NEW APPROACH TO THE SZELETIAN – CHRONOLOGY AND CULTURAL VARIABILITY

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Abstract

The Central European Szeletian does not represent a homogeneous unit and should be divided into two groups on the basis of stratified and radiometrically dated assemblages. The Early Szeletian, which is rooted in the Central European Micoquian (we can observe the smooth passage from the typical Micoquian to the classical Szeletian), and the Younger Szeletian characterized by Moravany-Dlha leaf points. The latter appears after the chronological gap corresponding to the Campanian Ignimbrite and Heinrich 4 events. Probably, the classical/Early Szeletian and the Moravany-Dlha industries do not represent the same cultural tradition.

Key words: Initial/Early Upper Palaeolithic, Szeletian, Bohunician, Jerzmanowician, Kostenki-Streletskaya industry.

INTRODUCTION

Leaf points are considered the diagnostic artifact type not only for the Middle/Upper Palaeolithic transition in Central and Eastern Europe but also as indicator of several Middle Paleolithic cultural entities. Among the Middle Paleolithic entities of this region leaf points are first and foremost characteristic of the Micoquian (Kulakowskaya, 1990; Kozlowski, 1995; Valoch, 1995), as well as of the Moustero-Levalloisian of the Balkans and the Lower Danube basin (Sirakova, 1990, 2009; Kozlowski, 1992; Paunescu, 1993; Valoch, 1993). Several episodes during their time of existence demonstrate the occurrence of leaf points, possibly since the early phase of the Middle Paleolithic (Guadelli et al., 2005) until their late phase.

Among the “Transitional units” leaf points were found and classified in four basic lithic complexes:

– the Szeletian in Central Europe, the oldest in the Middle Danube basin,
– the Sungirian (or Kostenki-Streletskaia industry) in the Russian Plain,
– the Jerzmanowician (or the Lincombian-Ranisian-Jerzmanowician) in the Central European Plain,
– the Bohunician in Moravia (in the type-site Brno-Bohunice and several surface sites).

The Szeletian – the primary objective of analysis in this paper – was defined by F. Prošek (1953) as an industry of the transitional Middle/Upper Palaeolithic phase that evolved from the Mousterian under the influence of the Aurignacian. The Szeletian was dated to Würm 1-2, corresponding to the Interpleniglacial (MIS 3). This definition is to a large extent valid today although it has been criticized in a number of publications.

The discussion concerning the origins of the Szeletian drew the attention to the Micoquian rather than to the Mousterian. The origins of the leaf points in the Micoquian industry was ascertained in Moravia (Valoch, 1990, 1995), in wes-
tern Slovakia (Kaminská et al., 2005a) and in the territory of Hungary (Ringer, 1983, 1989).

The reliability of the stratigraphic sequences at the eponymous site in Szeleta Cave (Fig. 1.12) has also been disputed (Lengyel and Mester, 2008). This site is the only one among the Szeletian assemblages that provided two subsequent cultural levels with leaf points ascribed to the Early and Late Szeletian (Allsworth-Jones, 1986; Svoboda and Simán, 1989; Simán, 1990). Some doubts were raised as to the supposed homogeneity of two stratified assemblages and whether the radiometric dates of the finds from previous excavations (Vértes, 1965) and from more recent investigations (Adams, 2002; Ringer, 2002) indeed correspond to the occupational episodes in the Szeleta Cave (Lengyel and Mester, 2008). Nonetheless, the suggested chronological hiatus between the two Szeletian occupations in Szeleta Cave is currently supported by the dates (ka BP) from a workshop of leaf points of the “developed Szeletian” type from quartz-porphyry at the open-air site of Egerszalók-Kővágó on the margin of Bükk Mountains (Kozłowski et al., 2009). The recent techno-morphological analysis of leaf points from Szeleta cave, in spite of the absence of direct dates for the lower complex demonstrates that no direct links could be established between the Early and Developed Szeletian (Mester, 2010).

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1 All the dates in the text are uncalibrated if contrary it is clearly written.
The links of the Szeletian with the Aurignacian proposed by F. Prošek (1953) have also been controversial. Some researchers suggest that a special type of Aurignacian with leaf points should be distinguished (Miškovice type – Oliva, 1990). However, this conclusion was based mostly on surface materials from Moravian sites. The occurrence of leaf points in the Gravettian sites in Moravian sites (Svoboda, 2002) and in western Slovakian sites (Bárta, 1988; Kaminská et al., 2008), only in the Late phase of the Gravettian, is unquestionable. Thus the claim of a direct evolution of Szeletian to Gravettian (Allsworth-Jones, 1986) is dubious.

In deed, the Szeletian assemblages required a major re-analysis that takes into account newly obtained evidence, first in Moravia (Neruda and Nerudová, 2009; Škrdla et al., in press), and Slovak (Kaminská et al., in press). The previously obtained sources must also be re-examined. Most importantly, the chronology of the assemblages ascribed to the “Szeletian entity” and the supposed techno-typological homogeneity.

In spite of some differences we should stress that two “transitional units” with bifacial points show some common features with the Szeletian, as follows:

- The Sungirian (Streletskian-Sungirian) and the Jerzmanowician (LRJ unit) known to be derived from the Middle Paleolithic cultural units that are part of broadly defined Micoquian (Flas, 2008; Kozłowski, 2010).
- The two entities persisted almost until the end of MIS 3 (Anikovich et al., 2008; Kozłowski, 2010).

Both units are partially contemporaneous with the Aurignacian (Sinitsyn, 2003; Flas, 2008). Finally we should mention the occurrence of individual Jerzmanowician points not only in the Bohunician assemblages such as in Stránská skála IIa, layer 5 (Svoboda 2003: fig. 10.1j), but also in the Szeletian assemblages in Moravia (Želešice-III) and in Upper Silesia (Bluszcz et al., 1996).

THE EARLY PHASE OF THE SZELETIAN IN MORAVIA

Szeletian assemblages were reported from dozens sites in the Moravian territory (Allsworth-Jones, 1986; Oliva, 1991; Valoch, 2000; Svoboda, 2001; Neruda and Nerudová, 2009). However, the majority are surface sites attributed to the Szeletian due to the presence of bifacially worked leaf points and other characteristic tools. The only stratified collections with absolute dates are only those excavated: Vedrovice V, Moravský Krumlov IV, and Želešice-III. Based on available radiocarbon dates, technological and typological studies we define the Moravian Szeletian as Early Szeletian. In addition, they demonstrate a high level of resemblance to the late Micoquian collection from Kůlna cave.

Vedrovice V

The site is located on the southeasterly slope near the foot of the Krumlovský les mountain ridge at an elevation 270 m (Fig. 1.1). The sources of Krumlovský les-type chert are located nearby. During 1982–1983 K. Valoch (1993) excavated several thousands of artifacts from several artifact clusters embedded in interstadial soil at a depth of ca. 90 cm bellow surface and covered by loess.

The artifacts were produced mainly from local raw material – Krumlovský les-type chert and supplemented by isolated artifacts shaped from imported rocks (radiolarite and erratic flint). The technology is characterized mostly by non-Levallois flake production (including several Levallois flakes with faceted striking platform), with rare blades and blade cores. The typological inventory is composed by high frequency of notched and denticulated tools, side scrapers, and leaf points, supplemented by end scrapers, burins and combined tools. Radiocarbon dates range between 45–39 ka BP (Valoch, 1993). However, the OSL dates, range from ca. 45 ka BP obtained from overlying horizon through 60 ka BP from the archaeological layer to 102 ka BP for the bottom of this horizon (Nejman et al., 2011). In addition a radiocarbon date of ca. 39 ka BP (Valoch, 1993) was obtained the layer above the archaeological horizon and thus suggests an earlier age of the Vedrovice V Szeletian, settling the issue of possible attribution of the site to the Micoquian.

Moravský Krumlov IV

The site is located at an altitude of 320 m, on southeasterly oriented slope from top of the Krumlovský les mountain ridge (Fig. 1.2). The prehistoric people were attracted by the presence of
raw material outcrop (pebbles of the Krumlovský les-type chert in Tertiary gravel deposits), available near this locality. During 2000–2004 P. Neruda and Z. Nerudová excavated an area of 43 m$^3$ (Neruda and Nerudová, 2009). A collection of 6000 artifacts were excavated from the upper archaeological horizon located within the complex of interstadial soils affected by periglacial features. The industry is dominantly flake; one third of which resulted from bifacial thinning. Blades are rare and blade cores are not present. Leaf points of different shapes and in different stages of production represent the prevailing type. In addition to the points there are notched tools, flake end scrapers, side scrapers, and denticulated tools.

Charcoal samples yielded a series of dates ranging between 43–41 ka BP. The OSL dates range from 64 ka BP at the base of the archaeological horizon to 43 ka BP in the upper part of this layer, similarly to Vědrovice V and also suggest an earlier age than expected from radiocarbon dates and possible affiliation with the Micoquian.

**Želešice-Hoynerhügel**

The site is located above the right bank of Hájany Creek, and represents one part of the series of the sites following the course of this creek and along the Bobrava River from Orechov on the west to Popovice on the east (Fig. 1.3, Fig. 2). The altitude of the site ranges between 268–276 m a.s.l. The site was reported by K. Valoch (1956) and other finds were published by M. Oliva (1987). Since 2009 this site was under surface survey by P. Škrdla (Škrdla et al., 2010). Because test pits dug on the site in 2009 and 2010 yielded evidence for artifacts in intact sediments, a small scale excavation was carried out in the summer of 2010 (Škrdla et al., in press). The excavation yielded a collection of 138 stone artifacts recorded in 3D, with additional 59 artifacts (often microchips)
found during wet-sieving. The artifacts were excavated from three stratigraphic horizons. The study of the relationships between the horizons is the aim of planned excavation. The charcoal lens in the lowermost horizon yielded a date of 37,700 ±800 BP (Poz-37821), which is comparable to other Moravian sites assigned to the Szeletian as in Vedrovice V and Moravský Krumlov IV (Valoch, 1993; Davies and Nerudová, 2009). OSL dating, which would allow us to compare this site with earlier dates from Vedrovice V and Moravský Krumlov IV, is not yet available. The artifacts were produced from Krumlovský les-type chert, Stránská skála-type chert, radiolarite, quartz, and Olomučany-type chert. The technological spectrum is characterized by debitage. Important are five artifacts with faceted striking platforms (Fig. 3.8–12). The collection of tools includes 11 items: an end-scraper made from Krumlovský les-type chert (Fig. 3.4), an atypical end-scraper made from Stránská skála-type chert, a radiolarite burin (Fig. 3.5), a radiolarite distal fragment of a Jerzmanowice point (Fig. 3.2), a distal fragment of a Mousterian point made from Stránská skála-type chert (Fig. 3.1), a proximal fragment of a unifacially retouched leaf point made from radiolarite (Fig. 3.3), a splintered piece from burnt Krumlovský les-type chert, a fragment of bilaterally retouched blade from the Olomučany-type chert (Fig. 3.14), a fragment of a retouched radiolarite tool (Fig. 3.7), and two truncated blades made from the Olomučany-type chert (Fig. 3.6, 13).

The typological spectrum is enlarged by surface finds (over 500 artifacts in total) from which only the important ones are noted — three fragments of leaf-points (Fig. 3.18, 24, 30), four fragments of Jerzmanowice-type points (Fig. 3.17, 19, 20, 25), and a series of artifacts with faceted striking platform (Fig. 3.21, 26–28). The collection from the site including surface finds is significant due to the presence of characteristic attributes of several EUP cultures. Side scrapers and a retouched leaf-point fragments are generally considered as typical of the Szeletian industry; prepared (facetted) platforms and opposite reduction surfaces are considered as typical of the Bohunician; Jerzmanowice-type points are considered as typical of the Szeletian or Bohunician; and steeply retouched end scrapers are considered as typical of the Aurignacian.

**THE SZELETIAN IN THE WEST SLOVAKIA**

Among the Szeletian key-sites reported in different papers two caves often mentioned: Čertova Pec and Dzeravá Skala as well as four open-air sites: Moravany-Dlhá, Zamarovce, Ivanovce-Skala and Trenčianske Teplice (originally described as Veľký Kolačin), with additional sites the contain only isolated finds. Recently, several of those collections were reanalyzed, several sites were reexcavated, and new radiometric, dates were obtained.

**Ivanovce – Skala**

The site is located on the limestone cliff above the Váh river bed. The altitude of the site reaches 210 m (Fig. 1.4; Fig. 4). The site was excavated by F. Prošek (1953) in 1949, and later continued by J. Bárt (1966:fig. 4), who cleaned Prošek’s profile. The stone industry was recovered from the decalcified W 1-2 fossil soil between two loess layers and the malacofauna was described as Striata-type. Recently malacofauna analysis place it in the interplenioglacial (Kaminská et al., 2008:219).

The artifacts were produced from radiolarite supplemented by quartzite and other siliceous rocks. The earliest find was published by J. Skutil (1938: fig. 41) as a “knife“, however, J. Bárt (1966: 26) identified it as a coarse leaf-point made from flint.

F. Prošek (1953: 146–148) described the Szeletian technology as based on the reduction of irregular and discoid cores, supplemented by several prismatic cores. Broad flakes were frequent and side scrapers dominate the group of tools. End-scrappers were carinated with infrequent blade end-scrappers. The burins include dihedral and carinated types were not few. Isolated backed microblades were documented. Artifacts described as leaf-points have dorsal flat retouch and only partial ventral flat retouch on the basal end (Prošek, 1953:tab. III.6), or ventral retouch of both basal and distal ends (Prošek, 1953:tab. III.9). The wide and coarse triangular points, sometimes with flat retouch (Prošek, 1953:tab. III.4, IV.5, 6) are most probably retouched flakes according to the drawings in the publication. Another points described by Prošek (1953:tab. III.4,
Fig. 3. Želešice-Hoynerhügel, selected material. 1-15: material from 2010 excavation; 16-31: surface collection
6, 7, 9, IV.5, 6) as heath-shaped leaf-points are suggestive of small bifaces and it cannot be excluded that they represent Szeletian artifacts in an early stage of shaping.

In 2006, the part of a profile on the southern margin of Skalka was cleaned and it became apparent that the exposed stratigraphic sequence differs from the previously described. Interstratified between two loess layers was a calcareous soliflucted layer (Kaminská et al., 2008:fig. 35), from which small pieces of charcoal and three radiolarite flakes were recovered. The solifluction of the find horizon was already mentioned by J. Bártá (1966:27), and in addition, on the surfaces of many of the artifacts from Prošek’s excavation (deposited at AÚ SAV at Nitra) carbonate coating survived. Unfortunately, the retouched tools – end-scrapers, burins, points – still reported by J. Bártá (1966:fig. 10 bottom) are currently missing from depository. An important feature of the collection is the presence of UP cores initiated from the frontal crest of prismatic and pyramidal cores (Kaminská et al., 2008:fig. 34), found together with crested blades.

The industry is composed of two parts. The earlier one includes discoidal and irregular cores, broad flakes, bifacially worked artifacts, and retouched flakes, and the later includes significant Aurignacian implements such as carinated scrapers and cores. We cannot exclude that some mixing of Middle and Upper Paleolithic components occurred due to solifluction, as documented in the cleaned profile in 2006 and was originally reported by J. Bártá (1966:27). Another important observation is that none bifacially retouched leaf-point was found.

**Zamarovce-Skalka brickyard**

The site is located on the south slope of White Carpathians, slightly above the right bank of Váh River, in an altitude of 210 m (Fig. 1.5).

The site was located in the wall of former brickyard quarry in which several archaeological horizons were distinguished. From one layer wide flakes removed from discoidal cores were reported. These artifacts were associated with bifacially retouched items found during sediments exploitation without stratigraphic context. Prošek
(1953) described the part of material as Szeletian. Chmielewski (1969) reclassified the industry as Micoquian, a classification that became broadly accepted (Kaminská et al., 2008). The brickyard did not survive further development and re-exca-vation is not possible.

Plavecký Mikuláš, Dzeravá skala Cave

The cave is located in a small brook valley jutting from the Lesser Carpathian Mountain ridge to the north (bellow the cave) and later to the west (closer to Rudava River valley). The cave entrance reaches an elevation 450 m and it is located 37 m above local the brook channel (Fig. 1.6).

The site was excavated by Hillebrand (1913, 1914) and Prošek (1951, 1953), and later was described as a classical Szeletian site with characteristic leaf points and bone points. The site was re-excavated during 2002–2003 (Kaminská et al., 2005a, 2005b) and Late Paleolithic, Gravettian, Aurignacian, and Micoquian occupations were documented. It allowed the changing of Prošek’s classification of the Szeletian bone points to Aurignacian. The lowermost layer 11 yielded only three artifacts including bifacially worked artifact similar to Prošek’s finds. The AMS and OSL dates indicate that the layer is ca. 45–57 ka BP thus placing the occupation of the cave to the Micoquian (Kaminská et al., 2005a).

Radošina, Čertova pec Cave

The site Čertova near Radošina is located in the W–E oriented gap within Považský Inovec mountain ridge, summit of which reaches an elevation of 450–750 m (Fig. 1.7, Fig. 5). The cave is in an altitude of 230 m and the cave tunnel runs in southwest – northeastern direction with entrances on both ends. While Čertova pec cave is opened to Nitra River Valley, 4 km to the northwest, when crossing mountain ridge, it opens to Váh River Valley where is the site Moravany-Dlhá.

The cave was excavated by L. Zotz (1937 and 1941; no reports are available), by F. Prošek (in 1949; Prošek, 1950), and J. Bárta (in 1958–1961; Bárta, 1959, 1965, 1972; Musil, 1996). While the first two excavators probably excavated only the Gravettian deposits, the later opened deep trenches and recognized EUP and MP occupa-

![Fig. 5. Radošina, Čertova pec Cave, a view to a site](image-url)
lations, mainly near the northeastern entrance. The most notable of Bártas’ discoveries was a hearth, dated to 38 ka BP, and assigned by author to the Szeletian. The attribution of this layer to the Szeletian relied on two artifacts with flat retouch (Bárta, 1965:tab. XV.1, 2). Below the Szeletian horizon the same author recognized Mousterian layers. R. Musil, who analyzed the osteological assemblage from the cave, discussed in his study, based on differences among the faunal assemblages, the possibility that more horizons, unfortunately not separated during Bártas’ archeological excavation, were present.

Recently, we reanalyzed all the available material from this excavation (deposited in AI SAS depository) and confronted it with Bártas’ field notes which survived in the same institute, written during every day of the excavation and noting the depths attained in individual squares, including drawings of important artifacts. Bárta discovered the hearth on 22 October 1958. His original description of the hearth located it at the boundary between sectors 19 and 20 at the depth 170–180 cm. It is important to note that there were no artifacts reported from this area in the original documentation. The presence of the Szeletian occupation of the cave was later based on the radiocarbon date from the hearth and the presence of two artifacts with flat retouch (currently missing from the depository). The first flat retouched artifact (Bárta, 1965:tab. XV.1) made of brown radiolarite was found within the sediments removed from the cave and its association with the hearth is uncertain. It was found one month earlier before the hearth was uncovered when MP artifacts (including e.g., a side-scraper – Fig. 6.15; a Levallois flake – Fig. 6.4) were retrieved in sector 14 and its surroundings. The second, (Bárta, 1965:tab. XV.2) a bifacially semi-flat retouched point made from a grey chert was found two years later in sector 27, in the depth of 95 cm, in a layer originally described by Bárta as W1-W2. Therefore its association with the hearth is uncertain. Szeletian artifacts assigned by Bárta were small undiagnostic radiolarite flakes from sector 14, from depths of 280 cm (Fig. 6.2). The only artifact we suggest that could be attributed to the Szeletian is a double side-scraper made on bifacial thinning flake (BTF) from sector 16, from depth 160–180 cm (Fig. 6.7), which is the same depth as that of the hearth. Hence, based on the above reanalysis of the stratigraphic situation, we suggest that the Szeletian occupation of the cave is not well documented. The only indication for a Szeletian occupation is the presence of this hearth. The recently new dates of bones located near the hearth and approximately at the same level, although slightly higher are 40 100±1 200 BP (OxA-24106), 42 100±1 500 BP (OxA-24107) and 45 000 BP (OxA-24108). In fact, our interpretation is that if the cave was visited by Szeletian hunters only during a short visit and thus none of technologically or typologically Szeletian characteristic material elements were left in place. On the other hand, taking into account a documented MP occupation of the cave and a relatively late date for the late Micoquian from Kúlna cave in the Moravian karst, the hearth may belong to the MP period as well, similarly to above mentioned Dzeravá skala cave. The MP is technologically documented by a presence of bifacial retouched artifact (Fig. 6.1), different kinds of side-scrapers (Fig. 6.9, 14), BTFs (Fig. 6.5, 6, 10), and Levallois flakes (Fig. 6.4, 12). Morphologically, we can suggest both Micoquian (biface, BTFs) and Moustérien (Levallois flakes) occupational episodes.

LATE PHASE OF THE SZELETIAN

Recently obtained AMS date from earlier excavation in Moravany-Dlhá indicates a late phase of Szeletian on Western Slovakia, which is characterized by Moravany-Dlhá-type points.

Moravany-Dlhá

The site is located on the left bank of Váh river, on the southwestern slope of Povážský Inovec mountain ridge, in an altitude of 330 m facing into Váh river valley (Fig. 1.8, Fig. 7).

The Paleolithic research in Moravany on Váh-Dlhá started with an amateur surface collection, whose results were presented by L. Zotz in 1939 (Zotz and Vlk, 1939). First systematic research was initiated by L. Zotz (1951: 181). Exact location of the trench from this excavation is not known. The excavation of this site was continued in 1946 by K. Absolon (Nerudová and Valoch, 2009). The artifacts, especially leaf points, which are stored at the Piešťany museum, were published by J. Bárt (1960). Subsequent excavations
Fig. 6. Radošina, Čertova pec Cave, selected material from Bárta's excavation
were carried out by J Bártá in 1963 and 1990. J. Bártá published the results only partially in short papers (Bárta 1967, 1970).

The excavations were continued in 2008 in several trenches where a few artifacts appeared in intact deposits from which samples were taken for soil micromorphological analyses. Unfortunately charcoal or bones for dating were not found.

In trench II/2008 below the Holocene soil appear light brown loamy loess and a horizon of fossil soil rich in carbonates was exposed. The micromorphological sample from the depth of 80 cm represents at least three or four different climatic stages. The presence of organic matter, root casts and bioturbations formed under stable climatic conditions. The slightly higher amounts of organic matter can be seen in thin sections. The value of magnetic susceptibility is quite low due to the presence of diamagnetic organic matter and secondary calcium carbonates. The intrusive accumulations of secondary calcium carbonates in root channels and its surroundings represent probably quite stable, more arid environment (Bezce-Deak et al., 1997), with phases characterized by desiccation and slow matrix impregnation along root channels. The uppermost part of the sample contains microstructures typical for at least one stage of freezing and thawing. The features are the product of seasonal temperature changes in the Last Glacial (FitzPatrick, 1984; Van Vliet-Lanoe et al., 1984). It is obvious that there was no re-deposition after the development of those features. The presence of Fe hydroxides impregnating the matrix below in a thin layer is the result of more humid conditions. The features described above were probably developed due to the same, very cold environmental conditions. The state of the organic matter and surrounding matrix, together with the increased values of P, Ca/Mg and S marks the buried A soil horizon secondary influenced by more arid and later cold and humid conditions. The landscape configuration plays an important role in the development as well as preservation of this horizon. The material from this horizon does not show any features typical for long distance redeposition.

Among samples from the investigations by L. Zotz in 1943, which were stored in the collection of the Institute of Archaeology of SAV, corresponding probably to the soil horizon from trench II/2008, anthracological analysis revealed 67 charcoal fragments which represent both gymnosperms and angiosperms. In the former group, three specimens may be attributed both to Picea (spruce) or Larix (larch) and Pinus (pine).

In the group of angiosperms, three taxa were found: two genera (Prunus sp. and Salix sp./Populus sp.) and one species (Carpinus betulus). Some of these charcoals are from small branches as they present very strong ring curvature. Taking into consideration the climatic conditions and previously documented taxa from Paleolithic sites (Hajnalová and Krippel, 1984; Willis et al., 2000; Damblon and Haesaerts, 2002; Willis and van Andel, 2004), the most suitable charcoal for radiocarbon dating from Moravany-Dlhá would be gymnosperms. The AMS dating of a fragment of Pices sp./Larix sp. produced a date of 33 600±300 (Poz-29011) which places the sample and the artifacts from L. Zotz’s investigations in the younger part of the Interpleni glacial (MIS 3). The calibrated radiocarbon date using CalPal-Hulu-2007
Weninger et al., 2007; Weninger and Jöris, 2008), indicates a date of ca. 39,000 cal BP, which coincides with H-4 (Heinrich Event) or the beginning of GIS8 (Greenland Interstadial) called Denekamp (Rousseau et al., 2006).

This age is consistent with the results of the micro-morphological analysis, notably of the sample obtained at a depth of 50 cm in trench III from the 2008 excavation. The preservation of organic material also with a higher content of P, C/Mg and S shows that this is horizon A of Interpleniiglacial soil.

The section of trench III/2008 below the Holocene soil shows traces of B horizon of a fossil soil. Micromorphological analysis of this layer indicates small amount of organic matter. The most typical feature is in situ is limpid crescent clay coating. This feature is typical for the formation of the B horizon. This is an indication of re-deposition of soil material. The higher accumulation of Fe, Al and Mg goes together with clay leaching down the section. This horizon was micromorphologically described as in situ soil B horizon.

The industry from J. Bártta excavations in 1963 and 1990 is based mostly on radiolarite and quartz. Imported Carpathian obsidian and limno-quartzites are relatively rare. The structure of the major technological groups is characterized by a smaller number of cores (23, mostly prismatic, single platform), a large number of flakes and chips (more than 1500), and blades (202 and 200 fragments) that are more numerous than retouched tools (123). Among the tools the most frequent are leaf points (67 items) mostly triangular with a convex basis (Moravany-Dlhá-type, Fig. 8.1–8). In addition, there are end-scrapers (10; Fig. 8.10–12, 14), burins (3), retouched blades (12), retouched flakes (11) and side-scrapers (4; Fig. 8.13). Moravany-Dlhá site was probably a workshop producing mostly bifacially worked leaf points represented also by unfinished pieces. Other tasks in which end-scrapers, sidescrapers, retouched blades and flakes were used seems to have marginal importance.

Trenčianske Teplice-Pliešky

The site is located on the southwestern slope of the code 282 m a.s.l., above the right bank of Teplička River, which is the left tributary to the Váh River, currently running 4 km to the north-west (Fig. 1.9, Fig. 9). The site is in a protected narrow Teplička’s side-valley and separated by Dubovec Hill (the summit of which reaches 342 m, a part of Strážovské vrchy mountain ridge) from the Váh River Valley.

The site was discovered by local collectors who assembled a collection of leaf points given to Bártta, including the dominant Moravany-Dlhá-type (Fig. 10). Bártta (1974) continued the survey and published the material from the site under the name of Velký Kolačín. In addition, he discovered several localities with Paleolithic artifacts in the vicinity of this site. In 2009, the artifact collection from the site was re-analyzed, the site was relocated in the neighboring cadastral territory of Trenčianske Teplice. A series of trenches (total length of 40 m) were excavated (Kaminská, in press). The artifacts from the 2009 excavation were uncovered from intact colluvial sediments laying directly bellow the topsoil, at a depth of up to 70 cm (Fig. 11). The find horizon lay on the weathered Mesozoic bedrock. The collection consists of over 600 items made from prevalent local radiolarite, supplemented by silicified sandstone, and limnic siliceous rocks. From a technological point of view the dominant portion of the lithic assemblage is composed of flakes, while blades and cores are infrequent. Several artifacts show a coarse faceted striking platform. Not surprising is a presence of BTFs. The typological spectrum is composed of side-scrapers (including flat retouched side-scrapers), different kinds of end-scrapers (including a thick fan-shaped, on retouched blades, and on a short blades), a leaf point of a willow shape, a small fragment of another leaf point, and a Mousterian point (supplemented by another unretouched pointed flake of similar shape). The collection contains also a denticulated tool, a notched tool, a splintered piece, and several retouched pieces. Although the dating attempts (AMS and OSL) were not successful yet, basing our conclusions on the typological and technological indices, this site could be correlated with Moravany-Dlhá as younger Szeletian occupation.

Trenčianska Turná-Hámre

This open-air site is located on the southeastern slope of Strážovské vrchy mountain ridge above the right bank of Turňany brook, which is a
Fig. 8. Moravany-Dlhá, selected material from Bárta’s excavation
left tributary of the Váh River (Fig. 1.10). The altitude of the site reaches 255 m a.s.l.

The site was discovered by T. Michalík (2003, 2006), who reported morphologically Szeletian and Gravettian/Epigravettian artifacts. In 2007, four trenches were dug in order to verify the stratigraphic position of the finds, however, with no positive results (Kaminská et al., 2008). Morphologically, only 37 artifacts from the surface survey and test trenches is possible to join with Szeletian. This industry is made of prevailing local radiolarite, supplemented by limnic siliceous rock, Krumlovský les-type chert, and quartz. Important is a presence of three leaf points with rounded base together with bifacially retouched side-scraper. In the case of another tools and debitage is difficult to affiliate it with particular cultural units.

Vlčkovce-brickyard Vinohradky

The site is situated on the loess accumulation slightly extending from Váh River into the alluvial plain at an altitude of 146 m a.s.l. (Fig. 1.11). The small collection of artifacts including a characteristic leaf point of Moravany-Dlhá-type and an arched backed piece was excavated during 1955–1957 from a layer underlyng the Gravettian layer ( Bárt a, 1962). The brickyard was removed and re-excavation is not an option anymore.

DISCUSSION

The available radiocarbon record, although very limited, together with the available technotypological studies suggests the homogeneity of the assemblages described as Szeletian. We can distinguish two facies: Early Szeletian and Late Szeletian. The Early Szeletian is mainly known from the Moravian sites (Vedrovice V, Moravský Krumlov IV, Želešice III) and radiometric dates fit well with GIS-11 and GIS-10 (ca. 43–42 ka BP). However, the OSL dating suggests an earlier age. This observation is supported by technological and typological observations. Reconstructed bifacial reduction sequence from the site Moravský Krumlov IV is characteristic of Middle Paleolithic industry. The Upper Paleolithic tool types are rare and the Middle Paleolithic tools prevail.
Fig. 10. Trenčianské Teplíce-Pliešky, selected points from Bártas surface survey
Fig. 11. Trenčianské Tepliče-Pliešky, selected material from Kaminská’s excavation
Generally, those industries are rooted in the Micoquian and may represent a continuation of the Micoquian occupations as suggested by the relatively more recent dates from Kúlna cave. The industries from the two caves (Dzeravá skala and Čertova peč) in western Slovakia were re-evaluated and the Szeletian classification of their assemblages was refuted. Both collections were classified as Micoquian rather than Szeletian. The only Early Szeletian site in western Slovakia is probably Ivanovec-Skala.

The arguments presented in this paper suggest that the Late Phase of Central European Leaf-Point industries corresponds to the period after the Flegreen Field volcano eruption and the sedimentation of Campanian Ignimbrite tephra, and the following cooling described as Heinrich Event 4. This phase is represented, first of all, by the assemblages with the Moravany-Dlhá points that were found in Slovakia and Moravia, although individual points of this type were also recorded in Austria (Brudenhof – Freund, 1952), Hungary (Miskolc-Petőfi street – Vértes, 1965:pl. XXXV) and Romania (Ceahlău-Cetėtica – Paunescu, 1987:fig. 5.1).

At the eponymous site (and at other homogeneous assemblages) Moravany-Dlhá points co-occur with a small number of retouched tools: mainly short, usually flake, end-scrapers, side-scrapers, retouched flakes and possibly retouched blades.

Sites with Moravany-Dlhá pointes accompanied by artifacts that are diagnostic for other taxonomic units of the Early Phase of the Upper Paleolithic were also recorded, but homogeneity of such assemblages is uncertain. These are the Moravian open-air sites where Moravany-Dlhá points occur in the Szeletian context (e.g. Neslovice – Valoch, 1958:pl. VIII.2, XII.3; Valoch, 1993:fig. 8.5; Želešice), in the Bohunician context (e.g. Ofechov – Valoch, 1956, 1960; Mohelno – Škrdla, 1999), in Aurignacian context (e.g. Diváky-Končiny – Oliva, 1987), and in one case only at Slovakia – in the Zwierzynieckian context (Vlčkovce – Bárta, 1962).

The co-occurrence of Moravany-Dlhá points with leaf points typical for the earlier, classical Szeletian at the sites near Trenčín, possibly in Moravian sites, providing that the sites of Mohelno and Ofechov can be alternatively ascribed to the Szeletian, could demonstrate continuity between the Early and Late Phase of industries with leaf-points in Central Europe, however, because the homogeneity of these assemblages is uncertain they cannot constitute a decisive argument in favor of such cultural continuity.

Another hypothesis has to be taken into consideration, namely, that there is no continuity of cultural tradition between the Early and the Late Phase of Leaf-Point industries, while the industry with Moravany-Dlhá points has an independent origin. Some similarities of triangular Moravany-Dlhá points to the points of the Kostenki-Strelets-kaya (Sungirian) unit may suggest links with Eastern Europe. However, there are notable differences, first in technology as the Moravany-Dlhá points were made by using soft hammer or punch technique, whereas the Kostenki-Strelets-kaya points were mainly made by pressure technique, and second, morphologically the bases of central European points are convex and those of Eastern European are concave. These differences make us inclined to assume that similarities between these points are the effect of convergence, especially if we consider the large distance separating the areas of distribution of the two units. On the other hand, two facts cannot be overlooked: the context of Kostenki-Strelets-kaya points is similar to the context of Moravany-Dlhá points with short end-scrapers mainly on flakes, retouched flakes and side-scrapers (Anikovich, 1992; Anikovich et al., 2008), and the presence in Central Europe of points resembling more closely Kostenki-Strelets-kaya points that were unfortunately found in uncertain contexts although sometimes co-occurring with Aurignacian artifacts. Such triangular points with straight basis were recorded at Moravian sites such as Lhota and Hlinsko near Lipník on Bečvou (Klima, 1979; Oliva, 1990; Škrdla, 2007), and individual specimens occur also in Kvasice II (Oliva, 1990:fig. 3.4) and Jarošov-Rochuz (Škrdla, 2005:fig. 3.55.8).

CONCLUSIONS

The Szeletian industries do not represent a homogeneous group and minimally should be classified into two facies recognized on the basis of stratified and radiometrically dated assemblages. The Early Szeletian is rooted in the Central Euro-
pean Micoquian and we can observe the smooth passage from typical Micoquian assemblages to the Szeletien. The upper chronological limit between the Early Szeletian and the younger phase of the leaf-point industries in Central Europe coincides with the Campanian Ignimbrite and Heinrich 4 events. The relationship between the two Szeletian facies is unknown, however the chronological gap between these two facies, as well as differences in technology and typology indicate that they do not represent the same cultural tradition.

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