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EARLY UPPER PALEOLITHIC LEVALLOIS-DERIVED INDUSTRIES IN THE BALKANS AND IN THE MIDDLE DANUBE BASIN

ABSTRACT: This paper deals with the problem of the Middle/Upper Paleolithic transition in south-eastern Europe, particularly with "transitional" industries derived from the Levallois technological tradition. The possibility of the local origin of these industries in the Balkans and in the middle Danube Basin from the Moustero-Levallosian has not been confirmed by recent studies. Some typological features indicate links with the Near Eastern Emirian/Ahmarian tradition. After reaching south-east Europe this tradition contributed to the formation of the Early Upper Paleolithic units in the Balkan, such as the Bachokirian which – in turn – participated in the genesis of – at least some – elements of "Aurignacian package" in south-eastern Europe.

KEY WORDS: Early Upper Paleolithic – Balkans – Levallois technology – Bachokirian – Aurignacian

INTRODUCTION

The objective of this paper is to present a few new ideas concerning the Middle/Upper Paleolithic transition in central and south-eastern Europe. Classical works on the subject placed greatest emphasis on the contrast and cultural hiatus between the Middle Paleolithic represented by the Moustero-Levalloisian and the Early Upper Paleolithic of the Aurignacian type. The contrast was further stressed by anthropological arguments as the Middle Paleolithic was associated with the Neandertals, whereas the Aurignacian with anatomically modern humans (Mellars 1989, 1992, 1996). This classical hypothesis, however, overlooked the whole cultural diversity of the Middle/Upper Paleolithic transition, especially in the Balkans – as in the Middle Danube basin "transitional industries" such as the Szeletian and the Bohunician had already long been distinguished (Prošek 1953, Valoch 1976, 1986, Svoboda, Simán 1989, Kozłowski 2000).

It is only recently that more attention has been devoted to the complex cultural differentiation in south-eastern Europe in the transitional period. Although the Szeletian has not been recorded in the Balkans, the occurrence of "transitional industries" deriving from Levallois technological tradition has been confirmed, for example, in the Temnata Cave, trench TD II, layer VI (Drobniewicz *et al*. 2000). At the same time, the existence in south-eastern Europe of Upper Paleolithic industries with an early date and some morphological traits resembling the Aurignacian – described as the Bachokirian – encouraged researchers to look for the origins of the Aurignacian in this part of Europe. The weakness of this hypothesis was, precisely, the typological hiatus between the Mousterian and the Early Upper Paleolithic. This hiatus would suggest an allochthonous genesis of the Aurignacian in south-eastern Europe. In view of the fact that the poorly investigated, huge territory of Anatolia separates south-eastern Europe from Iraq and Iran, where the Baradostian is a sufficiently early culture unit exhibiting aurignacoid traits, the Baradostian could, then, constitute a hypothetical ancestor of the European Aurignacian (Olszewski, Dibble 1994, Kozłowski, Otte 2000).

Recent investigations into "transitional cultures" based on Levallois technological tradition have also pointed to

conceivable allochthonous origins of such units in south-eastern and central Europe. We should, first of all, mention the work by G. Tostevin (2000, 2003) who, on the basis of a complex analysis of technological attributes of "transitional cultures", notably of the Bohunician, has arrived to the conclusion that these cultures show some differences in comparison to the local Mousterian in central Europe and, on the other hand, a greater similarity to "transitional units" in the Levant such as the Emirian. Consequently, it seems that the hypothesis put forward by K. Valoch some time ago (Valoch 1986) about the diffusion of "transitional industries" with Levallois roots from the Near East to eastern Europe should be seriously reconsidered. This diffusion, as Valoch suggested, took place via the route proposed so far for the Aurignacian but ahead of the emergence of this unit (Kozłowski 2001, Bar Yosef, Svoboda 2003).

"TRANSITIONAL INDUSTRIES" IN THE BALKANS

Undoubtedly, the assemblage from layer VI, trench TD II in the Temnata Cave in Bulgaria reveals the transitional character between the Middle Paleolithic with Levallois tradition and the Upper Paleolithic. The assemblage consists of about 2,100 artefacts with cores accounting for 4.3%, flakes – 33.4%, blades – 18.5% and tools – 9.8%. The remaining artefacts are chips and indeterminate fragments. Local raw materials have distinct ascendancy (93.9%), the proportion of mesolocal raw material is small (4.4%), whereas extralocal raw materials, though a small percentage (1.5%), are represented by a whole variety of siliceous rocks, among them rocks from remote deposit areas (for example from eastern Bosnia or north-east Bulgaria).

The blank production technology in this assemblage is based, to a large extent, on the Levallois method namely: opposed platform cores reduction that enabled to obtain blades with parallel or convergent sides (*Figure 1: 1–4*). The Levallois technique of the *recurrent* type that used centripetal preparation of cores and subsequent detachment of *debordant* flakes was also present. Recurrent Levallois cores were transformed into discoid cores in the final stage of reduction.

Parallel to the Levallois method there occurs the method based on Upper Paleolithic volumetric type cores, both single- and double-platform. These cores often exhibit preparation of flaking surfaces from the central crest installed on the narrower side of a concretion. Subsequently, the flaking surface was extended onto broader core sides until, in the final stage of reduction, it was almost completely rounded (*Figure 2: 1–4*).

The two types of *chaîne opératoire*: the Levallois and the volumetric, occur independently on each other, but sometimes there was some interference – for example: opposed platform Levallois cores were transformed into volumetric cores by rounding the flaking surfaces until almost cylindrical forms were obtained (*Figures 2: 5, 6; 3: 1, 2*).

Among the tools in layer VI, trench TD II there are both Middle and Upper Paleolithic types. In terms of quantity Upper Paleolithic forms dominate (end-scrapers – 14.1% – *Table 4*, 1–8; burins – 6.4% – *Figure 4: 9–12*; retouched blades – 18.6%) over the Middle Paleolithic forms (Mousterian points – 2.9% – *Figure 3:3, 5*, side-scrapers – 10.8% – *Figure 3: 4, 6, 7*). Other forms such as retouched flakes, denticulated and notched tools are not sufficiently diagnostic.

Of special interest is a rectangular shale plaquette with incised lines making a rhythmical pattern (Cremadès 2000) that can be assigned to non-utilitarian objects interpreted as systems of notations (Marshack 1972) although this explanation has been criticized. It should be added that the lines incised on the plaquette from the Temnata Cave were made with a single tool.

The dating of layer VI, trench TD II based on radiometric criteria provided only approximate chronological frameworks (^{14}C dates from this layer defined only its minimal age namely: > 38,700 years BP, Gd-4687). The TL dates on burnt flint – on the other hand – place layer VI between 46,000±8,000 (Gd-TL-255) for layer 4 in trench TD-I and 67,000±11,000 (Gd-TL-254) for layer 6 in trench TD-I. C. Ferrier and H. Laville (2000) attempted to narrow these chronological frameworks on the basis of a hypothetical parallelization of layer V from trench TD-II with the stalagmitic layer 5 in trench TD-I.

The Middle Paleolithic inventories in the Temnata Cave sequence, from layers 10–6 in trench TD-I and TD-V that are earlier than the "transitional" assemblage from TD-II, are characterized by different ratio of Levallois technique and the presence of numerous side-scrapers and Mousterian points. However, to see a direct continuity between the assemblages from TD-I and the assemblage from layer VI, trench TD-II is unjustified. The Levallois *recurrent* technique in the Middle Paleolithic used first of all radial preparation method. As the result flake blanks tend to be subtriangular. In the "transitional" assemblage the most important method is the use of an opposed platform core and parallel preparation. As the result blanks tend to be blade-like with parallel sides. In the Mousterian assemblages in TD-I bifacial retouch appeared that can be seen on leaf points; these forms are absent in the assemblage from layer VI in TD-II.

As we have already emphasized in the paper published in 1996 (Ginter *et al*. 1996) the assemblage from layer VI is closer to the reconstructed inventories from the upper levels of the Samuilitsa II Cave (Sirakov 1983) where the number of "blades without Levalloisian features clearly rises in the youngest assemblages. Also very important is the increase of blades obtained from opposite-platform cores…" Unfortunately, these data come from the reconstructed inventories whose content has not been unquestionably established. Moreover, the age of the upper portion of the sequence from Samuilitsa II Cave is relatively late, as the date of 42,780±1,280 years BP suggests. This would make the upper portion of the Samuilitsa Cave younger than layer

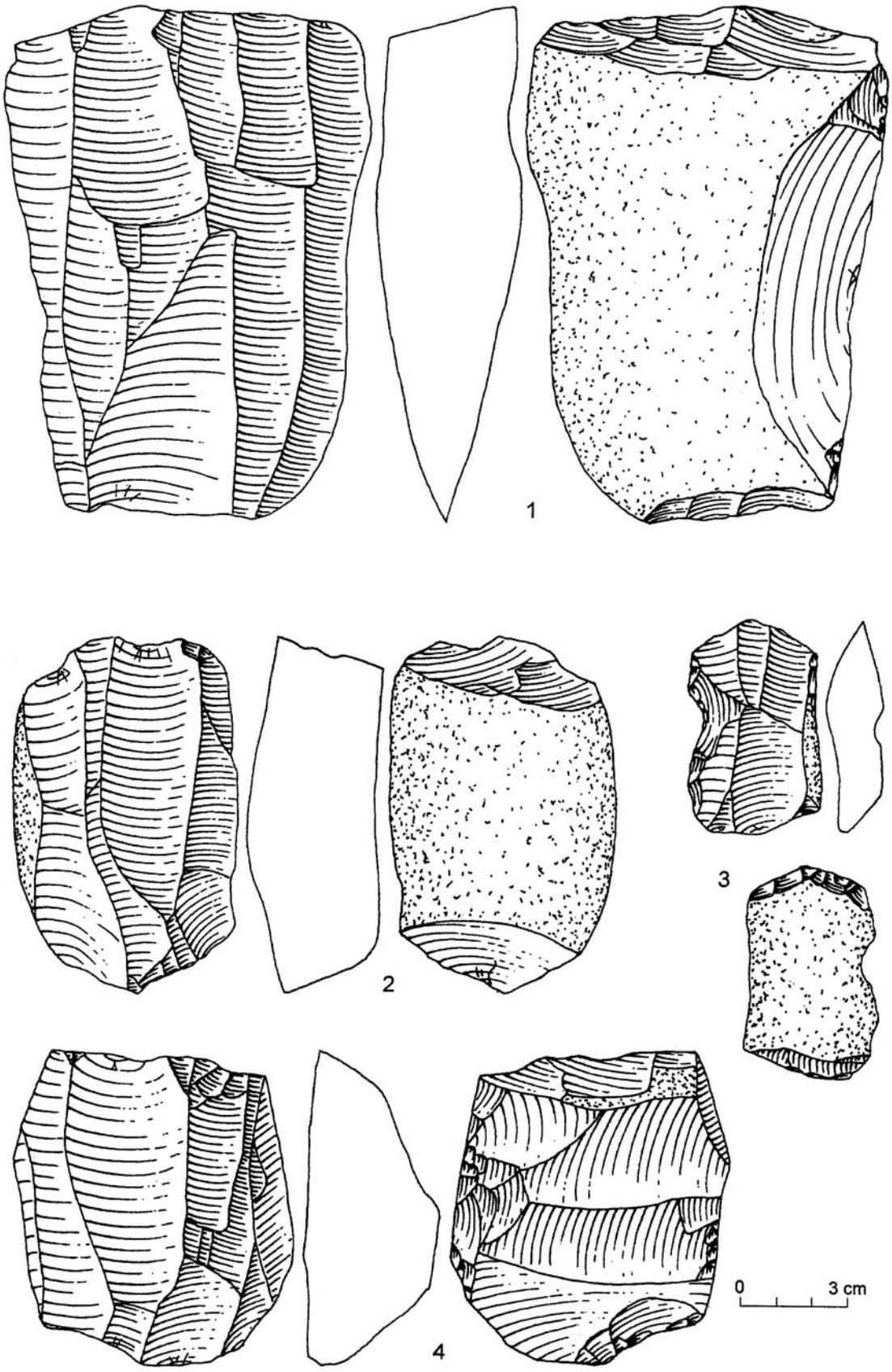

FIGURE 1. Temnata Cave, sector TD II, layer VI, Bulgaria. 1–4 – cores.

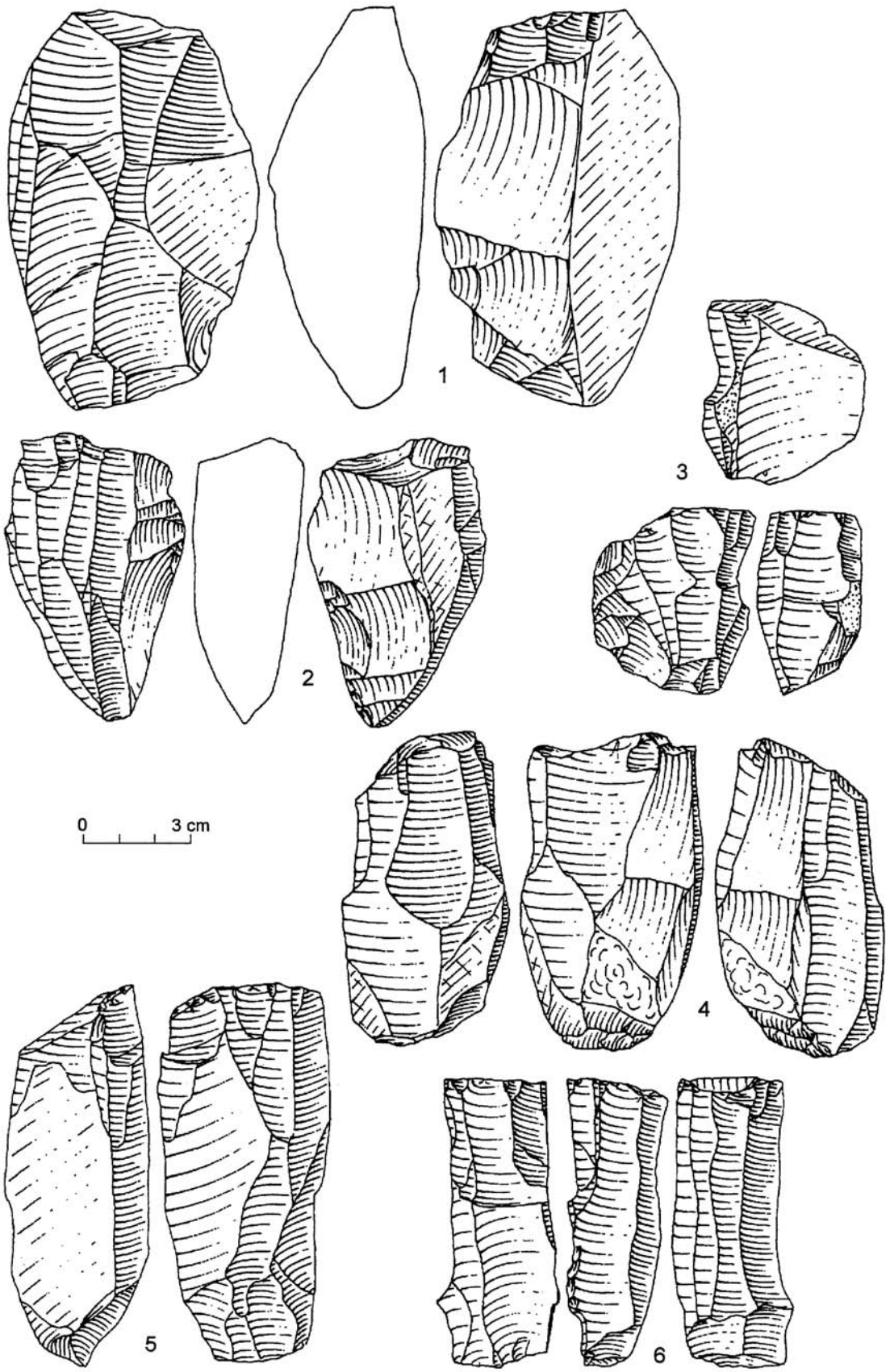

FIGURE 2. Temnata Cave, sector TD II, layer VI, Bulgaria. 1–6 – cores.

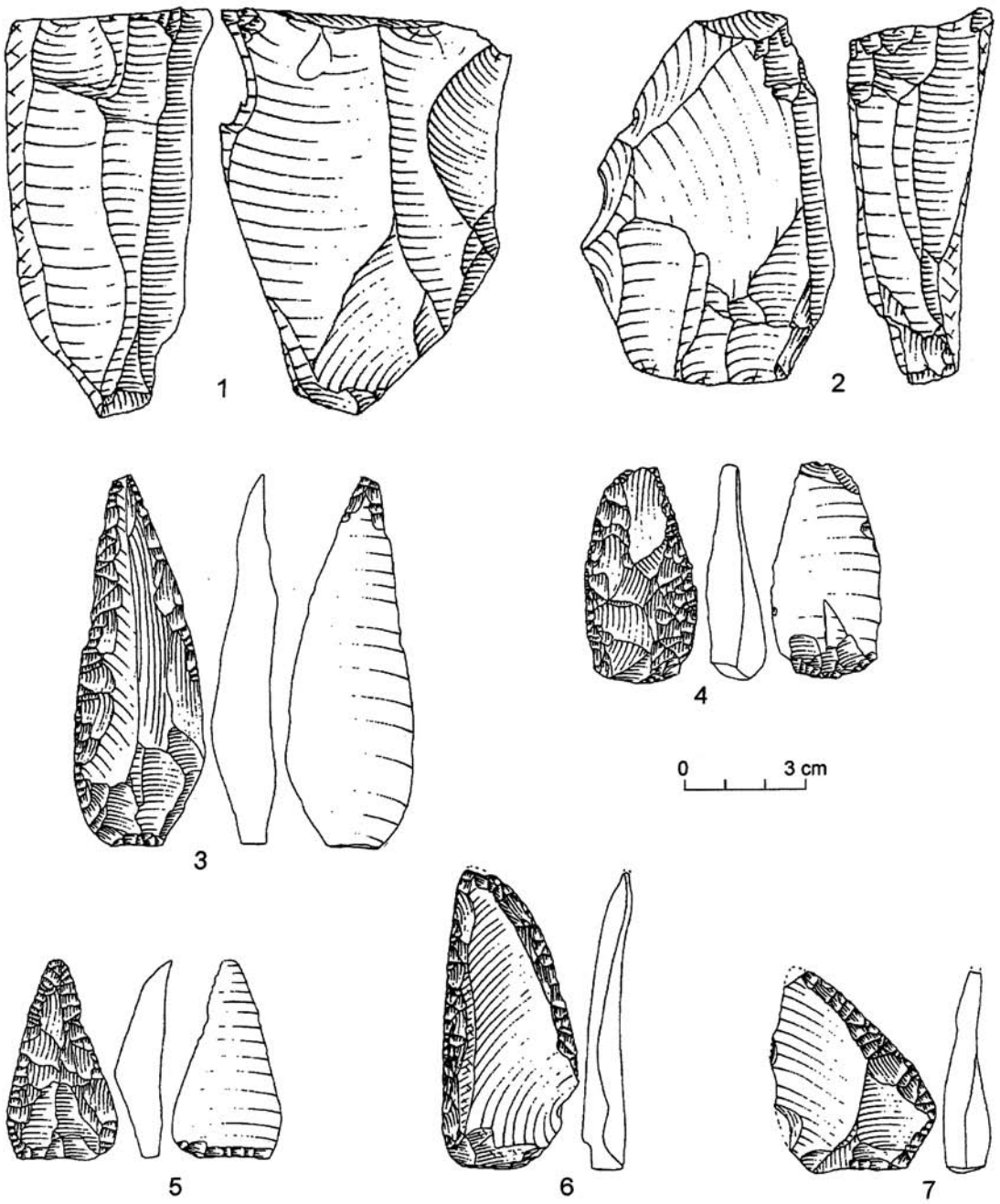

FIGURE 3. Temnata Cave, sector TD II, layer VI, Bulgaria. 1, 2 – cores, 3–5 – Mousterian points (4, 5 with ventral retouch resembling Emireh points), 6, 7 – side-scrapers.

VI in the Temnata Cave. But a possibility cannot be excluded that besides the Middle Paleolithic artefacts, the inventory of Samuilitsa II could, possibly, contain Early Upper Paleolithic additions. If we assumed that the "transitional industries" from layer VI in the Temnata Cave are not the effect of local transformation of the Mousterian which had taken place in the Iskar river Gorge – i.e. in the immediate vicinity of the Temnata Cave – then we should consider the possibility that the industry in layer VI might be the outcome of the evolution of other Moustero-Levalloisian industries in the Balkans. The recently published sequences from Thessaly – the Theopetra Cave (Panagopolou 2000), and the Peloponese – from the site of Lakonis I (Harvati *et al*. 2003) are supposed to indicate the increase in the proportion of Upper Paleolithic elements in the Late Mousterian industries dated at between 44,000 and 36,000 years ago. Unfortunately these industries have not been adequately published to allow to evaluate what technological and typological elements in these sequences are the evidence in favour of the evolution towards the Upper Paleolithic and – most importantly – what technologies were used for blade production. The discovery

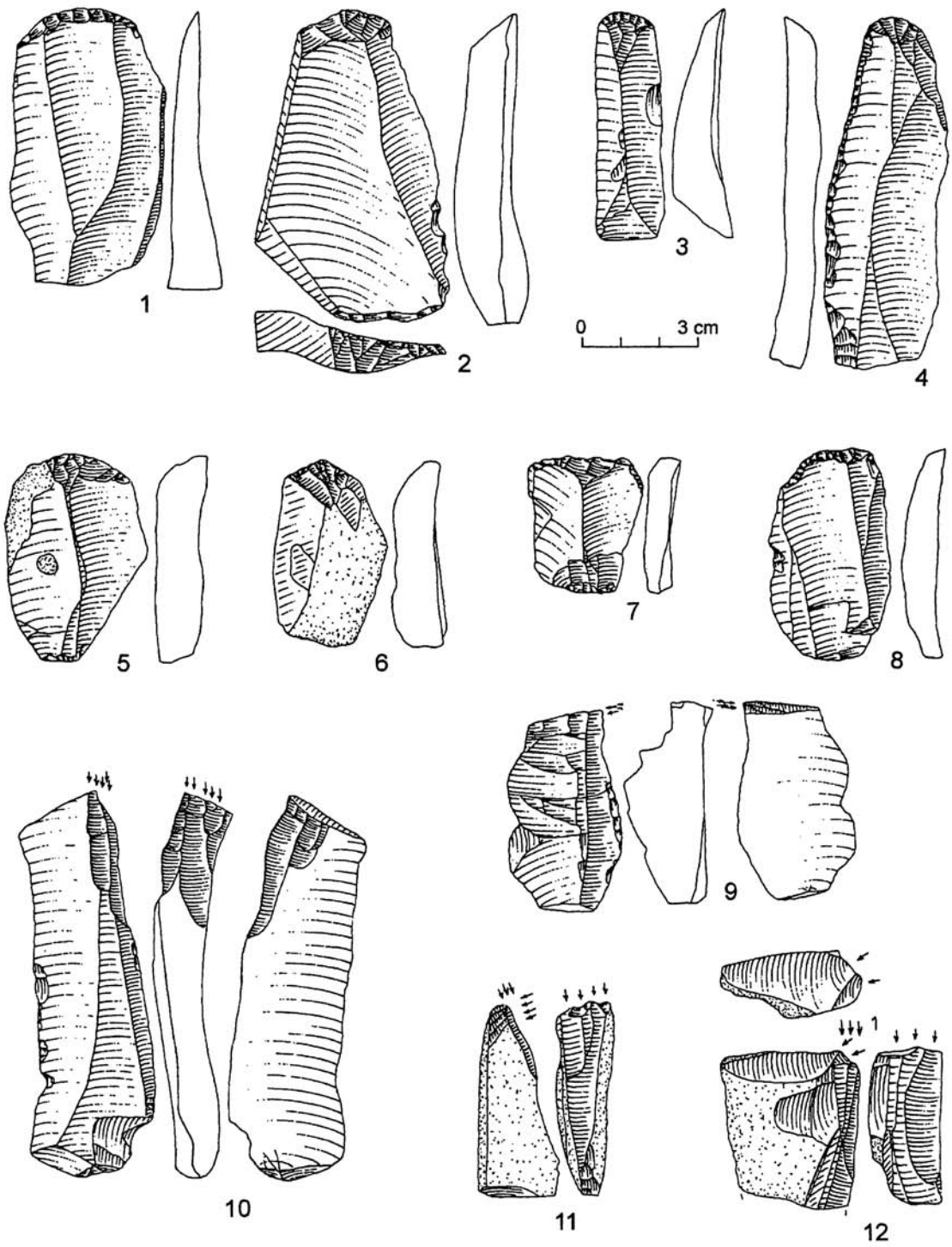

FIGURE 4. Temnata Cave, sector TD II, layer VI, Bulgaria. 1–8 end-scrapers, 10–12 –burins.

at Lakonis I of a tooth of a Neandertal suggests that the industries at Theopetra and Lakonis were created by Neandertals.

The hypothesis about the formation of a "transitional industry" in the Temnata Cave as the result of the evolution of the Balkan Moustero-Levalloisian reveals today a number of weak points. For this reason and in the present state of knowledge the hypothesis about the Near East origin of the "transitional industry" in the Temnata Cave should be regarded as equally valid.

The sequence of "transitional" levels 1–4 from Boker Tachtit in the territory of Central Negev shows many similarities with the Temnata Cave sequence. The "transitional" sequence at Boker Tachtit has been dated to between 47,280±905 (SMU 580) and 35,055±410 (SMU 579) although similar industries occur in the whole

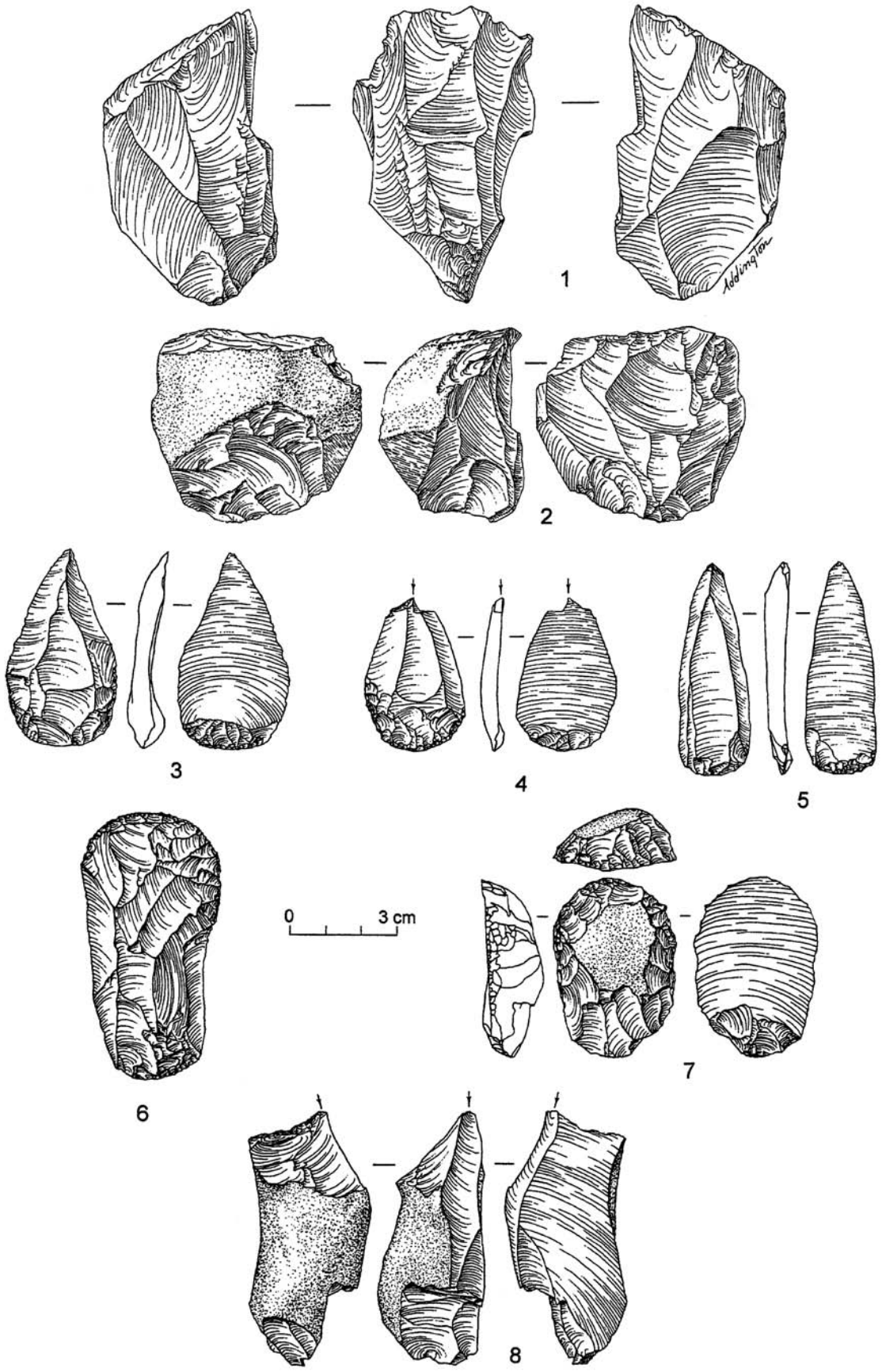

FIGURE 5. Boker Tachtit, layer 2, Israel. 1, 2 – cores, 3–5 – Emireh points, 6, 7 – end-crapers, 8 – burin.

area of the Syrian-Palestinian coast (Bar Yosef 2000) as far north as south-east Turkey (Kuhn *et al*. 1999). A characteristic feature of the sequence from Boker Tachtit is the replacement of the double-platform Levallois reduction method by the volumetric single-platform core technique (Marks, Kaufman 1983 – *Figure 5: 1, 2*). While the majority of blades in levels 1–3 still resemble elongated Levallois points, in level 4 they are already different, representing almost exclusively the use of single-platform core reduction, mainly pyramidal, volumetric cores (Volkman 1983). In level 4 double-platform cores are extremely rare, predominantly with twisted flaking surfaces (Marks, Kaufman 1983: 115). Numerous refits from Boker Tachtit show that the preparation of double-platform cores, which occur in level 1, was carried out from lateral crests removed by detaching crested blades (Volkmann 1983: 141).

But the technique used at Boker Tachtit differed, nonetheless, from the double-platform core technique used in layer VI in the Temnata Cave, first of all in that the shape of obtained blanks was different: nearly half of the blades are with parallel and only one fifth is with convergent sides resembling elongated Levallois points. But at the Temnata Cave also double-platform cores with lateral crests are present. After the crests had been removed the flaking surfaces were extended onto cores sides (Drobniewicz *et al*. 2000: Pl. 4) in a similar way as it was done at Boker Tachtit (Volkmann 1983). The most important difference between the Temnata Cave and Boker Tachtit is, first of all, that in the Temnata Cave the transformation of Levallois opposed-platform cores into volumetric double-platform cores was smooth: the flaking surface was gradually rounded until a core became wholly residual (Drobniewicz *et al*. 2000: Pl. 8). Moreover, in the volumetric single-platform core reduction sequence in the Temnata Cave – unlike in Boker Tachtit – also cores with central – posterior and anterior – crests are used (Drobniewicz *et al*. 2000: Pl. 12: 2,3). On the other hand, single-platform cores without preparation similar to the specimens found at Boker Tachtit (Marks, Kaufman 1983: 116, 117) also occur (Drobniewicz *et al*. 2000: Pl. 11: 3, 12: 1).

In comparison with the Temnata Cave, the typological tool composition at Boker Tachtit is less rich because the number of Middle Paleolithic tools – mainly side-scrapers and Mousterian points – is insignificant. Side-scrapers are only slightly more than 1% (starting from level 1), Mousterian points are absent, replaced by Emireh type *points* (*Figure 5: 3–5*). Two such points (*Figure 3: 3, 5*) were found in layer VI in the Temnata Cave (Drobniewicz *et al.* 2000: Pl. 20: 6, 7) where they could, possibly, be the evidence in support of links between the Temnata Cave and the Emirian in the Near East. Against such links, on the other hand, is the small proportion of side-scrapers at Boker Tachtit, typical, too, for the local Mousteo-Levalloisian in the Near East. As a rule the Near East Mousteo-Levalloisian is characterized by a low frequency of retouched tools, whereas the Balkan Mousteo-Levalloisian assemblages are supplemented by side-scrapers. In layer VI in the Temnata Cave the proportion of side-scrapers is as much as 10%. But the typological composition of Upper Paleolithic major tool groups in the Temnata Cave and at Boker Tachtit is *similar* (*Figure 5: 6–8*). Moreover, the presence of specimens with Kostenki retouch in the two assemblages provides another argument in support of the existence of links between the Temnata Cave and Boker Tachtit.

Closer to the Temnata layer VI are assemblages of the "Northern" variant of transitional industries, recently distinguished by J. Sarel and A. Ronen (2003) in Raqefet Cave layers VIII–V. To this "Northern" variant inventories from Emireh, El-Wad F, Kebara E and Ksar Akil (phase B) can be also attributed. The most important technological feature of these industries is the combination of preferential and *recurrent* Levallois cores with opposed, twisted platform cores for blades. The Levallois blanks were used to produce Middle Paleolithic implements (points, side-scrapers) and leptolithic blades to produce Upper Paleolithic tools (retouched blades, endscrapers, notches and denticulates).

THE PROBLEM OF THE BACHOKIRIAN

In the Bacho Kiro Cave, investigated in the 1970s, the Mousterian in layers 13–12 is separated from the typical Aurignacian in layers 9–4b by assemblages in layer 11. A number of features of raw materials acquisition, technology and typology of these assemblages contrasted with the Mousterian assemblages suggesting the existence of a hiatus between the Mousterian and the Early Upper Paleolithic in layer 11. The industry in layer 11 has been given a separate taxonomic status of the Bachokirian (Kozłowski 1979). In the monograph of the Bacho Kiro Cave (Kozłowski 1982) the contrast between the Mousterian in layer 12 and the Bachokirian in layer 11 – especially in respect of typology and raw materials – caused that some morphological and – more importantly – technological elements that were discordant with the Upper Paleolithic character of assemblages in layer 11, had not been sufficiently appreciated.

The reconstruction of the reduction sequence in layer 11 was additionally made difficult because the artefacts were made mostly from extralocal flints which underwent processing on the site only to a very small extent. Cortical flakes are merely 6.68% of all flakes, and cores only 0.09% of all the artefacts (without chips – 0.61%). The majority of blanks were brought to the sites as completed forms. Throughout the levels in layers 11 (I–IV) multistage tool rejuvenation took place, and, in a lesser degree, the final phase of reduction of the few cores was reached. More than 85% of the inventory are chips and small flakes, and considerable degree of reutilization of tools causes that the initial character of blanks of which the tools were made cannot be reconstructed.

We can, therefore, agree with the views of the authors of a recently published paper (Tsanova, Bordes 2003) who

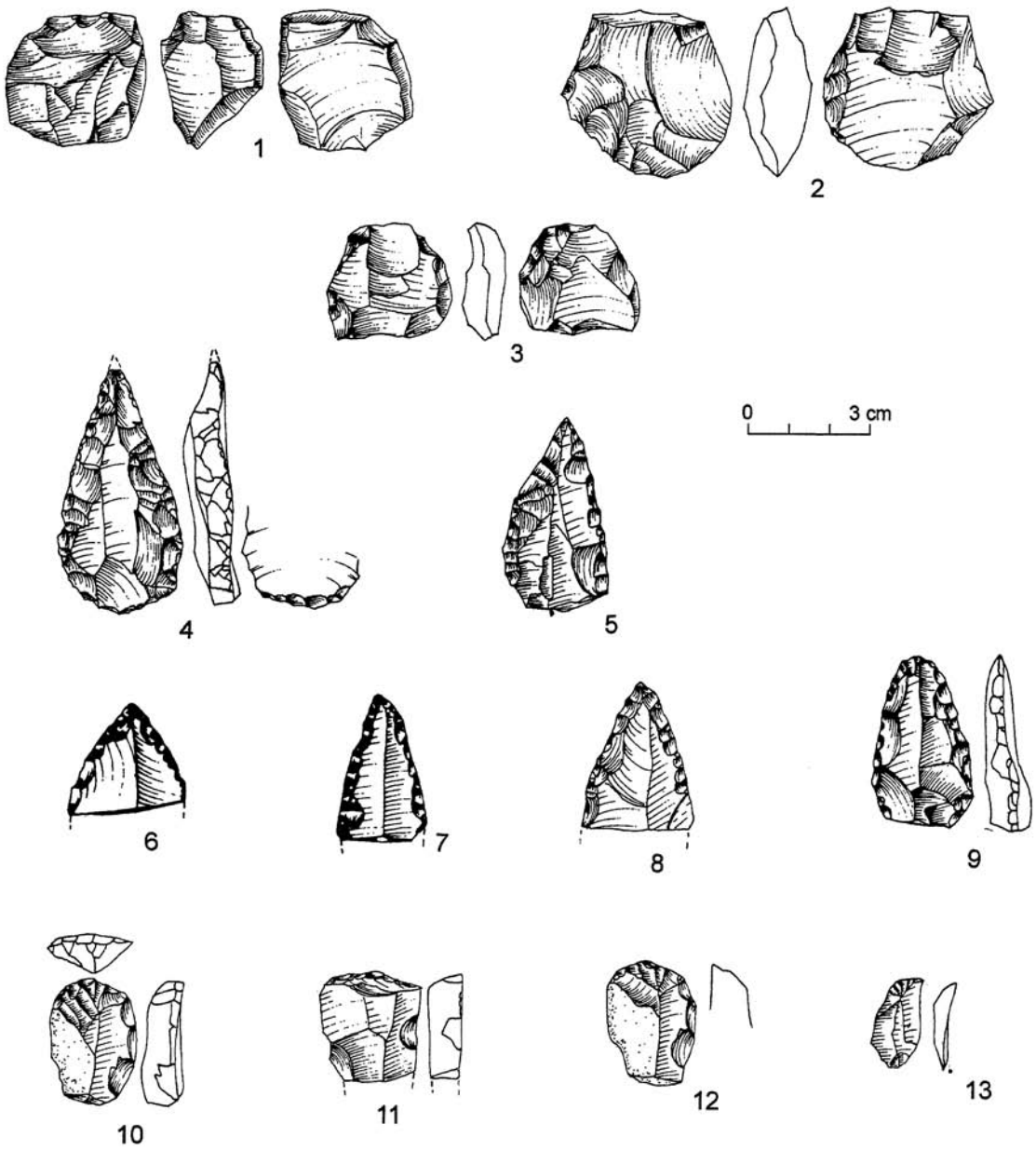

FIGURE 6. Bacho Kiro, layer 11, Bulgaria. 1–3 – cores, 4, 5, 9 – Mousterian points, 6–8 – tips of Mousterian points, 10–12 – end-scarpers, 13 – retouched truncation.

maintain that some of debitage products in the Bacho Kiro Cave come from double-platform cores that are developed from the Levallois reduction method evidenced by two double-platform residual cores (*Figure 6: 1–3*). In the advanced phase of their reduction the flaking surfaces were extended onto core sides and rounded (see: Kozłowski 1982: Pl. I, 6). This type of transformation of double-platform cores can be seen in the "transitional industries" from the Temnata Cave (Drobniewicz *et al*. 2000: Pl. 8). The remaining cores (or fragments) in layer 11, which exhibit preserved parts of original flaking surfaces, indicate weak rounding of fairly flat flaking surfaces (Kozłowski 1982: Pl. I 1–3).

In the conclusion we can say that the technology of layer 11 in the Bacho Kiro Cave shows some traits of the Levallois reduction method. At the same time, it must be admitted that the interpretation of the Mousterian points in layer 11 (Kozłowski 1982: Pl. X, 12, 13) was too restrictive when these points were interpreted as an intrusive, Middle Paleolithic addition in this layer (*Figure 6: 4, 5, 9*). When we assign the Mousterian points to the assemblages from layer 11 then, consequently – we can interpret some of the bilateral, convergently retouched distal ends of blades (*Figure 6: 6–8*) as originating from elongated Mousterian points (Tsanova, Bordes 2003: Fig. 3: 3–6).

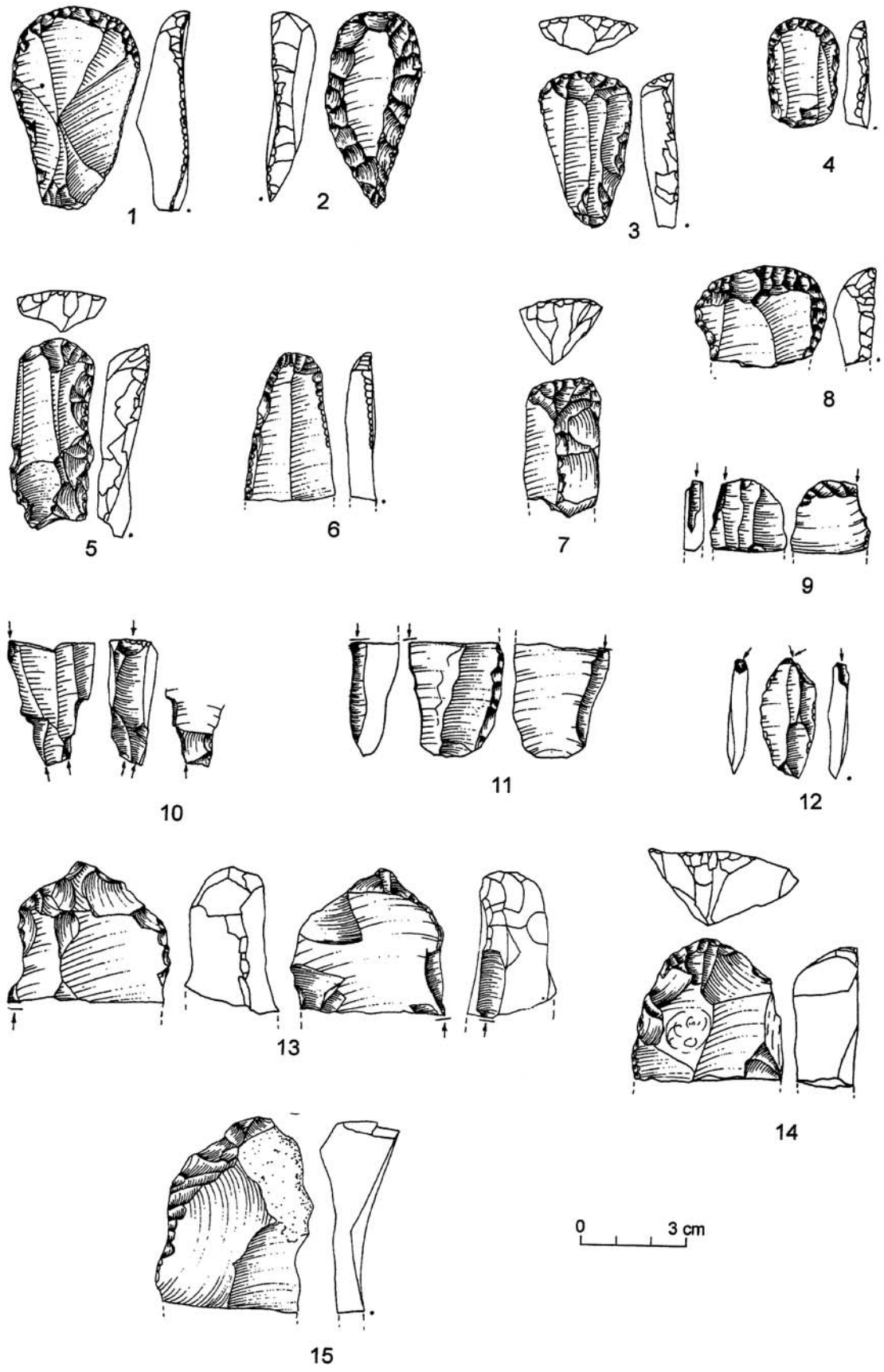

FIGURE 7. Bacho Kiro, layer 11, Bulgaria. 1– 8 – end-scrapers, 9–12 – burins, 13–15 – nosed and carinated end-scrapers.

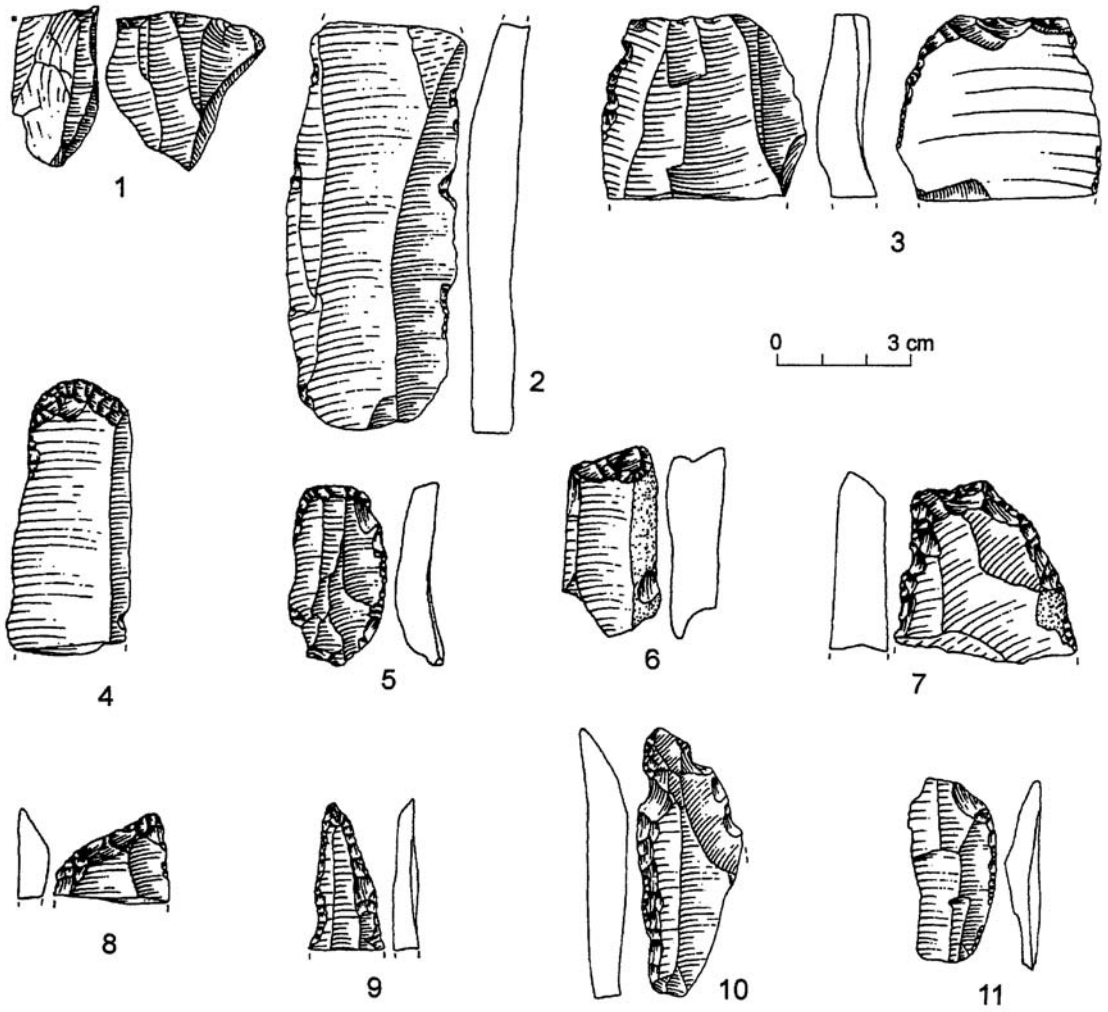

FIGURE 8. Temnata Cave, sector TD–I, layers 4, level C. 1 – core, 2 – blade, 3 – Kostenki truncation, 4, 5 – end-scrapers, 6–8 – retouched truncations, 9–11 – retouched blade.

The Middle Paleolithic traits in the assemblages from layer 11 are difficult to estimate in terms of quantity as the number of cores is small and the fragmentary preservation of debitage. The quantitative structure of retouched tools reveals, however, that the proportion of Upper Paleolithic forms is considerable (*Figures 6: 10–13; 7: 1–15*). There are groups such as: end-scrapers (13.04%), burins (4.34%), truncations (4.79%), most of the bilaterally retouched blades (even when some specimens that could be fragments of elongated Mousterian points are excluded, there remains still nearly 30% of the specimens), and numerous splintered pieces (9.29%). As we can see, more than 60% of all tools are leptolithic types. Among the remaining specimens non-diagnostic forms are most numerous, first of all retouched flakes.

The industry from layer 11 in the Bacho Kiro Cave does not exhibit, as we can see, such a drastic contrast in comparison with the Middle Paleolithic – as it was suggested in the monograph from 1982 – especially in respect of technology. Taphonomy, first of all, a lack of local traces of a full cycle of production, the strong transformation of the debitage products brought to the site, does not allow to estimate the degree of "leptolization" of the assemblages in layer 11, although it seems greater than in the case of assemblages from layer VI in the Temnata Cave. As far as chronology is concerned, layer 11 in the Bacho Kiro Cave formed in the period from > 43,000 years BP (the date for culture level I – GrN-7545) to 38,500±1,700 years BP (OxA-3213) for level IV. Layer 11 is later than layer VI in the Temnata Cave. Taking into account this chronological difference, a possibility that techno-morphological links exist between these two assemblages, cannot be excluded.

Providing the Bachokirian from layer 11 from the eponymic site could be the effect of the evolution of "transitional" type industries from the Temnata Cave, then the question arises: what is the relation between the Bachokirian and the Ahmarian in the Near East and the Bohunician from the Middle Danube Basin? To answer this question is not easy as all the assemblages in layer 11 in the Bacho Kiro Cave represent the final phase of reduction and transformation of blanks and tools.

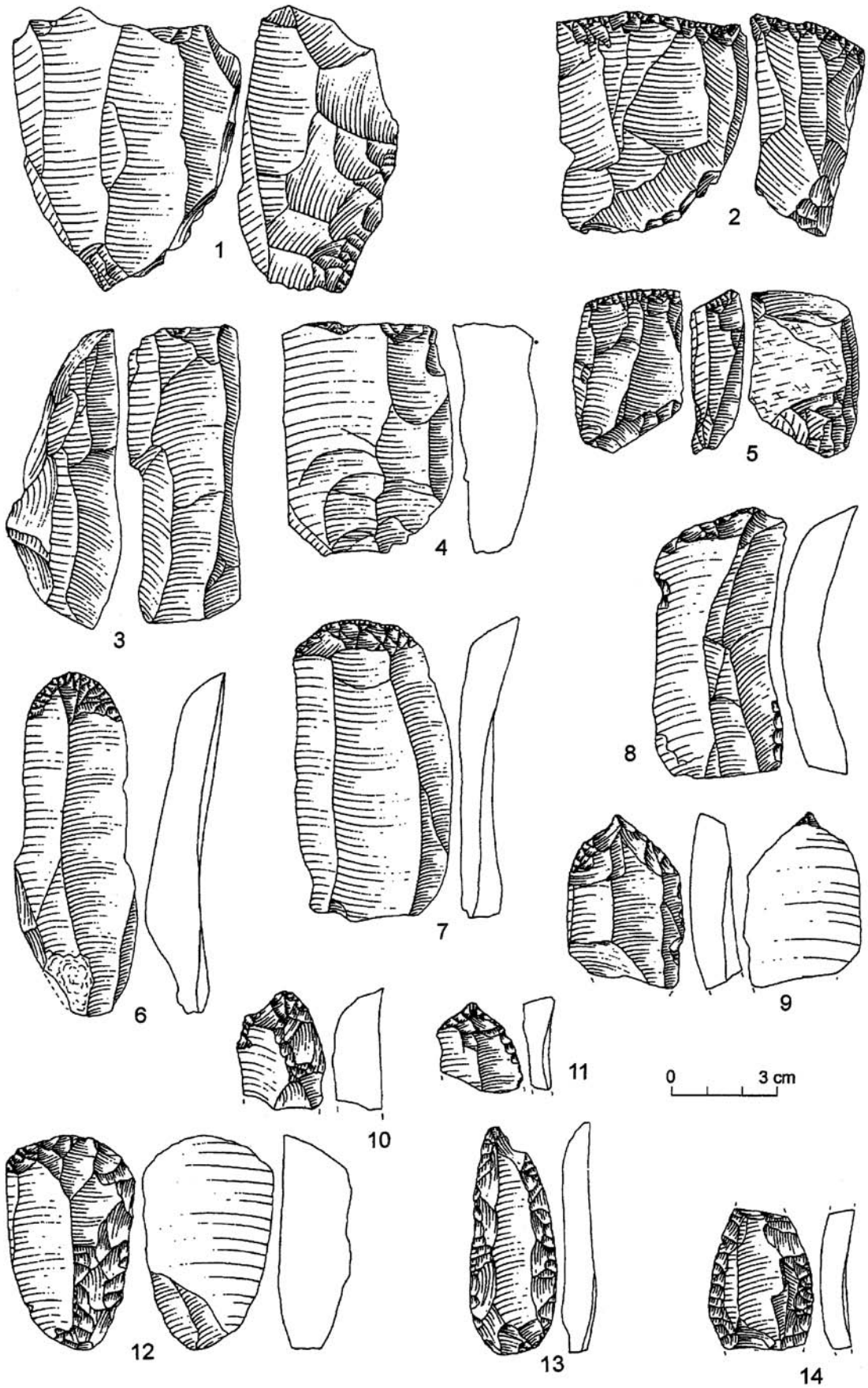

FIGURE 9. Temnata Cave, sector TD–I, layer 4, level B. 1–5 – cores, 6, 7, 12 – end-scrapers, 8 – retouched truncation, 9–11 – nosed end-scrapers, 13, 14 – points.

A comparison with the Bohunician from, for example, Brno – Stránská skála reveals some similarities of end-scraper morphology [among others: the presence of fairly high fronts both in the Bachokirian (*Figure 7: 13–15*) and in the Stránská skála – Kozłowski *et al*. 1982: Pl. II, 1–13, Svoboda 2003: Fig. 10: 1 f–h, 10: 3h], but in the Bohunician blades with marginal retouch do nor occur, whereas side-scrapers reach 10% (Svoboda 2003: 158), at Bacho Kiro – on the other hand – only one typical side-scraper was recorded in the youngest occupational level (I) (Kozłowski *et al*. 1982: 139). We might try to assign some of the retouched flakes to side-scrapers (Kozłowski *et al*. 1982: Pl. IX, 14) unfortunately the specimens have been, generally, preserved as fragments.

A comparison of the Early Ahmarian and the Bachokirian reveals even more significant differences between these two units. The dissimilarities consist, first of all, in the totally different technology used in the Ahmarian which is based on single-platform volumetric cores, the production of bladelets with microretouch – occasionally alternate – described as the El-Wad points (Marks, Ferring 1988). All this combines to give the Ahmarian its totally special character, different from the Bachokirian. If Levallois tradition is indeed concealed in the Bachokirian, then its sources should rather be sought in earlier "transitional" industries in Balkans such as in layer VI in the Temnata Cave, rather than directly in the Ahmarian in the Near East. It does not seem likely either that the Bohunician should have played a role in the origin of the Bachokirian. In the light of results of the technological attributes analysis carried out by G. Tostevin (2000, 2003), the difference coefficient between the various assemblages at Stránská skála is lower (0.9–1.5) than the difference coefficient between Stránská skála and Boker Tachtit 1 (1.93), or Boker Tachtit 2 (1.40). Assuming these results are reliable, then, consequently, they can indicate diffusion of "some behavioural package" from the Levant into the territory of central Europe. However, this diffusion would have been earlier than 42,000 years BP, close to the appearance of transitional assemblages in the Near East i.e. about 47,000–46,000 years BP. Subsequently, regional differentiation of this tradition, rooted in the Levantine Moustero-Levalloisian, would have taken place, and in the period from 42,000 to 39,000 years ago local units formed in the Balkans, in the Middle Danube basin, in the Upper Tisa basin (Korolevo II/II, I/Ia, sites on the Ondava river – Usik 1989, Kaminská *et al*. 2000), and in the Volhynian Plateau (Kremenecian, Demidenko, Usik 1991).

"TRANSITIONAL UNITS" AND THE APPEARANCE OF THE AURIGNACIAN IN SOUTH-EAST EUROPE

The most emotional discussion among researchers dealing with the early phase of the Upper Paleolithic concerns the issue of conceivable relations between "transitional units" with the typical Aurignacian in the Balkans and the middle Danube basin. When the hypothesis about the sources of the European Aurignacian in the Bachokirian was put forward (Kozłowski, Otte 2000, Otte, Kozłowski 2003) its fundamental weakness was that the genesis of the Bachokirian could not be explained. The Bachokirian seemed to emerge in complete discontinuity with the Balkan Middle Paleolithic. It is only when the technological features of the Bachokirian were re-evaluated under – among others – the influence of the work by T. Tsanova and J. G. Bordes (2003) that we were able to explain the formation of the Bachokirian on the substratum of "transitional cultures" that had existed earlier in the Balkans and – possibly – derived from the Levant, without having to resort to the Early Upper Paleolithic industries of the northern part of the Near East such as the Baradostian (Olszewski, Dibble 1994, Olszewski 1999).

This hypothesis would be even more interesting if we could define more precisely the position of the juvenile mandible from layer 11 in the Bacho Kiro Cave which is considered modern or non-diagnostic (Glen, Kaczanowski 1982, Fig. 1: 2–3). So far this is the sole fragment of a human bone discovered in the context of Levallois-derived "transitional industries".

If we assume that the Bachokirian could derive from the Levantine type Levallois tradition, then the initial hypothesis which connects the genesis of the Aurignacian with the Bachokirian is worth re-considering (Kozłowski 1999). This hypothesis was primarily based on morphological features, mainly on the style of the preparation of fronts: nosed (Kozłowski *et al*. 1982: Pl. II, 6–10, 12, 23, X, 9) or carinated (*op.cit*., Pl. II, 11–13). Some of the lateral retouches are stepped, multiseriate. According to T. Tsaneva and J. G. Bordes (2003), technological evidence argues against interpreting the Bachokirian as a plausible ancestor of the European Aurignacian; first and foremost the Bachokirian used only a hard hammerstone, but volumetric concept and microblade debitage are absent. The question is whether all these features characterize the whole of the European Aurignacian and to what extent the western Meditterranean and western European standards can be treated as valid for the whole in Europe. Another question is whether before 36,000 years BP (Zilhao, d'Errico 1999) – the date for the "classical" Aurignacian – earlier stages of the gradual formation of consecutive components of the "Aurignacian package" could have occurred.

It is exactly the territory of north-eastern Balkans that seems to provide evidence in support of such a hypothesis. First of all the sequence of occupational levels in layer 4 in the Temnata Cave (trench TD–1) (Drobniewicz *et al*. 2000a) shows the evolution of a single technological tradition throughout three levels (C, B, A), with a distinct increase in the proportion of tool shapes exhibiting Aurignacian morphology. The chronological framework of layer 4 from TD-I is delimited by the TL date for the bottom of this layer (occupation level C) of 45,000±7,000 years (Gd-TL-

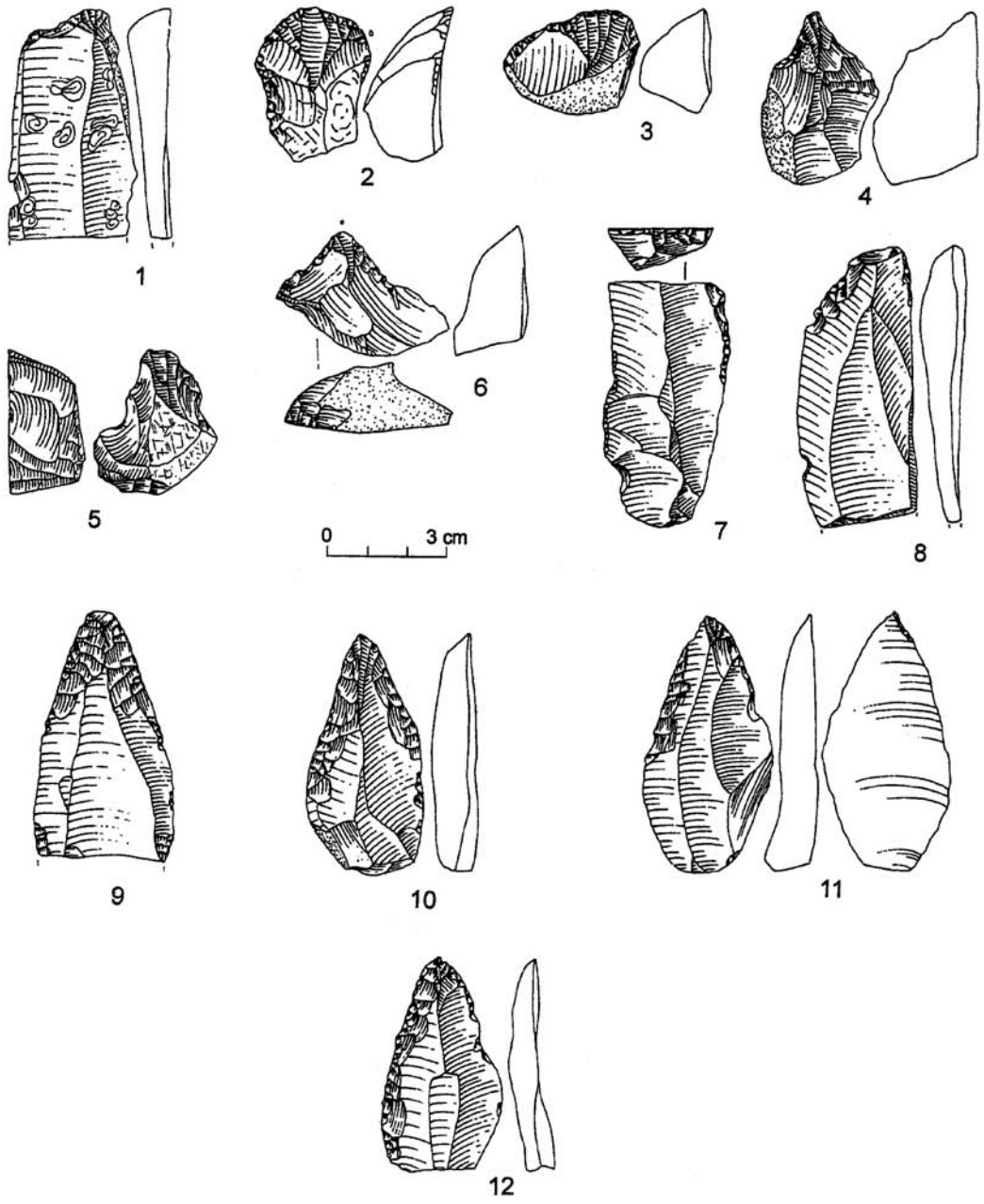

FIGURE 10. Temnata Cave, sector TD–I, layer 4, level A. 1–6 – nosed and carinated end-scrapers, 7, 8 – truncations, 9–12 – points.

256), and the AMS date for the middle portion of this layer (39,100±1,800 OxA 5169, 38,800±1,700 OxA 5170 and 38,200±1,500 OxA 5171). The hearth in the top itself of layer 4 was dated at 31,900±1,600 (Gd 2354). In trench TD–V – so far unpublished – a conspicuous Aurignacian component of typical Aurignacian forms increases in the interval between the AMS date of 38,300±1,800 (OxA-5172) and 36,900±1,300 (OxA-5173). After the date of 33,000±900 (OxA-5174), on the other hand, microretouched bladelets occur (Ginter *et al*. 1996, Kozłowski 1999) which in the Bacho Kiro Cave, too, appear as late as level 6a dated to after 32,700±300 (GrN-7369), or even nearer to 29,150±950 (Ly-1102) (Kozłowski 1982).

The reconstruction of the technological process in level C was not easy because only 7 cores were found – all in a well advanced stage of reduction. Two specimens exhibited single-platform reduction system based on the preparation of a central crest and gradual rounding of the flaking surface onto core sides (*Figure 8: 1*). These were, then, volumetric, pyramidal (Drobniewicz *et al*. 2000a: Pl. 1; 1, 2), change-of-orientation, completely residual cores also occurred. Most blades were detached from single-platform cores

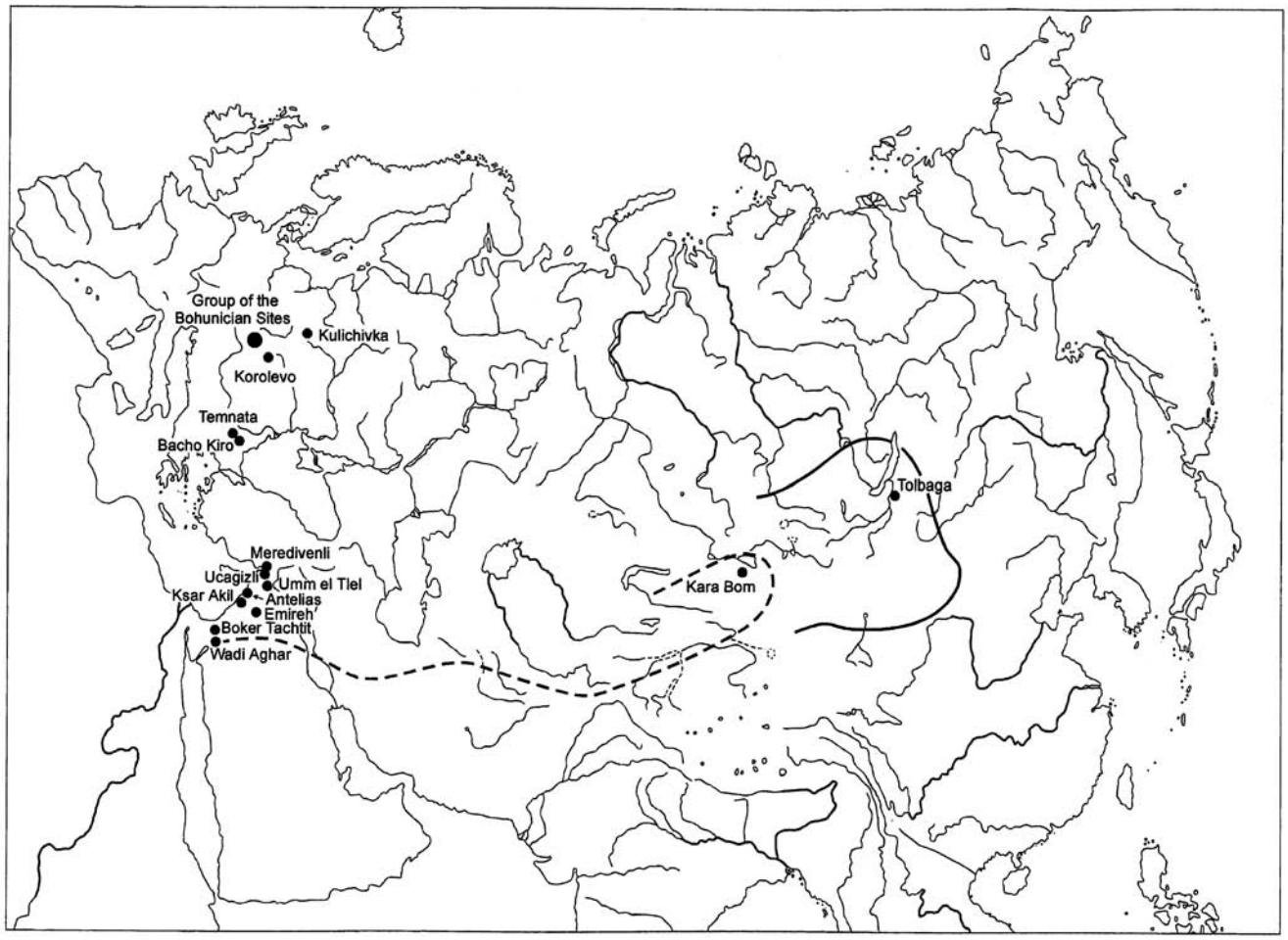

FIGURE 11. Early Upper Paleolithic Levallois-derived industries in Eurasia: interrupted line – the southernmost and eastern range of influence of the Middle East group, continuous line – easternmost limit of the Kara Bom tradition.

(55%), specimens detached from double-platform cores were less than 10% (*Figure 8: 2, 3*). These facts made us – in our first monograph – approach with caution the conceivable links between the assemblage from layer VI trench TD-II and assemblage C from layer 4 trench TD-I – this caution however, seems now ungrounded. Analysis of blanks from assemblage C shows a number of fairly broad specimens with traces of lateral, or even radial, preparation (Drobniewicz *et al*. 2000a: Pl. 1: 11), fairly broad blades with facetted platforms (*op.cit*., Pl. 1: 13), or even broad specimens that could have been detached from opposed platform cores (*op.cit*., Pl. 2: 4). In the morphology of tools from assemblage C, Upper Paleolithic common substratum types dominate, such as blade end-scrapers (*Figure 8: 4, 5*), truncations (*Figure 8: 6–8*), retouched blades (*Figure 8: 9–10*) resembling the Bachokirian. Middle Paleolithic forms are practically absent, with the exception of one side-scraper with inverse retouch and a bilateral specimen with convergent retouch assigned – probably erroneously – to retouched blades (Drobniewicz *et al*. 2000a: Pl. 2: 1).

The technology of assemblage B has been more thoroughly studied as the number of cores is bigger (20 specimens). They represent both single-platform (7) and double-platform core reduction (9). The single-platform core reduction used the preparation from postero-lateral crests and attempted to preserve the symmetrical flaking surface as it was being extended onto core sides (*Figure 9: 1, 2*). This principle is characteristic for the Upper Paleolithic core reduction, notably the Aurignacian method. Double-platform cores in assemblage B, with broad, flat flaking surfaces that were extended onto core sides as core exploitation continued (*Figure 9: 3–5*), are closer to the core reduction registered in the assemblage from layer VI in the Temnata Cave. Thus, assemblage B might, conceivably, be interpreted as a result of the evolution based on the local EUP tradition in the direction of Aurignacian technology. Among the tools in assemblage B, too, there are blade end-scrapers (*Figure 9: 6–8, 12*), and new technological elements such as, most importantly, nosed end-scrapers (*Figure 9: 9–11*) accompanied by the artefacts that are typical of the Bachokirian [blades with bilateral retouch (*Figure 9: 13, 14*), truncations] and even individual specimens representing the Middle Paleolithic tradition (side-scrapers). Assemblage B, therefore, corresponds in

terms of technology, typology and also chronology (39–38 Kyr conv. ^{14}C BP) to the late phase of the Bachokirian.

Assemblage A has a very similar technology of blade production from volumetric, double- and single-platform cores; but more than 50% of blade blanks come from single-platform cores and only 10% from double-platform cores. A characteristic feature of the tool group is the presence of a fairly large proportion of carenoidal and nosed specimens (*Figure 10: 1, 2*) often made on thick flakes (*Figure 10: 3–6*) accompanied by blade end-scrapers sometimes made on unilateral retouched blades and truncations (*Figure 10: 7, 8*). For the first time, worked bone appeared in this assemblage, although this was merely an awl made from *Vulpes* bone. Typically, blades with uni- and bilateral retouch continue to occur. Some of the blades resemble *appointée* types, and when they are made on broad blades (*Figure 10: 9–12*) they are similar to Bachokirian points (Drobniewicz *et al*. 2000a, Pl. 26: 4–11). Clearly, assemblage A is a combination of the Bachokirian and the Aurignacian traditions.

This phenomenon has not been registered in the middle Danube basin, where a chronological and technological hiatus occurs between the Bohunician and the Aurignacian, identified in two consecutive mild oscillations as evidenced by the well stratified assemblages from Stránská skála (Bar-Yosef, Svoboda, 2003). The difference between the two traditions is, first of all, that in the Aurignacian assemblages technological Levallois traits that are typical of the Bohunician, vanish while diagnostic Aurignacian end-scrapers appear. Other major tool groups – end-scrapers and burins – are similar in the two units.

The contrast between the EUP blade technologies and the Aurignacian is even more conspicuous in the upper Vistula basin in the sequence from Piekary near Cracow where following the blade assemblages TL dated to 60–36 Kyr BP, the Aurignacian appears dated by AMS to 32–31 Kyr BP (Valladas *et al*. 2003).

CONCLUSIONS

When we admit a major role of Levallois-derived "transitional industries" in the development of the Eurasian Upper Paleolithic, we can then put forward new hypotheses concerning the out-of-Africa diffusion of anatomically modern humans. In a paper published in 2001 (Kozłowski 2001) I tried to show the contrast between Levallois-derived "transitional industries" (*Figure 11*) that had Eurasian distribution range (the Emirian and the Ahmarian in the Near East, the Temnata Cave TD-II/VI in the Balkans, the Bohunician in the middle Danube basin, and Kara Bom in central Asia) and local "transitional industries" occurring in various parts of Europe (industries with leaf and backed points). The drawback of the hypothesis about the association of Levallois-derived industries with the AMH diffusion in the period between 50 and 40 Kyr BP is the question – still unresolved – of conceivable origin of Levallois-derived blade industries in the territories other than the Near East, and the lack of human bone remains from such local industries. A new look into the problem of the Bachokirian – after more than 20 years since the publishing of the monograph of the site – inspired by the work of T. Tsanova and J. G. Bordes (2003) – has provided new arguments in support of the thesis that proposes that the Bachokirian did not appear in the Balkans in complete cultural discontinuity, but – in all likelihood – appeared as another phase of the evolution of the earlier Levallois-derived industries of the EUP which could possibly originate in the Near East (Kozłowski 2001). In the Syrian-Palestinian belt the effect of further evolution of the Levallois-derived EUP (= the Emirian) was the Ahmarian that continued until the end of the Upper Paleolithic (Bar Yosef 2000). The Aurignacian could be the result of a similar evolution both in the northern part of the Near East (Baradostian) and in the Balkans. In Europe, on the other hand, the Aurignacian is probably the result of expansion which – on the temporal scale of the Paleolithic – was very fast.

The hypothesis put forward in this paper offers a reasonable way to explain the contradictions that caused recent "querelle aurignacienne" (Zilhao, D'Errico 1999, Kozłowski, Otte 2000). On the other hand, the question of the temporal scale of the emergence of the Aurignacian, recently emphasized by J. Zilhao and F. D'Errico (2003: 344), still remains unresolved. These authors claim that "production system has been invented and ameliorated in the order of minutes, the days and, or, at most, weeks that an experienced knapper would need to perfect the technology, not the centuries or the millennia." Our knowledge so far suggests, nevertheless, that the temporal scale of the spread of technological innovations in the Paleolithic was often unimaginably longer than the temporal scale for such innovations in historical times. For this reason, when we look at the problem of the "constitution" of the Aurignacian we find it difficult to concede that this was a process of short duration which, moreover, supposedly took place synchronously in the spheres of economy, material and symbolic culture. The complete western European technological-cultural Aurignacian "package" did not form in a single moment but – rather – was the effect of gradual accumulation of innovations introduced in different territories at different times.

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