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TRANSCARPATHIAN CULTURAL CONNECTIONS AND RAW MATERIAL CIRCULATION IN THE MIDDLE/UPPER PALAEOLITHIC TRANSITION

ABSTRACT: In the transition from the Middle to the Upper Palaeolithic, the autochtonous cultural units – the Szeletian on both sides of the western Carpathians and the Jerzmanowician north of the Continental Divide – are opposed to the allochtonous units such as the Bohunician and the Aurignacian. This paper concentrates mostly on the question of the origins of the Szeletian, rooted in the Micoquian of the Carpathian basin. We have attempted to document a more complex process of the Micoquian – Szeletian transformation and propose a hypothesis that claims polymorphous origins of the Szeletian. The links between the different variants of the Szeletian are documented by the circulation of lithic raw materials between the Carpathian basin and the territories north of the Carpathians and the Sudetes.

KEY WORDS: Middle/Upper Palaeolithic – Szeletian – Jerzmanowician – Bohunician – Lithic raw materials

INTRODUCTION

The Western Carpathians at the Middle/Upper Palaeolithic transition separated two cultural spheres: the Middle Danubian zone and the territory of the Central European Lowland. In the first of the two zones, which embraces western Slovakia and Moravia, the end of the Middle Palaeolithic was marked by the presence of units of the Mousterian complex and the Micoquian. At the beginning of the Upper Palaeolithic, on the other hand, appeared the Szeletian with bifacial technology and cultural units such as the Bohunician with Levallois technology and the Aurignacian with blade technology (Svoboda 2003, Svoboda *et al.* 2002). In the zone north of the Western Carpathians and the Sudetes, the end of the Middle Palaeolithic is represented by the Micoquian and the blade units of the Mousterian complex (Kraków, Księcia Józefa and Piekary II/IIa – Valladas *et al.* 2003, Sitlivy *et al.* 2009, 2014); whereas the beginning of the Upper Palaeolithic is manifested by the occurrence of the Szeletian with bifacial points that preceded the appearance of the Jerzmanowician and the Aurignacian based on blade technology.

The key question in the investigations into the Middle/Upper Palaeolithic transition in the territories

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around the Western Carpathians is the problem of autochthonous vs allochthonous origins of culture units in these territories. A fundamental analysis of the problem is offered in the works by M. Oliva (first of all: 1979, 1991, 1992, 1995) who documented genetic links between the Micoquian and the Szeletian, and – at the same time – emphasised the separate nature of the Bohunician (Oliva 1984, 2006).

This contribution aims to draw attention to the complexity of genetic links between the Micoquian and the Szeletian, to the routes of contacts between the Szeletian in the Middle Danube basin and the territories north of the Carpathians and the Sudetes, and to the complex issue of the appearance of the Szeletian (*Figure 1*). Moreover, this contribution provides and opportunity to rectify the misinterpretations of Polish inventories from the Initial Phase of the Upper Palaeolithic.

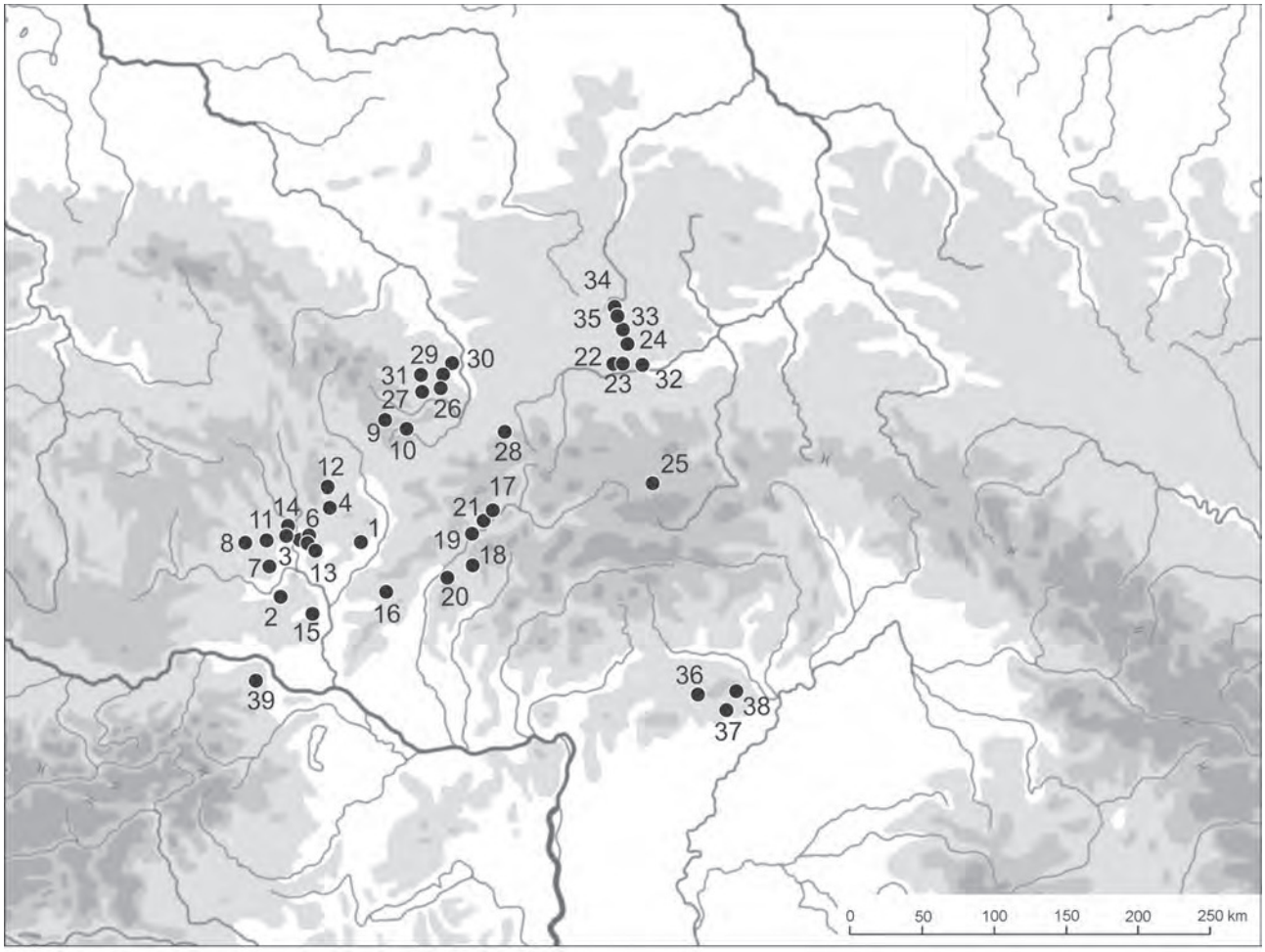

FIGURE 1. Sites cited in this paper: Czech Republic: 1, Moravský Krumlov IV; 2, Vedrovice V; 3, Želešice-Hoynerhügel; 4, Kůlna Cave; 5, Šipka Cave; 6, Stránská skála (IIa, III, IIIa); 7, Ořechov; 8, Mohelno; 9, Třebom; 10, Otice; 11, Neslovice; 12, Ondratice 1; 13, Líšeň-Čtvrtě; 14, Brno-Bohunice; 15, Diváky-Končiny; Slovakia: 16, Dzerava skala Cave; 17, Zamarovce; 18, Radošina-Čertova pec Cave; 19, Ivanovce-skala; 20, Moravany-Dlhá; 21, Trenčianske Teplice-Pliešky; Southern Poland: 22, Kraków-Księcia Józefa street; 23, Piekary (II and IIa); 24, Mamutowa Cave; 25, Obłazowa Cave; 26, Dzierżysław (1, 3, 8); 27, Rozumice; 28, Cieszyn 1; 29, Kietrz 3; 30, Cisek 5; 31, Lubotyń 11; 32, Kraków-Zwierzyniec I; 33, Jerzmanowice – Nietoperzowa Cave; 34, Biśnik Cave; 35, Strzegowa – Jasna Cave; Hungary: 36, Szeleta Cave; 37, Eger-Kövago; 38, Miskolc-Petöfi utca; Austria: 39, Brudernhof.

GENETIC LINKS BETWEEN THE MICOQUIAN AND THE SZELETIAN AND THE EVOLUTION OF THE SZELETIAN IN THE MIDDLE DANUBE BASIN

Regretfully, no reliable data is available from the classical Szeletian territory of the Bükk Mountains for the Early Phase of the Szeletian. Layer 3 in the Szeleta Cave which provided the earliest date of >41,700 BP (GXO 197) (Ringer 2002) does not guarantee a Szeletian contex which could have been equally, Mousterian, Jankovichian or Early Szeletian (Lengyel, Mester 2008). However, Ringer in his works (Ringer 1989, Ringer *et al.* 1995) points to the presence of a Middle Palaeolithic unit – the Babonyian – at the footslopes of the Bükk Mts. whose beginnings could have reached back to OIS 5 stage. This unit could have been a predecessor of the Early Szeletian in Hungary. The evolution of the Hungarian Szeletian lasted, in all likelihood, until 28,170±200 (Poz-19088) as the date for an open-air site of Eger-Kövago suggests (Kozłowski *et al.* 2009) – if we disregard the younger dates from Szeleta, which are probably Gravettian (Lengyel, Mester 2009). However, direct techno-morphological links between the Early and the Late Szeletian have not been registered (Mester 2010) in the territory of Hungary. Thus, a hiatus between these two phases/facies is plausible.

In Moravia and western Slovakia the genetic links between the Micoquian and the Szeletian are documented by, both, a direct chronological succession as well as by technology of bifacial tool production and core reduction. These issues were looked into in detail in the works on the classical Early Szeletian sites in Moravia such as Moravský Krumlov IV (Neruda, Nerudová Eds. 2009), Vedrovice V (Valoch 1993) and Želešice-Hoynerhügel (Oliva 1987, Škrdla *et al.* 2010) which drew attention to similarities with Micoquian technology. The dates for these sites (Moravský Krumlov IV: 37,550±280 GrN-2845; 38,350±310 GrN-18296 BP; Vedrovice V: 35,150±650 GrN 15513; 39,500±1100 GrN 12375 and even earlier – Davies, Nerudová 2009, Valoch *et al.* 1993, Haesaerts *et al.* 2013; Želešice-Hoynerhügel: 37,700±900 Poz-37821; 41,300±700 OxA-27342; 42,500±1500 Poz-31617; Kaminská *et al.* 2011) together with the dates for some Micoquian sites in Moravia (see: the classical Micoquian layer 7a from Cave Kůlna – between 38,600±950 GrN 6024 and 45,660±2850 GrN 6060; Mook 1988, see also Neruda, Nerudová 2013, 2014, and – possibly also – Šipka Cave – 39,940±550 GrN 29906; Neruda 2005) form an uninterrupted sequence.

The distinguishing of the Younger Phase of the Szeletian in Moravia is made more complicated by the absence of dated and homogeneous sites. The identification of this phase on the basis of surface collections involves a high risk of contamination by artefacts of – in fact – other Upper Palaeolithic units that are treated as markers of later phases of the Szeletian. Such intrusions are, first of all, the components of allochthonous units of the Early Upper Palaeolithic i.e. the Aurignacian and the Bohunician such as Levallois technique and Jerzmanowice points (Oliva 2006). The continuation of the Aurignacian is well-documented in the younger part of OIS 3, while the youngest dates for the Bohunician (Stránská skála IIIc) are as late as 35–34 Kyr BP (Svoboda 2003).

In the territory of Western Slovakia absolute determinations for some sites with bifacial leafpoints – that used to be attributed to the Szeletian – indicate that these sites well precede the beginnings of the Szeletian and can, probably, be recognized as the Late Phase of the Micoquian. An important example is the site of the Dzerava skala Cave, layer 11, which yielded bifacial points initially believed to be Szeletian (Prošek 1953). However, the radiometric determinations from recent investigations are earlier than the lower boundary of the beginning of the Upper Palaeolithic and indicate, as more likely, the Micoquian (the middle portion of layer 11 with AMS date of 44,600 OxA 13973, while the OSL date for the floor of layer 11 is 57,000±4900 – Kaminská *et al.* eds 2005). Moreover, we should also assign to the Micoquian western Slovakian sites, originally believed to represent the Szeletian, such as Zamarovce skalka brickyard (Kaminská *et al.* 2008) and Radošina Čertova pec with the ^{14}C dates of 40,100±1200 OxA 24106; 42,100±1500 OxA 24103 and 45,000 OxA 24108 (Kaminská *et al.* 2011). Thus, the sole Early Szeletian site in western Slovakia is, in all likelihood, Ivanovice-Skala dated by malacofauna to OIS 3 (Kaminská *et al.* 2008). In the case of this site it is not unlikely that, due to the processes of solifluction, the Szeletian assemblage with a strong Middle Palaeolithic tradition was contaminated by Aurignacian artefacts (Kaminská *et al.* 2008).

After a hiatus of several thousand years on the middle Vah in western Slovakia emerged a local Szeletian group with typical Moravany-Dlhá leaf-points. The micromorphological and anthracological analyses of trial trenches carried out in 2008 are consistent with the ^{14}C dating on samples from earlier investigations by L. F. Zotz of 33,605±300 (Poz-29011)

(Zotz 1951, Kaminská *et al.* 2011) thus placing the Moravany-Dlhá culture level in the younger part of OIS 3. The same type of the Late Szeletian on the Upper Váh was registered near Trenčín at the site of Trenčianské Teplice-Pliesky (Kaminská *et al.* 2011). Radiocarbon dates for this site could not be obtained. In Moravia assemblages of Moravany-Dlhá type have not been registered, except for single Moravany-Dlhá points found, however, in a probable Bohunician (Ořechov – Valoch 1960 and Mohelno – Škrdla 1999) or Aurignacian context (Diváky-Končiny – Oliva 1987). Further south of Slovakia and Moravia Moravany-Dlhá points occur as isolated artefacts (e.g. in Hungary in Miskolc-Petöfi ut – Vértes 1965, in Austria at Brudernhof – Freud 1952). This facies of the Late Szeletian is absent in northern Moravia, Silesia or Lesser Poland.

All in all, the Late Szeletian with Moravany-Dlhá points does not show continuity with the Early Szeletian in the Middle Danube basin. In all likelihood the emergence of the Late Szeletian is the effect of new cultural impulses after the hiatus which began with the volcanic eruption in the Flegrean Fields and the subsequent cooling referred to as Heinrich Event 4 (Kaminská *et al.* 2011).

GENETIC LINKS BETWEEN THE MICOQUIAN AND THE SZELETIAN AND THE EVOLUTION OF THE SZELETIAN NORTH OF THE CARPATHIANS AND THE SUDETES

Although in the light of new ^{14}C dates, the Micoquian in the upper Vistula basin lasted until about 41,500±1000 Poz-27268 (Valde-Nowak *et al.* 2014; there are even later dates of up to 37.8–38.6 Kyr but in uncertain cultural context) we find no evidence for continuation of local Micoquian tradition in the Szeletian. North of the Carpathians and the Moravian Gate the Szeletian appears in its mature form, probably as cultural impulse, mainly from Moravia.

In southern Poland, Szeletian sites are unique in nature: these are, mainly, remains of transient visits by Szeletian hunters, both in caves and in open terrain. The Mamutowa Cave, is one such site, where layer VII [clay with weathered rubble dated at 40,700±800 BP (OxA-14407) – the investigations by S. Kowalski]. Trench III provided one artefact with initial bifacial reduction (Kowalski 1967, Pl. VIII 2; *Figure 2:1*). Finds from layer VI in the Mamutowa Cave have been assigned to the Jerzmanowician on the basis of two partially bifacial blade points (Chmielewski 1975a, Pl. XXXVIII:3, 4 – layer VI, Trenches III and IV; *Figure 2:3, 4*). But these points co-appear with fully bifacial points (Chmielewski 1975a, Pl. XXXVIII 1, 2; layer VI, trenches II and IV); fully bifacial points, so far unpublished, were also found in layer VI in trenches III and IV (*Figures 2:2–5, 2:1, 2*). These points are elongated with a rounded base (*Figure 2:4*), oval (*Figure2:5*) or rhomboidal (*Figure 3:1*). The bifacial working was done, alternately, from opposite edges, in the case of one specimen with a plani-convex section; the two surfaces were worked in succession. In the case of 5 points (*Figures 2:2–5, 3:1*) the primary form was altered by secondary retouch shaping of the tip (*Figure 2:4*) or a kind of shoulder (*Figure 2:2*). Among the points from layer VI, mostly from local Jurassic flint, two are from extralocal raw materials, namely from Carpathian radiolarite (plani-convex leaf point, *Figure 2:3*) and from "chocolate" flint (*Figure 2:4*). Layer VI has been dated at 42,400 BP (OxA-14447); this layer is earlier than the level with Mladeč bone points and Aurignacian stone artefacts in the Cave (Kozłowski, Kozłowski 1996, Pl. 40) dated directly from bone points at between 32,290±220 (OxA-14434) and 33,640±250 (OxA-14436). The technique of production and morphology of leaf points document the probable mixing of Szeletian and Jerzmanowician artefacts, which originate from different episodes of the occupation of the Mamutowa Cave by Palaeolithic hunters.

Another brief Szeletian episode is registered in the Obłazowa Cave in the Western Carpathians. Layer XI (unfortunately undated, but stratified beneath the Aurignacian and the Early Gravettian level – Valde-Nowak *et al.* 2003) yielded 66 artefacts, among them 6 leaf-points and fragments. The site can be described as a small hunting camp where the game was brought and points were repaired. A small number of expedient tools were used, mainly retouched flakes. The artefacts are damaged, which means that some of the previous typological definitions seem ungrounded (e.g. a segment – Valde-Nowak *et al*. 2003, Fig. 27:9 or a backed knife, *op. cit.*, Fig. 27:12).

Much more frequently found are individual Szeletian points at open-air sites, sometimes in association with single tools or debitage products. Obviously, they can be remains of destroyed base camps, but can also evidence transient occupations. Szeletian sites that provided several or a dozen or so artefacts, rarely up to 50, are first noted in the Upper Oder basin. These are Dzierżysław 3, several sites near

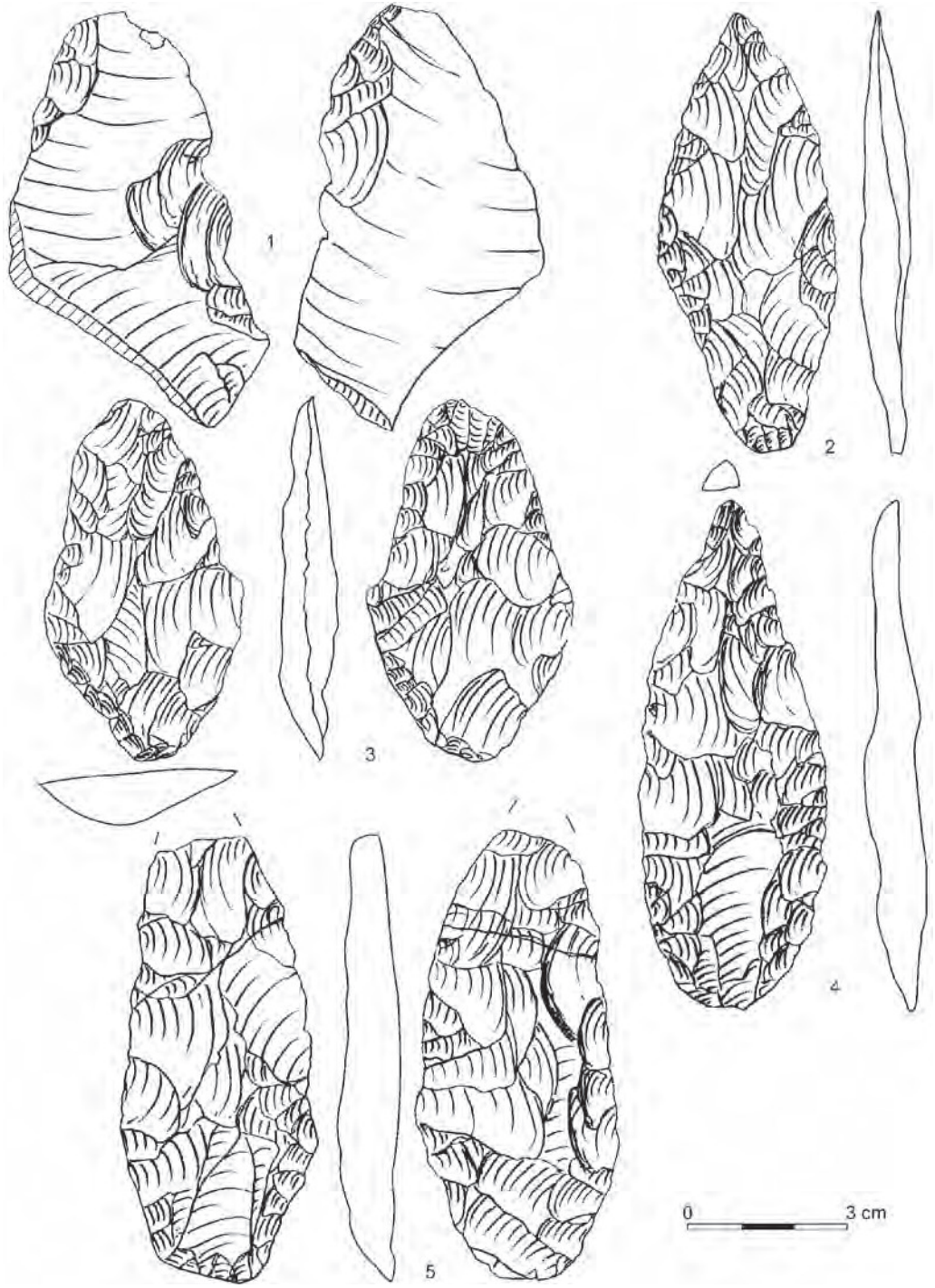

FIGURE 2. Mamutowa Cave near Wierzchowie, Lesser Poland: 1, initial pre-form of the bifacial tool made from Jurassic flint (layer VII, trench III); 2, leaf point transformed by unilateral secondary retouch in proximal part (white patinated flint, layer VI, trench IV); 3, bifacial plani-convex leaf point with rejuvenated edges made from reddish Carpathian radiolarite (layer VI, trench IV); 4, bifacial point with secondary retouch forming distal perforator made from "chocolate" flint (layer VI, trench II); 5, bifacial leaf point with secondary retouch on the edge in proximal part made from Jurassic light brownish flint (layer VI, trench II).All specimens are from the collection of Kraków Archaeological Museum.

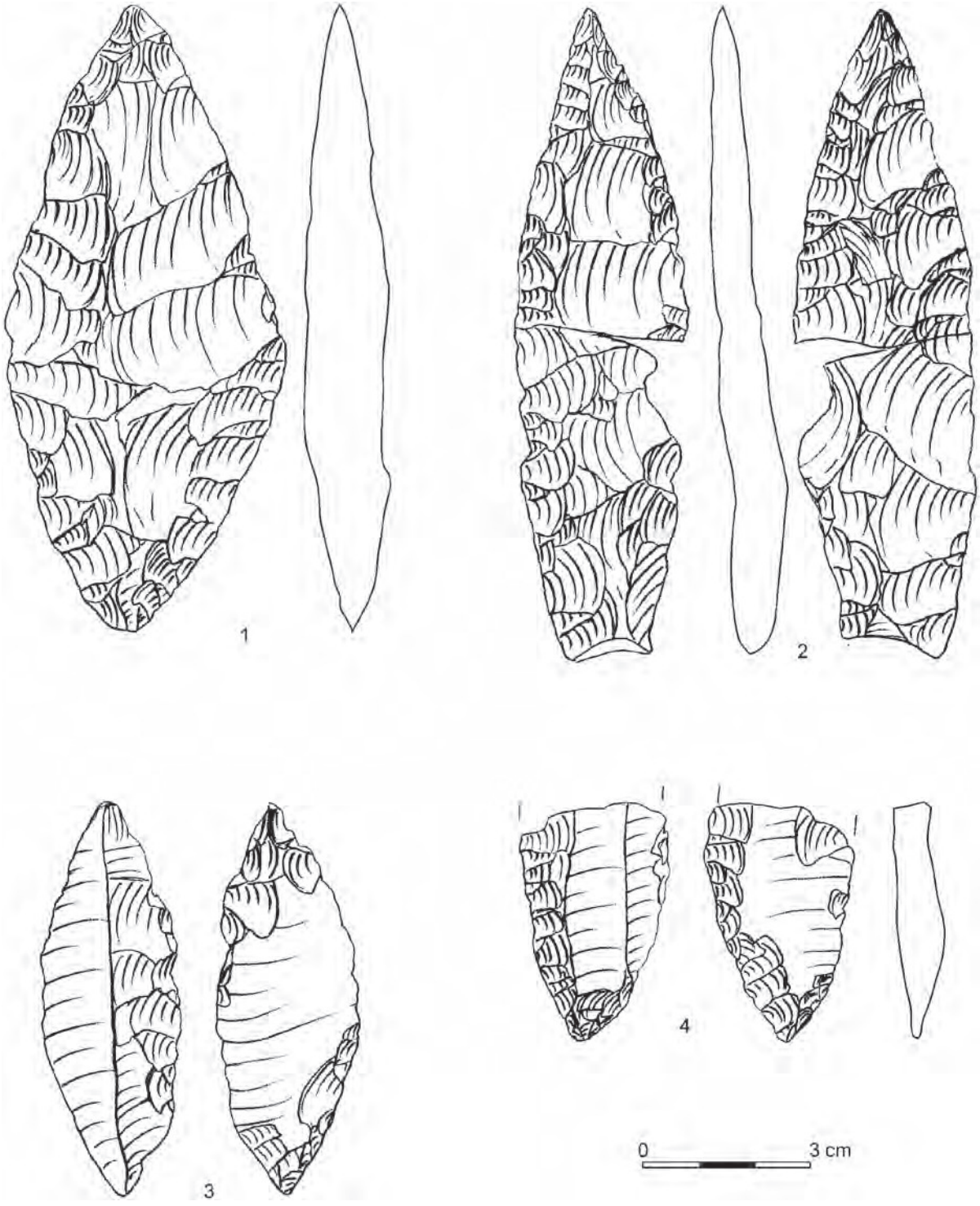

FIGURE 3. Mamutowa Cave near Wierzchowie, Lesser Poland. 1, leaf point formed by alternative treatment on both sides made from Jurassic flint (layer VI, trench III); 2, elongated bifacial leaf point made from white patinated flint (layer VI, trench IV); 3, unifacial leaf point made from Jurassic flint (layer VI, trench III); 4, unifacial leaf point made from Jurassic flint (layer VI, trench IV). All specimens are from the collection of Kraków Archaeological Museum.

Rozumice, Cieszyn 1, Kietrz 3, Cisek 5 and others (Kozłowski 1964, 1967, Foltyn, Foltyn 1998, Foltyn 2003). These sites are brief hunting camps (sites with leaf-points and single other tools) and with remains of workshop activities e.g. a small quantity of debitage, also from tool repair. A similar situation is noted in northern Moravia, notably near Opava, but there are no dated sites from this region (Svoboda *et al*. 2002). In the zone north of the Carpathians and the Sudetes, larger Szeletian sites are very rare. Among larger sites are, first of all, Dzierżysław 1 and Lubotyń 11 in Upper Silesia, and Kraków-Zwierzyniec in Little Poland.

Dzierżysław 1 provided a sequence of two levels with leafpoints: the lower level stratified within a hydromorphic subarctic soil, and the upper level within a solifluction complex mantled by upper Pleniglacial loess (Foltyn *et al*. 2005). We have no radiometric dates from the lower level, except for a TL date on the sediment building the soil (> 75 Kyr BP Gd-351 – Bluszcz *et al.* 1994), whereas for the upper level we have two TL dates: 22±3 Kyr BP GdTL-347 and < 36.5±5.5 Kyr BP (Bluszcz *et al.* 1994) but which define only a very general time bracket for this level. The structure of the solifluction level, notably the presence of palsa whose destruction coincided with the occurrence of Szeletian finds, define its age as equivalent to the middle Interpleniglacial (GI8–GI7 about 37 Kyr BP).

The question of cultural attribution of the lower level at Dzierżysław 1, obviously, still remains open. A hypothesis claiming that this level is associated with the Bohunician is based, mainly, on the co-occurrence of Jerzmanowice type points and the Levallois technique (Kozłowski, Kozłowski 1996, Pl. 27, Foltyn 2003). The upper level, on the other hand, is undoubtedly associated with the Szeletian, constituting a typical example of a more permanent camp with a conspicuous workshop component. A total of 1,255 artefacts were recovered from the site (the number of finds could be even higher considering that part of the collection from the years between the two World Wars had been destroyed). In the inventory cores account for as much as 10.6%, flakes are 61.1%, and tools only 5.4% of which leafpoints are 22.5% (Kozłowski 1964). A more stable nature of the site is corroborated by the presence of a hypothetical round dwelling structure from erratic boulders (Desbrosse, Kozłowski 1994). The industry from Dzierżysław 1 is equivalent to Szeletian industries from Moravia both in respect of blade technology (cores are predominantly single-platform, less often double-platform – Kozłowski 1964, Pl. XXXV), blade-flake technique and the method of production of bifacial forms showing some links with the Micoquian tradition (*Figure* 3:1–7). The tool-kit, too, is similar to that at Moravian sites (indices of tool groups and types of end-scrapers, burins and side-scrapers).

The site of Lubotyń 11 is situated only 1.5 km south of Dzierżysław 1, yet it provided much more numerous lithic artefacts (about 10,000) that concentrated around hearths (Bobak *et al.* 2013, Fig. 5 a, b). The radiocarbon dates on hearths are strongly dispersed: from 35,100±800 BP (Poz-25208), to 38,100±800 BP (Poz-25207) and 39,500±700 BP (Poz-36904), to 43,000±1,000 BP (Poz-36903), or even 44,000±1,100 BP (Poz-36905). The authors of the report are inclined to assume an association of finds from Lubotyń 11 with the residue of Komorniki type soil, which is confirmed by the presence of pine charcoals in the hearths and 12 taxa indicating a forest-tundra environment (Bobak *et al.* 2013, 27). Thus, we would have to assume that the age of, at least, part of the finds from Lubotyń 11, is comparable with the age of Dzierżysław 1, as the group of younger dates from Lubotyń 11 suggests.

The two Silesian sites – Dzierżysław 1 and Lubotyń 11 – represent workshop episodes evidenced, among others, by the presence of unfinished leafpoints at both sites (Bobak *et al.* 2013, Fig. 6) and numerous debitage products.

The greatest controversies arise in the case of Kraków-Zwierzyniec site investigated by, in turn, A. Jura (1939), L. Sawicki (1952), W. Chmielewski (1975a,b) and T. Madeyska (Chmielewski, Madeyska 1976). The synthetic profile of the site, described by T. Madeyska (2006), consists of two levels with leafpoints: the top portion of layer 11 which is built of loess deluvia and which Madeyska correlates with the younger part of the Older Pleniglacial (OIS 4) contained "scarce archaeological materials present in a secondary bed" (Madeyska 2006: 298). The second level with leafpoints is stratified within an interpleniglacial soil complex made up of tundra soil B-horizon (12) resembling "chernoziem soil" (13), and gley soil (14). In this complex leafpoints occur in layer 13 where they co-occur with Aurignacian finds (Madeyska 2006: Fig. 27). W. Chmielewski assigned the leafpoints in the top portion of layer 11 to the Middle Palaeolithic (Chmielewski 1975b) and interpreted them as "pre-Szeletian", whereas J. K. Kozłowski and S. K. Kozłowski (1996) defined them as "Muselievian". The latter diagnosis was based on the analogies of the technique of leafpoint treatment

with the techniques used in the Balkan sites dated to OIS 4, as well as on the fact that the leafpoints in layer 11 co-occur with Levallois technique. A more detailed description of the artefacts from the investigations of L. Sawicki at Zwierzyniec I (Trench I) can be found in the work by J. Krzepkowska (2006). She assigns Sawicki's finds to the Bohunician or the Szeletian and registers similarities between these and finds from Zwierzyniec I – trench J from the investigations by A. Jura in the years 1937–1939 (Kozłowski, Kozłowski 1996: Pl. 25, 26). The correlation of the two assemblages is supported by a refit of a halfproduct of a leaf-point (from sector J, layer 6 see: Kozłowski, Kozłowski 1996, Pl. 26:1 and in L. Sawicki's trench I see: Krzepkowska 2006: Pl. 116:95). J. Krzepkowska registers the leaf-points in Trench I in several different sedimentational units within the top portion of layer 11 i.e. within "soil deluvia above clayey loess" (3 specimens), within "soil deluvia under grey clay" (one specimen), and within "soil deluvia" (2 specimens). Besides these leaf-points bifacial side-scrapers are also registered (grey intercalation in soil deluvia and grey clay under ferrugineous concretions), together with a large number of various types of side-scrapers. In L. Sawicki's Trench I leafpoints are represented by halfproducts, oval in shape, with a preserved natural back on one side (Krzepkowska 2006: Pl. 117), and by mesial and proximal parts (with rounded base) of relatively small bifacial points (Krzepkowska 2006: Pl. 116). Finds from sector J, layer 6 consist mainly of unfinished leafpoints (*Figure 5:1*) among them an asymmetrical specimen with a lateral natural back (Kozłowski, Kozłowski 1996: Pl. 25:1), shaped using Micoquian technique. Moreover, two fragments of unfinished leafpoints (*Figure 5: 2, 3*) with preserved cortical surfaces also occur (Kozłowski, Kozłowski 1996: Pl. 26:1, 2). The assemblage contains only one completely bifacial point, with a flat-convex cross-section, with traces of re-trimming (Kozłowski, Kozłowski 1996: Pl. 25:2), and side-scrapers probably re-worked from bifacial points.

Thus, the upper portion of layer 11 with various intercalations, also pedological, indicates the mixing up of deluvial sediments from different periods of time. Consequently, the presence of a "Pre-Szeletian" level at Zwierzyniec is doubtful, and that the inventory from layer 11 is, allegedly, distinct from the inventory from layer 13. S. K. Kozłowski (2006) has already drawn attention to these discrepancies and suggested that the leafpoints industry from trench J could be contemporaneous with the assemblages of the younger phase of leafpoints from layer 13 (trenches 1, 4 and '73–'74; investigations by W. Chmielewski). J. K. Kozłowski and S. K. Kozłowski (1996) assign the artefacts from layer 13 to the Szeletian, claimed by D. Mańka (2006) to be Jerzmanowician. The interpleniglacial soil (layer 13 acc. to T. Madeyska) provided two inventories with leaf-points: the inventory from the investigations by A. Jura (1937–1939 – sector 4a layer 7) and by W. Chmielewski (1976–1978 – layers 4 A–E). The two inventories differ considerably: the inventory from sector 4a layer 7 consists of bifacial leafpoints with a biconvex cross-section, worked by alternate removals; most leafpoints are damaged (Kozłowski, Kozłowski 1996, Pl. 29). Besides these leaf points the inventory contains bifacial side-scrapers and end-scrapers. The inventory from layer 4 A–E from the investigations in the years 1976–1978, does not exhibit the techno-typological characteristics of the Jerzmanowician that D. Mańka wanted to see (2006). The leafpoints are initial specimens (*Figure 5:4*) with a sequence of removals on the entire surface on one side, executed from one lateral edge (Mańka 2006: Pl. 121); an example of a more advanced stage of reduction is a leafpoint with partial bifacial reduction from one lateral edge on one side, and from two edges on the other side (*Figure 5:5*). Small fragments of leafpoints found in the inventory were split off when items were damaged in the process of manufacture. Two specimens are finished products: one in the form of a laurel leaf (*Figure 5:6*), the other is a willow leaf (*Figure 5:7*). These specimens co-occur with single-platform blade-flake cores without preparation except for the platform (Mańka 2006: Pl. 120) and a few flake tools such as side-scrapers, denticulated tools and atypical burins. The inventory totals 497 artefacts including: flakes – 59.1%, blades – 14.9%, and cores – 7.0%. The structures of the inventories from Zwierzyniec indicate that while the inventory from A. Jura's excavations was a base hunting camp, that inventory by W. Chmielewski was a camp with workshop activities.

Szeletian sites in the territory of Poland represent – as we have tried to show – four types of activities:

a) workshops associated with exploitation and processing of local raw materials: erratic flint in Silesia and Jurassic flint in the region of Kraków (e.g. Dzierżysław 8 in Upper Silesia),
b) more stable hunting camps where lithic artefacts were not only used and repaired but also, to a lesser extent, manufactured, including leaf-points (e.g. Dzierżysław 1; possibly part of the Szeletian finds from Kraków-Zwierzyniec),

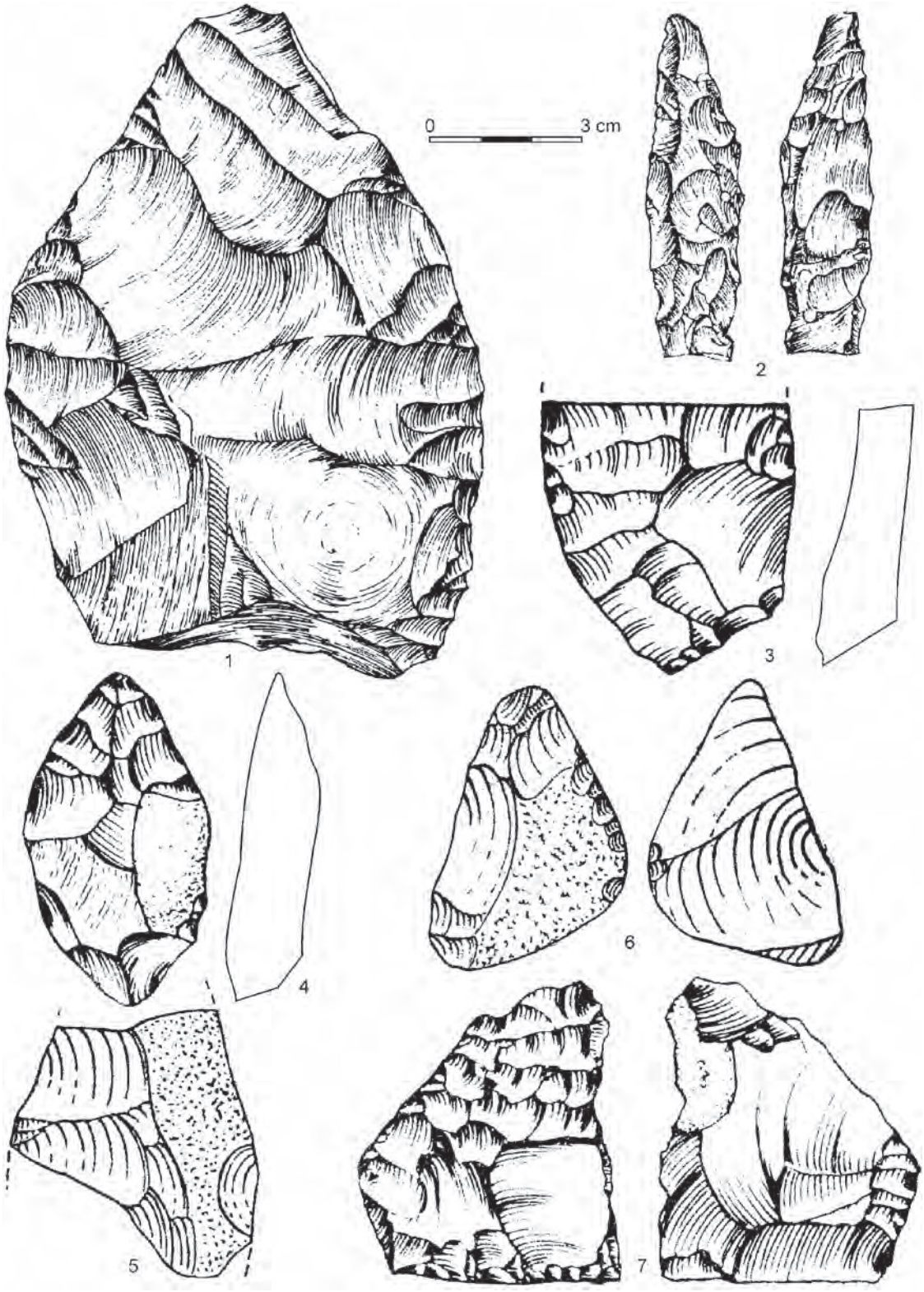

FIGURE 4. Dzierżysław 1, Upper Silesia. 1–7, unfinished leaf points made from erratic flint (acc. to J. K. Kozłowski 1964).

c) transient hunting camps with minor local lithic production (e.g. Obłazowa),
d) brief occupation episodes whose traces are isolated artefacts, first of all, leafpoints. To this group are assigned some individual surface finds of leafpoints and cave finds e.g. in level VI in the Mamutowa Cave.

A question that still remains disputable is the presence of the Late Phase of the Szeletian north of the Carpathians and the Sudetes, as we have mentioned earlier. The few absolute dates for sites in Poland, also absence of typological indices of the Late Phase cause that this phase cannot be distinguished.

Moreover, a different interpretation refers to the presence of the Jerzmanowician in the territories bordering with the European Lowland. The Jerzmanowician is a unit with leafpoints and blade technique, which is part of a complex of Lowland units: the Lincombian-Ranisian-Jerzmanowician (Flas 2000–2001, Kozłowski 1990). The Jerzmanowician in Poland in the Nietoperzowa Cave is dated at between 38,500±1240 BP (GrN-2181) for layer 6, 32,500±400 BP (Poz-23628) and 30,500±2100 BP for layer 4. It can, thus, be claimed that the Jerzmanowician is, in all likelihood, later than the Szeletian. However, in the case of some isolated finds of leafpoints from cave sites in the northern part of the Kraków-Częstochowa Jurassic Plateau e.g. from the Biśnik Cave complex G (Cyrek 1998, Cyrek Ed. 2002) or from the Jasna Cave at Strzegowa (Kozłowski, Kozłowski 1996: Pl. 29:10) it is difficult to determine whether they can be assigned to the Szeletian or to the Jerzmanowician. It should be added, that the stratigraphical position of the point from Cave Jasna is associated with a rubble-loess series equivalent to the Upper Pleniglacial (Sawicki 1953, Madeyska 1981). In other cases it is questionable whether the flakes/blades with partial bifacial treatment e.g. from G complex in the Biśnik Cave (Cyrek Ed. 2002: Pl., II 1, 2) indeed correspond to the early phase of the Upper Palaeolithic (Cyrek *et al*. 2010) – despite the dates of U/Th 32–79 Ka and TL dates of 54–58 Ka.

In the analysis of chronological relations between the Szeletian and the Jerzmanowician (L-R-J) the question is still open of the presence of unifacial points – similar to Jerzmanowice points – not only in the Szeletian sites (Vedrovice V – Valoch 1993; Želešice-Hoynerhügel – Škrdla *et al*. 2014), but also at the Bohunician sites in Moravia. Some, not very typical, unifacial points attributed to the Jerzmanowice type were noted at Stránská skála III (Svoboda 1987, Fig. 26:12), IIIa (op. cit. Fig. 26:12) and IIa (Svoboda 1991: Fig. 9:10). Single points of this type appear in surface collections from Líšeň-Čtvrtě (Svoboda 1987: Fig. 32) and from Ondratice I (Nerudová 2015). At Stránská skála, the Bohunician is dated within the time bracket of 34,530+830–740 BP GrN-11504; 38,500±1400 GrN-1208 or even 41,300±3100 BP GrN-12606 just as at the Bohunice-Red Hill sites are dated at between 41,250±450 BP OxA-14845 and 43,600±550 OxA-14846 (Valoch 2008, Svoboda 2003) and Brno-Bohunice between 36,050±260 OxA-18298 and 40,050±360 Ox-18301. The most complete list of Bohunician dates from Moravia was published by Richter *et al*. 2009.

In view of the above the age of the units of the L-R-J complex in the Kraków-Częstochowa Plateau, that could have impacted on Moravia and resulted in the appearance of *pointes à face plane*, requires a new analysis in a very broad regional context, and – moreover – in the light of new dates for layer 5 in the Nietoperzowa Cave. The new dates indicate that the middle part of the Jerzmanowician sequence in the Nietoperzowa Cave can reach back to 37,100±900 BP and 39,400±900 BP (Krajcarz *et al*. 2016). These dates mean that the radiocarbon age assumed for lowermost Jerzmanowician layer 6: 38,500±1240 BP (GrN-2181) could be questionable.

TRANSCARPATHIAN RELATIONS IN THE SZELETIAN IN THE LIGHT OF LITHIC RAW MATERIALS CIRCULATION

Unquestionably, the most important route of contacts between clusters of Szeletian settlement in Moravia and in Upper Silesia were the Moravian Gate and the Upper Oder basin. This route has been confirmed by the occurrence in Moravia of erratic flint from morains in Upper Silesia. Erratic flint was worked not only in workshop sites in Upper Silesia, but also in Opava Silesia (see: Třebom, Otice near Opava – Svoboda *et al.* 2002). In classical Szeletian sites in central and southern Moravia local raw materials are prominent e.g. the base camp from Vedrovice V is entirely dominated by local Krumlovsky Les hornstone. Other raw materials are no more than 6% of the inventory, including erratic flint – 2.3% and radiolarite – 3.2% (Neruda, Nerudová Eds. 2009: 196), The proportion of Krumlovský Les hornstone is even higher at the Moravský Krumlov IV site, which in its nature is a typical workshop manufacturing leaf points

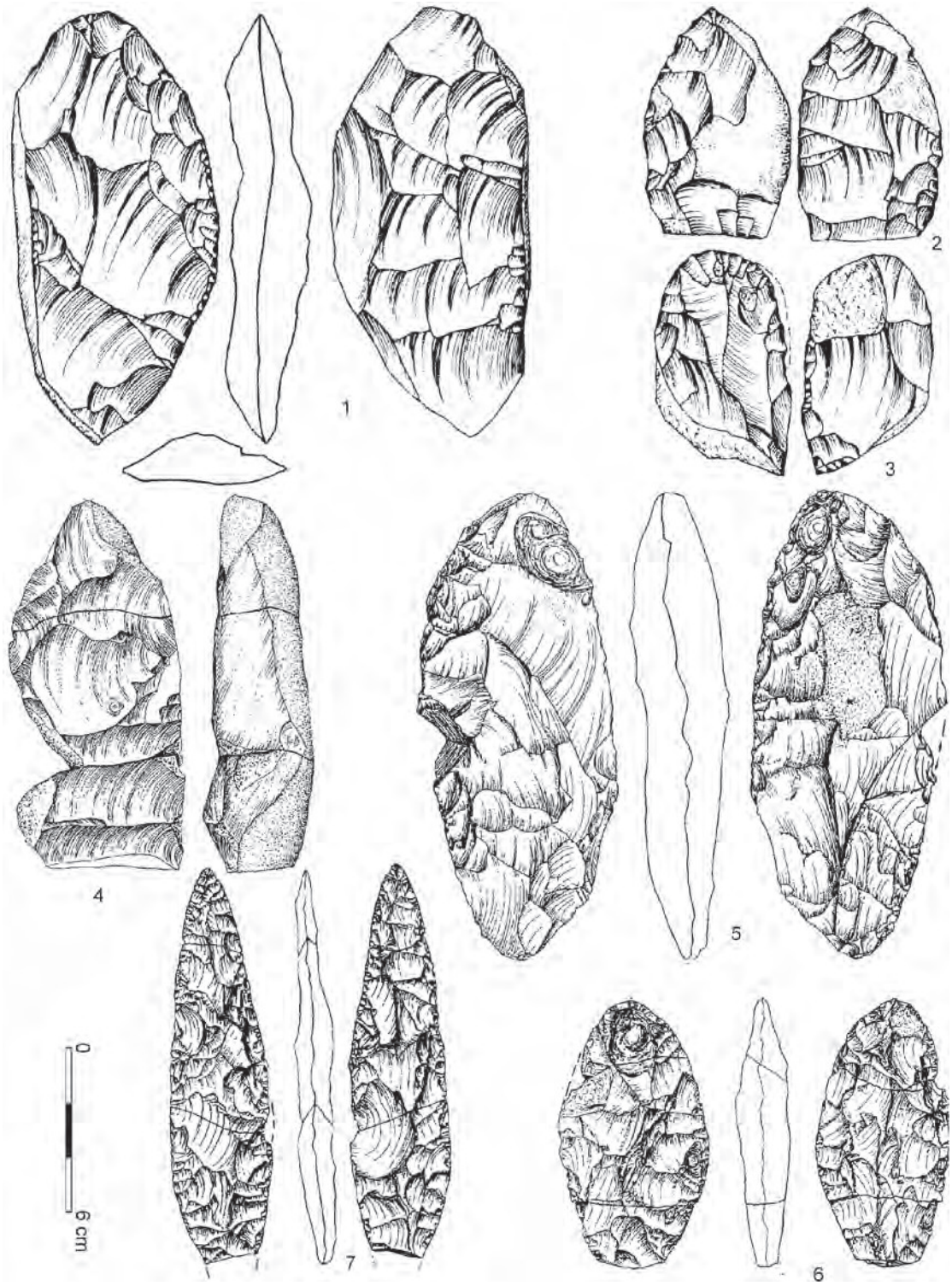

FIGURE 5. Kraków-Zwierzyniec, Lesser Poland. Sector J, layer 6. 1, unfinished leaf point with preserved natural back; 2, 3, initial stages of bifacial working. W. Chmielewski's excavations 1976–1978; 4, initial stage of surface treatment, 5–7, bifacial points (acc. to D. Mańka 2006 and S. K. Kozłowski 2006).

(Neruda, Nerudová Eds. 2009). The most diverse spectrum of raw materials in Moravia was noted at Želešice-Hoynerhügel (14 types of raw materials: Škrdla *et al*. 2014).

Moravian raw materials are infrequent in Upper Silesia. Quartzite from the Drahany Plateau was used to produce a few artefacts e.g. Cisek 6 – precores, a blade, microlithic tools, Dzierżysław 1 – *enclume* and a macrolithic tool. Dzierżysław 8 is unique with 10 precores with bilateral treatment, made from Drahany quartzite (Kozłowski 1964: Pl. XLIV, XLVIII–LIV). They co-occur with single-platform cores with sporadic preparation (Kozłowski 1964: Pl. XLVII 1, 5) but made from erratic flint. In Upper Silesia trace quantities occur of radiolarites – probably western Slovakian – and Jurassic flint (sites on the Głubczyce-Hlučin Plateau).

The route of transcarpathian contacts ran from western Slovakia, via the Vah basin, to the Poprad and Dunajec basin in Little Poland. On the north side of the Carpathians it is documented by the site in the Obłazowa Cave, layer XI (Valde-Nowak *et al.* 2003) that marked the route to the Upper Vistula basin (sites near Kraków and in the Kraków-Częstochowa Plateau). Contacts with western Slovakia – the area of natural occurrence of radiolarite – are, first of all, documented by artefacts from this raw material, prominent in western Slovakia, numerous in the Obłazowa Cave, sporadic at the site of Kraków-Zwierzyniec I sector 4a, and in the Mamutowa Cave layer VI (*Figure 2:3*). The more eastern connections are confirmed by the presence of a leaf point from "chocolate" flint in layer VI of the Mamutowa Cave (*Figure 2:4*). The Szeletian in the Upper Vistula basin exploited as a rule, local Jurassic flints, which were sporadically exported to western Slovakia (e.g. Ivanovce-Skala – Kaminská et *al*. 2008). In the Silesian and Moravian sites Jurassic flint is extremely rare, but the presence of erratic flint in Moravian sites points to direct contacts through the Upper Oder basin.

The general conclusion is that the Szeletian used mostly local raw materials. The evidence of the circulation of raw materials across longer distances is very rare. An example are unique artefacts made from Carpathian obsidian in western Slovakia (Moravany-Dlhá – Bárta 1960) and Moravia (Neslovice – Valoch 1973). A leaf-point from quartz-porphyr, which is the most important raw material in Hungarian Szeletian sites, was discovered at Ořechov in Moravia (Nerudová 1997).

CONCLUSIONS

The remarks offered in this paper on the Early Phase of the Upper Palaeolithic concern, most importantly, an autochthonous unit which is the Szeletian, to less extent allochthonous units such as the Bohunician and the Aurignacian. In the discussion of the origins of the Szeletian, adopting as an initial premise the transformation of the Micoquian into the Szeletian, we have attempted to document a more complex process of this transformation and propose a hypothesis that claims polymorphous origins of the Szeletian. The origins of the Szeletian in the territory of Hungary were rooted in the local variant of the Micoquian see the Babonyian. In south-western Slovakia and in Moravia the Szeletian would have been a direct continuation of the Middle European Micoquian, whereas north of the Carpathians and the Sudetes the emergence of the Szeletian would have been the result of individual intrusions from the Carpathian Basin that must have occurred, more likely, after the Micoquian had vanished. The links between the different variants of the Szeletian are documented by the circulation of of lithic raw materials between the Carpathian Basin and the territories north of the Carpathians and the Sudetes. The origins of the Late Phase of the Szeletian – whose main territory is Western Slovakia – which is separated from the Early Szeletian by a chronological hiatus, still remains a subject of controversy (Kaminská *et al.* 2011).

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