase of the Upper Palaeolithic and the Middle Phase of the Upper Palaeolithic. Chronologically the Middle Palaeolithic period spans the time interval from MIS6 until the first half of MIS3 (ca. 190-40 ka BP). Culturally it is associated with two traditions: the Micoquian and the Levallois-Mousterian. The EUP period spans the earlier part of MIS3 (from GIS 13 – ca. 50-40 ka BP); in terms of cultural taxonomy we are dealing with several specific stylistic-technological traditions of leaf-points (the Szeletian, the Štreletskian-Sungirian, the Jerzmanovician, and the Bohunician). These traditions are often referred to as “transitional” (from the Middle to the Upper Palaeolithic); the boundary between these traditions and other “transitional” units (such as industries with backed points) or typical Upper Palaeolithic cultures such as the Aurignacian are not quite clear. The third period of occurrence of
leaf-points spans the later part of MIS3 and the beginning of MIS2 (ca. 40-25 ka BP). At that time in Central Europe leaf-points are not diagnostic for any autonomous taxonomic unit (such as e.g. the Solutrean in Western Europe) but they appear in various assemblages of the Gravettian technocomplex (Svoboda 2002: 145). Against this background the position of Moravany-Dlhá-type points, which are triangular, shaped by bifacial retouch, with a weakly convex base, still remains a puzzle. This is caused, first of all, by difficulties in the dating and definition of the cultural context of these points both at the eponymous site as well as at other sites where such points were recorded. The term Moravany-Dlhá-type points i.e. poplar-shaped points, was introduced by L. Zotz (1951: 183).

It is important to determine whether the Moravany-Dlhá-type points (Fig. 1) are an element of the second (Early Upper Palaeolithic) or the third (Middle Upper Palaeolithic) period (Freund 1952; Bárta 1965).

HISTORY OF RESEARCH IN MORAVANY NAD VÁHOM-DLHÁ

Palaeolithic research in Moravany nad Váhom-Dlhá started through amateur surface collections, presented by L. Zotz in 1939 (Zotz and Vlk 1939). First excavation was initiated by L. Zotz (1951: 181) during WWII. However, the exact location of his trench is unknown. K. Absolon continued the excavation of this site in 1946. The artifacts, specifically leaf points, which are stored in Piešťany museum, were published by J. Bárt (1960, 1980). The material from Absolon’s excavation was recently presented by Z. Nerudová and K. Valoch (2009).

Later excavations were conducted by J. Bárt in 1963 and 1990. The results of the 1963 excavations were published only partially, in short papers (Bárta 1967, 1970, 1980), and the material was recently re-examined by A. Nemergut (2010).

The excavations, comprising several trenches continued in 2008. Some in situ artifacts were recovered and samples for soil micromorphological analyses were collected (Kaminská et al. 2011). Unfortunately neither charcoal or bone that could be used for dating were not recovered. However, charcoal samples discovered in original boxes from Zotz’s excavation, currently at the Archaeological Institute SAS in Nitra, were recently dated (Kaminská et al. 2011).

Fig. 1. A typical Moravany-Dlhá-type point (after G. Freund 1952, Bild XV: 7)

STRATIGRAPHY OF THE SITE

The area investigated by L. Zotz in 1943 yielded an unusually high number of stone artifacts, specifically leaf points. Although the location of the trench is unknown, J. Bárt (1960: 300) noted that Zotz’s trenches were narrow and excavated perpendicular to the slope. Two-hundred leafpoints were recovered from an area of 30 m² at a depth of ~40 cm (Zotz 1951: 183). The exact location of K. Absolon’s excavation is also unknown. In 1963 J. Bárt excavated 25 trenches covering an area of 150 m² (Nemergut 2010: 184). The photos from Bárt’s excavation, currently deposited in Archaeological Institute SAS in Nitra, show that the artifacts were mostly scattered in a layer just under the plough soil. J. Bárt (1970: 39) determined this find horizon as a fossil soil. Only a few of the artifacts were present in the underlying layer that J. Bárt (1970: 39) identified as a light-yellow loess. The excavated area in 1990 was limited to 7 trenches. The artifacts appeared at a depth of 30-70 cm. Some of these trenches were far away from the 1963 excavation area (Nemergut 2010: obr. 3).
Three trenches were dug during the 2008 excavation (Kaminská et al. 2011). Trench I/2008 (2 x 1m), and trenches II/2008 and III/2008 (1 x 1m). While trench II/2008 reached only an „A“ horizon of fossil soil and no artifacts were found (the artifact-bearing layer was probably not reached), trench III/2008 yielded isolated artifacts scattered within a „B“ horizon of a fossil soil (Lisá 2009). The presence of artefacts within intact sediments is promising for further excavations.

ANTHRACOLOGICAL ANALYSES

In order to determine the absolute age of the Moravany-Dlhá site, it was vital to find two charcoal samples (numbered 3155 and 3156) from Zotz’s 1943 investigation, which had been stored in the collection of the Institute of Archaeology of SAV. During the anthracological analysis, 67 charcoal fragments that represent gymnosperms and angiosperms were identified (Table 1). In the former group, three specimens were identified as Picea sp. (spruce) or Larix sp. (larch) since the wood anatomy of these genera is difficult to distinguish (Schweingruber 1990), especially when only small fragments are available. One specimen represents Pinus sp. corresponding to different species which are characterized by the presence of one large fenestriform pit per cross-field in the radial section. These species, according to the present distribution in Central Europe, may represent the subgenus Pinus (P. sylvestris, P. mugo) or subgenus Strobus (P. cembra) (Schweingruber 1982, 1990), of which P. cembra and P. mugo are typical mountain trees.

In the group of angiosperms, three taxa were identified: two genera (Prunus sp. and Salix sp./Populus sp.) and one species (Carpinus betulus). First, in the case of Salix sp./Populus sp. only observations of the rays (homo- or heterogeneous) made it possible to differentiate the two genera (Schweingruber 1990; Jacquiot et al. 1973); however, these charcoal fragments belong to young shoots and therefore they may possess some irregularities typical for juvenile wood (Schweingruber et al. 2006). Second, on the basis of anatomical studies Carpinus betulus and C. orientalis cannot be easily distinguished (Schweingruber 1990); nonetheless on the basis of modern distribution of both species in Europe, the wood charcoal probably represents C. betulus (Tutin et al. 1964-1993). The strong ring curvature suggests that some of these charcoals are from small branches.

In sample 3155, a high number of charcoal fragments and a greater taxonomic diversity were recorded. However, the most frequent taxa (Carpinus betulus and Salix sp./Populus sp.) may be the case of an overrepresentation since they belong to branch wood and may result from a breakage of large fragments. Sample 3156 contained 7 small charcoal fragments of wood belonging to gymnosperms (Table 1).

Gymnosperm charcoals are the most suitable materials for radiocarbon dating of Palaeolithic sites such as Moravany-Dlhá, as demonstrated by other palaeobotanical sites covering a period corresponding to MIS 3 (Hajnalová and Krippel 1984; Willis et al. 2000; Damblon and Haesaerts 2002; Willis and van Andel 2004). For the evaluation of the chronology of the charcoal assemblage, one piece of Picea sp./Larix sp. has been chosen from sample No. 3155. In sample No. 3155 angiosperm wood dominated. However, it is likely that this sample is chronologically mixed, which has been found to be the case from more recent dating attempts. Thus J. Bárt (1965) had obtained a very recent date from one charcoal fragment, unfortunately taxonomically unidentified, from his excavations in 1960, of 1275 ± 80

<table>
<thead>
<tr>
<th>Taxa</th>
<th>3155</th>
<th>3156</th>
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<tbody>
<tr>
<td>Carpinus betulus</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Salix sp./Populus sp.</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Picea sp./Larix sp.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Pinus sp.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Prunus sp.</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Gymnosperms</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Angiosperms</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sum of fragments (Σ)</td>
<td>60</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 1. The absolute frequency of wood charcoal fragments analyzed from Moravany-Dlhá
(GrN 4479). On the other hand, if sample 3156 is contemporaneous with sample 3155, it may also prove the presence of different broad-leaved taxa in the local environment, which could suggest that this location was a refugium. Nevertheless, it will be necessary to date the angiosperms (*Carpinus betulus*, *Prunus* sp.) in order to confirm their chronology.

**DATING**

A fragment of *Picea* sp./*Larix* sp. from sample No. 3156 was dated by AMS with a result of 33600 ± 300 ¹⁴C BP (Poz-29011). This supports the original classification as “a second Würmian interstadial (W2/3)” (Zotz 1951: 185; Freund 1952: 251) and indicates that this site dates to the Early Upper Palaeolithic period. This age estimate has been confirmed by the results of a micro-morphological analysis, notably of a sample obtained from a depth of 60-80 cm (trench III) from the 2008 excavation season. The preservation of organic material and a higher content of P, C/Mg and S shows that this is an A horizon, a fossil soil, which was likely an Interpleniglacial soil.

The date, when calibrated using CalPal (ver. 2014; Weninger and Jöris 2008) with IntCal 13 calibrating set (Reimer et al. 2013), provides an age of 37866 ± 490 calBP (two sigma ranges). This age fits in within the time span stretching from Heinrich Event 4 (cold phase) to the beginning of a milder phase GIS-8 (Greenland Interstadial) called Denekamp (Rousseau et al. 2006). However, we have only one isolated date from an old excavation without the knowledge of its exact planigraphical and stratigraphic position. Clearly, more dating is required for a detailed discussion of the sites’ age.

**LITHIC INDUSTRY**

The relevant data for raw material, technological and typological composition are available only for the material excavated during J. Bártá’s 1963 and 1990 excavations (Nemergut 2010).

A large proportion of the raw material (95%) is radiolarite of different colors (prevailing colors are reddish-brown, then brown, greyish-green and combinations of thereof). Presence of pebble cortex indicates collection of radiolarite pebbles from nearby gravel terraces of the river Váh (minimum distance from the current river channel is 3 km). The quartz, most probably of the same origin, accounts for 4% of the assemblage. The artifacts also include isolated implements made from silicified siltstone, sandstone of local origin and imported limnic siliceous rocks (minimum distance 70 km to the east) and obsidian (distance of ~285 km to the east).

From the technological point of view, the prevailing category is waste (including chips, flake fragments, raw material fragments, and burin spalls; altogether 52%), followed by flakes (35%). Blades and blade fragments comprise only 8% of the assemblage and partly retouched artifacts 2%. The cores including prepared cores, exploited cores (single-platform cores, discoidal cores and cores with changed orientation) and an exhausted core account for 1% of the assemblage.

Over one half of tools are leaf points and their fragments (54%), supplemented by retouched blades and flakes (13% each), end scrapers (9%), notches (4%), side scrapers (3%), burins (2%), and a splintered piece (1%). The end scrapers are often a-typical and are made on flake blanks or blade fragments (Fig. 2). The burins are made with a single blow on broken blanks.

In general, technologically speaking, the assemblage is dominated by debitage and typologically speaking, by leaf-points. Zotz (1951: 183) interpreted this situation as a workshop for the production of leaf points.

**MORAVANY-DLHÁ-TYPE POINTS IN THE CONTEXT OF THE EARLY PHASE OF THE UPPER PALAEOLITHIC**

We analysed the collection of points from Bártá’s excavations (Fig. 3) enlarged by the currently available points from both Zotz’s and Absolon’s excavations (Freund 1952; Nerudová and Valoch 2009).

In terms of morphology, two types of leaf points can be distinguished: typical triangular, poplar (*Populus nigra* L.) shaped specimens (Moravany-Dlhá-type points) and elongated forms which also have a convex base.
Fig. 2. Moravany and Vahom-Dlha. End – scrapers and side – scrapers from J. Bártá’s excavations
Fig. 3. Moravany nad Váhom – Dlhá. Leaf points from J. Bártová’s excavations
The Moravany-Dlhá-type points are triangular in shape with a center of gravity close to the proximal end, a straight or a slightly convex base, a thin cross-section, and they are often made using a soft hammer or a punch on flake blanks, fully or partially flat retouched. This makes them different from the triangular points with a concave base of the Streletskian-Sungirian type which were manufactured, as a rule, using the pressure technique.

The eponymous site of Moravany-Dlhá was probably a leaf-point workshop (Zotz 1951; Freund 1952: 249; Báráta 1960; Hromáda 2000) as evidenced by a large number of such points (including specimens in various stages of processing) retrieved during several excavation campaigns – up to 200 leaf points were excavated by Zotz (1951), 36 items by Absolon (Nerudová and Valoch 2009), and 67 items by Báráta (Nemergut 2010). All the analysed points are made of radiolarite of the White Carpathians type. In addition, G. Freund (1952: 249) described isolated items made on quartz, limnic siliceous rock, and obsidian.

In the production of these points two reduction systems can be identified: the larger group of points was produced on flake blanks (as indicated by the residuals of flake ventral surfaces) while the smaller group of points displays bifacial thinning of raw material being pebbles or plaquettes.

The Moravany-Dlhá-type points with only partial bifacial retouch were made on relatively thin flakes; some of these flakes show traces of lateral preparation (Báráta 1960: tab. I.3, 6; II. 4; IV.5; 1965: tab. XVI.1). Some points were made on Janus-type flakes (Báráta 1960: tab. I.4) or on other flakes with linear platforms (Báráta 1960: tab. III.2, 4). It should be emphasized that point tips are distally or proximally oriented, especially when the proximal part was thin and the platform was linear.

Unfinished bifacial points, relatively few in the collection published by J. Báráta (1960, 1965), were made on radiolarite plaquettes: reduction began with shaping one edge and a convex base while the lateral facet of the plaquette functioned as the opposite edge (Báráta 1960: tab. V.4, possibly 5, VI.6, VII.6, IX.4; 1965: tab. XVI.5, 10, 12). Subsequently, at a further stage of reduction the lateral facet was thinned and the opposite edge of a triangular point was shaped. As a result, although the cross-sections of bifacial points are almost lenticular, there is a tendency towards a rhomboidal cross-section.

As far as metric parameters are concerned the Moravany-Dlhá-type points are fairly small. Their lengths range 23-66 mm with a mean of 40 mm. The distribution of lengths fits well with a normal distribution curve. Their widths range 18-41 mm and have a bimodal distribution with the first peak at 20 mm and the second at 36 mm. The length/width ratios range 0.97-1.84 and are distributed normally (Fig. 4). It is important to note that the smallest specimens are metrically similar to post Palaeolithic arrowheads (Freund 1952: 251) and may indicate bow and arrow hunting.

![Fig. 4. Moravany nad Vahom-Dlhá. Histogram of lengths (a), wides (b), and length/width ratios (c) of Moravany-Dlhá-type points. The fitted curves indicate normal (Gaussian) distribution](image-url)
DISTRIBUTION OF MORAVANY-DLHÁ POINTS

Tracing the occurrence of Moravany-Dlhá-type points, a site and several isolated finds were documented in the Váh valley, the second concentration of finds was documented in Moravia, a third concentration in Romania, and isolated implements were reported from Austria and Hungary (Fig. 5).

VÁH VALLEY (WESTERN SLOVAKIA)

A surface site that yielded the largest number of Moravany-Dlhá-type points is Trenčianske Teplice-Pliešky near Trenčín, located 42 km NNE from Moravany (published by Bártat 1974 and Kaminská et al. 2008 as Velký Kolačín). These points – as at Moravany-Dlhá – are made on radiolarite and in terms of morphology and morphometrics are most similar to the collection from the eponymous site. Current investigations (2009) uncovered artifacts scattered in colluvial sediments including a willow-shaped leaf point and a fragment of another (undiagnostic) leaf point (Kaminská et al. 2011: fig. 11.7, 11).

Of interest is the association of a bifacial Moravany-Dlhá radiolarite point from Vlčkovce (Bárta 1962), an arched backed blade of Zwierzyniec type (Bárta 1962: tab. VIII.10) and a carenoidal core associated in Vlčkovce (Bárta 1962: tab. VIII.2).

Trenčianska Turná-Hámre provided a subtriangular point with a rounded base and a lenticular cross-section, made from radiolarite (Kaminská et al. 2008: obr. 17.4). The point was found with fragments of other bifacials.

MORAVIA

A second important concentration of finds is reported from Moravia, where points were documented in three Early Upper Palaeolithic technocomplexes, unfortunately often only within surface artifact clusters, i.e. from open-air sites where the assemblage homogeneity and cultural contexts are uncertain.

Sites with Szeletian context

Vedrovice V is the most important site. A single leaf point resembling the Moravany-Dlhá-type (Valoch 1993: abb. 28.7) as well as convex-base points were excavated there. The second important site is a surface artifact cluster at Neslovice where at least two Moravany-Dlhá-type points were reported: a bifacial point and an elongated, partially bifacial specimen (Valoch 1958: pl. VIII.2 and XVII.2, Valoch 1993: fig. 8.5). Another Szeletian site with Moravany Dlhá-type points is Želešice V (Krása 2012: fig. 17) as well as Drnoviec-Končiny and Kněží háj (Svoboda 1989: obr. 3.1).

Sites with Bohunician context

The Bohunician type-site at Brno-Bohunice produced a series of leaf points, rarely with a convex base, of different shapes (more elongated) compared to the Moravany-Dlhá-type (Valoch 1976: abb. 8.13, abb. 9.11; Tostevin and Škrdlá 2006: obr. 13.2).

Convex base leaf points were collected from a series of Bohunician surface sites, including Líšeň-Čtvrtě (Svoboda 1987: obr. 33.3, 6) and Mohelno-Boleniska (Škrdlá 1999: obr. 4). Only the latter site yielded a typical Moravany-Dlhá-type point made of blueish-green radiolarite (Škrdlá 1999: obr. 4.1); however, some authors classify this site as Szeletian (Oliva 1995).

Sites with Aurignacian context

According to M. Oliva (1990) the bifacial points in Moravian sites occur in Aurignacian contexts, Epi-Aurignacian contexts and Miškovice-type contexts. However, these three facies were distinguished only on the basis of typology, because they were all found on the surface. The leaf points are missing in the stratified assemblages (Škrdlá 2016).

The only Moravany-Dlhá points in the Aurignacian context were found at Diváky-Končiny (Oliva 1987: Fig. 5.3), probably made from Krumlovský Les-type hornstone, and a point
Moravany-Dlhá: A phenomenon of the poplar-leaf shape points

Moravany-Dlhá: A phenomenon of the poplar-leaf shape points points from Přestavlky-Opálky (Klíma 1978: obr. 4.31), both of which occurred in association with typical Aurignacian end-scrapers.

Some Moravian points were reported in association with Aurignacian tools in a site cluster in Lhota and Hlinsko near Lipník nad Bečvou microregion (cf. Klíma 1979; Oliva 1990: fig. 4.1, 2; Škrdla 2007; Figel’ et al. 2009: obr. 17.1) as well as isolated finds from Kvasice II (Oliva 1990: fig. 3.4), Myslejovice (Oliva 1990: fig. 2.4), Brno-Kohoutovice (Oliva 1990: fig. 3.2), Boršice/Buchlovice (Škrdla 2005: fig. 3.20.2), and Jarošov-Rochuz (Škrdla 2005: fig. 3.55.8) are triangular, but they have straight bases which makes them more similar to Streletsian-Sungirian points.

Though Oliva (1990) claimed that the triangular specimens occur in Epi-Aurignacian contexts or ‘Miškovice type’ contexts, no such points were found in Miškovice.

ROMANIA

The easternmost site that contained Moravany-Dlhá points was discovered in Romania, named Ceahlău-Ceteţica (Păunescu 1987: fig. 5.1). The site yielded Szeletian laurel-leaf points, numerous Mousterian type side-scrapers: lateral and transversal, and blade endscrapers including specimens with a high frontal crest (Păunescu 1987: fig. 5). This material was stratified in the sub-surface layer at a depth of ca 38 cm, within a level that C.S. Nicolăescu-Plopsor (et al. 1966: 19-21) believed to be a relic of Interpleniglacial fossil soil. If we take this fact into account, the homogeneity of the Ceahlău-Ceteţica assemblage is uncertain. It should be added that at another site, Ripiceni-Izvor, two layers have been attributed to the Aurignacian (Ia, Ib) dated at 29-30 ka BP (Păunescu 1987). They contained Szeletian points but did not yield any
Moravany-Dlhá points. The Gravettian layers at this site (Ia and Iib), on the other hand, contained triangular points with a concave base, similar to Streletsian- Sungirian points (Paunescu 1993). But in Ripicieni-Izvor these layers are younger, dated close to 28 ka BP.

**SINGLE FINDS OF MORAVANY-DLHÁ POINTS**

Among individual finds of Moravany-Dlhá-type points devoid of context is a radiolarite specimen from Hungary, Miskolc, Petöfi-street (Vértess 1965: tab. XXXV) and an atypical specimen from Bruderndorf near Stockerau in Lower Austria (Freund 1952: bild XVI.4).

There are also isolated occurrences in Eastern Slovakia, where the points with convex bases, in terms of morphology resembling the Moravany-Dlha-type point, were found during surface surveys within Aurignacian contexts. Those include a point from Kechnec (Bánesz 1959: obr. 11.3) and a point from Veľký Šariš (Bánesz 1960: obr. 109). Another specimen from Tibava (Bánesz 1958; Bárt 1960, 1965) is irregular and does not represent a typical Moravany-Dlhá-type point, which is widest at its base.

**CONCLUSIONS**

The lithic economy at the eponymous site Moravany-Dlhá is based predominantly on exploitation of local sources supplemented by infrequent imports. The technology is characterized by flake production, while prismatic cores and blades are rare. The typology is characterized by leaf points, among which a leaf point of poplar shape called „Moravany-Dlhá-type point“ represents the prevalent form. The points are supplemented by retouched blanks (both blades and flakes) and endscrapers. Burins, sidescrapers, notches, splintered pieces and other tools are rare (Nemergut 2010: 193). In contrast, at the second important Slovakian site – Trenčianske Teplice, the Middle Paleolithic tool types including side scrapers and points, are more frequent (Kaminská et al. 2011).

Generally, the Moravany-Dlhá-type points are triangular in shape with the center of gravity close to their proximal end, they have a straight or a slightly convex base, and a thin cross-section; they are often made on flake blanks, and are fully or partially flat retouched. Because their shape resembles a water droplet or a poplar leaf (*Populus nigra* L.), L. Zotz (1951: 183) introduced the term „Pappelblattform“ (i.e. „poplar shape leaf point“) into the literature. Those points are supplemented by more elongated forms documented at the eponymous site and at Trenčianske Teplice (Kaminská et al. 2011). Another variant represents a leaf point with a convex base but more oval in shape and with a center of gravity close to its center.

The first available date from a charcoal sample collected by Zotz in 1943, places the occupation of Moravany-Dlhá within a relatively wide time span (37305-39101 cal BP) covering the end of the HE4 cold phase and beginning of the GIS-8 milder phase of the last glaciation. It means that Moravany-Dlhá is contemporaneous with the Middle Aurignacian documented in the Lesser Carpathians (Dzeravá skála cave; Kaminská et al. 2005) and neighboring regions (e.g. Stránská skála, Liščí, Milovice, Napajedla, and Mladěc Cave in Moravia; Svoboda 2006; Teschler-Nicola 2006; Škrdl and Rychtaříková 2012: fig. 2).

This chronological position of Moravany-Dlhá means that the site represents a phase of the Szeletian which is younger than the classical Early Szeletian from Szeleta Cave (Lengyel and Mester 2008) and the Moravian Szeletian (Vedrovic V, Moravský Krumlov IV, Želešice; Mook 1993; Davies and Nerudová 2009; Škrdl et al. 2011; Škrdl in press) and, probably, Lower Austrian sites (providing we ascribe Willendorf II AH2 to this unit; Nigst 2012). The dates obtained from these sites correspond to the earliest Interpleniglacial oscillations GIS12-GIS11.

The hypothesis presented in our earlier publication (Kaminská et al. 2011: 45-46) that assumed the existence of a Late Phase of the Szeletian, namely: the facies with Moravany-Dlhá type points, has recently been criticized by K. Valoch (2012: 185). Valoch claimed that apart from the single date from Moravany-Dlhá “there is no convincing proof of the existence of some late phase of the Szeletian”. K. Valoch refers to the old view that the stratigraphic position of the Moravany-Dlhá-type point in the loess sequence of the Vlčkovce site (Bárta 1960) as well as the fossil
soil from Moravany-Dlhá, dated to Würm 2/3 by L.F. Zotz and G. Freund, correspond to the palaeopedological horizon PK I. But he does not take into account the fact that the Interpleniglacial soil complex is rather complex and to synchronize the various horizons without absolute dates and detailed micromorphological studies is not possible (see, for example Haesaerts et al. 2009).

We propose two explanations of the stratigraphic position of the Szeletian with Moravany-Dlhá-type points: these facies could be partially contemporaneous with the classical Szeletian, or a hiatus separates the two facies.

It is significant that the investigations at the eponymous site have shown that the Moravany-Dlhá facies continued after the CI eruption (although Slovakia was not directly affected by volcanic ash) which could have had a dramatic impact on human occupation of Eastern and Central Eastern Europe (cf. Hoffecker et al. 2008; Lowe et al. 2012).

The presence of triangular leaf points with a straight base similar to Streletskian-Sungirian points (Anikovich 1992) in Central European sites, especially Moravian sites, compels us to consider the possibility of contacts between Eastern and Central Europe after the CI eruption. On the other hand, there are a number of arguments to support the interpretation that these similarities are a phenomenon of convergence: both in the sphere of technology as well as morphology. Local origin of Eastern European points (in all likelihood on the basis of the Crimean Micoquian – Anikovich et al. 2008), absence of sites with Streletskian-Sungirian points in the territory between the Dnieper and the Carpathians, and predominance of points with a concave base (not straight as at Moravian sites) are significant arguments. Moreover, the fact that in Eastern Europe Streletskian-Sungirian points do not occur in Aurignacian contexts is also significant.

The finds of Moravany-Dlhá-type points are noticeably concentrated on the middle course of the Váh river. Similar shapes were documented in Moravia and isolated implements were reported from Eastern Slovakia, Austria, Hungary, and Romania.

In conclusion, the stylistic variant of Moravany-Dlhá-type bifacial points has been registered across almost the entire territory of occurrence of the Szeletian, with the exception of territories north of the Carpathians.

Similarly shaped points are documented in Moravia during the early Szeletian (with the exception of one item from Vedrovice V, all are from surface assemblages); however, the Moravany-Dlhá points are not entirely identical (they are thicker and more irregular). Isolated occurrences were reported from a context with a Levalloisian industry (Mohelno, Ořechov I). The most significant observation is that the presence of Moravany-Dlhá-type points in Aurignacian contexts (surface assemblages from Moravia and eastern Slovakia) chronologically overlap with the occupation of Moravany-Dlhá. This is also supported by radiocarbon dating.

Despite doubts about the homogeneity of collections which contain Moravany-Dlhá-type points, the recent radiometric dating of Moravany-Dlhá presents strong evidence for the claim that Moravany-Dlhá-type points are diagnostic for a specific technocomplex of the Early Phase of the Upper Palaeolithic in Central Europe.

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