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AROUND THE BIŚNIK CAVE – THE AREA OF HUMAN PENETRATION DURING PALAEOLITHIC

ABSTRACT: To date, the Palaeolithic tradition of south-eastern part of the Ryczów Upland was known only from sparse sites, with the Biśnik Cave being the most recognised one. On the basis of the studies conducted in recent years we may paint a broader picture related to the settlement of the south-eastern part of the Ryczów Upland. The paper aims to present the multifaceted relations between humans and the environment of this microregion during particular periods of Palaeolithic on the basis of data collected from several sites located in the Wodąca and Udorka Valleys, as well as in the surrounding highlands.

KEY WORDS: Palaeolithic settlement – Palaeoenvironmental background – Lithic artefacts – Distribution – Ryczów Upland – Kraków-Częstochowa Upland

INTRODUCTION

The identification of the character and circumstances behind the settlement of prehistoric communities constitutes one of the key tasks in Stone Age research. The primary method consists in conducting detailed analysis of archaeological sites. It is also crucial to gain good knowledge on the space around them as the main agent enabling social and cultural development. In the archaeological studies on the Palaeolithic a particularly significant role is played by studies focused on obtaining a detailed information on a given microregion.

The research undertaken by the authors aimed to depict the multidimensional relationship between the human species and the environment of south-eastern part of the Ryczów Upland microregion in subsequent phases of the Palaeolithic on the basis of the data collected from several sites located in the Wodąca and Udorka Valleys (*Figure 1*).

The works conducted so far, in relation to the Palaeolithic in this region, focused on the sites within the area of the Wodąca Valley, mainly the Biśnik Cave site (Cyrek *et al.* 2010, 2014). On the basis of the studies carried out in recent years by an interdisciplinary research

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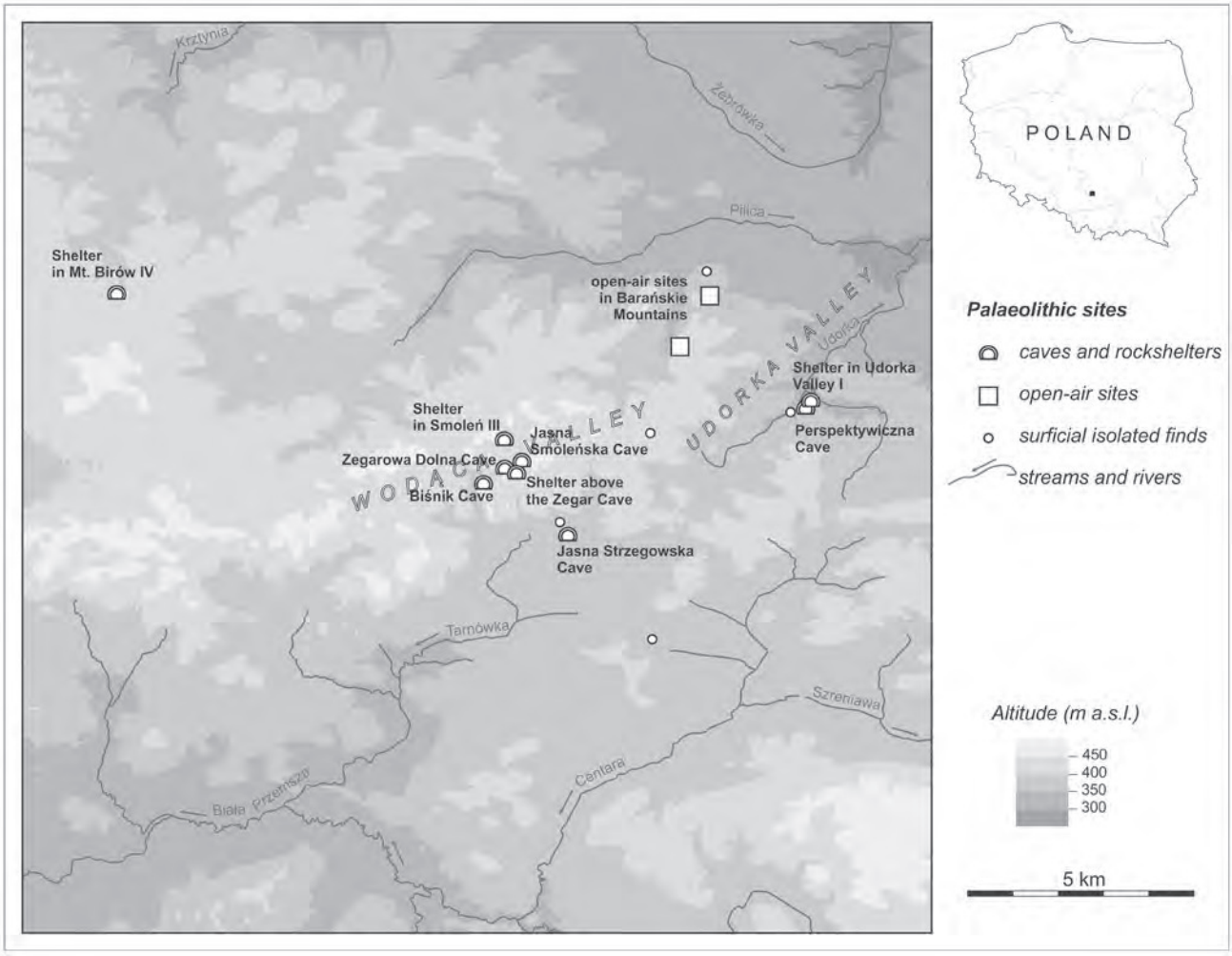

FIGURE 1. Location of presented sites (drawn by M.T. Krajcarz).

team it is possible to obtain a broader picture regarding the settlement of the south-eastern part of the Ryczów Upland.

PALAEOLITHIC SETTLEMENT IN SE RYCZÓW UPLAND – STATE OF RESEARCH

The investigated area is located in the Kraków-Częstochowa Upland, in the south-eastern part of the Ryczów Upland microregion. From the point of view of Palaeolithic settlement this area seemed to be a particularly favourable one. A characteristic feature of the region consists of the system of valley depressions, which fork out and produce clear separation lines among the hills. Particularly favourable conditions are observed in two neighbouring valleys: the Wodąca and Udorka Valleys. In the period of Middle and Late Pleistocene, this region offered to Palaeolithic hunters a variety of subsistence resources: animals migrating across the valleys provided food, karstic watercourses and springs – water, caves and rockshelters – refuge, whereas limestone outcrops – good quality Jurassic flint necessary for the production of tools and hunting weapons. The region selected for the study is located amidst outcrops of Jurassic flint (Krajcarz *et al.* 2012a, b).

To date, only a few researchers were involved in the studies of the south-eastern part of the Ryczów Upland. In the years between 1942–1949, K. Kowalski carried out inventory works on the karst objects of this region, with the results published in volume I of his catalogue

The Caves of Poland (Kowalski 1951). After World War II, L. Sawicki commenced archaeological excavations in this region, and in the period 1947–1950 he conducted a partial examination of two large sites: the Jasna Smoleńska and Jasna Strzegowska Caves (Sawicki 1953). This was followed by a long pause in works implemented in this region until 1990 when B. Muzolf began to investigate the area of the Grodzisko Pańskie Hill (Muzolf 1997). In 1997, together with a team of paleozoologists led by T. Wiszniowska, he also started a research in the region of the Zegarowe Rocks (Stefaniak *et al.* 2009). In the 1990s archaeological excavation works were carried out by A. Pelisiak, who studied on the area above the Jasna Strzegowska Cave (Pelisiak 2003, 2006) and the region of the Barańskie Mountains (Pelisiak 2006), and in 1991, the region of the Biśnik hill (Pelisiak 1993–1994). From the beginning of the 1990s, works in this area were carried out by K. Cyrek, who in 1991 continued the research in the Jasna Strzegowska Cave (Rybicka, Cyrek 1997), and since 1992 has been the head of an interdisciplinary team investigating the Biśnik Cave (Cyrek *et al.* 2010, 2014).

As the above review indicates, research of the south-eastern part of the Ryczów Upland centred on the scarce and relatively large caves. Nonetheless, we need to highlight the fact that small sites, such as rockshelters and overhangs, were frequently settled in the period of Palaeolithic and are extremely attractive with regard to the obtained paleoenvironmental information, which was proven with the discoveries made in the area of Ojców (Sąspowska and Prądnik Valleys) (Chmielewski 1988, Madeyska 2006) or the Kroczyckie Rocks (Cyrek 1994, 2009, Cyrek *et al.* 2000).

The works undertaken by the authors in the years 2011–2014 within the project entitled *"Palaeolithic settlement of Wodąca and Udorka Valley (Częstochowa Upland) against the palaeoenvironmental background"*, resulted in discovery of number of sites representing episodic settlement during subsequent phases of the Palaeolithic (Sudoł *et al.* 2013a). A distinguished one among them is the Perspektywiczna Cave – a multicultural site located in the Udorka Valley (Sudoł *et al.* 2013b).

MATERIAL AND METHODS

The article discusses issues connected with the settlement of the south-eastern part of the Ryczów Upland in the Palaeolithic, based on the data from several sites located within the Wodąca and Udorka Valleys, as well as in the surrounding plateaus.

The determination of the cultural affiliation of stone inventories recovered from archaeological sites and investigated within the last several years was obtained on the basis of a techno-typological analysis of lithic artefacts. In the case of lack of diagnostic forms or traces, of human presence unrelated to stone inventories (hearth relics, animal bones with anthropogenic marks), attempts have been made to establish the chronology with the use of radiometric dating techniques (^{14}C, TL, OSL). In the case of archive sites the characterisation of cultural levels was conducted on the basis of information included in source publications.

The described sites are characterised by diversified degrees of preservation of cultural levels and research advancement. The article presents a review of published and newly obtained data on cultural levels from the sites located in the microregion. The first group of analysed material is constituted by sites known to the authors mainly from literature: the Jasna Strzegowska Cave (Sawicki 1953, Rybicka, Cyrek 1997, Pelisiak 2003, 2006, Mirosław-Grabowska, Cyrek 2009), the Jasna Smoleńska Cave and the Zegar Cave (Kowalski 1951, Cyrek 2009, Stefaniak *et al*. 2009). The second group encompasses sites with well-recognised Palaeolithic levels on the basis of the source materials: the Biśnik Cave, the Deszczowa Cave, the Shelter in Krucza Skała, the Shelter in Mt. Birów IV. The enlisted sites were or still are examined by authors, with the majority of materials being published (Cyrek 1994, 2009, 2013, Cyrek *et al*. 2000, 2010, 2014, Muzolf *et al.* 2009). New material includes initially recognised sites (through sample surveys: the Perspektywiczna Cave, the Shelter in Smoleń III, the Shelter above the Zegar Cave, as well as superficial studies: a site complex in Sławniów). This group is supplemented with numerous loose findings.

Due to the initial phase of works on the sites located in the south-eastern part of the Ryczów Upland, comprehensive GIS analyses, as well as a detailed raw material analysis are in preparation and will be published in the future as separate papers. This article aims to present the preliminary results and the potential of the microregion for future studies on the settlement of the Stone Age.

RESULTS AND DISCUSSION

The Middle Palaeolithic

The oldest traces of Neanderthal man in south-eastern part of the Ryczów Upland have been documented in the Biśnik Cave, situated on the left edge of the currently dry

Wodąca Valley. The preserved sediment profile comprises layers dated back to the period preceding Odranian stadial of Saalian glaciation (i.e. to MIS 7 and earlier periods), up to the Holocene (Cyrek *et al.* 2010, Krajcarz *et al.* 2014). The oldest traces of Palaeolithic settlement reaching over 400,000 years (Krajcarz, Cyrek 2011). Flint products from layers 19b, 19c and 19d (inventory A8) refer to the Acheulean tradition (Cyrek 2013: 33–34). The artefacts show technological similarity and are preserved in similar stratigraphic situation as the inventories from Korolevo, level V, dated to the end of Lower Palaeolithic (Stepanchuk 2006), and to Markkleeberg assemblages from the beginning of Middle Palaeolithic (Wiśniewski 2012). Perhaps, elements of late Acheulean cultural tradition are also found in inventory A7 discovered in the top of layer 19a (*Figure 2*) (Cyrek 2013: 38). Middle Palaeolithic inventories (A6–F), connected with the Mousterian

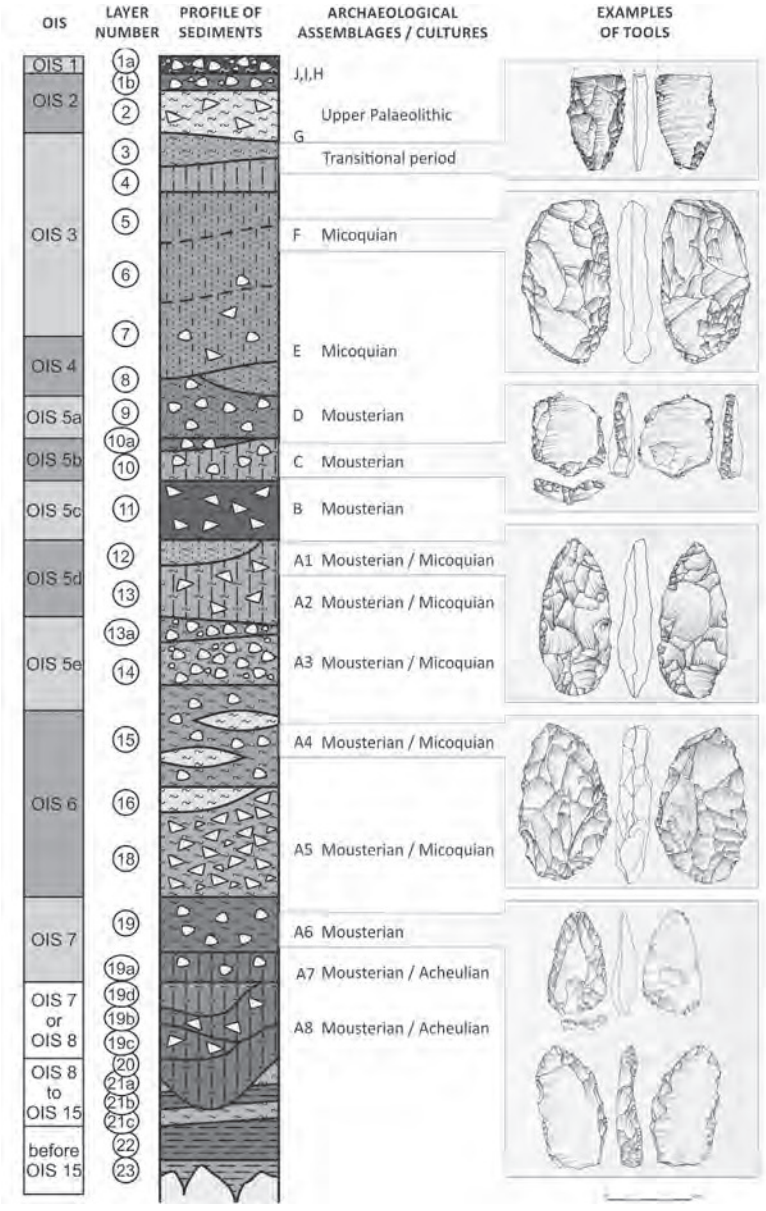

FIGURE 2. Schematic profile of Biśnik Cave sediments (after Krajcarz *et al*. 2014) with marked position of Palaeolithic cultural levels and examples of tools (drawn by M. Sudoł).

(older) and Micoquian (younger) (*Figure 2*), are preserved in the form of stone and bone products, hearth relicts and post-consumer animal bone fragments (Cyrek 2013, Cyrek *et al.* 2014).

The Middle Palaeolithic cultural relicts are also known from two other caves located on the slope of the Wodąca Valley within the ridge of Zegarowe Rocks, i.e.: the Zegar Cave (Stefaniak *et al.* 2009) and the Jasna Smoleńska Cave (Mirosław-Grabowska, Cyrek 2009). The research conducted in the Zegar Cave proved that it was inhabited at least several times with the oldest traces of man connected to late phases of Middle Palaeolithic (ca. 50–60 thousand years ago) on the basis of climatostratigraphic interpretation of the age of sediments (Stefaniak *et al.* 2009). The assemblage consists of small tools made from flakes e.g.: a tool with a round denticulate/notch retouch, fragment of a tool made from Levalloisian flake and a Levalloisian flake. The assemblage obtained from this site was classified as a Micoquian complex, mainly due to analogy with the stratigraphic situation of the nearby Biśnik Cave. Sondage trench performed in the internal part of the Jasna Smoleńska Cave also revealed presence of small quantities of flint flakes accompanied with the bones of a woolly rhinoceros and reindeer in the deeper layers. Sparse quantities of flakes were also found outside the cave and were presumably washed out from the dumps left behind after the former excavations conducted before the year 1949 by L. Sawicki and later by K. Kowalski (Kowalski 1951: 367). These materials have never been studied. What we are most likely dealing with is an analogous inventory recovered from the Zegar Cave.

Relicts of Middle Palaeolithic cultures were also found in the nearby Jasna Strzegowska Cave located within the area of the village Strzegowa. The sedimentary filling of the main chamber was nearly entirely excavated by L. Sawicki between 1947 and 1949, whereas in 1991, K. Cyrek conducted research works in the lateral corridor of the cave, the so-called Lisie Jamy (Kowalski 1951: 369, Rybicka, Cyrek 1997: 5). The Middle Palaeolithic materials were noted in the loamy-sand layers examined by L. Sawicki (Sawicki, 1953: 176–179). This poor Middle Palaeolithic inventory is still awaiting proper analysis and publication. Among the archive materials stored in the Institute of Archaeology and Ethnology of the Polish Academy of Sciences in Warsaw, special attention should be paid to a significantly reduced backed knife (*Figure 3: 1*) found together with a Levalloisian point (*Figure 3: 2*). These relicts are undoubtedly linked to the Micoquian culture (Sudoł 2013). This inventory is well complemented with a Middle Palaeolithic surficial find of unifacially-worked knife (*Figure 3: 3*) recovered by Jadwiga and Lucjan Wodarz in October 2013, approximately 20 metres from the entrance to the cave. Before undertaking a field verification it is difficult to determine the depository character of this finding. It may be assumed that the knife was dislocated into the field with Pleistocene sediments, which in 19th c. and at the beginning of the 20th c. were commonly extracted from caves and moved into fields as fertiliser.

It is worth mentioning that the research carried out in the neighbouring Udorka Valley also revealed relicts of Middle Palaeolithic settlement in the newly discovered Perspektywiczna Cave (Sudoł *et al.* 2013b). However, in the current phase of studies it is impossible to define its closer cultural or chronological affiliation. In the very same layer the numerous fossils of the Pleistocene fauna were discovered, including cave bear, cave hyena, reindeer, woolly rhinoceros and giant deer.

Transitional period

Traces of human existence, which may be linked to the transitional period between Middle and Upper Palaeolithic, i.e. with the complex of cultures with leaf-shaped points, were also noted in the discussed area. Sites of this type are extremely rare in the territory of Poland.

The mixed sediments of the Biśnik Cave yielded a fragment of an assemblage identified with the Jerzmanowician or Szeletian (Cyrek 2002a, Sudoł 2013). Particularly distinguishable among the retouched forms are retouched flakes, end-scrapers made from massive chipped flake with retouched edges (*Figure 4: 1*) and burins (*Figure 4: 2–3*). Also a damaged leaf-shaped point deserves a special attention (*Figure 4: 4*). The point was performed on a flake fully worked on the upper surface, with partly flat and half-steep surficial retouch, and slightly denticulated at the edge. It is presumed that one of the knives previously attributed to the youngest Middle Palaeolithic inventory (Cyrek 2002a: plate V: 8) may be in fact connected with the inventory of transitional cultures (*Figure 4: 5*). The mentioned knife was probably made from symmetrical bifacial handaxe-like tool and its asymmetry seems to be accidental in order to make use of a damaged top part of the tool which was worked with secondary abrupt retouch. The affiliation of the mentioned forms to one of the transitional cultures seems to be consistent with radiocarbon dating of a bone, it means 31,740 ± 410 BP (Poz-46806, Krajcarz *et al.* 2014; 34,525–32,846 calBC acc. to OxCal 4.2), classified as a part of the youngest

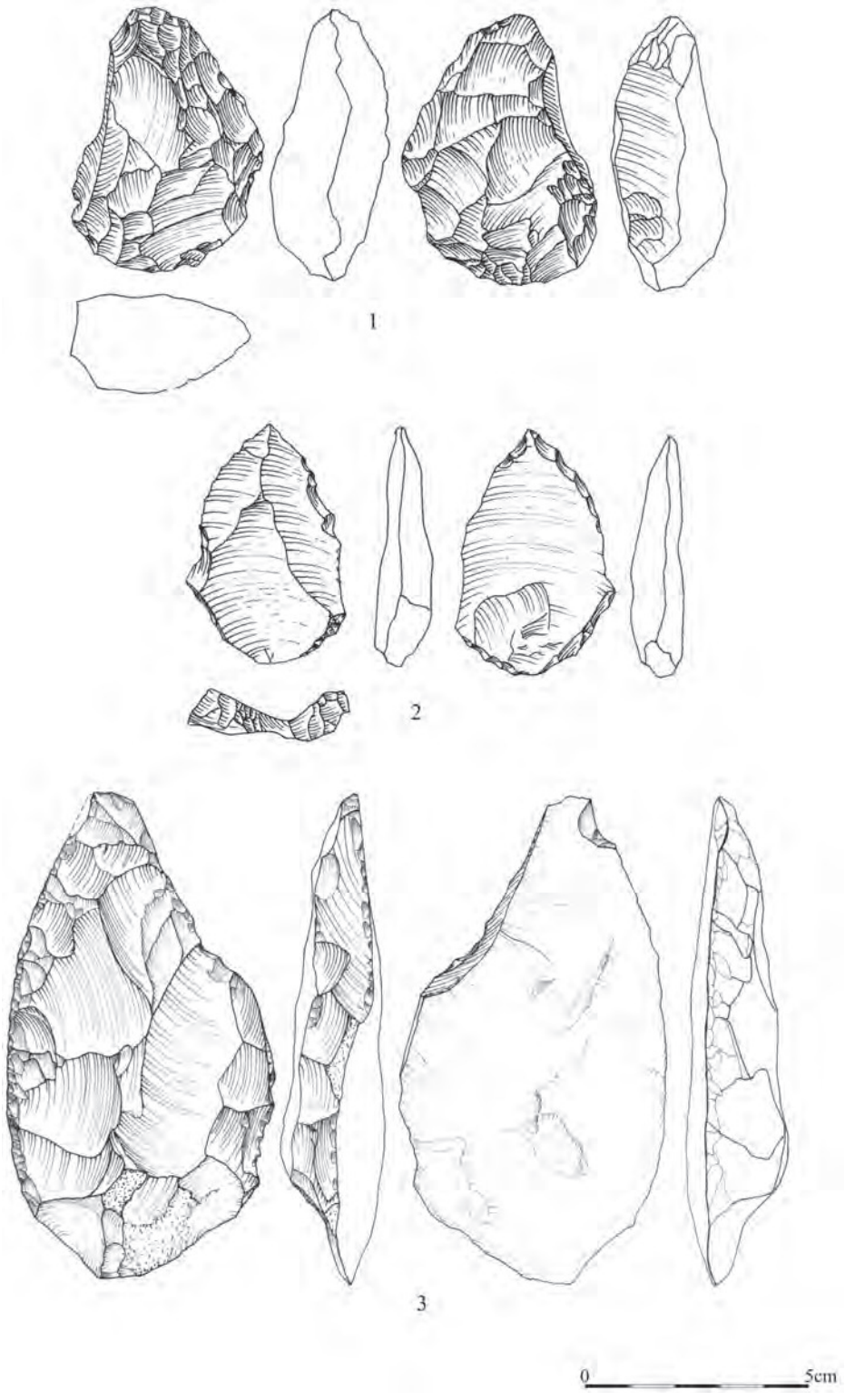

FIGURE 3. Examples of Middle Palaeolithic flint artefacts from Jasna Strzegowska Cave. 1, reduced backed knife; 2, Levalloisian point; 3, unifacially-worked knife (drawn by M. Sudoł).

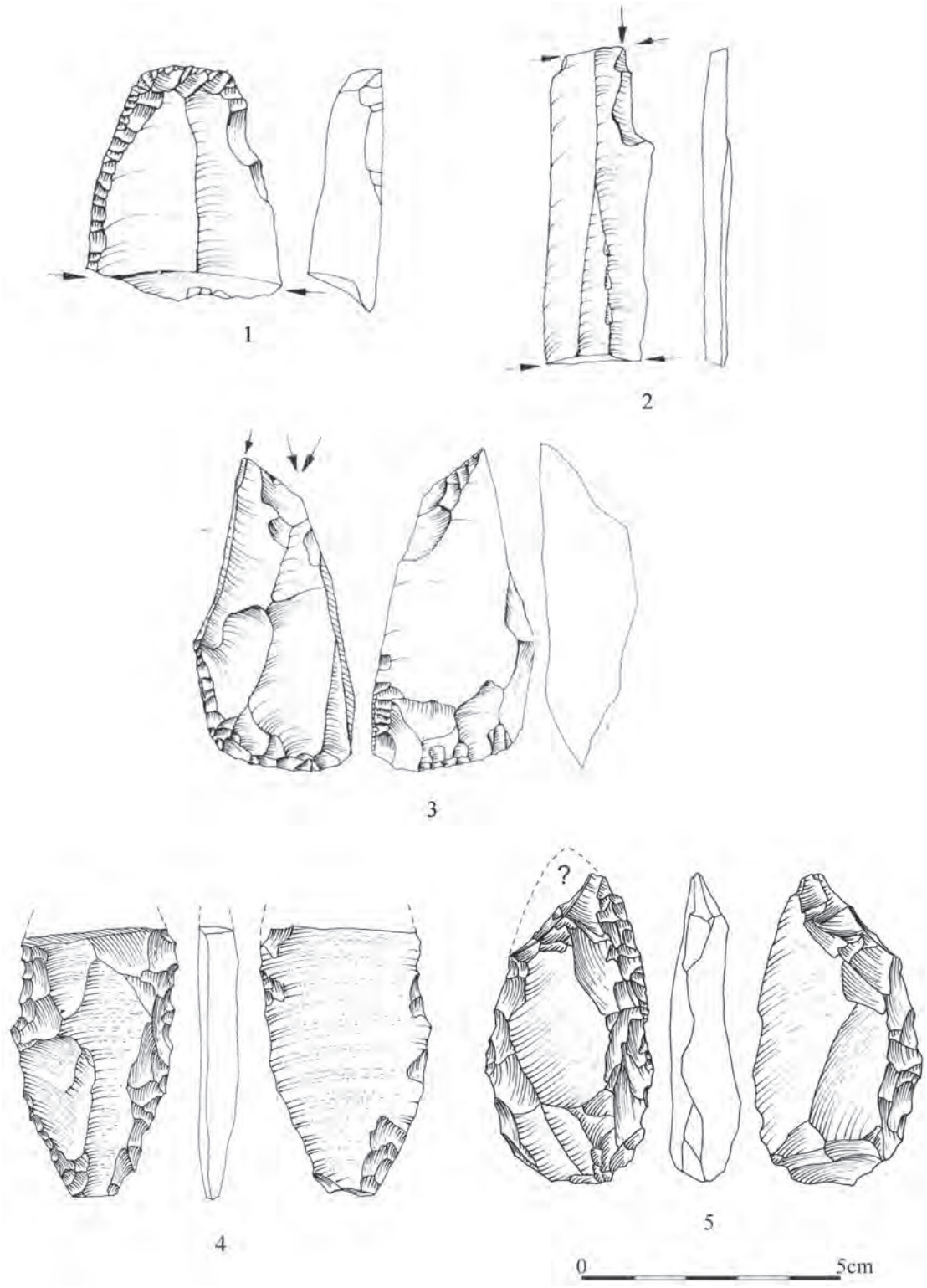

FIGURE 4. Tools selected from the Upper Palaeolithic / transitional Middle-Upper Palaeolithic level from Biśnik Cave. 1, end-scraper; 2–3, burins; 4, fragment of leaf-shaped point; 5, knife (drawn by M. Sudoł).

Middle Palaeolithic inventory. However, the same inventory yielded also a date 10,060 ± 200 BP (Poz-46805, Piskorska *et al.* 2015). Due to unclear stratigraphic situation in this part of sedimentary sequence it is difficult to conclusively determine whether we are dealing with an inventory of transitional cultures (e.g. the Szeletian culture), i.e. the one including both Middle- and Upper-Palaeolithic components, as it is observed for instance at Moravian sites (Neruda 2008–2009, Nerudová 2008–2009), or are we rather faced with a mix of two genetically isolated inventories, i.e. a mix of elements of the younger Upper Palaeolithic / transitional inventory with the older – Middle Palaeolithic one.

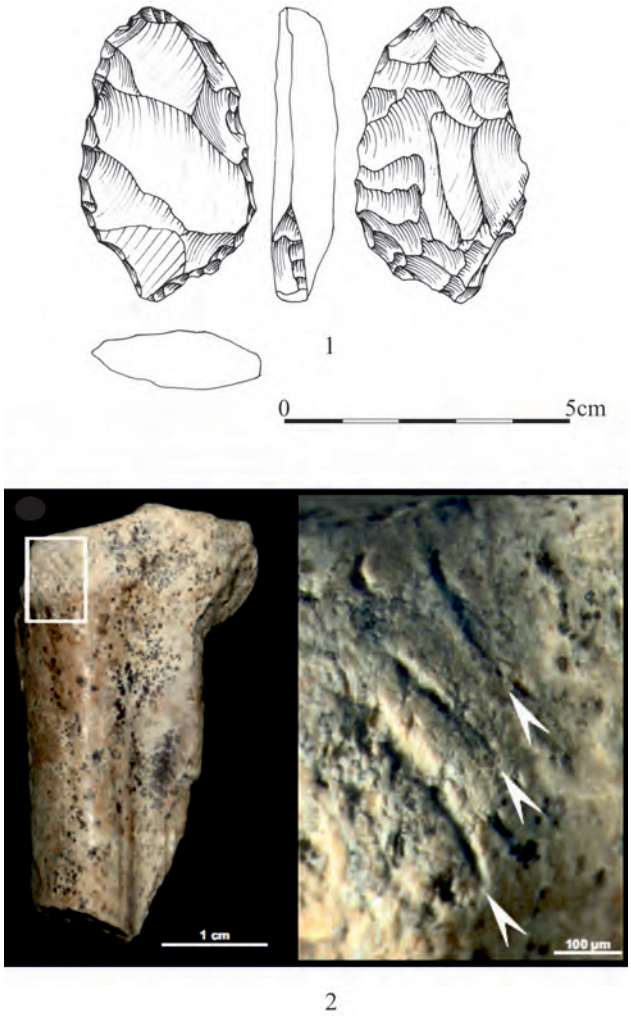

FIGURE 5. Exemplary artifacts from Shelter above the Zegar Cave. 1, leaf-shaped point (drawn by M. Sudoł); 2, animal bone (cervid metapodial) with cut mark and enlargement of marks (photo by M. Krajcarz).

What seems interesting in this situation is the discovery of a leaf-shaped point produced in the Middle Palaeolithic technique (*Figure 5: 1*), found near the Shelter above the Zegar Cave, located approximately 600 metres from the Biśnik Cave, within the area of the Zegarowe Rocks (Krajcarz *et al.* 2012c). Unfortunately, this artefact was found on a slope outside the cave, whereas research carried out inside the rockshelter indicated the presence of a cultural layer with hearth relicts and a bone with traces of intentional cut marks (*Figure 5: 2*), however failed to provide any flint artefacts. The date 29,060 ± 330 BP (Poz-44079, Krajcarz *et al.* 2012c; 31,985–30,364 calBC acc. to OxCal 4.2) obtained from reindeer bone excavated from that layer refers to the previously described layer from the Biśnik Cave.

It appears that the findings from the Biśnik Cave and the Shelter above the Zegar Cave record the cultural shifts in the period between 36-32 thousand years BP.

The Upper Palaeolithic

The oldest indisputable Upper Palaeolithic artefacts were discovered in the middle part of the Ryczów Upland, in the Shelter in Mt. Birów IV near Podzamcze (Cyrek 2009), as well as in its northern part, in the Deszczowa Cave, 3rd cultural level (layer VII and VIIa) (Cyrek *et al.* 2000). Both inventories consist of artefacts bearing the traits of the Aurignacian. In the Deszczowa Cave these included: a nosed endscraper with a steep Aurignacian retouch, Aurignacian retouched blades, carenoidal burin and short endscraper (Cyrek *et al.* 2000: fig. 15). The inventory is complemented with bone and antler artefacts, among others: bone awl ornamented near its base with two rows of cuts, antler fragment covered with cuts or a knife made from a long bone and massive bone awl (Cyrek *et al.* 2000: fig. 14; Cyrek 2002b: fig. 7–9). These findings are well complemented with a fragment of antler with spotted ornaments from Shelter IV at Mt. Birów (Cyrek 2009: fig. 15). The chronology of sites is confirmed with ^{14}C AMS dating of animal bones (Nadachowski *et al.* 2009: 72, Lorenc 2013: 406, Muzolf *et al.* 2009: 284) from 28–36 000 cal years BP.

The traces of penetration of the south-eastern part of the Ryczów Upland during the period of Upper Palaeolithic were recognised in the Perspektywiczna Cave situated in the Udorka Valley (Sudoł *et al.* 2013a, 2013b). The cultural layer was preserved with intense dark colour due to presence of large quantities of charcoal. Several dozen flint artefacts of workshop

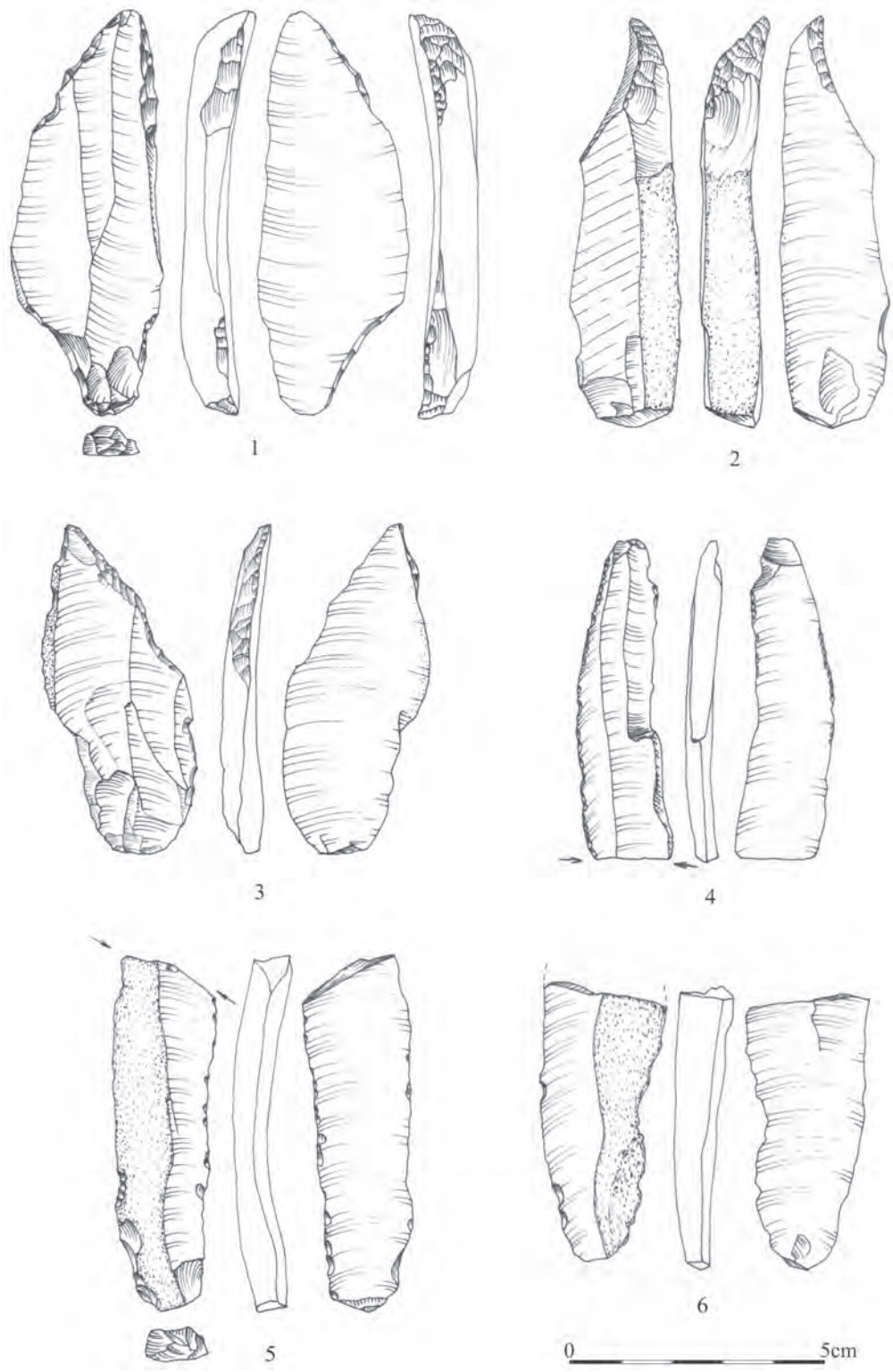

FIGURE 6. Examples of flint artefacts from Upper Palaeolithic level of the Perspektywiczna Cave. 1–3, asymmetric, massive perforators with high and abrupt retouch; 4–6, fragments of blades (drawn by M. Sudoł).

nature were uncovered within this sediment. Among them the most distinguishable artefacts are those in the form of asymmetric massive perforators (also with high and abrupt retouch) (*Figure 6: 1–3*), fragments of blades (*Figure 6: 4–6*), massive blades (*Figure 7: 1–2*) and cores (*Figure 7: 3–4*). Unfortunately, it is difficult to precisely define cultural affiliation on the basis of this small part of the inventory, as similar forms are found within the inventories of various cultures of Upper and Late Palaeolithic. This is complicated with the fact, that the inventory was discovered in sediments disturbed by mass movements, outside the entrance of the cave. The preserved sedimentary structures (erosional channels and low-angle bedding) and the mixed character of the fauna (forest and steppe-tundra mammals) indicate that the mixing of several archaeological assemblages cannot be ruled out. The excavation works in the Perspektywiczna Cave are being continued and perhaps will enable us to explain its complex stratigraphic situation.

The Upper Palaeolithic assemblage corresponding to the Gravettian or Epigravettian was recovered from the Jasna Strzegowska Cave (Rybicka, Cyrek 1997, Mirosław-Grabowska, Cyrek 2009). In this site a scanty finds of Gravettian point (*Figure 8: 1*), backed microblades (*Figure 8: 2–3*), end-scraper (*Figure 8: 4*), burin (*Figure 8: 5*) and a triangular limestone pendant with two bored orifices (*Figure 8: 6*) were discovered. The isolated flint artifacts of Upper Palaeolithic type and one bone point from the youngest sediments of Biśnik Cave (Cyrek 2002a: table II) may also be linked with this cultural unit.

Traces of activity of Gravettian hunters were also discovered in northern part of the Ryczów Upland in the Deszczowa Cave (2nd cultural level, layer VIII and VIIIa) (Cyrek *et al.* 2000). The recovered animal bones (Wojtal 2007) were dated with the use of radiocarbon method (Nadachowski *et al*. 2009, Lorenc 2013, Wojtal *et al.* 2015). One of the bear bones with traces of cut from layer VIIIa was dated to 24,580 ± 200 uncal years BP (Wojtal *et al*. 2015). Moreover, human presence is proved with numerous lithic (doubles retouched blades) and bone artefacts (an antler artefact with a cylindrical shape, bone point) (Cyrek *et al.* 2000: fig. 13). It is difficult to precisely determine the cultural identity of the artefacts from the 2nd cultural level. Particularly if we consider the fact that layers VIII and VIIIa also included animal bones from younger periods (Cyrek *et al*. 2000, Lorenc 2013), we cannot exclude the possibility of mixing of the Gravettian level with the younger 1st cultural level (Cyrek *et al*. 2000).

The Final Palaeolithic

References to the Final Palaeolithic are found in two open-air sites located between the villages Cisowa and Sławniów (so called Góry Barańskie hills), ca. 2 km to the west from the Udorka Valley (*Figure 1*) (Krajcarz *et al.* 2014). The cores (*Figure 9: 1, 2, 10: 1*) and blade debitage (*Figure 10: 2, 3*) allow us to establish a link between these sites and analogous Final Palaeolithic inventories. In their proximity a fragment of a tanged point or perforator (*Figure 10: 4*) was discovered, which may be interpreted as an indicator of penetration by hunters representing the Świderian or another Final Palaeolithic cultural unit. It is also likely that the other site located at the outcrops of striped flint located in Góry Barańskie is also related to this culture.

Moreover, an unclear cultural affiliation is observed in the case of a Late Palaeolithic trace of settlement found in the Shelter in Smoleń III (Sudoł, Krajcarz, 2014). Traces of Palaeolithic settlement in the form of hearth relict were found in the loess layer. In the area near the hearth the pieces of charcoal and charcoal dust were detected (*Figure 11: 1*), as well as a long bone of elk as relicts of a poor cultural level (*Figure 11: 2*). No flint artefacts were discovered. The faunistic material was extremely poor. On the basis of sparse rodent remains (appearance of bank vole in addition to arctic fauna) and lithology (more smoothed limestone rubble in relation to loess below and above) the period of sedimentation of the layer with the hearth was defined as a short-term weak warming occurring during a very cold period of loess sedimentation. Thermoluminescence dating (TL) linked the loess material to the transitional period between the Interpleniglacial and Late Pleniglacial periods (MIS 3/2). The TL age obtained for the loess sediment in the layer located over the hearth indicates its upper time limit (23.2 ± 1.4 ka), whereas the dating related to the part situated below the hearth designated the bottom boundary (29.2 ± 1.7 ka). Such results suggest that the object may be treated as a trace of a short-term stay of Upper Palaeolithic hunters, presumably related to the Gravettian complex, whose traces are known from the nearby Jasna Strzegowska Cave. However, radiocarbon dating performed on the charcoal recovered from the hearth – 10,790 ± 70 BP (Poz-53307) and elk long bone – 12,110 ± 60 BP (Poz-56207) (Krajcarz *et al.* 2015) points to a later period connected with penetration of Final Palaeolithic hunters. The disparity in dating results may be explained by the fact that the TL dating technique is related to the moment of aeolian loess sedimentation which does not necessarily has to be contemporary with final sediment

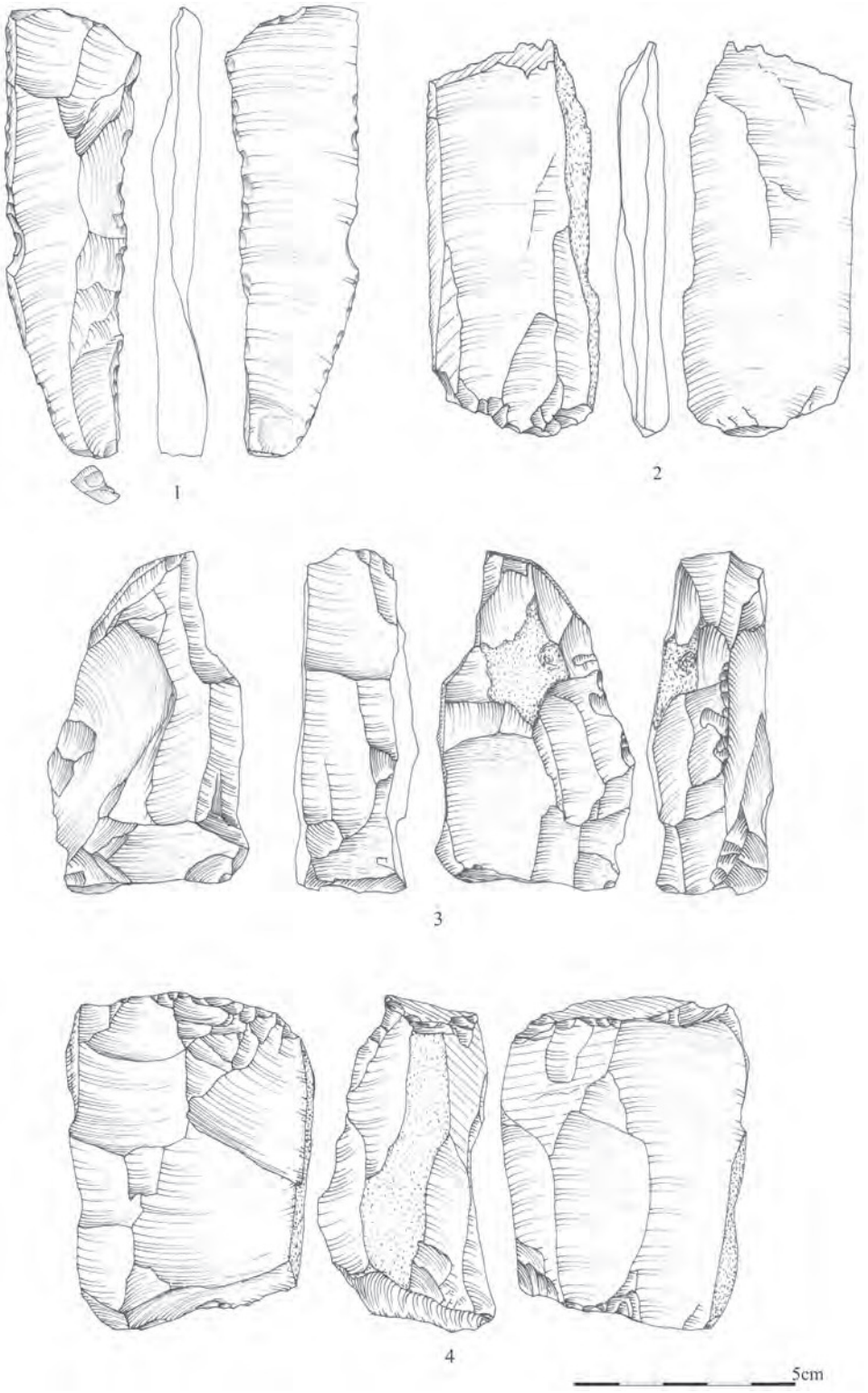

FIGURE 7. Examples of flint artefacts from Upper Palaeolithic level of the Perspektywiczna Cave. 1–2, massive blades; 3–4, cores (drawn by M. Sudoł).

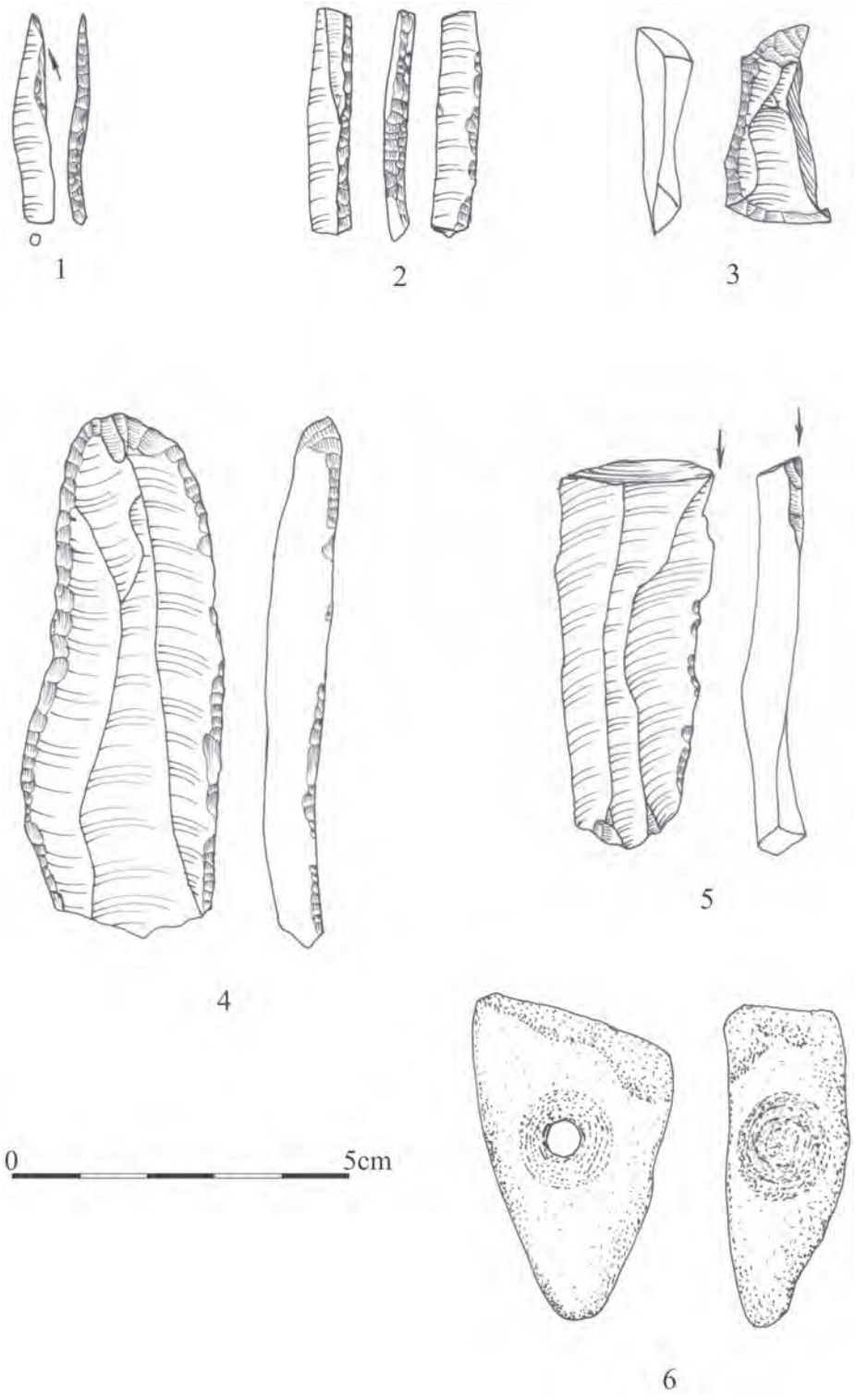

FIGURE 8. Examples of Upper Palaeolithic flint and limestone artefacts from Jasna Strzegowska Cave. 1, Gravettian point; 2–3, backed microblades; 4, end-scraper combined with retouched blades; 5, burin; 6, triangular limestone pendant with two bored orifices (drawn by M. Sudoł).

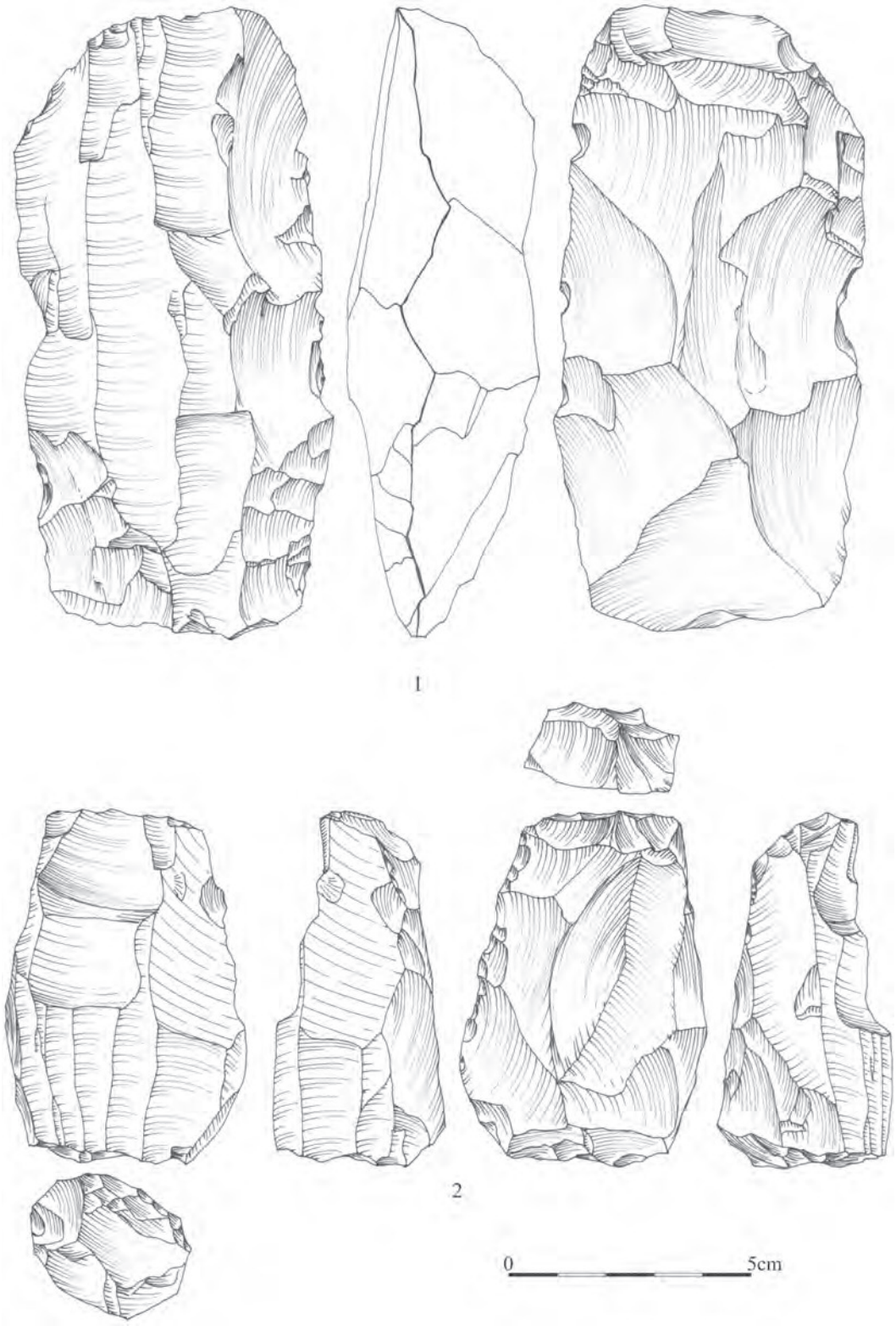

FIGURE 9. Examples of flint artefacts from Góry Barańskie. 1–2, cores (drawn by M. Sudoł).

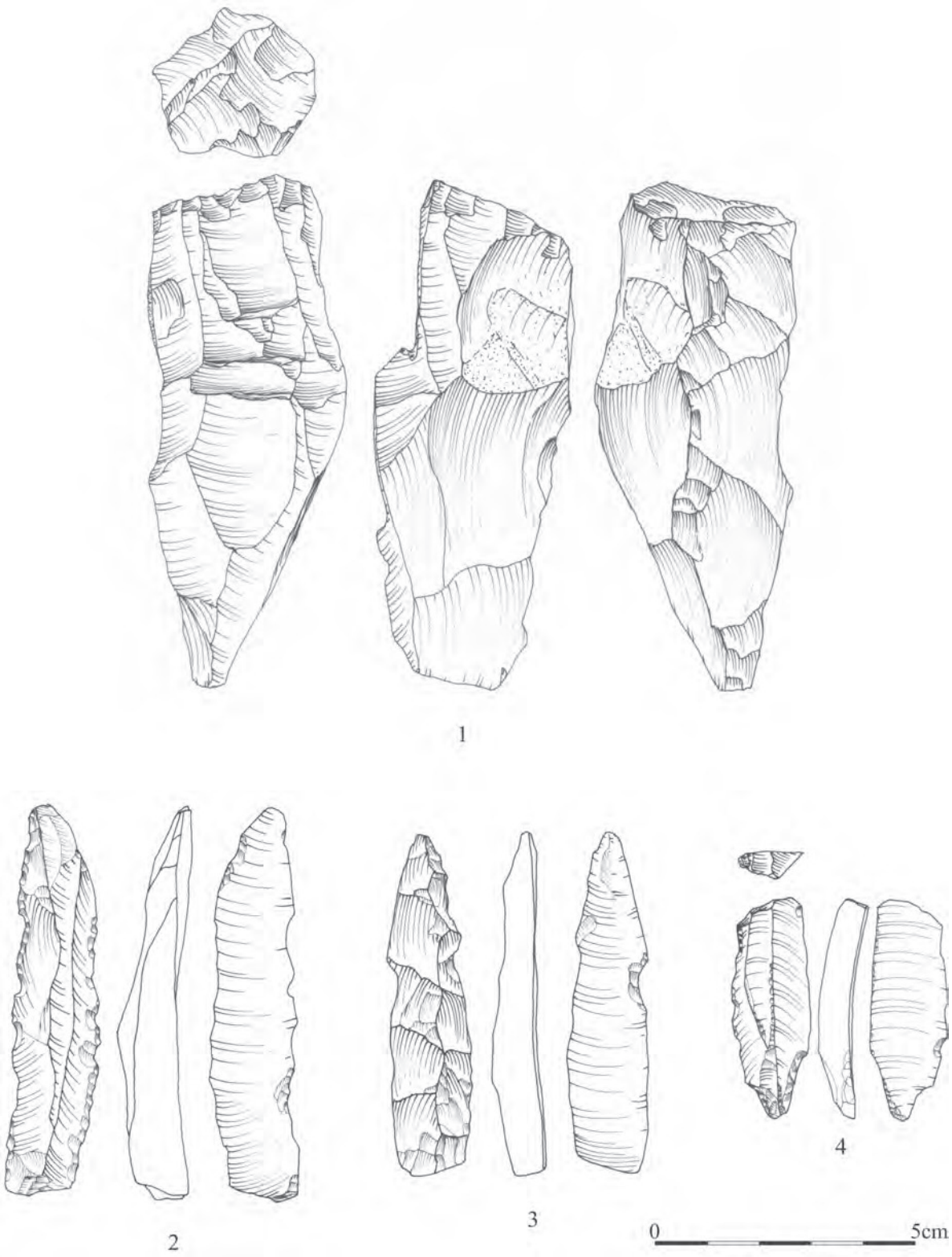

FIGURE 10. Examples of flint artefacts from Góry Barańskie. 1, core; 2–3, technical blades; 4, tanged point or perforator (drawn by M. Sudoł).

deposition nor the subsequent settlement of man (as indicated by radiocarbon dating). The radiocarbon dating is directly related to the components of a cultural level and as such is a more reliable indicator of its age.

The sparse traces of Final Palaeolithic human settlement are also known from northern part of Ryczów Upland, from the Shelter in Krucza Skała (Cyrek 1994, 2009), where short-term camps attributed to Magdalenian were found. In Krucza Skała, besides the flint inventory consisting of bladelets, backed bladelets and burins, researchers discovered a fragment of antler with zoomorphic and geometric engraving (*baquette demi–ronde*) (Cyrek 1994; Cyrek 2002b, fig. 4). Scarce flint products from the 1st cultural level in the Deszczowa Cave (Cyrek 1999, 2009, Cyrek *et al.* 2000), i.e. short flake endscrapers, microburins and flake core with changed orientation, are typologically linked with the settlement of Late Palaeolithic traditions of the cultures with backed bladelets, or with older Mesolithic (Cyrek *et al*. 2000: 59).

1

2

FIGURE 11. Shelter in Smoleń III. 1, traces of hearth in the loess layer; 2, long bone of elk as relict of a poor cultural level (photo by M. Sudoł).

Conditions related to the availability of raw material

Independently of the phase of the Palaeolithic, the south-eastern part of the Ryczów Upland was characterised by very favourable conditions with regard to the availability of raw materials, and its geomorphological and environmental factors. The human settlement in this region covers all stages of Palaeolithic. The different character of cultural levels from different periods of Pleistocene suggests that since Middle Palaeolithic till Final Palaeolithic the settlement pattern and strategy of land exploitation in the Ryczów Upland underwent changing.

An extremely important issue is the availability and utilisation of flint raw materials. The field prospection conducted in last years by the authors revealed wide variation of flint raw materials in the Ryczów Upland, particularly in its southern part (Krajcarz *et al*. 2012a, 2012b). The discovery of new outcrops, including high quality chocolate and striped flint (Krajcarz *et al*. 2012a, 2012b, 2014), the presence of which has until recently been linked only with the region of the Holy Cross Mts., casts a new light on the issue related to obtaining the raw material, as well as its use and distribution in particular periods of the Palaeolithic.

Despite the different progress of archaeological research among sites, the initial observations show certain preferences not only with regard to the selection of flint raw material in particular periods of the Palaeolithic (*Figure 12*), but also to the choice of places of settlement and diversification of their function (*Figure 13*).

The research conducted so far in the Biśnik Cave enabled recognition of the nature of settlement at the time of Middle Palaeolithic. The site was inhabited at least twenty times; however, the most intense activity was dated to the end of this period, as proven by large quantities of lithic artefacts and bone waste in the youngest Middle Palaeolithic inventories E and F (Cyrek *et al*. 2010, 2014). Such situation may suggest that during older phases of Middle Palaeolithic the Biśnik Cave served as a short-term hunter campsite. Quite opposite situation is observed in the early Vistulian levels, as well as in the remnants from the older part of Interplenivistulian, when the Biśnik Cave may have served as a primary camp, whereas the scarce traces from this period found in other neighbouring caves and shelters are remnants of hunting penetration. In the younger part of the

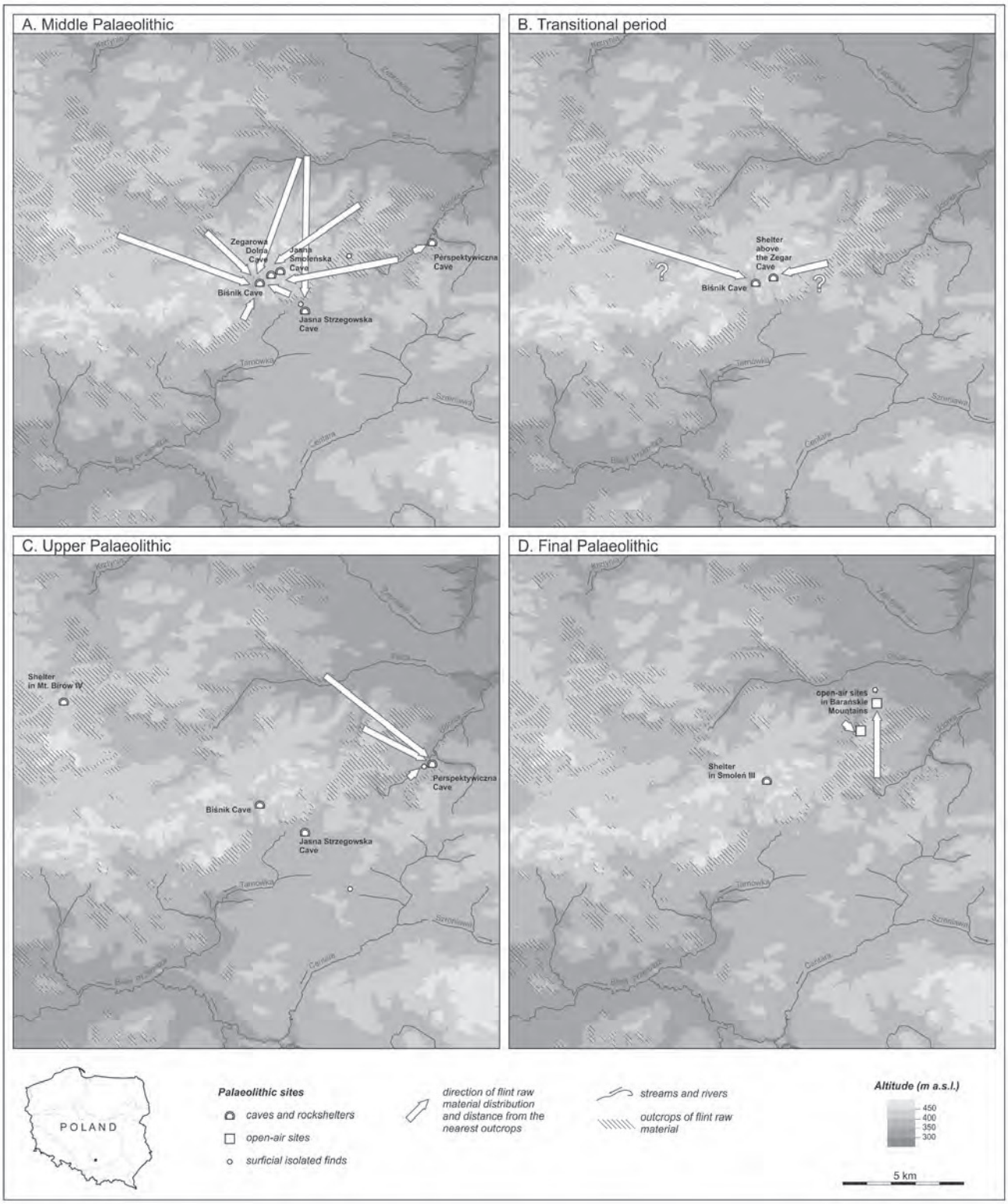

FIGURE 12. Maps of area penetrated during Palaeolithic in a 20 km-side square around the Biśnik Cave based on location of archaeological sites and raw material provenance (drawn by M. T. Krajcarz).

Interplenivistulian and younger Plenivistulian (Upper and Late Palaeolithic) the sites located in southern territory of the Ryczów Upland, both caves and open-air areas, take the form of workshops or in-house workshops, and are located in immediate proximity to outcrops of good quality raw materials in the region of the Udorka Valley and Góry Barańskie (Krajcarz *et al*. 2012a, 2014). A good examples are the Perspektywiczna Cave and most of the workshops related to the open-air site complex in Sławniów (so far only initially recognised), which are situated in close vicinity to outcrops, despite the lack of immediate access to water courses.

The settlement of the northern region of the Ryczów Upland, is visible in the traces of short-term camps from all periods of Palaeolithic. It seems that during Middle Palaeolithic more attention was paid to other properties of the landscape than the proximity of lithic raw material sources. The factors probably taken into consideration while selecting the cave included: site morphology and structure; closeness to the valley bottom; number, size and exposure of entrance openings; proximity of water and the related availability of wild game. These aspects seem to lose importance during Upper and Late Palaeolithic for the benefit of location in immediate vicinity of outcrops of the best mineral raw materials in the region (*Figure 12: A, B*), which is undoubtedly related to changes in the production techniques of semi-processed raw materials and tools. The predominant raw material in the majority of Middle Palaeolithic inventories was more difficult to work and was obtained from areas situated closely to the large caves. This does not change the fact that the Neandertal man did appreciate the very good properties of the chocolate flint, striped flint and the flint from Wierbka. These types of raw material were used in tool production, mainly bifacial, and brought from outcrops situated 5 to 10 km away from the inhabited caves (*Figure 12: C, D*) (Krajcarz *et al.* 2012b).

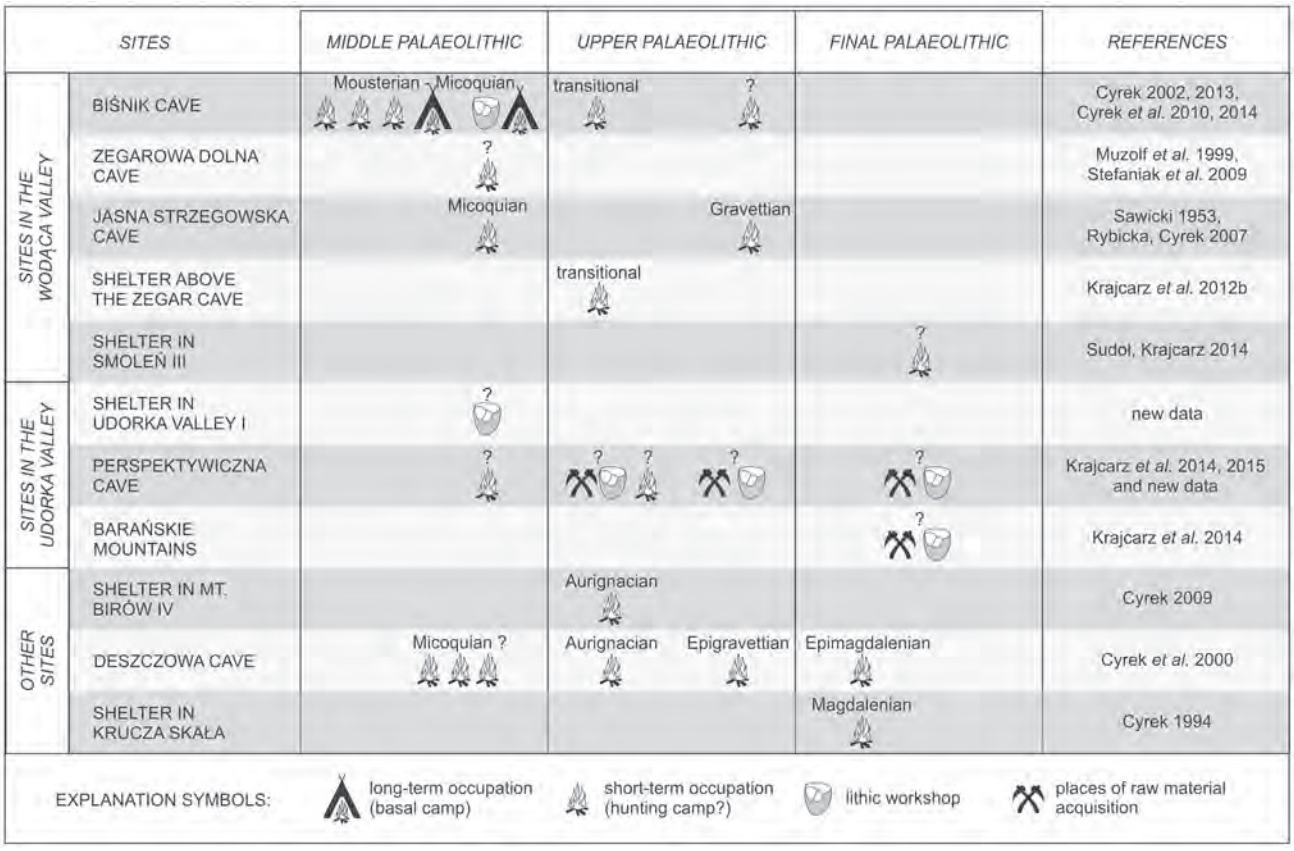

FIGURE 13. Generalized chronology and cultural attribution of Palaeolithic horizons from sites located in the south-eastern part of Ryczów Upland (drawn by M. Sudoł, M.T. Krajcarz).

CONCLUSIONS

The so far conducted research in the Biśnik Cave enabled very precise recognition of the period of Middle Palaeolithic. The initial results of examinations performed in close proximity of the cave indicate that the region was repeatedly penetrated by representatives of younger cultures during Upper and Final Palaeolithic (*Figure 13*).

Undoubtedly, further systematic research will provide the better understanding of the human's choice of settlement location and determine the environmental factors, relationships and preferences of the space penetrated in particular periods of the Palaeolithic.

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