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KRZYSZTOF CYREK, MAGDALENA SUDOŁ

ARTEFACTS OR GEOFACTS? PRESENTING A DILEMMA BASING ON THE EARLY VISTULIAN FINDS FROM THE BIŚNIK CAVE, POLAND

ABSTRACT: The aim of the current work is to attempt to clear up doubts connected with the intentional character of some of the finds, define characteristic features of pseudo-retouches and deal with the problem of re-deposition of sources on the Middle Palaeolithic cave site in the Biśnik Cave. Taking into consideration the character of cave sediments and the evidence proving their re-deposition, one can assume that also flint finds underwent partial relocation, which can have a significant influence on the interpretation of Palaeolithic inventories. Criteria for differentiating between the intentional and natural character of retouches has been established. The identification of intentional and natural character of retouches represents an important issue in the study of Middle Palaeolithic flint assemblages. Taking into consideration the intentional character of retouches among flint inventories of the Early Vistulian levels of the Biśnik Cave, three groups of artefacts have been distinguished: a group of tools with intentional retouch, a group of pseudo-tools with natural retouch, and a group of tools with natural retouch laid over the intentional one. Conclusions from the observation presented in article suggest cautious interpretation of flint tools from the cave sediments.

KEY WORDS: Biśnik Cave – Early Vistulian finds – Artefacts – Geofacts

INTRODUCTION

The Biśnik Cave is situated within the boundaries of Strzegowa village, in the region of the Niegownice-Smoleń hills, in the southern part of the Częstochowa Upland, province of Małopolska (*Figure 1*). During 11 research seasons, an interdisciplinary team supervised by Krzysztof Cyrek, have discovered 20 sedimentary levels ranging from the pre-Pleistocene to the Holocene. Among those, there are at least 16 phases of Middle Palaeolithic cave inhabitation (*Figure 2*). Until now the following elements of the cave system have been

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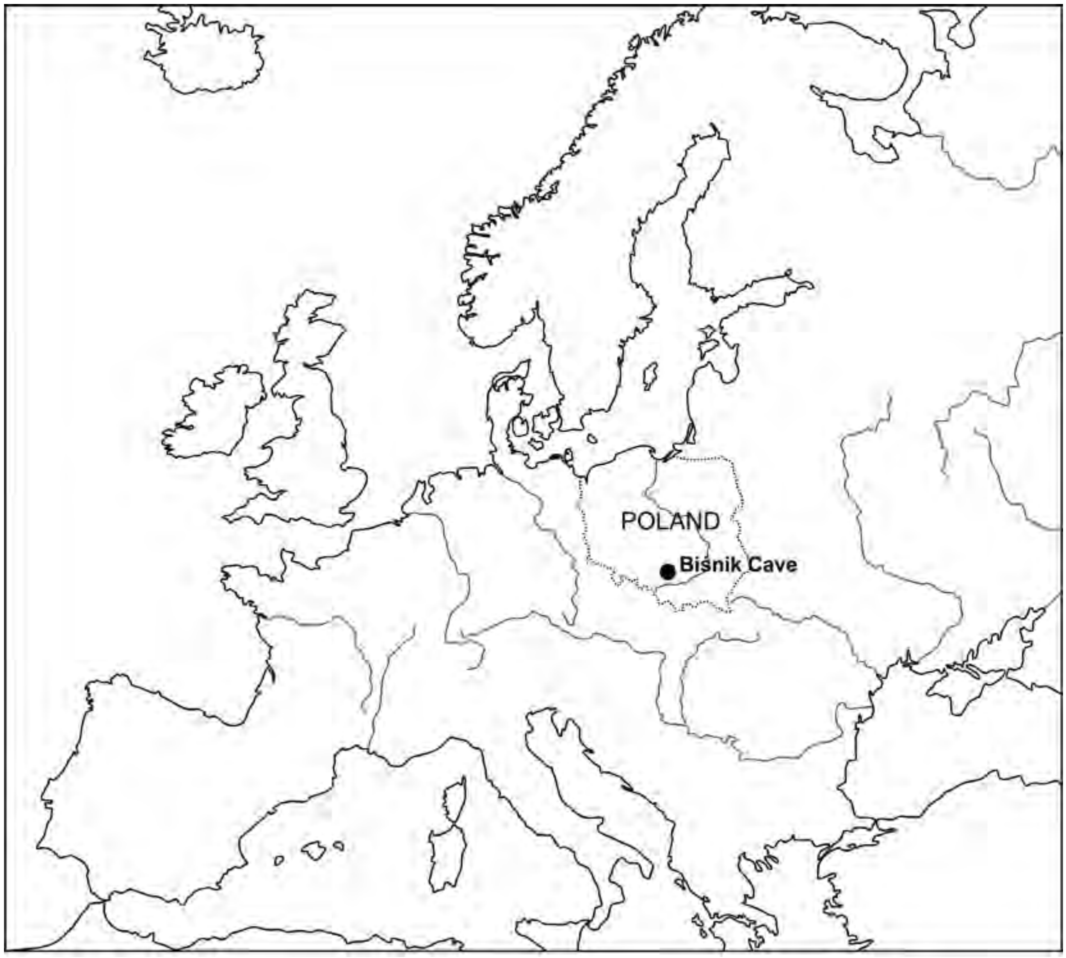

FIGURE 1. Location of the Biśnik Cave.

unearthed: the main chamber, side shelter, side chamber, and the area under the overhang (*Figure 3*) (Cyrek 2002, Cyrek *et al.* 2009). Over many years of research the team have observed a difference between sedimentation inside the cave, where the layers have a linear, horizontal position (*Figure 4*), and the sediments under the overhang, where the layers are disturbed and have a non-linear character (*Figure 5*) (Cyrek, Sudoł 2010).

Artefacts from inventories B, C, and D found in layers 9–11 date back to the Early Vistulian. This chronostratigraphy was obtained by lithological analysis (Mirosław-Grabowska 2002), U-Th dating, electron paramagnetic resonance (Hercman, Gorka 2000, 2002), thermo-luminescence analysis (Kusiak unpublished), from the results of palaeobotanical, and above all from palaeozoological analysis (Cyrek *et al.* 2009, Wiszniowska *et al.* 2002). Early Vistulian layers have been found in all the previously mentioned parts of the cave. The spatial analysis of three inventories (B, C, and D) found in the layers has proved a similar distribution of both, flint artefacts and animal bone fragments, i.e. on both sides of the entrance to the main chamber, in the shelter, and in the side chamber (*Figures 6–8*). At the entrance to the main chamber each layer bore traces of hearths (*Figure 5*).

The aim of the current work is to attempt to clear up doubts connected with the intentional character of some of the finds, define characteristic features of pseudo-retouches and deal with the problem of re-deposition of sources on the Middle Palaeolithic cave site. This paper attempts to establish criteria, which would help differentiate between the intentional and natural character of retouches.

OIS	*Cross-section*	Layer	*U-Th for bones* min-EU-max-LU ka.	*TL for sediment (J. Kusiak)* ka.	*TL for flint artefacts (J. Kusiak)* ka.	*Climato-stratigraphy*	*Fauna complexes*	*Assem-blages.*	*Culture*
1		**1**				Holocene	**I**	**H**	**N/WB/Ś**
2		**2**	*37 - 93*	25+-3 26+-3 29+-4		Upper Plenivistulian	**II**		
3		**3** **4**	32 - 79		54+-10 58+-11	Middle Plenivistulian	**III**	**G**	**PG**
4		**5** **6**		67+-15		Lower Plenivistulian	**IV**	**F**	**Mi**
		7	94 - 96					**E**	**Mi**
		8	*106 - 270*	120+-22					
5a		**9**	*11 - 30*	96+-27 127+-24	81+-17 86+-14 94+-17	Early Vistulian	**V**	**D**	**Mo**
5b		**10**	48 - 106	101+-27	97+-17			**C**	**Mo**
5c		**11**	60 - 153		108+-21			**B**	**Mo**
5d		**12**	*31 - 66*	142+-27	122+-22 135+-23			**A1**	**Mo / Mi**
5e		**13**	63 - 143		126+-25	Eemian	**VI**	**A2**	**Mo / Mi**
6		**14**	56 - 126		81+-17 139+-33 195+-35 224+-49	Wartanian	**VII**	**A3**	**Mo/ Mi** **Mo / Mi**
7		**15**	216 - 930		195+-35	Lublinian (Lubavian)	**VIII**	**A4**	**Mo/ Mi** **Mo / Mi**
?		**16 - 17**				?			
8?		**18**	116 - 346	230+-60	230+-51 279+-97	Odranian	**IX**	**A5**	**Mo** **Mi**
		19	125 - 346					**A6**	**Mo** **Mi**
		19 abc		569+-182	568+-131			**A7**	(?)
?		**20**				Pre-Pleistocene/ Pliocene ?			

FIGURE 2. Overall stratigraphy of the Biśnik Cave (after Cyrek *et al.* 2009, Table 3).

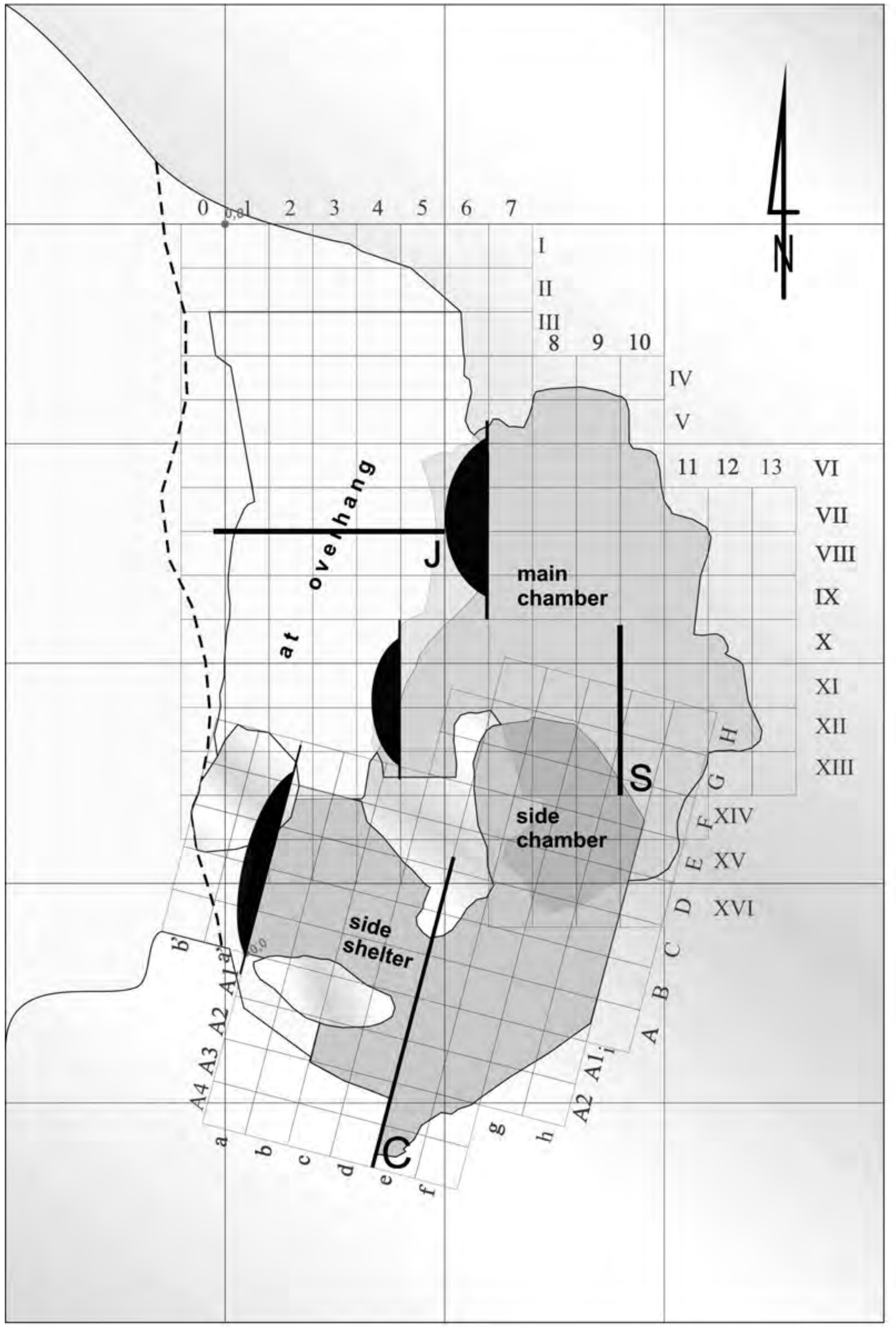

FIGURE 3. Map of the Biśnik Cave site.

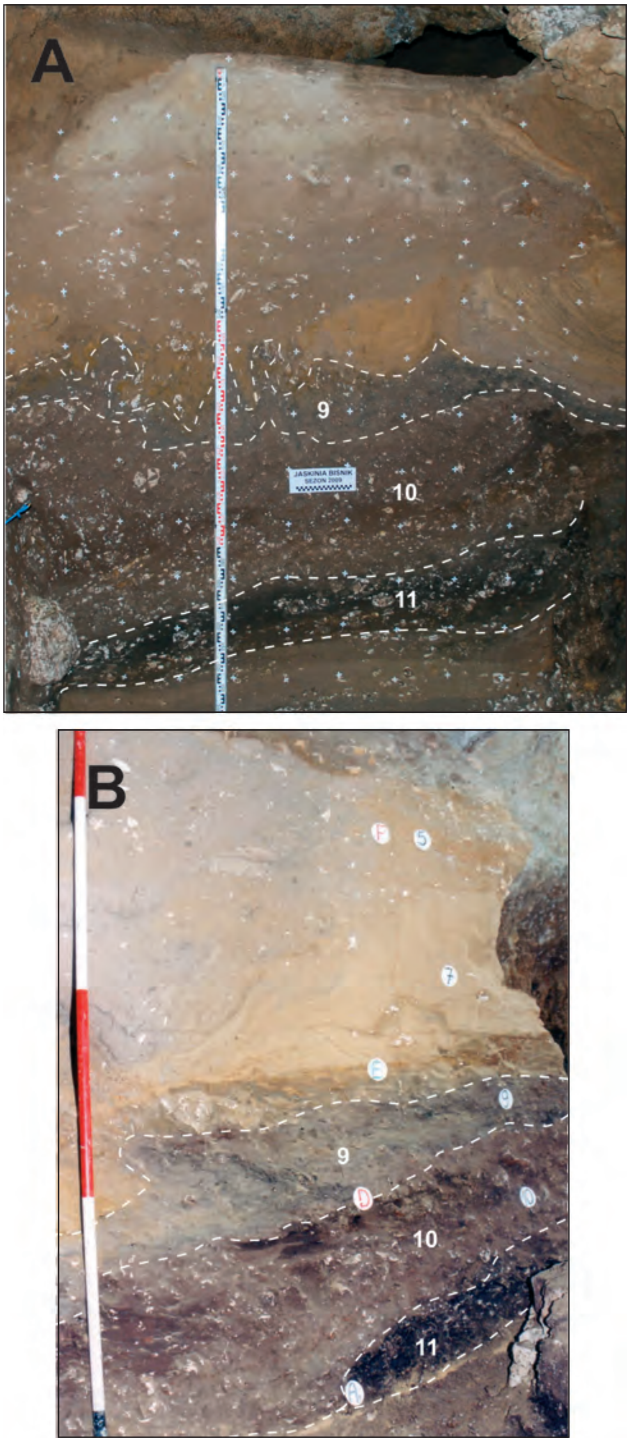

FIGURE 4. Comparison of the cross-section from the side chamber (A), with the cross-section under the main chamber (B) (layers 9–11 highlighted).

STRATIGRAPHY

Layer 11 occupies the lowest position and is made up of dark-brown sandy clay, in some places one metre thick. Sand fraction dominates over dust and loam. The layer contains a large amount of weathered lime rubble (up to 47%) characterised by polished edges and surfaces with corrosion cavities (about 19%) (Mirosław-Grabowska 2002). The layer also contains a very large quantity of original humus (1.8%), which points to intensive cave inhabitation during the accumulation of the sediment.

Above layer 11 lies layer 10, up to 0.5 m thick, consisting of brown sandy clay. In terms of composition sandy fraction dominates over dust and loam. It contains considerably less rubble than layer 11, but the state of preservation is similar. The analysis of heavy minerals also bore a similarity to the previous layer and it indicates that during the layer formation the cave was provided with the material from the same source (Mirosław-Grabowska 2002).

The highest position among the Early Vistulian sediments is occupied by layer 9, which has a grey-brown, sandy clay composition. Its granulometric composition is similar to the previous layers, but the character of lime rubble is different, which points to a lower degree of chemical weathering during the layer formation. The roof contains large limestone rocks (pushed into the sediment), coming from the partially collapsed cave roof (Mirosław-Grabwska 2002).

ENVIRONMENTAL CONSIDERATION

The character of layers 9–11 proves that the deposition of the sediments took place in the conditions of a cool climate (Toruń stadial, after Lindner 1992 – OIS 5a–d). This is confirmed by the material used for sediment formation which was blown in straight from the areas around the cave, and also by the state of preservation of lime rubble which is less weathered than in the Eemian layers deposited below (Mirosław-Grabowska 2002: 177). It has to be emphasised that forest taxa are continuously present, especially in layer 9 (Cyrek *et al.* 2009), which can be linked with the approaching Gniew interstadial or may indicate that the cooling process was not too intense. Also one has to bear in mind the specific character of the area of the Kraków-Częstochowa Upland in the Pleistocene, where even cold periods were characterised by the presence of taxa typical of forests, forest borderlands and open areas. It can be

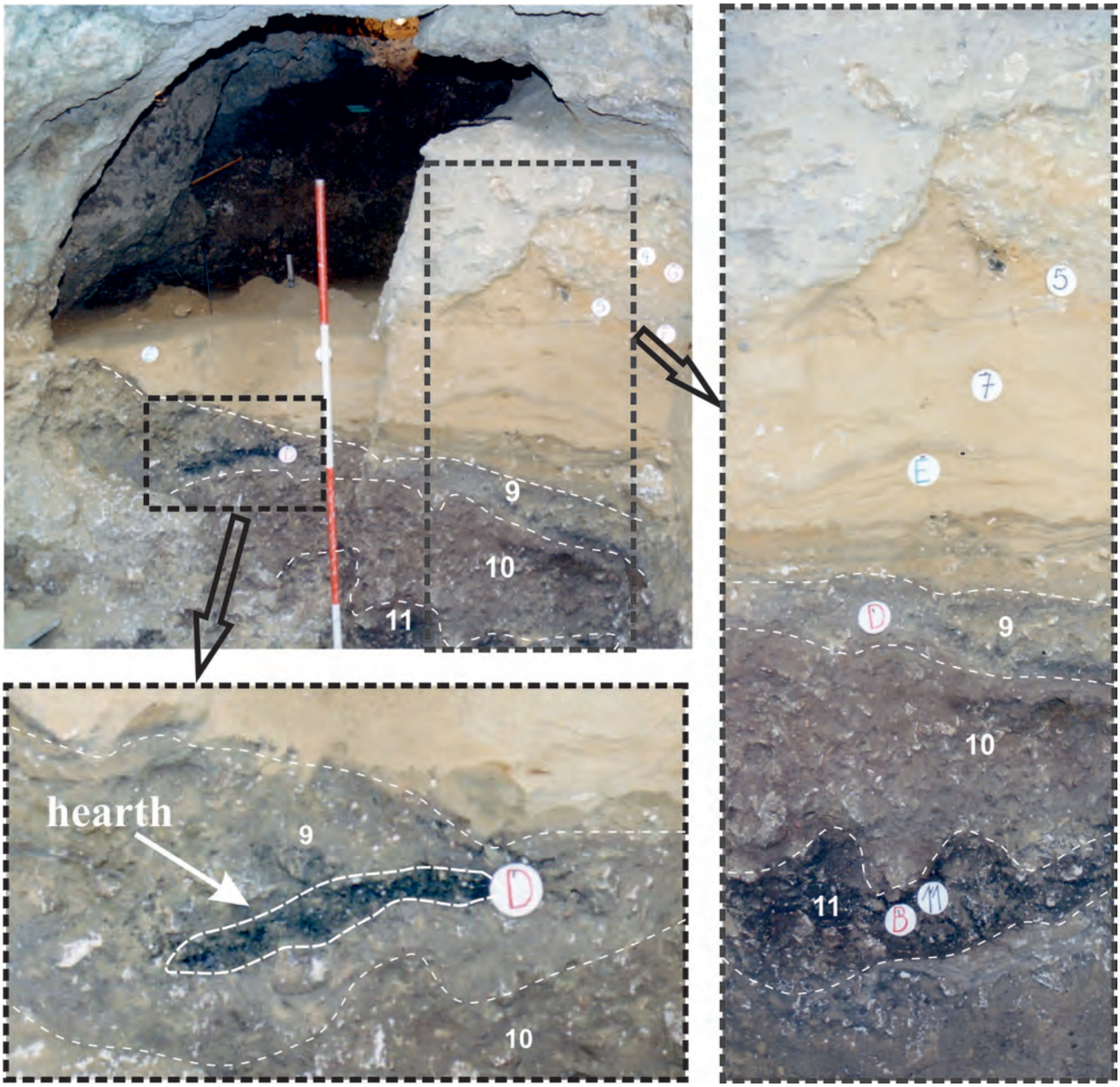

FIGURE 5. The cross-section from the overhang, at the entrance to the main chamber (layers 9–11 and hearth highlighted).

generally assumed that open areas with the presence of forested areas (park forests, forest-steppes) prevailed.

ARCHAEOLOGICAL REMAINS

Three cultural levels found in the Early Vistulian layers have a similar state of preservation and an analogous typological character. A total of 330 flint artefacts have been found in the separate inventories B, C and D. Layer 11 yielded 151 artefacts, layer 10 – 125 artefacts, and layer 9 – 54 artefacts (*Table 1*, state of research from 2008). The inventory contains a considerable number of chips (about 19%) obtained by sediment floating. The technical-typological analysis allows for a jointed treatment of the inventories. It is

TABLE 1. Tool structure in layers 9–11 (state of research from 2008).

	Layer 9				Layer 10				Layer 11			
Form	N	%	N	%	N	%	N	%	N	%	N	%
Raw material concretions and thermal chunks	22	14.6	22	14.6	22	17.6	22	17.6	5	9.3	5	9.3
Cores	10	6.6			8	6.4			3	5.6		
Levalloisian cores			5	3.3			2	1.6			2	3.7
Other cores			5	3.3			6	4.8			1	1.9
Debitage	14	9.3			13	10.4			6	11.1		
Levalloisian debitage			1	0.7			3	2.4			1	1.9
Ordinary flakes			13	8.6			8	6.4			5	9.3
Ordinary blades			0	0.0			2	1.6			0	0.0
Chips	42	27.8	42	27.8	12	9.6	12	9.6	10	18.5	10	18.5
Tools	63	41.7			70	56			30	55.6		
Retouched flakes			14	9.3			6	4.8			2	3.7
Retouched blades			2	1.3			2	1.6			0	0.0
Denticulates tools			2	1.3			15	12.0			3	5.6
Notches/denticulates tools			15	9.9			7	5.6			5	9.3
Side-scrapers			1	0.7			3	2.4			5	9.3
Atypical backed knife			1	0.7			0	0.0			0	0.0
Perforators			4	2.6			0	0.0			0	0.0
Bifacial leaf-point			0	0.0			0	0.0			1	1.9
Microlithic tools			17	11.3			26	20.8			6	11.1
Picks			1	0.7			0	0.0			0	0.0
Other tools			6	4.0			11	8.8			8	14.8
Total	151	100.0	151	100.0	125	100.0	125	100.0	54	100.0	54	100.0

confirmed by the recurrence of the same traits in the analysed inventories, i.e. the co-occurrence of the Levalois technique with the technique of multiplatform core, the dominance of flake, denticulate forms over side-scrapers (often converging, of the La Quina type) and the presence of microlithic forms (*Figure 9:1–8*). There was also one example of bifacial, leaf-shaped Mousterian point (*limace*) (*Figure 9:9*). It seems that these are Mousterian inventories with the Levalois technique formally linked with La Quina facies and denticulate facies (Cyrek 2006, Cyrek *et al.* 2009). Some typological analogies to the inventories in question can be found in the Obłazowa Cave (layers XX–XVII) (Valde-Nowak *et al.* 2003) and Kůlna Cave (layer 11) (Valoch 1988), but they both lack the use of the Levalois technique.

The prevalent raw material is Jurassic flint, most probably coming from the outcrop situated in the vicinity of the Biśnik Cave (*Figure 10*). Usually this was low quality raw material found in small concretions. This is confirmed by the observation of single concretions of raw material found in the previously described inventories, which are between ten and twenty centimetres in diameter (*Figure 11:1*). Their surfaces point to their erratic character. In many cases concretions and artefacts are covered with patina, the polishing of surfaces and edges, as well as pseudo-retouches, which in many cases are difficult to distinguish from intentional retouches.

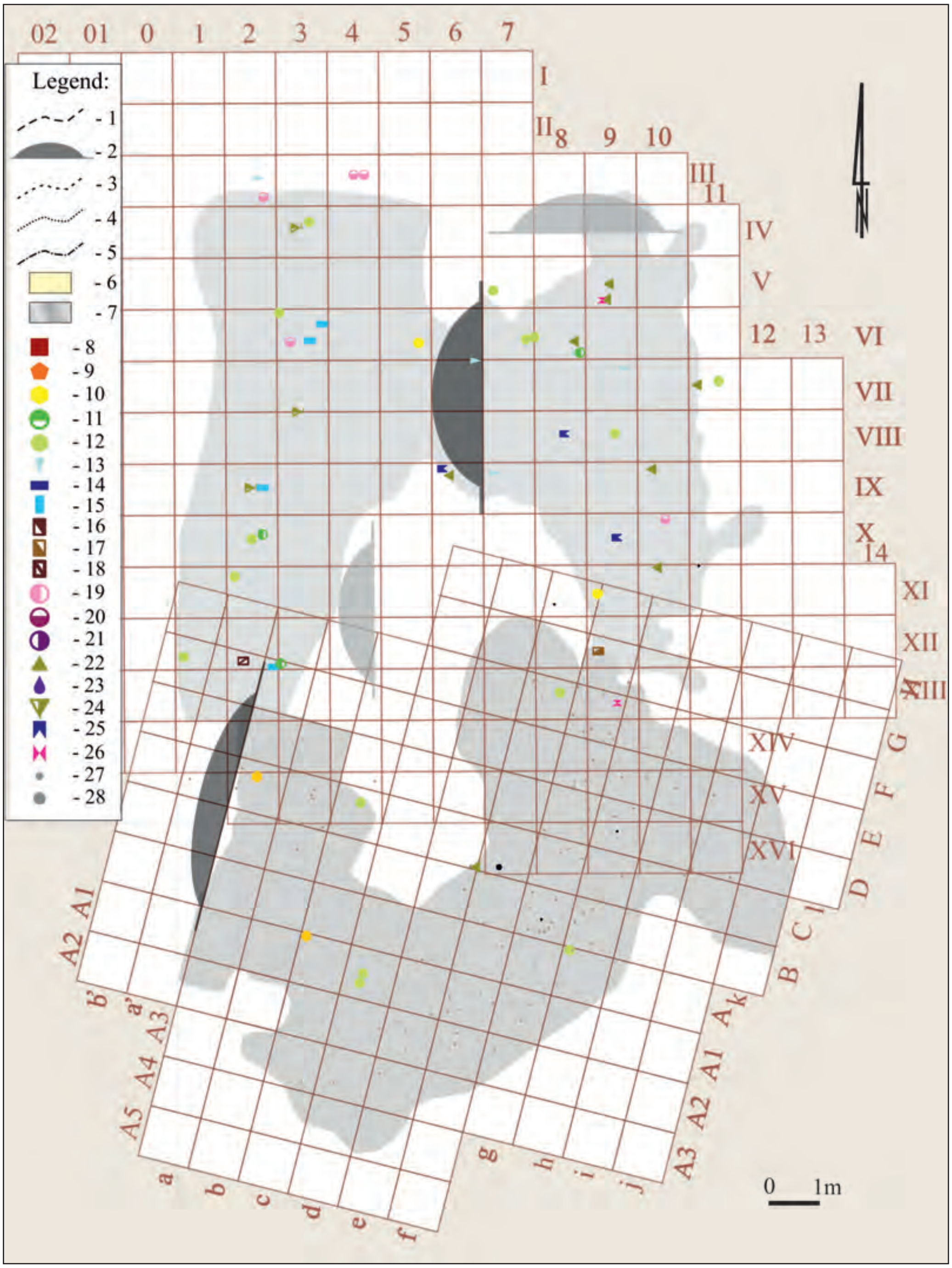

FIGURE 6. The range of the finds present in layer 9, spatial layout. Legend: 1, overhang range; 2, entrance to the cave; 3, overhang dig; 4, chamber dig; 5, side shelter and side chamber digs; 6, terrace in front of the cave; 7, rock; 8, Levallois cores; 9, discoidal cores; 10, other cores and pre-cores; 11, Levallois flakes; 12, ordinary flakes; 13, chips and chunks; 14, Levallois blades; 15, ordinary blades; 16, Levallois points; 17, Mousterian points; 18, other points; 19, side-scrapers; 20, knives/side scrapers; 21, backed knife; 22, denticulate and notche-denticulate tools; 23, bifacial tools; 24, scrapers and burins; 25, other tools and retouched forms; 26, raw material nodules; 27, bones; 28, stones, speleotherms, coprolites.

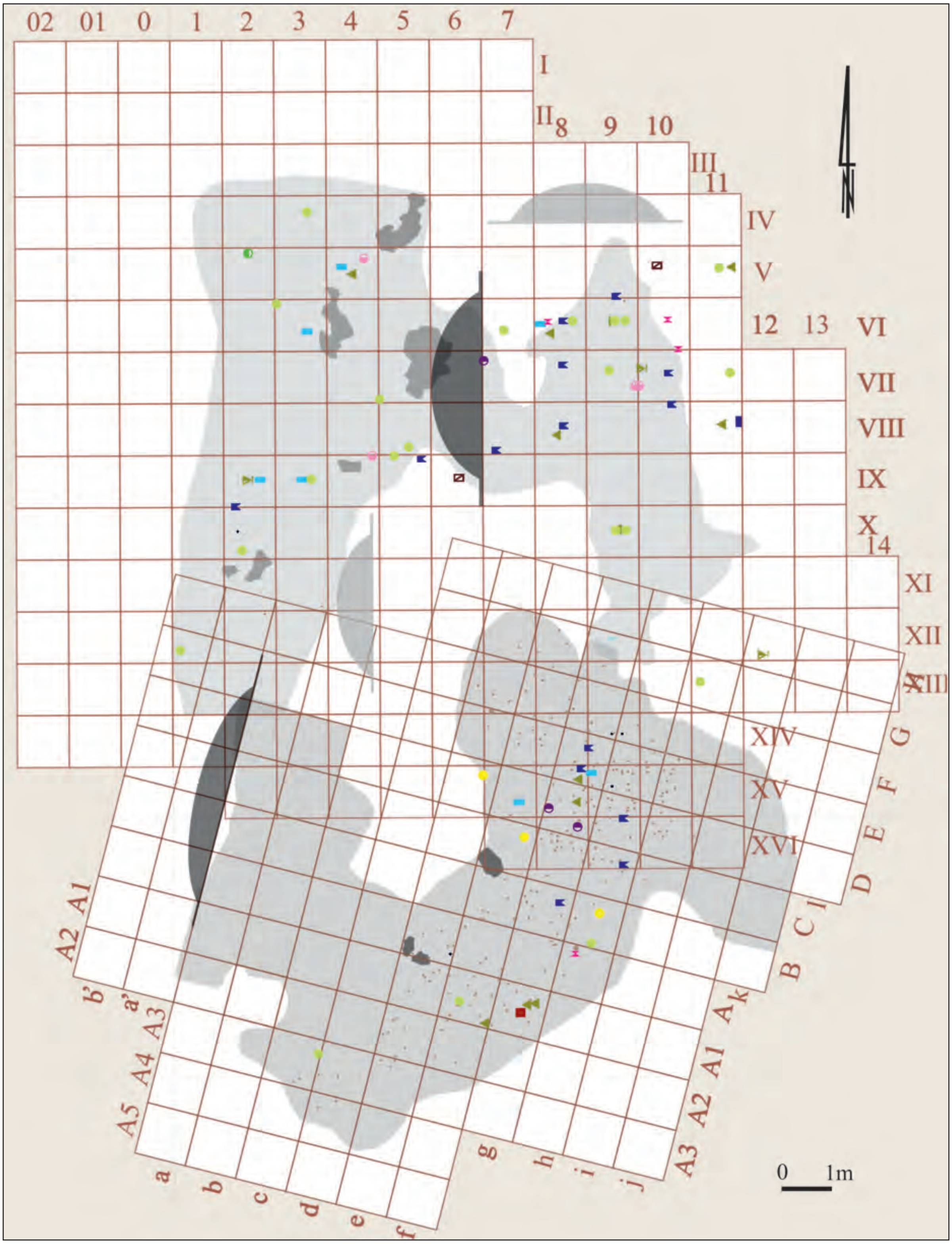

FIGURE 7. The range of the finds present in layer 10, spatial layout (for symbol explanation, see, *Figure 6*).

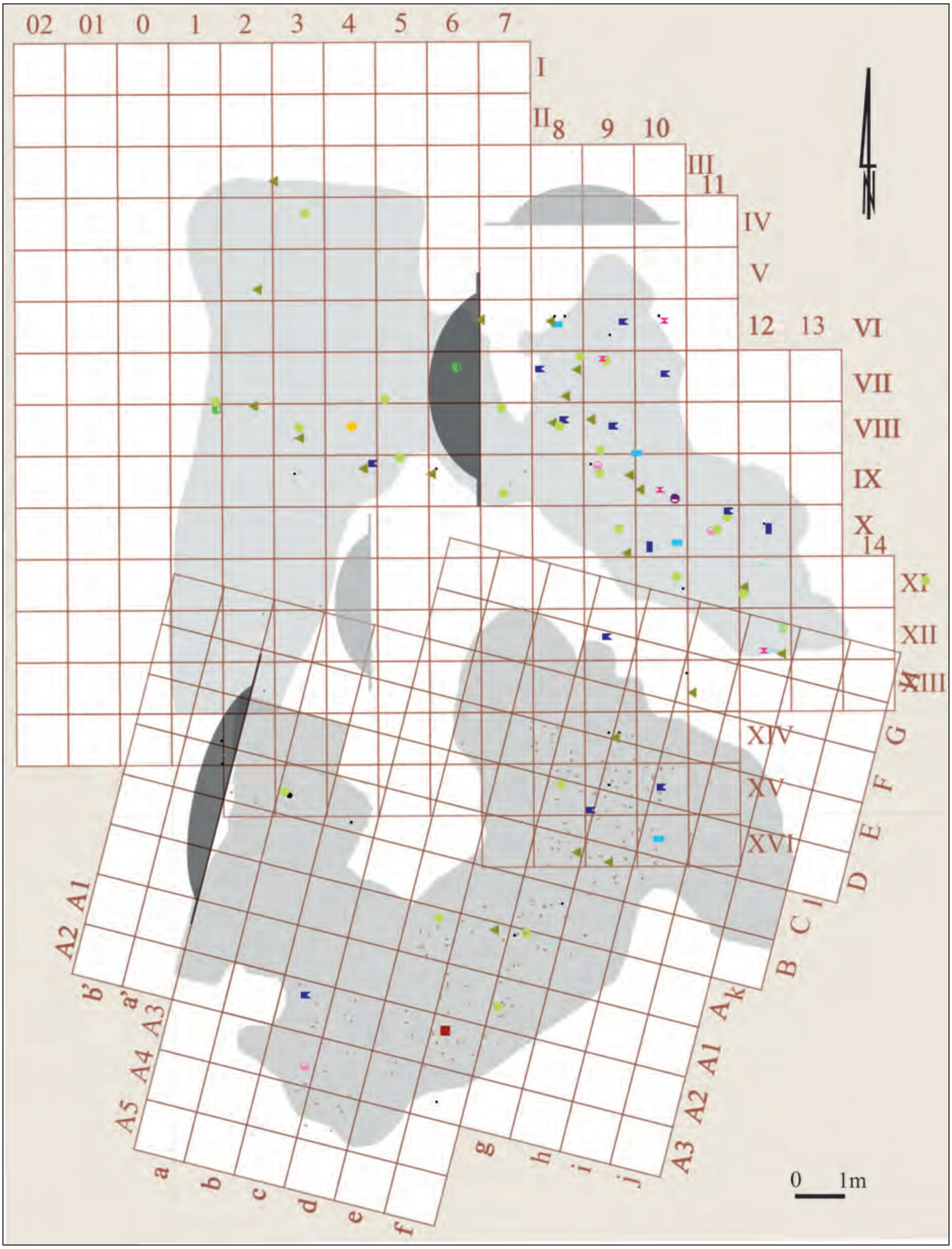

FIGURE 8. The range of the finds present in layer 11, spatial layout (for symbol explanation, see, *Figure 6*).

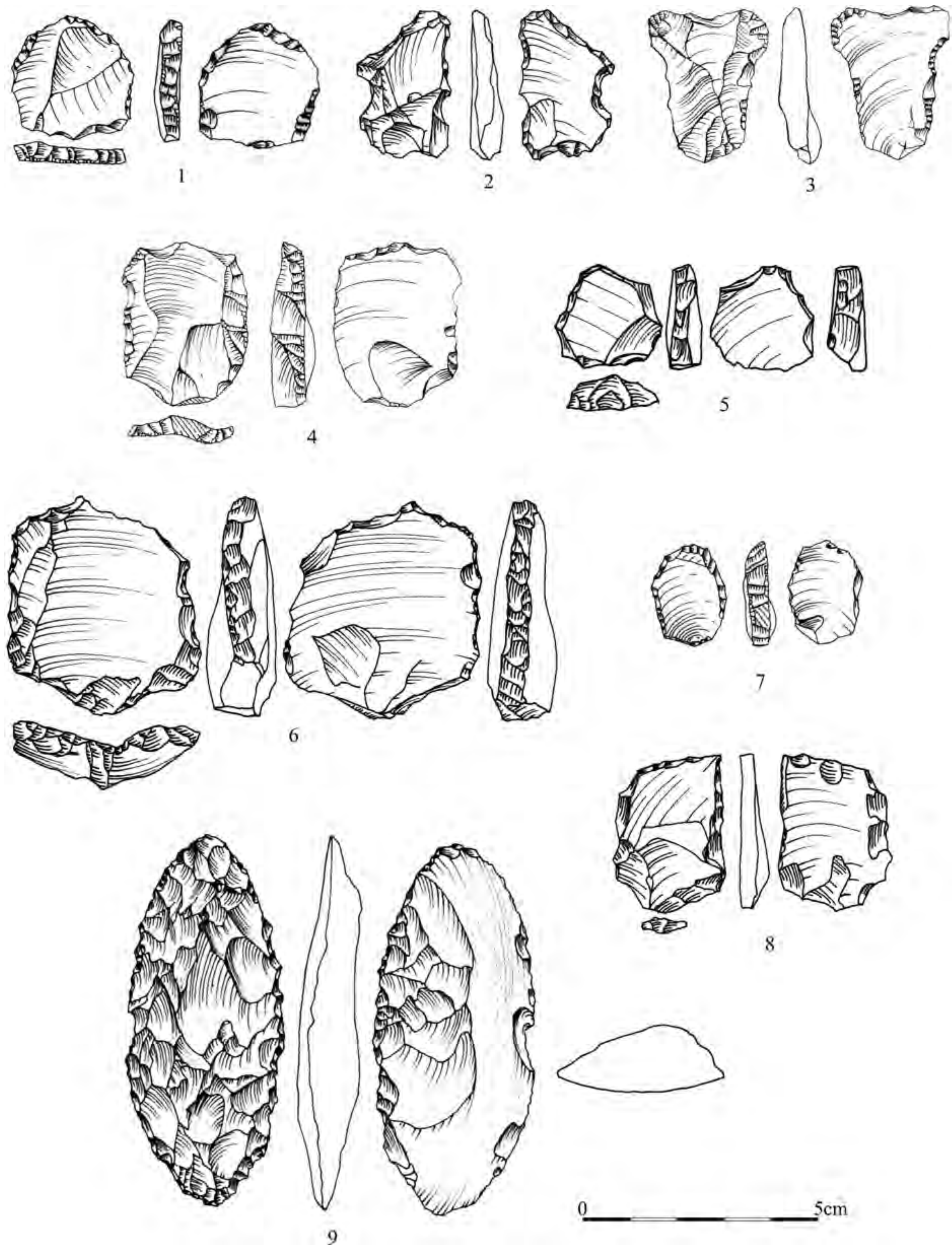

FIGURE 9. Artefacts from inventories B–D (layers 9–11); 1–8, notched and denticulate tools; 9, leaf-shaped Mousterian point.

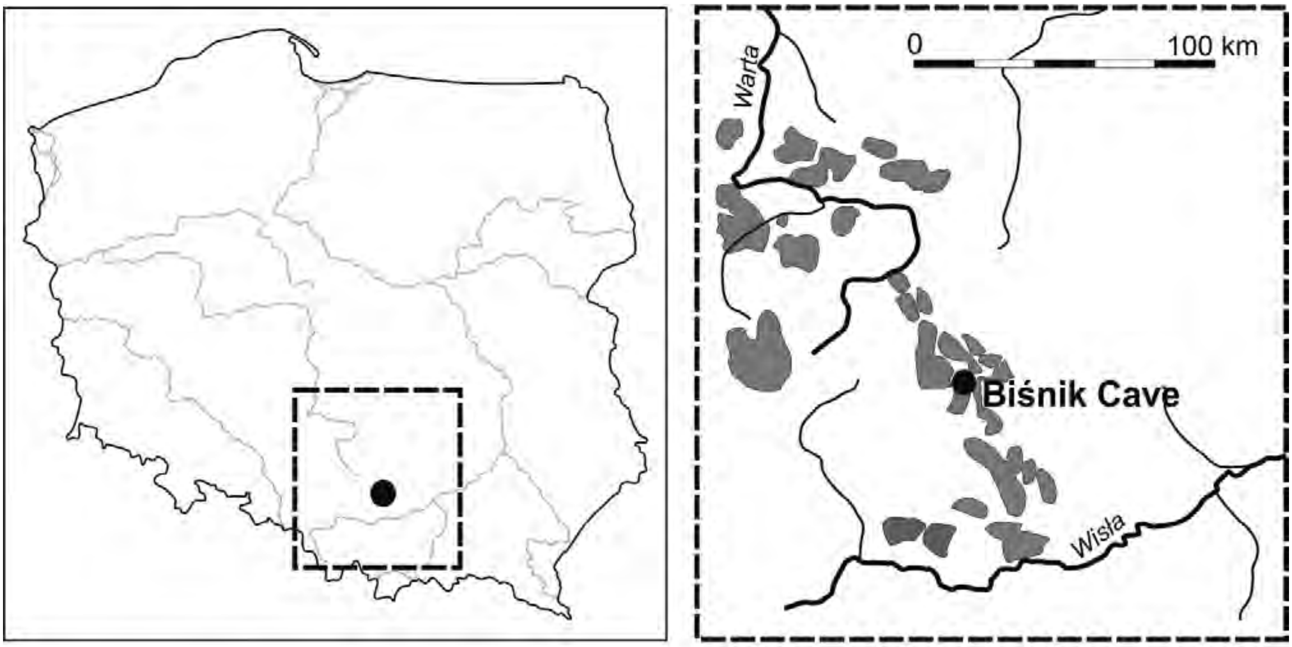

FIGURE 10. Location of the Biśnik Cave site at the background of Jurassic flint outcrops, in the Kraków-Częstochowa Upland.

TAPHONOMICAL PROCESSES

The state of preservation of flint tool forms from layers 9–11 must have been influenced by climatic changes in the Early Vistulian period. Sediments were accumulated in the conditions of a cooling climate. Numerous processes of freezing and thawing of artefacts must have taken place during their sedimentation. Those processes were intensified in the next period of the maximum glaciation of the Vistula, which undoubtedly led to the relocation of sediments and thus to the re-deposition of flint artefacts and animal bones. Those processes might and most probably did lead to greater or lesser modifications of flint artefacts after their deposition in the sediments.

The problem of re-deposition of sediments on cave sites and the material they contain has been tackled in literature a number of times. Local relocation within the boundaries of one or several layers of flint material may be indirectly proved by the phenomenon of natural post- sedimentary relocation of bone remains in the cave silt. This problem has been dealt with several times in archaeological, also Polish literature (among others Armour-Chelu, Andrews 1994, Chmielewski 1967, Coard, Dennell 1995, Dylik *et al.* 1954, Madeyska 1981). A recent attempt of this kind has been made by Krajcarz (2009), who provided further evidence to prove partial re-deposition of material, also between layers, based on the chemical analysis of bone material coming from the Early Vistulian (layer 11) and Eemian (layer 12, 13, and 13a) sediments in the Biśnik Cave. It is vital for the bio-stratigraphic research of the cave silts.

Mechanical fracturing, modification of edges, and relocation of flint artefacts might have taken place much later, in the inter-plenivistulian period, when the cave roof collapsed, especially at its entrance. Huge stones hit the ground, distorted the natural stratigraphy of sediments and thus caused the distortion of the surfaces and edges of flint artefacts, and contributed to the formation of pseudo-artefacts.

Apart from the environmental factors, human and animal activity should be taken into consideration while analysing natural deformations on the edges of the artefacts. Bearing in mind that the cave underwent several stages of inhabitation in the Early Vistulian period, artefacts and natural flint concretions were often fractured and relocated as a result of treading and digging cavities. To a great extent this must have been caused by animals, which inhabited the cave during the periods of human absence from the site.

RESULTS

All the above mentioned factors made the authors tackle the problem of doubts connected with the

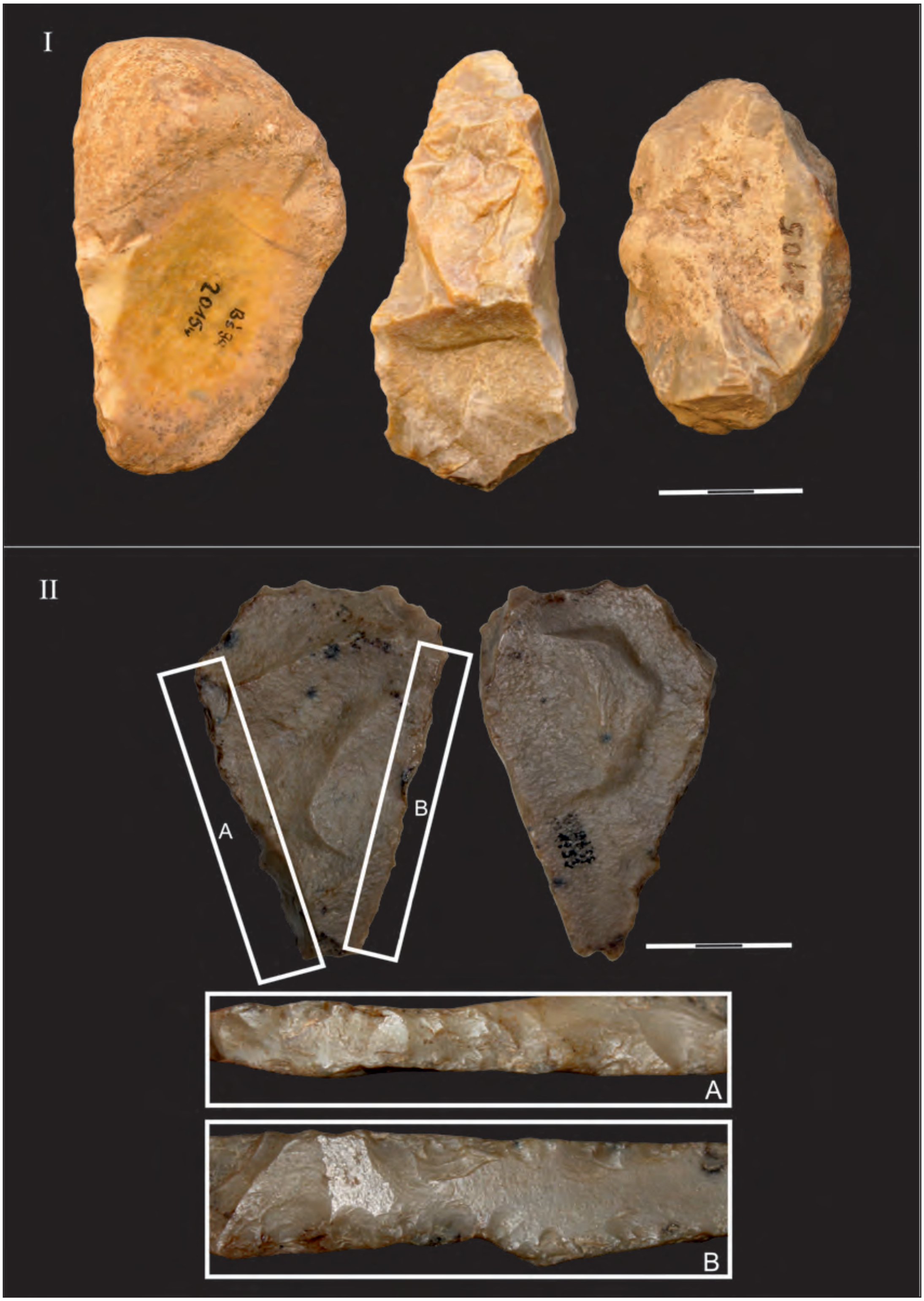

FIGURE 11. Examples of raw material in layers 9–11. I, concretions; II, pseudo-tools with natural retouch on natural concretions.

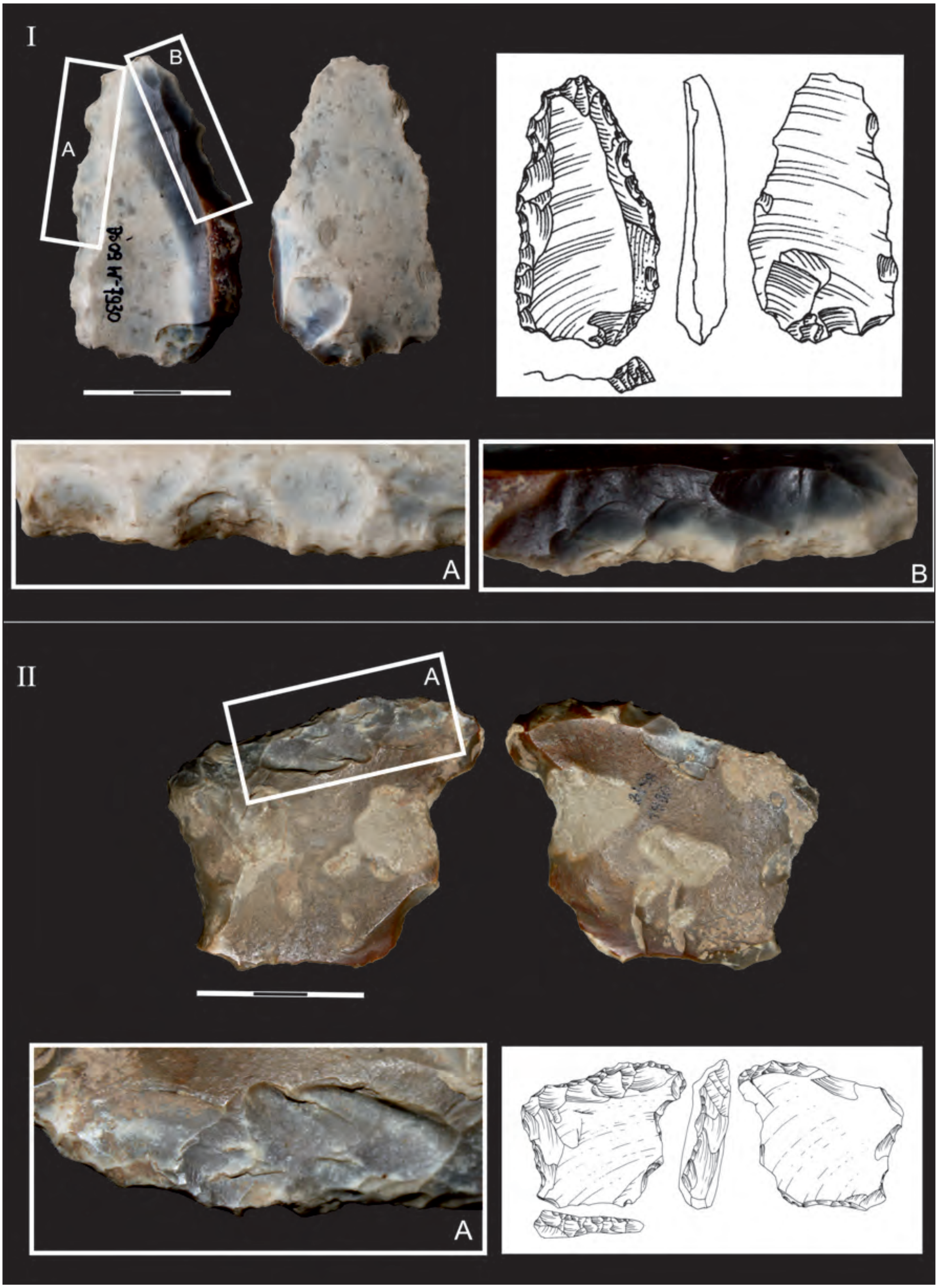

FIGURE 12. Examples of typical tools intentionally retouched. I, on debitage; II, on natural concretions.

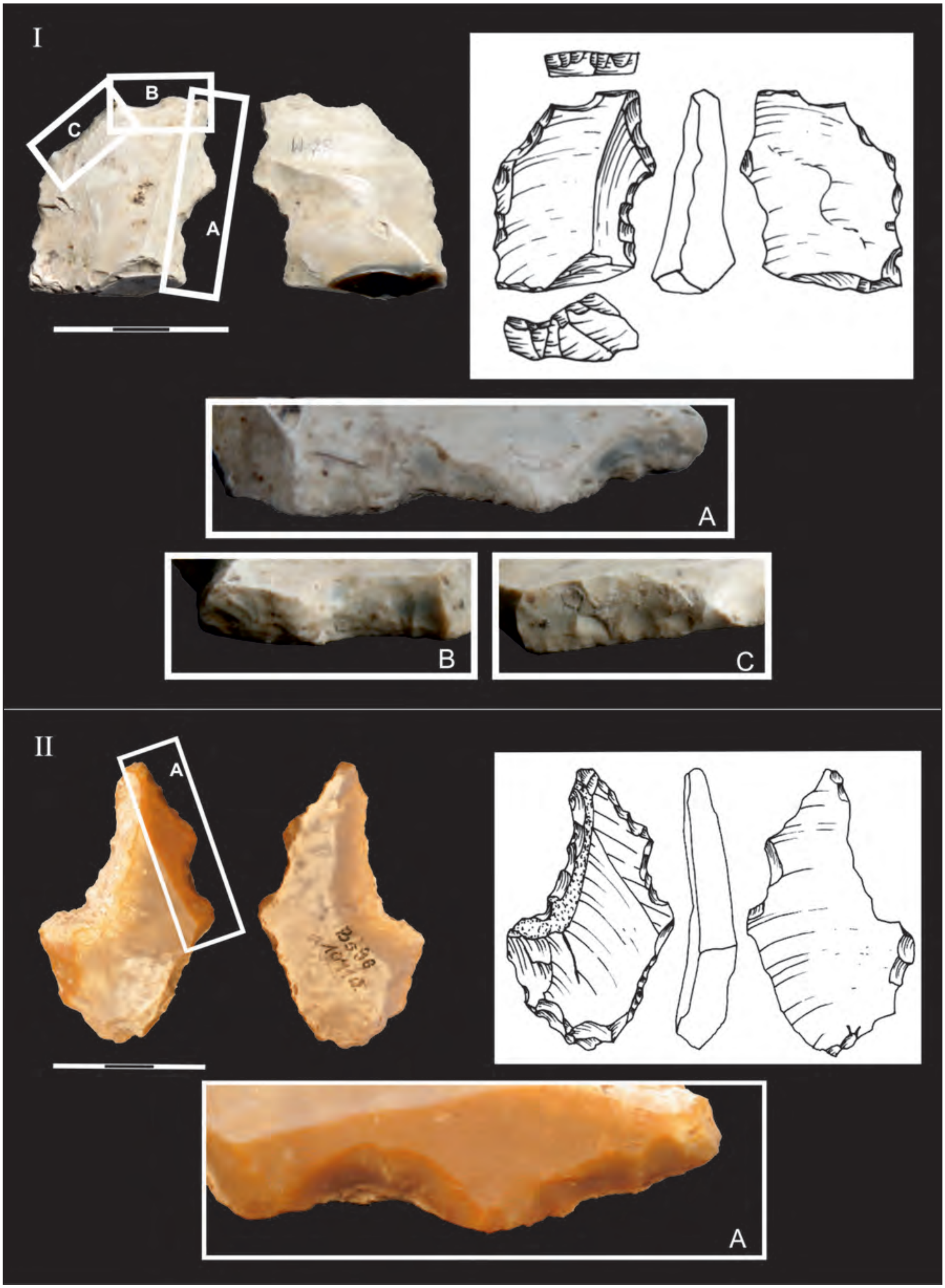

FIGURE 13. Examples of pseudo-tools with natural retouch on debitage.

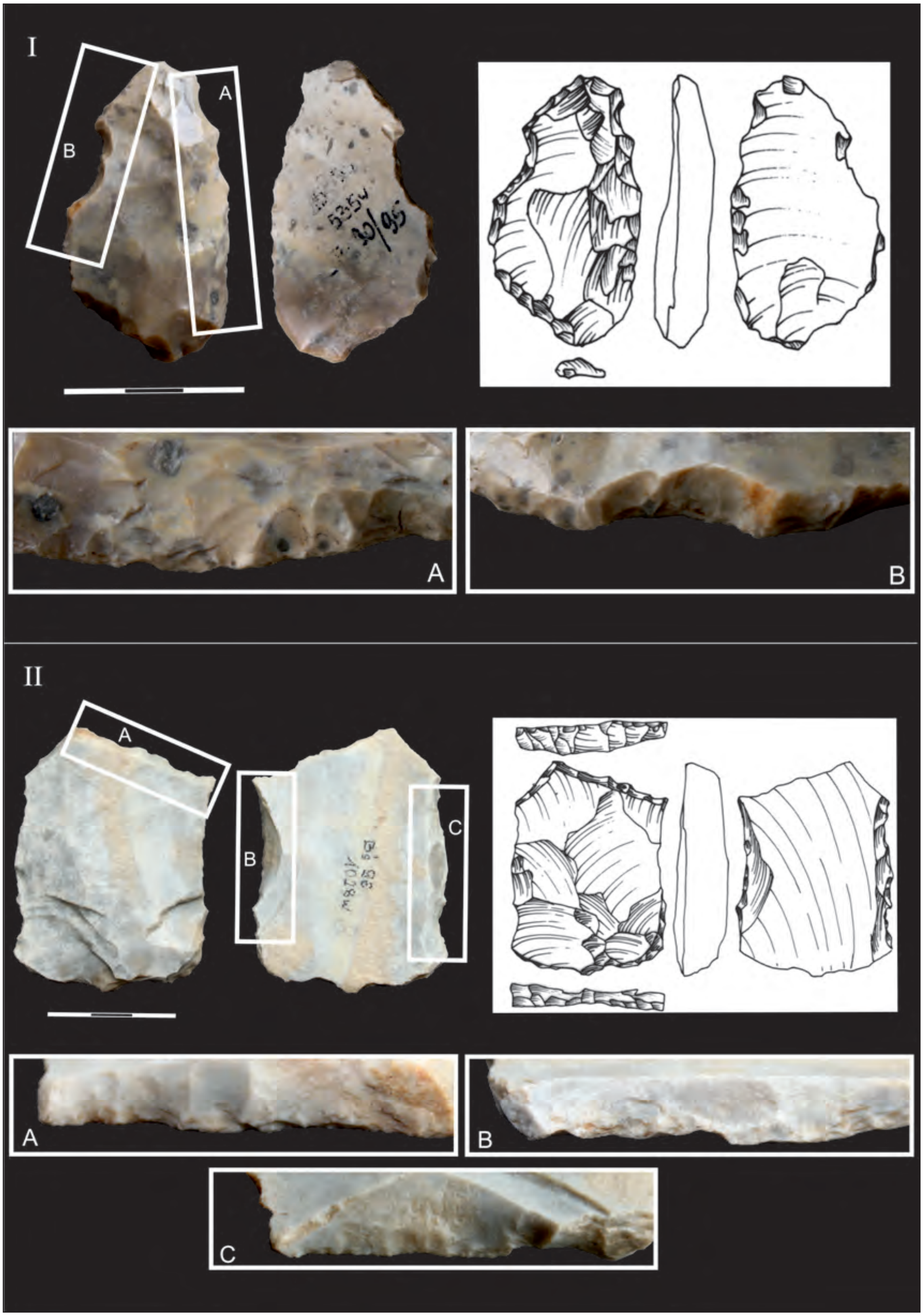

FIGURE 14. Examples of tools with natural retouch laid over the intentional one.

intentional character of some of the finds coming from the Early Vistulian sediments (layers 9–11) in the Biśnik Cave, and attempt to set out criteria which would help discriminate between intentional and natural retouches.

The current work is based on the observations of Polish and west-European researchers who dealt with the problem of micro-retouches and the natural chipping of edges (inter alia, Chmielewski *et al.* 1967, McBrearty *et al.* 1998, Prost 1993, Thiébaut 2010, Vallin *et al.* 2001), taking into account their own observations based on comparative analysis with other flint assemblages in the Biśnik Cave, coming from other climatic periods. We also included comparisons with assemblages dated to the early period of the Vistula glaciation coming from other European sites, both cave and open ones.

During the retouch analysis the following criteria were taken into consideration: the morphology of negatives/crumbling (shape, single, recurring, neighbouring, or overlapping negatives, micro-chipping, state of surface) their position in relation to semi product (location, range, gradient) and the form of edges (profile, side outline, state of surface).

Among flint inventories coming from the previously described layers 9–11, three groups of artefacts have been distinguished, taking into consideration the intentional character of retouches:

1. A group of tools with intentional retouch;
2. A group of pseudo-tools with natural retouch;
3. A group of tools with natural retouch laid over the intentional one.

The first group of artefacts is characterised by an edge, regular retouch, uniform in terms of morphology and the state of preservation. It is most commonly a one-sided retouch of the La Quina type reaching quite far at the upper surface of the semi-product and at times completely covering it. This is how one-sided and converging side-scrapers and the previously mentioned leaf-shaped point were made (*Figure 9:9*). It must be noted that a majority of the tools were made from flakes (*Figure 12:I*), with some examples of those made from flint sliver (*Figure 12:II*).

The second group, classified as pseudo-tools, was divided into two sub-groups. The first contained natural slivers with single pseudo-percussions, the fracturing of edges and pseudo-retouches (*Figure 11:II*). The second sub-group consists of flake and to a lesser extent blade semi-product, whose edges were chipped due to natural post-deposition processes (*Figure 13:I, II*). This pseudo-retouch shaped the edges of the semi-product in a way that is irregular, reverse, denticulate, mostly half-steep and steep, less frequently flat, with single traces of chipping. The pseudo-retouch often forms niches turning flakes into denticulate tools, irregular blades, scrapers and perforators. In a vast majority of cases the state of preservation of the pseudo-retouch differs from the state of preservation of the surfaces of the negatives on the semi-product – it is clearer, as if fresher, and not covered with patina, or covered with patina of less intense character.

The most numerous and at the same time most controversial of the three groups is the third one, containing authentic tools, whose intentional retouch was distorted by a later pseudo-retouch (*Figure 14:I, II*). It is visible on a number of flake tools, smoothing uneven edges or forming irregular niches. Examples of such fracturing are also visible on specimens with surface retouch. They can also be seen on core edges with a various degree of use. The most problematic issue is the unambiguous differentiation between the two categories of retouch (intentional and natural) in the case of flakes chipped around, or almost around with half-steep and steep, reverse and slightly denticulate retouch. Based on a comparison with evident fresh pseudo-retouches present on some pseudo-artefacts from layers 9–11, some of them, with a high degree of probability, could be excluded as natural. Intentional retouch was considered to be qualitatively different from the one described above. In such cases it is regular, linear, and one-sided, gradual, and at times far-reaching on the surface of the form. However, it is difficult to form an unequivocal opinion about the other retouches, e.g. steep, slightly denticulate, reverse and irregular, which may, as it seems, result from post-deposition processes and be indicative of traces of human activity (functional retouch formed as a result of using the above mentioned forms).

DISCUSSION

One has to take into account the similarity in the shape and character of the retouch of some metrically varied artefacts, i.e. flakes with denticulate around or almost around chipping, which constitute the most numerous group of tools. Among those we can find large, middle and very small forms. We may be dealing here with a long-term use of the tools on the site and the reduction of size resulting from numerous cases of fixing the retouched edges (?) (*Figure 15*). Perhaps this kind of modification was, in some cases, covered by natural retouch.

The traseological analysis of some artefacts from layer 9 carried out by G. Osipowicz highlights serious fracturing of all the analysed forms. In practically no case was the

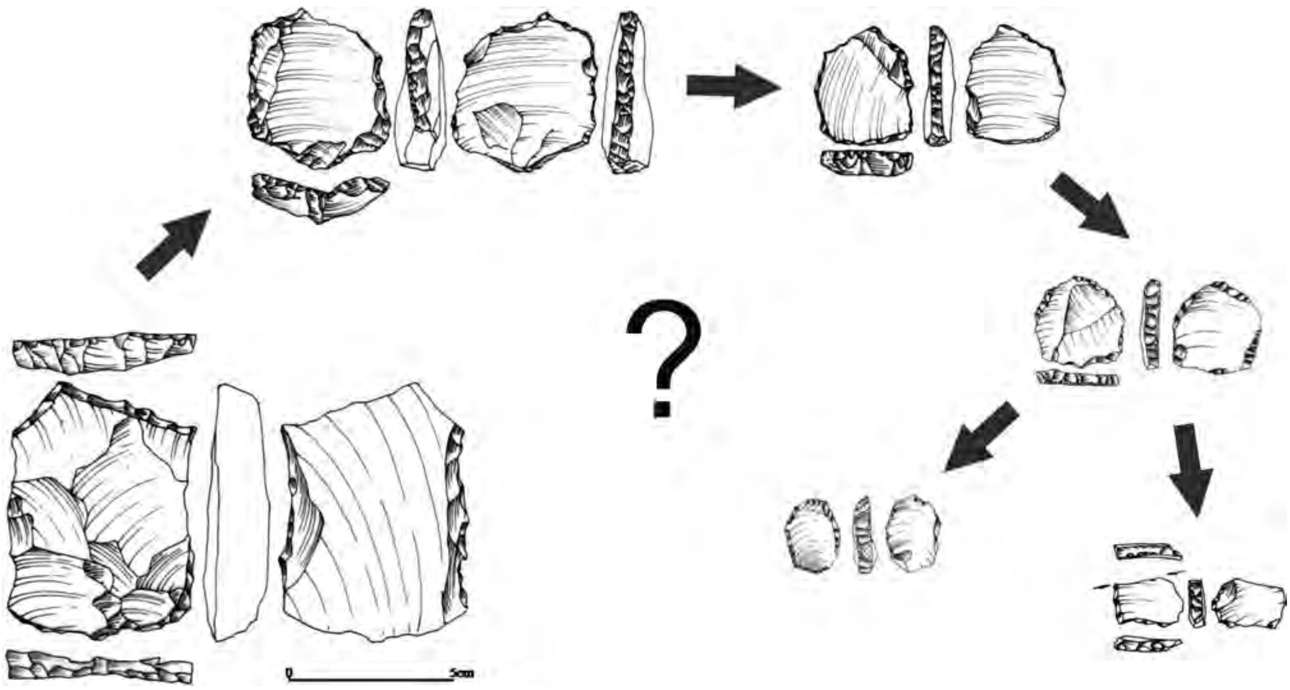

FIGURE 15. Diagram of the reduction of steeply-retouched forms during their use.

definite tool function possible to determine. One can only point to the prevalence of tools used for hard raw material processing, i.e. wood and bone/horn. The author underlines that functional traces on tools used for processing "soft" raw materials (e.g. leather and meat) are more prone to "erasing", so we cannot rule out the possibility that the observed situation is the result of serious post-deposition fracturing. The problem of a precise differentiation between some examples of functional micro sheen, especially when faintly visible, and those of post-deposition character has not been entirely solved so further research may help clear up the matter.

Inventories similar to those in terms of typology and the state of preservation were long ago dealt with by Polish researchers on sites such as: the Koziarnia Cave (layers 20–17), Nietoperzowa Cave (Chmielewski 1964, 1967), and the Okiennik Cave (Krukowski 1939–1948). The inventory from Okiennik was described by Krukowski as *dupicki* (Polish term) assemblage (according to Krukowski, it was previously called *frustes musteriennes;* Krukowski 1939–1948: 50). Chmielewski noting the similarity between the above mentioned assemblage and the ones coming from French sites (such La Micoque, Pech de l'Aze) described the inventories from the Koziarnia and Nietoperzowa as Tayacian – *dupicki*. Drawing on the observations of French researchers (Bordes, Burgon), he paid attention to two factors turning artefacts into pseudo-tools, i.e. the human factor (treading) and natural one ("processing" of artefacts within structures caused by cryoturbation – frost churning).

In terms of morphology and the state of preservation, one can also observe a similarity to the Fontéchevade site (France), where assemblages A, B, and E underwent numerous processes linked with the partial soil fluction of the deposit containing artefacts (Chase *et al.* 2009). The inventories are characterised by a high degree of fracturing present on two surfaces. Such damage was often recognised as retouch, especially in case of types 46–49, after Bordes (1961). A similar example is provided by niche and denticulate tools, which bear traces of intentional-like retouch. However, a high frequency of the tool occurrence in assemblages juxtaposed with the character of sediment and the processes they underwent after deposition, point to the fact that we deal with retouches void of human activity and formed as a result of (inter alia) sedimentary movements.

CONCLUSION

A morphological similarity of flint forms from layers 9–11 in the Biśnik Cave to pseudo-tools on the above

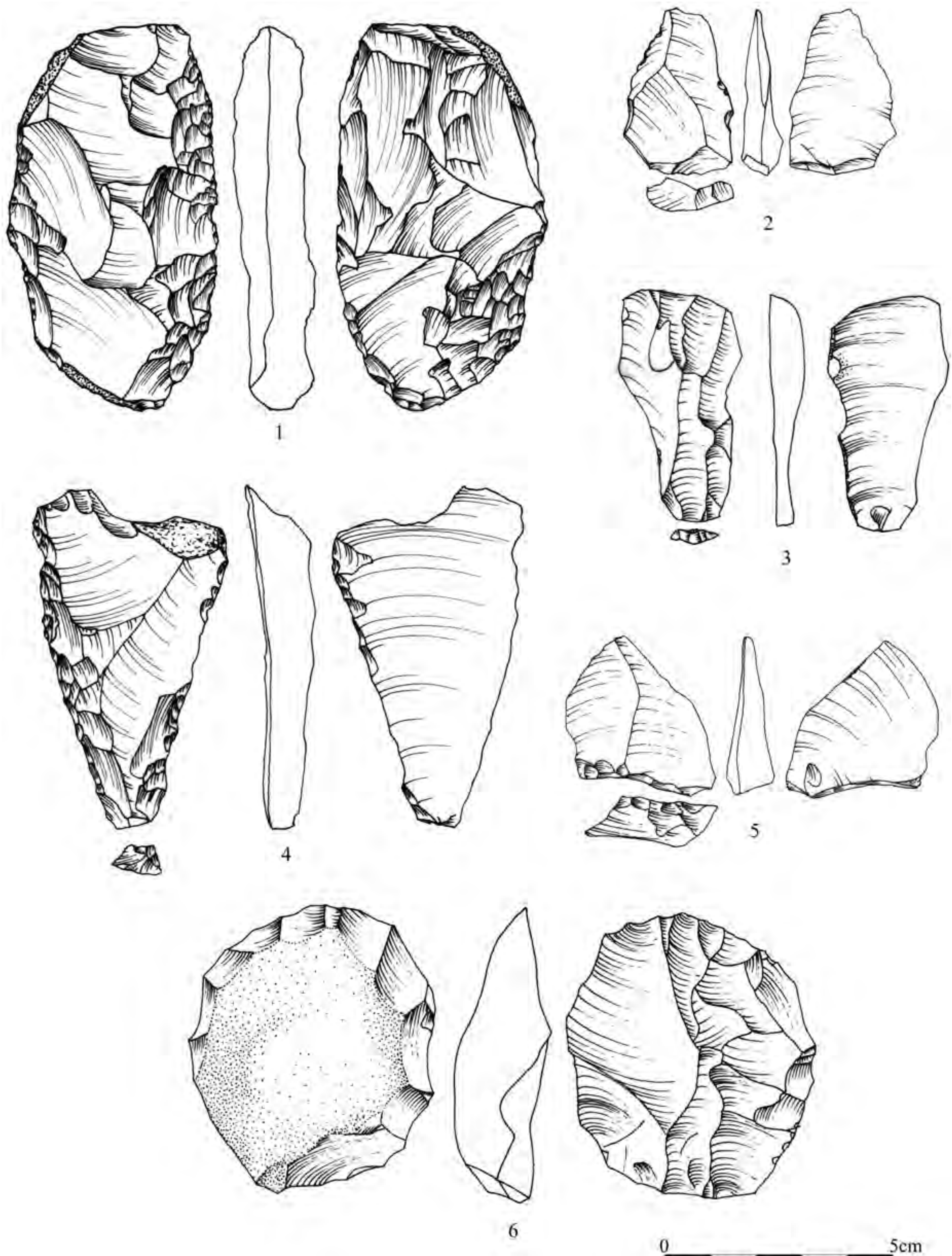

FIGURE 16. Artefacts from inventories F–E (layers 5–8).

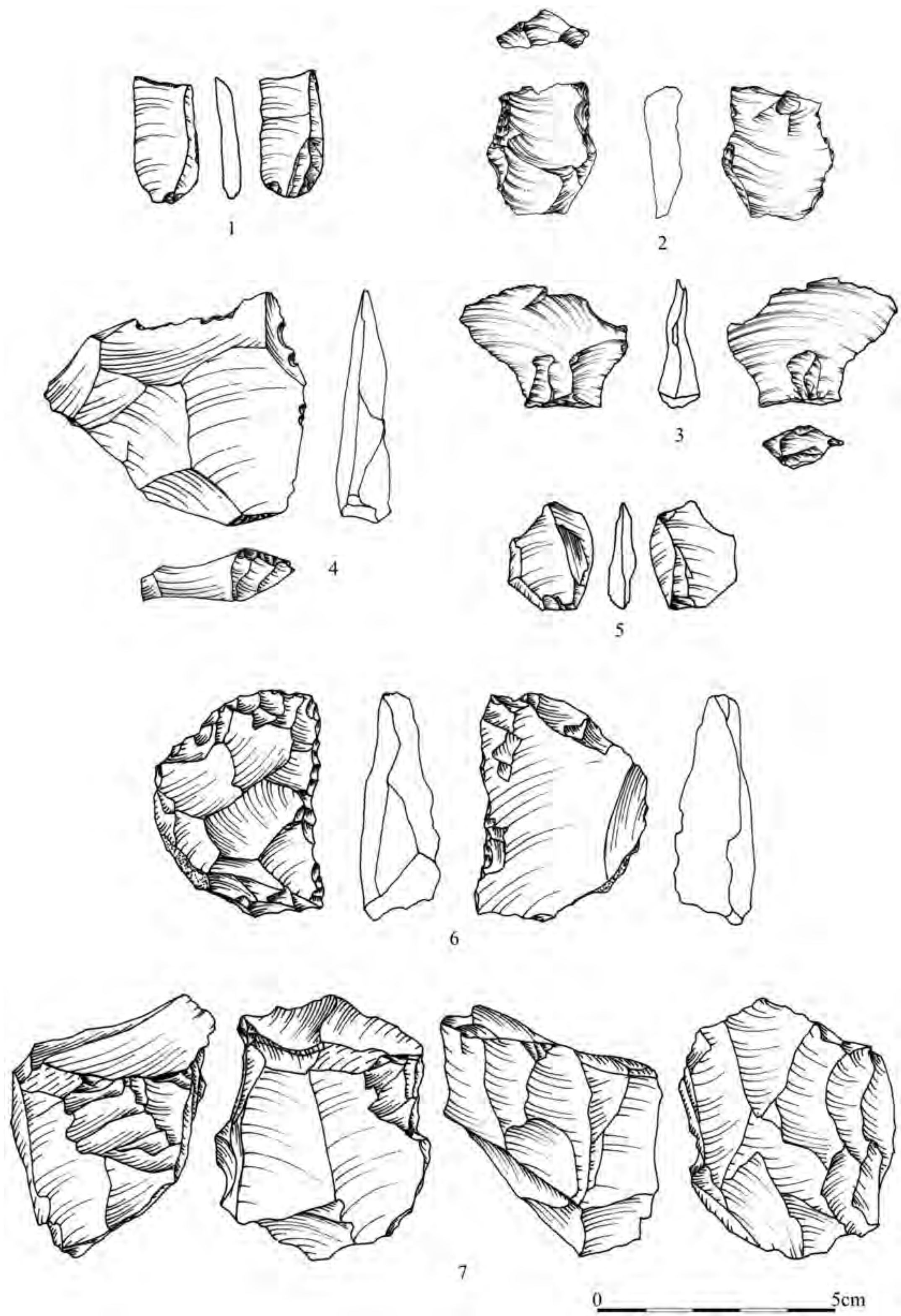

FIGURE 17. Artefacts from inventory A5 (layer 18).

mentioned sites, their state of preservation and occurrence in sediments containing features of partial re-deposition make us reconsider the character of some of the "artefacts" coming from assemblages B–D of the Biśnik Cave. This interpretation seems to be backed up by the presence of only a few forms of flint semi-product with naturally sharp edges, un-retouched in assemblages. The semi-product occurs in big quantities on a large number of Mousterian sites situated in the sediments unlike the cave ones, e.g. in Konigsaue B in Thuringia (Mania 2002), characterised by the use of the Levalois technique, and coming from the Early Vistulian period. A similar situation occurs on Mousterian sites with the Levalois technique in the western Ukraine. Examples of that kind are provided by loess sites of Jezupol or Proniatyn in Podole (Sytnyk 2000). The last site yielded a particularly abundant inventory of over six thousand specimens with un-retouched flake and blade semi-product prevailing. It contained very few examples of denticulate retouch and single niches. This situation may be caused by a different kind of sediment.

A striking comparison is also provided by other assemblages from the Biśnik Cave, deposited in the sediments of a different (sand-loam) character lying above (assemblages F, E from layers 5–8) (*Figure 16*) and underneath (inventory A5 from layer 18) (*Figure 17*) the above described levels. The semi-product and tool forms present do not bear traces of such a big post-deposition fracturing (lack of Aeolian patina, polishing, chipping, and pseudo-retouches). However, artefacts (assemblage A1 and A2) unearthed in the lower deposited sand-clay sediments (layers 12–13) dated to the Eemian interglacial reveal similar features to layers 9–11, both in terms of morphology (bifacial point forms) and the state of preservation. This certainly results from their partial re-deposition, similar chronological-cultural character and climatic conditions in which they were deposited.

To sum up we can assume that the presence of forms with the so-called pseudo-retouches in the Early Vistulian inventories from the Biśnik Cave is definite, but determining their percentage in the whole assemblage is problematic. We can expect that un-retouched semi-product could have primarily constituted a considerably larger percentage.

Finally, it is worth emphasising that the authors do not aim to come up with unequivocal solutions to the problem of pseudo-retouches in assemblages coming from cave sites, but their target is to indicate doubts which emerged while analysing and interpreting the problematic source material.

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Krzysztof Cyrek
Magdalena Sudoł

Department of Palaeolithic
and Mesolithic
Institute of Archaeology
Faculty of History
Nicolaus Copernicus University
Ul. Szosa Bydgoska 44/48
87-100 Toruń
Poland

E-mail: paleo@umk.pl
E-mail: sudol@umk.pl