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QUESTIONING THE FIRST AURIGNACIAN: MONO OR MULTI CULTURAL PHENOMENON DURING THE FORMATION OF THE UPPER PALEOLITHIC IN CENTRAL EUROPE AND THE BALKANS

ABSTRACT: For several decades, it has been commonly admitted that the Aurignacian was an homogeneous techno-complex related to the first diffusion of modern humans in Europe. The typo-technological Pan-European homogeneity of the Aurignacian has been explained on the basis of bone and lithic specific tools currently known since the Near East to the Atlantic coast (e.g. split-based points, Dufour bladelets, carinated and nosed end-scrapers). This predicted cultural homogeneity has led many authors to interpret the Aurignacian as the first East-West migration of modern men in Europe. The revision of 4 major so-called Aurignacian sequences located in the Balkans and in central Europe (more particularly from east to west Bacho Kiro in Bulgaria, Krems-Hundssteig and Willendorf in Austria and Geissenklösterle in Germany) is in contradiction with this model. In the Balkans, Bacho Kiro is more comparable with some transitional units than with the Aurignacian. In Central Europe, Austrian and German sites enable us to distinguish two distinct cultural traditions actually integrated in the Aurignacian: the Proto-Aurignacian and the Early classical Aurignacian (Aurignacian I). Their relationship and their place in the Middle-to-Upper Paleolithic transition are discussed at the end of the paper.

KEY WORDS: Anatomically modern humans (AMH) – Aurignacian – Middle-to-Upper Paleolithic transition – Bachokirian – Proto-Aurignacian – Early Aurignacian (I) – Central Europe – Balkans – Lithic technology

INTRODUCTION

One of the most critical issues in evolutionary anthropology is actually related to the behavioural and cognitive processes which underlied the technical and socio-symbolic mutations associated with the appearance of the Upper Paleolithic in Europe. As commonly argued, the sudden proliferation of symbolic items, antler and ivory tools associated with a durable miniaturization and much expressed standardization of lithic forms surely represent one of the best expressed global breaks in the Pleistocene record of the Old World (Mellars 1989, 1996, Bar-Yosef 1998, 2002, Gamble 1999). Associated with the "Aurignacian material culture", it has long been said that the widespread distribution from the Near-East to the Atlantic coasts of these so-called "culturally modern" patterns was the result of the initial dispersal of anatomically modern humans (AMH) in Europe (e.g. Mellars 1989, 1996, 1999, 2004, Djindjian 1993, Otte 1996, Bocquet-Appel, Demars 2000, Kozlowski, Otte, 2000, Davies 2001, Conard, Bolus 2003).

The abrupt coincidence between what is interpreted as a clear break in the cultural evolution and the first appearance of AMH in Europe has generally favoured a "single-species model" for the origin of modern human behaviour in Europe (e.g. Mellars 1989, 2004, 2005, Stringer, Gamble 1993,

Bar-Yosef 1998, Klein 2000). This dominant paradigm has recently been seriously challenged by scholars considering that characters that define cultural modernity in Europe are not peculiar to AMH and appear also among Neanderthal groups (d'Errico *et al*. 1998, Zilhão, d'Errico 1999, d'Errico 2003).

While scholars tend actually to bring very accurate data in this debate and to look at this phenomenon with a very large and broad geographical scale of analysis (e.g. Brantingham *et al.* 2004) thus tending to restrict the validity of the very specific French model, it also became clear that our epistemological framework did not evolve a lot during the last past 20 years and that the extension of our scale of analysis did not change the fact that the replacement model still remains the dominant paradigm (Teyssandier, Liolios 2004). The western European model (or in other words the Aquitan basin model) still dominates our concept of the Middle-to-Upper Paleolithic transition.

THE FIRST AURIGNACIAN IN CENTRAL EUROPE AND THE BALKANS

This paper addresses the issue of the formation of the Aurignacian in discussing 4 archaeological sequences often referred to in theories of AMH dispersal in Europe. From east to west, taphonomic processes, lithic productions and tools from Bacho Kiro layer 11 (Bulgaria), Willendorf II layers 1 to 4, Krems-Hundssteig (Austria) and Geissenklösterle layers IIIb to IIn (Germany) have been examined (Teyssandier 2003).

In the last three decades, two opposite theoretical models have been developed to explain the formation of the Aurignacian: the replacement model directly linked with the Out-of-Africa theory and the multi-regional model. In one case, the Aurignacian is considered as a remarkably consistent and homogeneous Pan-European cultural event, in clear break with the local Mousterian and strictly associated with AMH (e.g. Mellars 1989, Kozlowski 1993, Otte 1996), whereas in the second case, scholars assumed a more polymorphic interpretation of Aurignacian material culture with strong regional variations suggesting more complex and gradual interactions between what is actually refered to as distinct *Homo sapiens* sub-species: Neanderthals and AMH (e.g. Oliva 1989, Clark, Lindly 1990, Valoch 1990, Straus 1996, Wolpoff 1996, Miracle 1998, Karavanic, Smith 2000, Cabrera *et al*. 2001).

Recent papers have also long discussed the chronology of the first "Aurignacian–modern humans" dispersion in Europe and pointed to opposite scenarios. The first assumed was the contemporaneity of both "transitional" and Aurignacian industries and of the distinct populations classically related to these 2 sorts of complex, respectively Neanderthals and AMH. This supposed biological coexistence is then used to explain the technical and symbolic mutations of the so-called transitional industries, which have been viewed as the result of the local Neanderthals acculturation by modern Aurignacian invaders (e.g. Allsworth-Jones 1986, Demars, Hublin 1989, Harrold 1989, Mellars 1989, 2004, 2005, Hublin 1990, Hublin *et al*. 1996, Kozlowski 1993, Stringer, Gamble 1993, Bar-Yosef 1996, 1998, 2000, Otte 1996, Kozlowski, Otte 2000). The second pointed to the opposite conclusion that the Aurignacian first appears around 36,500 BP in the C^{14} chronology. In that view, Neanderthals have already accomplished their own Upper Paleolithic transition when Aurignacian groups entered Europe (d'Errico *et al*. 1998, Zilhão, d'Errico 1999, Zilhão 2001, d'Errico 2003).

One point seems crucial when examining the cultural processes involved in the appearance and spread of "Modern–Upper Paleolithic" behaviours in Europe. It concerns the nature and the definition of the distinct techno-complexes considered. While several scholars tend to be very affirmative in interpreting the widespread distribution of so-called Aurignacian traits all over Europe and the Near-East as the result of one Pan-European unified culture, we do not clearly know what exact technological traits define the first Aurignacian: split-based antler points, carinated end-scrapers, specific patterns of lithic core reduction… In this perspective, the unity of the first Aurignacian testimonies has to be challenged through detailed typo-technological analysis of material culture before addressing the issue of the meaning of Aurignacian industries in the AMH dispersal in Europe.

CENTRAL EUROPE AND THE BALKANS AS A TEST OF THE MONOCENTRIC ORIGIN OF THE AURIGNACIAN

The Bachokirian and the myth of the Balkans as a gate to Europe

"Ex oriente lux" has dominated for over a century the theories in Old World archaeology for explaining the wide spread of cultural, economical, symbolic or political innovations (Childe 1929, Garrod 1938, Bar-Yosef 2003). It thus did not come as a surprise when scholars argued for an analogy between the processes leading societies to an Upper Paleolithic or an agro-pastoral Neolithic way of life (Bar-Yosef 1998). In the frame of this historical-ideological paradigm, it has been considered for more than a century that the Aurignacian or more generally the European Upper Paleolithic came from the East: China (Breuil 1912), Central Asia (Riek 1934), Palestine (Garrod 1938). Thus, the publication of the earliest Upper Paleolithic industry with some "Aurignacoid" characters in the Balkans was easily accepted at the end of the 1970's (Kozlowski 1979, Kozlowski 1982). In the first publication of the lithic industry of Bacho Kiro layer 11, Kozlowski still remains very cautious in interpreting its relationship with Aurignacian-like industries (Kozlowski 1979: 92). He then reinforces the Aurignacian lineage of the assemblage

during the 1990's: *"Both the morphology of these tools* (e.g. retouched blades and nosed end-scrapers for instance) *and the presence of stepped retouch point to affiliations with the Aurignacian tradition. We have cautiously described this industry as the Bachokirian in order to stress dissimilarities in comparison to the classical Aurignacian. We realize, however, that in other European territories, it is precisely the Aurignacian assemblages rich in retouched blades that are typical of the oldest phase of this culture"* (Kozlowski 1992: 11).

Indeed, very early dates of approximately 43,000–38,000 BP have been commonly reported for "Pre-Aurignacian" assemblages such as Bacho Kiro layer 11 and Temnata layer 4-TD1 in Bulgaria (Kozlowski 1979, 1999, Kozlowski 1982, Hedges *et al*. 1994, Ginter *et al*. 1996). Defined in the late 1970's as a specific facies of a very Early Upper Paleolithic (Kozlowski 1979, 1982, 1999), the Bachokirian is also interpreted as reflecting a migratory phenomenon (Kozlowski, Otte 2000). Among the range of observations used to establish empirically this interpretation is the idea that layer 11 forms a clear break compared to the underlying Middle Paleolithic sequence. Differences would be particularly significant in terms of raw material procurement, technology and tool morphologies (Kozlowski *ibid*.).

The shift in patterns of raw material procurement inbetween the Bachokirian and the underlying Mousterian layers in Bacho Kiro cave is clearly significant. The inhabitants of layer 11 favoured imported flints while their "Mousterian" predecessors systematically used local volcanic or metamorphic rocks of lower quality for their productions (Kozlowski *ibid*.).

This raised the issue of a second related break between the Mousterian and the Bachokirian, which could be seen notably in the concept and technical processes of blade core reduction. Bachokirian core reduction is clearly linked by Kozlowski with fully Upper Paleolithic technological behaviour: *"Summing up, we can say that the earliest industries from the caves of Bacho Kiro (layer 11) and Temnata display a mature Upper Paleolithic technology – the volumetric concept of a blade core"* (Kozlowski 1999: 108). This feature has played an important role in the trait-lists used to distinguish the Middle and the Upper Paleolithic (e.g. Mellars 1989).

The technological identity of the Bachokirian

One of the crucial points when dealing with issues concerning the nature of the Bachokirian is the question of the homogeneity of the Bacho Kiro layer 11 assemblage. Due mainly to economic factors that include notably a

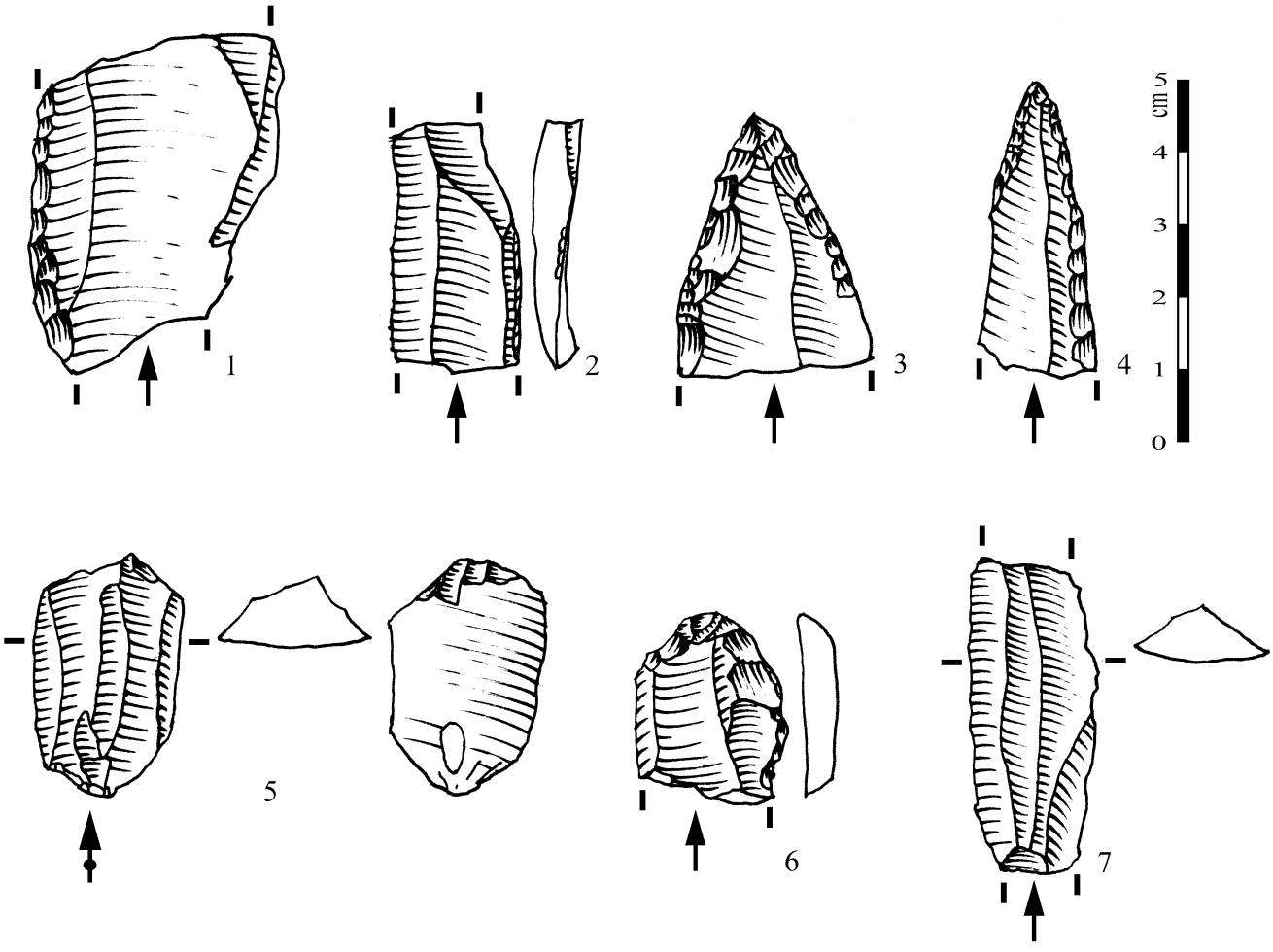


FIGURE 1. Bacho Kiro, layer 11: blades and tools that show opposite removals on their dorsal surface.

massive use of imported flints and a low proportion of on-site knapping activities, it has not been possible to search for refits across stratigraphic units. Nevertheless, in a global perspective, the lithic assemblage exhibits coherent typo-technological patterns that suggest the presence of a single techno-complex.

A technological approach applied to layer 11 of Bacho Kiro confirms the idea of the independence of the Bachokirian from the Aurignacian (Teyssandier 2003), as suspected previously by Zilhão and d'Errico (1999), Rigaud (2001) and Lucas and Rigaud (in press). Similar results were obtained by Tsanova and Bordes (2003) in their parallel study of the Bacho Kiro layer 11 lithic assemblage. One important point is the clear difference in the volumetric conception between layer 11 and classical Aurignacian core reduction (Teyssandier 2003, Tsanova, Bordes 2003). In the Aurignacian assemblages, blade cores are numerous and the blades were removed following a volumetric unidirectional conception and the use of soft hammer (Tixier 1991, Le Brun-Ricalens 1993, Teyssandier 2000, 2003, Bon 2002, Bordes 2002). This is clearly not the case in layer 11 of Bacho Kiro.

Whereas Bacho Kiro layer 11 have more often been referred to be a fully laminar Upper Paleolithic industry (Kozlowski *ibid.*), blade cores are totally lacking in the assemblage. This could be explained either by the fact that knappers are not concerned by blade production or more clearly by economic and functionnal patterns indicating that layer 11 is not a place of knapping activities. Cores in general are poorly represented and all the specimens are flake cores systematically knapped with a hard hammer. In sum, due to the exhaustive stage of reduction of the rare cores represented in the assemblage, they could not be used to determine specific patterns of lithic productions.

The blades testify to the use of bidirectional exploitation on cores with large flat surfaces for the production of large, thick and robust blanks. This has been deduced from the opposite removals on the dorsal surface of several blades (*Figure 1*) and from a plunging blade detaching the opposite striking platform (*Figure 2*). Even if the integration of this kind of reduction strategy into a clear technological taxinomy is really difficult due to the lack of on-site blade production sequences, the technical modalities we referred to thus exhibit more affinities with the Levallois concept than with classical Aurignacian core reduction (Teyssandier *ibid.*, Tsanova, Bordes *ibid.*) In the case of layer 11, knappers always used direct hard percussion in relation with thick facetted butts during all the process of blade reduction (*Figure 3*).

Where the typology is concerned, same kind of observations could be made about the hypothetic Upper Paleolithic nature of the toolkit. The numerous blade tools give this assemblage an Upper Paleolithic appearance that have masked the exact nature of this toolkit. A typo-technological approach led to distinct conclusions (Teyssandier *ibid*, Tsanova, Bordes *ibid*). The high proportion of splintered pieces and burins results from a systematic re-use of blanks and cores. True technical

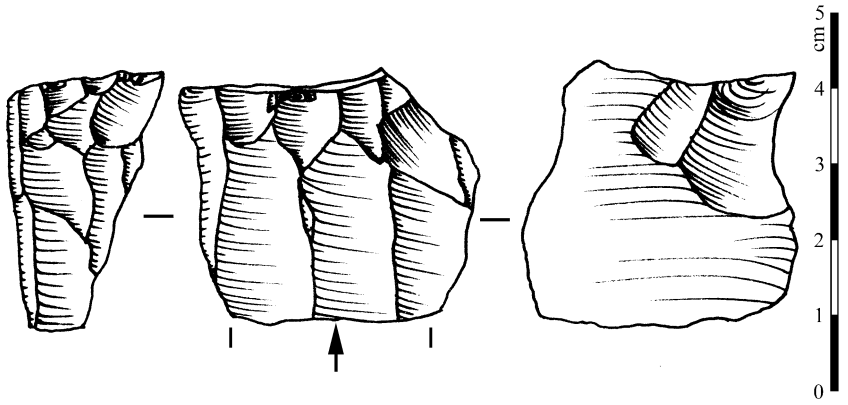


FIGURE 2. Bacho Kiro, layer 11: plunging blade detaching the opposite striking platform of a blade core.

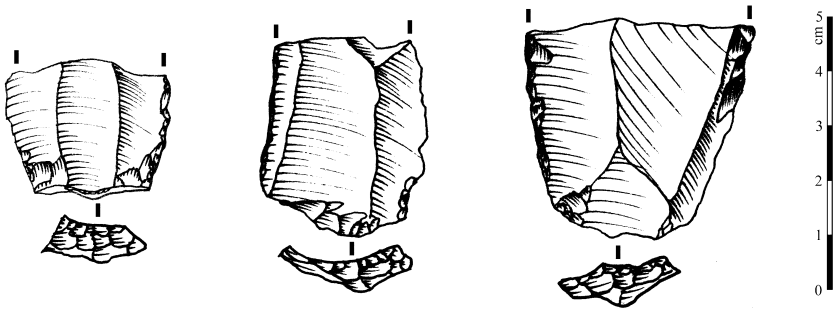


FIGURE 3. Bacho Kiro, layer 11: large blades with thick facetted butts.

burins in fact remain rare in the assemblage. The so-called retouched blades mainly on large thick blanks are very likely parts of Middle Paleolithic scrapers (*Figure 4*). More clearly, several distal parts of "typological" pointed blades are very similar to the 2 complete Mousterian points on Levallois blanks (*Figure 5*), which were considered as intrusive in layer 11 by Kozlowski (1982, 1999) and therefore not related to the Bachokirian. In our opinion, such pieces are directly related to the Bachokirian tradition. This interpretation of the Bachokirian technology is now accepted by Kozlowski (2004).

In sum, layer 11 at Bacho Kiro cave is from a technological perspective a Middle Paleolithic-like assemblage with specific economic patterns mainly related to the importation of flint blanks, which were not produced on-site and were intensively reduced and re-used by inhabitants of the cave. If layer 11 is clearly distinct from the Aurignacian, it could be more probably included in a large spectrum of industries, which also show the same combination of Middle Paleolithic Levallois technology associated to the florescence of some Upper Paleolithic tools and economic behaviours. Under the framework of a technological re-evaluation of layer 11 type-site assemblage, the Bachokirian could now be compared to specific transitional units with Middle Paleolithic roots (Teyssandier 2003: 256, Tsanova, Bordes 2003: 49, Kozlowski 2004: 275) as those well known for instance in the Balkans (Temnata layer VI, TD-II: Ginter *et al*. 1996, Drobniewicz *et al*. 2000a, b), central Europe (Bohunician industries: Škrdla 1996, 2003, Svoboda 2003, Svoboda, Bar Yosef 2003), Anatolia (Üçagizli: Kuhn *et al*. 1999) or the Near-East (e.g. Bar-Yosef 2000 for a synthesis and available data on Boker Tachtit: Marks *et al.* 1983, Marks 1993, Ksar Akil: Ohnuma 1988, Bar-Yosef 1996, 2000, Umm el Tlel: Boëda, Muhesen 1993, Bourguignon

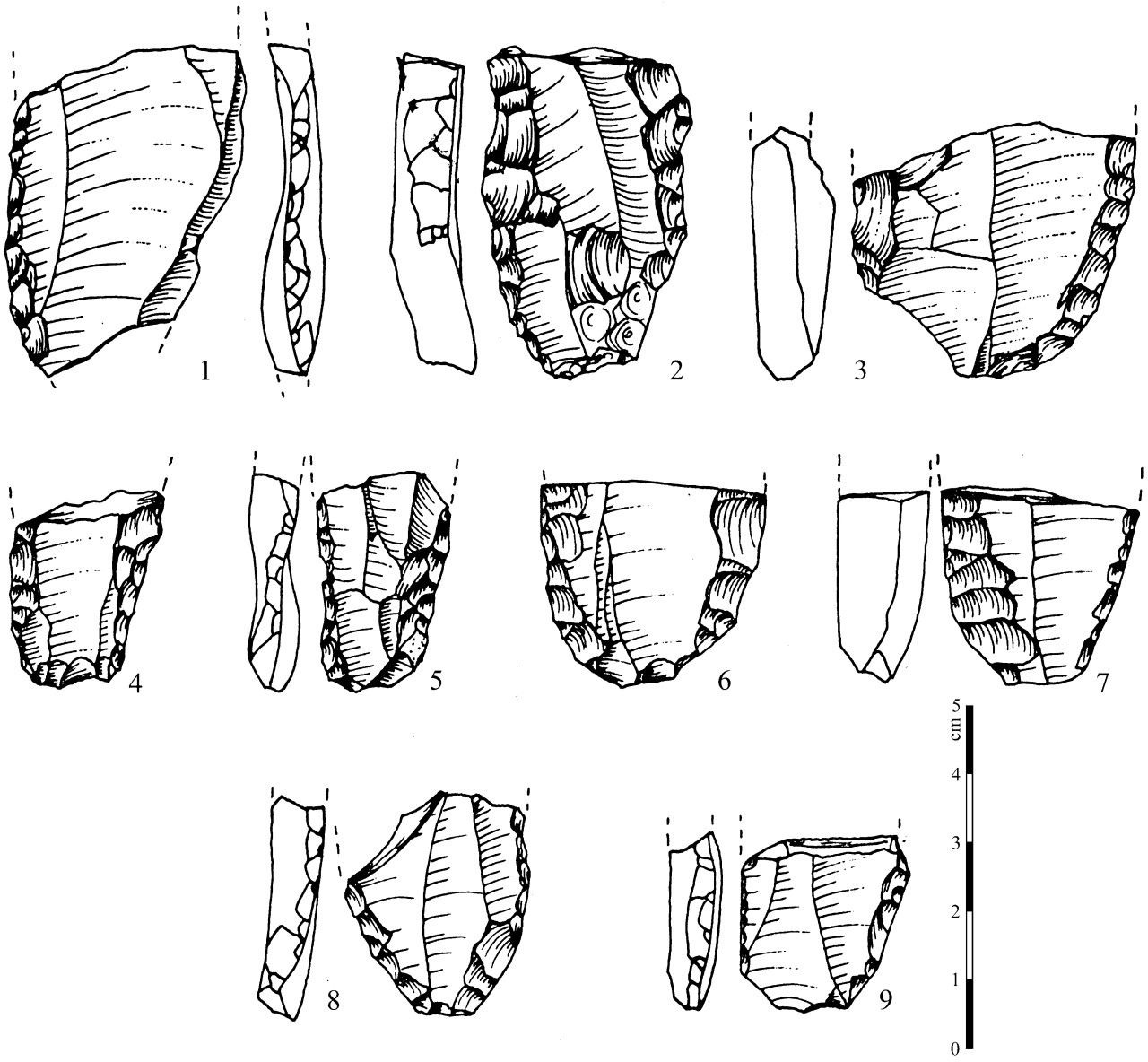


FIGURE 4. Bacho Kiro, layer 11: so-called retouched blades (e.g. Kozlowski 1982) heavily fragmented that are possibly parts of "Middle Paleolithic" scrapers (drawings after Kozlowski 1982).

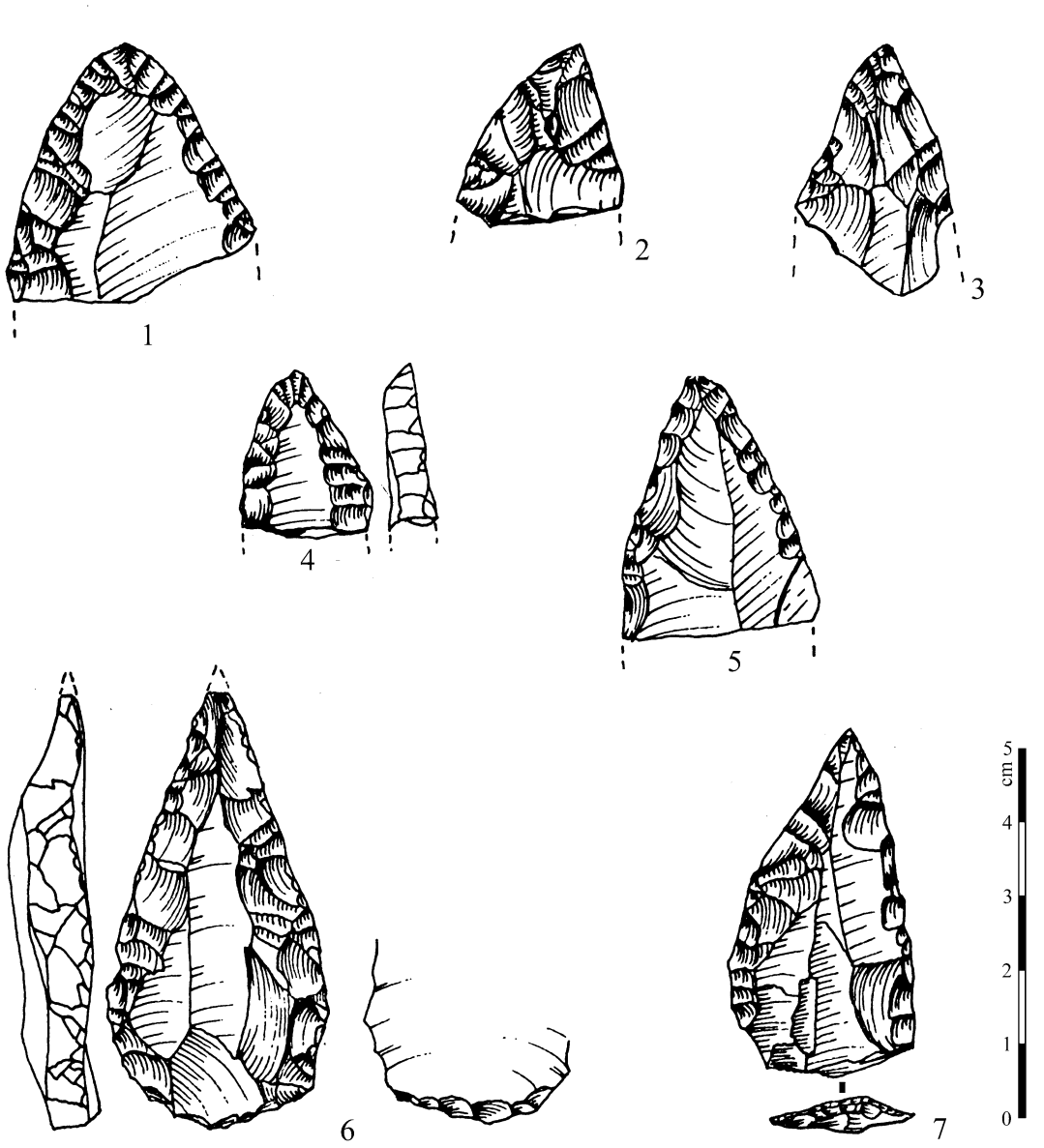


FIGURE 5. 1–5: so-called distal parts of pointed "Upper Paleolithic" blades (e.g. Kozlowski 1982); 6–7: Mousterian points on Levallois blanks (drawings after Kozlowski 1982).

1996). Based on similarities in patterns of core reduction and the morphology of elongated-pointed blanks of Levallois-type, several scholars assumed a diffusion of lithic traits and concepts from the Levant to Central Europe around 45,000–40,000 BP (Bar-Yosef 2000, Tostevin 2000, Svoboda 2003, Svoboda, Bar-Yosef 2003, Škrdla 2003), a period that could possibly be connected with the first migration of AMH into Europe. The question remains totally open whether or not these typo-technological similarities represent technical convergences, diffusion of ideas or human migrations.

Are there secure "Pre-Aurignacian" contexts in central Europe and the Balkans?

If we accept the idea that the Bachokirian is clearly different and strictly predates the Aurignacian, do there still exist Pre-Aurignacian contexts in the area concerned?

The Willendorf II case in question

Willendorf II open-air site in Lower Austria surely represents one of the most lively debated evidence in this perspective (Hahn 1993, Zilhão, d'Errrico 1999, 2003a, b, Kozlowski, Otte 2000, Haesaerts, Teyssandier 2003, Svoboda 2003, Teyssandier 2003, Mellars 2004). It is moreover one of the rare sites to offer a good chronostratigraphic framework for the period between 45,000 and 25,000 BP in central Europe (*Figure 6*). Indeed, Willendorf II shows a long loess-paleosoil record covering almost 20,000 years and with rather high paleoclimatic resolution due mostly to the work of Paul Haesaerts (Damblon *et al.* 1996, Haesaerts *et al.* 1996, Haesaerts, Teyssandier 2003). The lowest cultural layers 1 and 2 have been considered of critical importance in the debate concerning the appearance and spread of Aurignacian or Pre-Aurignacian-like industries in central Europe (Kozlowski, Otte 2000). These 2 layers excavated during the 1908–1909

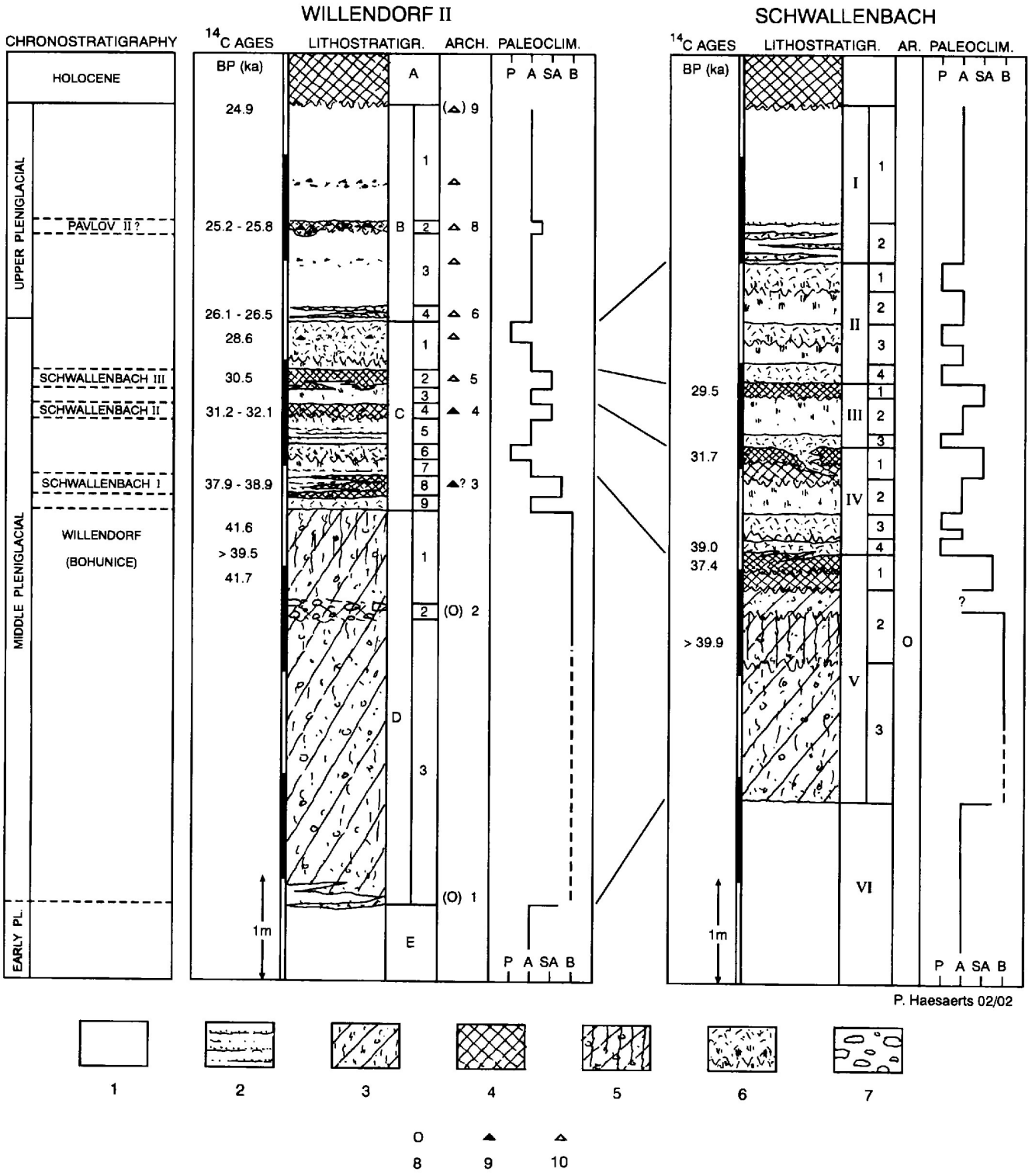


FiGURE 6. Willendorf II and Schwallenbach stratigraphies: comparative sequences (after Haesaerts *et al.* 1996). Graphic symbols. 1: loess; 2: sandy loess; 3: loam; 4: humiferous horizon; 5: B horizon; 6: bleached horizon (tundra gley); 7: stones; 8: Early Upper Palaeolithic; 9: Aurignacian; 10: Gravettian. Shortenings – Paleoenvironments; P: arctic, with deep frost or active permafrost; A: arctic; SA: subarctic; B: boreal.

excavations directed by J. Szombathy, J. Bayer and H. Obermaier are very difficult to integrate in the new 1993 section and their chronological position remains uncertain. According to Bayer's field notes, it is nevertheless possible to place layer 2 just below the subunit D1 loamy deposits corresponding to the Willendorf interstadial dated between 41,700 and 39,500 BP (Haesaerts *et al.* 1996, Haesaerts, Teyssandier 2003). If the chronology of both layers 1 and 2 remains approximative, their cultural affiliation has nothing to do with the Aurignacian or more globally with any specific

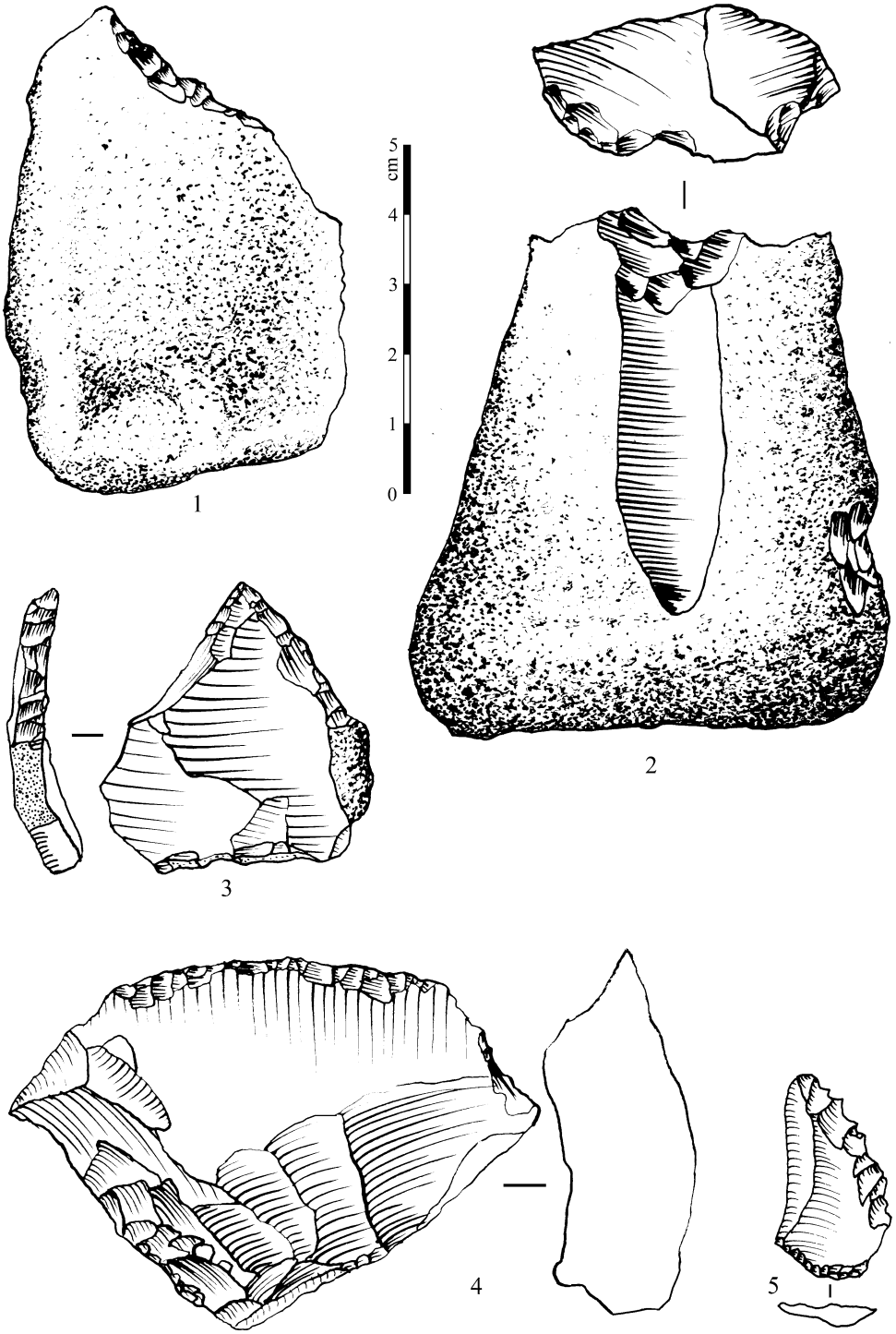


FIGURE 7. Willendorf II, layers 1 (1–2) and 2 (3–5). 1: retouched flake; 2: "core"; 3: bec; 4: sidescraper; 5: denticulate.

technocomplex: layer 1 only contains 3 artifacts (*Figure 7: 1–3*), all undiagnostic and layers 2 yielded a slightly more important assemblage, which is nevertheless insufficient to provide a chrono-cultural attribution. Few pieces of layer 2 argue for the presence of unidirectional blade production with the use of a soft hammer (*Figure 8: 5*). This is in contradiction with previous propositions for an attribution to the Bohunician for instance (Zilhão, d'Errrico 1999, Svoboda 2003). Thus, the 2 layers preceeding 39,000 BP show only undiagnostic tools and technical modalities that cannot be ascribed to the Aurignacian tradition nor to any other classical stage of the so-called Middle-to-Upper Paleolithic transition.

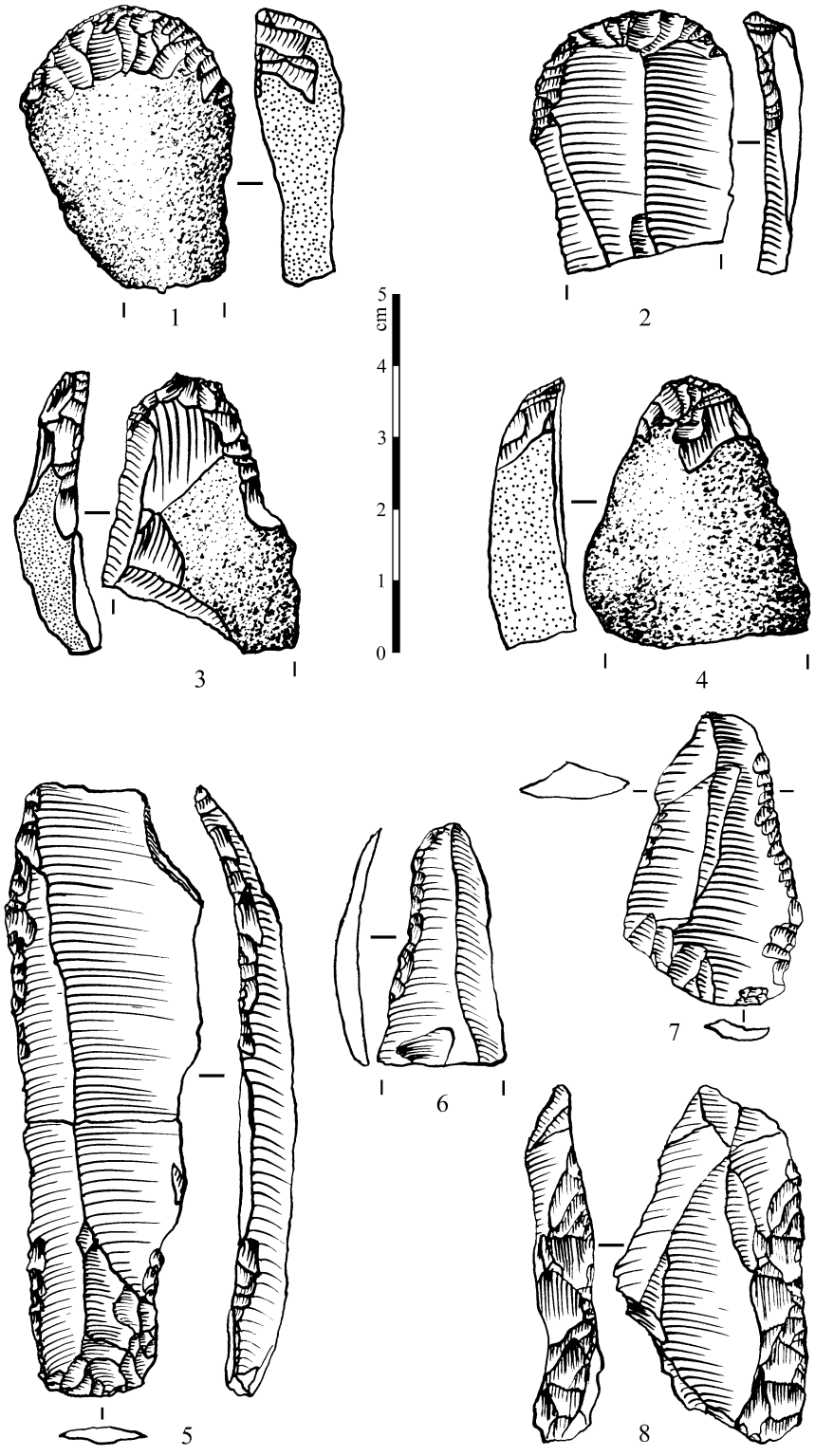


FIGURE 8. Willendorf II, layer 2. 1–4: single end-scrapers; 5–6: retouched blades; 7–8: retouched flakes.

On the opposite, the layer 3 lithic assemblage is strikingly different, with the appearance of Aurignacian blades (*Figure 9: 6, 9*) and carinated end-scrapers (*Figure 9: 1–4*), which were used for the production of small and curved-profile bladelets as in the Early Aurignacian of western (Bon 2002, Bordes 2002) or central Europe (Teyssandier 2003). Few examples of more or less complete blade specimens clearly argue for a unidirectional core reduction and the use of a soft hammer (*Figure 9: 6, 9*) (Teyssandier 2003, Haesaerts, Teyssandier 2003). Even if the lithic material recovered in

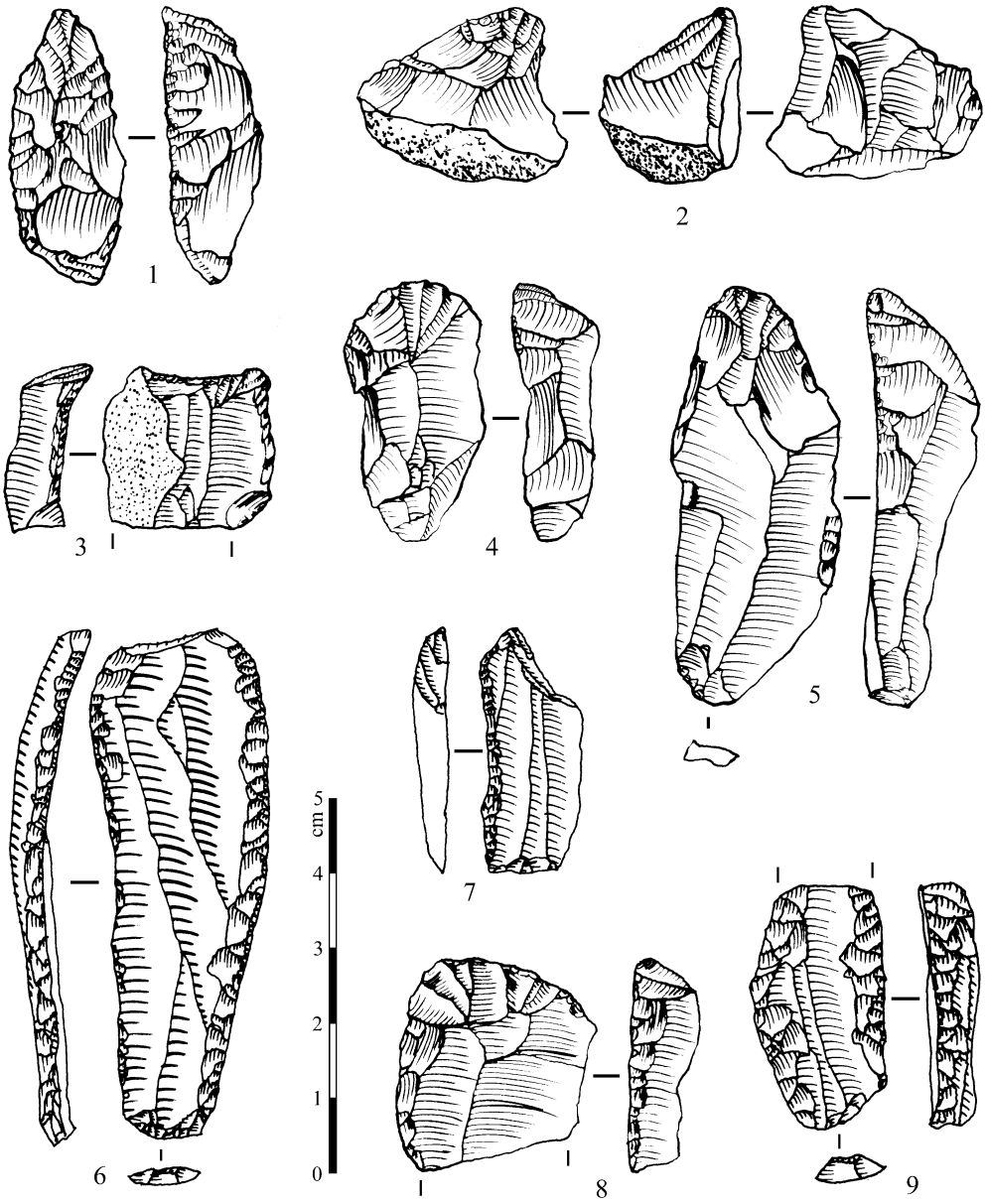


FIGURE 9. Willendorf II, layer 3. 1–3: nosed end-scrapers; 4–5: carinated end-scrapers; 6, 9: retouched "Aurignacian" blades; 7: burin on retouched truncation; 8: single end-scraper.

layer 3 only contains 38 pieces including 22 tools, all the typo-technological characters are in agreement with an attribution to the Early Aurignacian.

The chronological attribution of layer 3 remains more uncertain while 2 sets of data are not in clear accordance: two dates, one AMS and one conventionnal, place layer 3 between 38,000 and 39,000 BP, while another conventional measurement obtained in the 1980's is centered around 34,000 BP. Haesaerts considers more likely to be valid results around 38,000–39,000 BP (Haesaerts, Teyssandier 2003: 136); in this case, these results now appear to be in contradiction with the archaeological attribution, in respect to the classical time-span of the Early Aurignacian in the Aquitan basin (Bon 2002, Bordes 2002, Zilhão, d'Errico 2003a, b) or in the Swabian Jura (Teyssandier 2003, Zilhão, d'Errico 2003a, b, Teyssandier *et al*. in press). Indeed, either in western Europe or in the Swabian Jura, secure Early Aurignacian contexts did not seem to be developed before 36,000–35,000 BP. In any case, Willendorf II lithic assemblage is not able to demonstrate the validity of an Aurignacian facies preceeding the classical "Early Aurignacian" stage in central Europe.

After the revision of Bacho Kiro and Willendorf II lithic assemblages, it appears more and more clear that the Bachokirian or Pre-Aurignacian *sensu* Kozlowski and Otte (2000) have no relationship with the development of the Aurignacian. Moreover, industries included in this specific stage seem finally not to be connected with each other (e.g. Bacho Kiro layer 11 and Willendorf 1 and 2 for instance). Other "Pre-Aurignacian" secure, stratified and well-dated

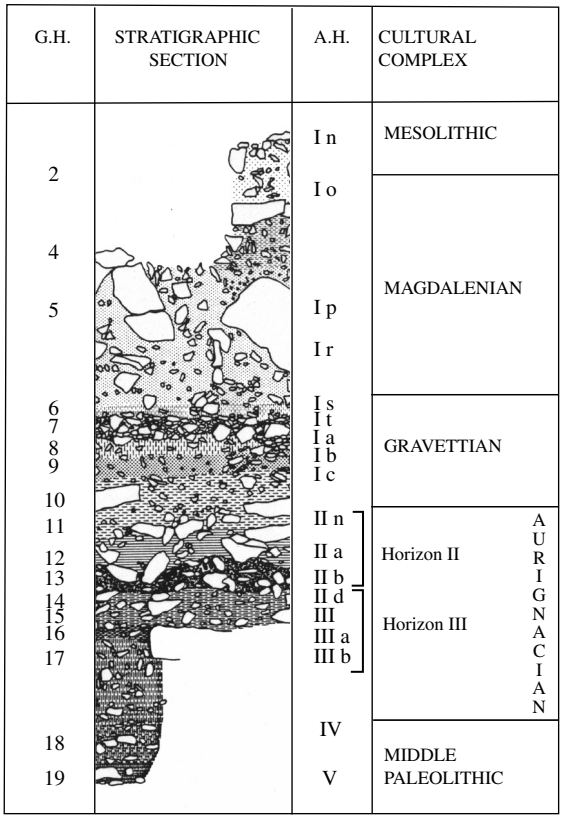


FIGURE 10. Stratigraphic profile of the Geissenklösterle cave (after Hahn 1988, modified). G. H. refers to the geological horizons and A. H. to the archaeological levels.

contexts still remain either rare or totally absent in central Europe or the Balkans (e.g. Zilhão, d'Errico 1999, 2003a, b, Teyssandier 2003).

The validity of a "Pre-Aurignacian" phase is now seriously challenged and, as a consequence, the question of the first Aurignacian in central Europe needs to be reconsidered.

Geissenklösterle, an Early Aurignacian (*sensu* Aurignacian I) in south-west Germany

Turning now to clear Aurignacian contexts, we will first consider the Geissenklösterle sequence, which has been viewed as the most serious candidate for a very early Aurignacian in central Europe (Hahn 1988, 1993, 1995, Kozlowski, Otte 2000, Richter *et al*. 2000, Conard 2002, Conard, Bolus 2003). Indeed, the lower horizon III has yielded 5 C^{14} AMS dates of approximately 36,000–40,000 BP, but their association to the Aurignacian material and, more largely, the chrono-cultural attribution of this assemblage to the Aurignacian have raised several problems and criticisms during the last years (e.g. Zilhão, d'Errico 1999, 2003 a, b).

Stratigraphy and problems of archaeostratigraphic reconstruction

Seven Aurignacian archaeological levels (IIIb to IIn, *Figure 10*) were originally defined by J. Hahn (1988). Based on the vertical and horizontal distribution of artifacts and on the vertical distribution of refitted objects, Hahn assumed in a pioneering study, using refittings across stratigraphic units and archaeological levels to better understand the archaeostratigraphy, that the seven archaeological levels represented a post-depositional sorting of the remains of only 2 major phases of human occupation: levels IId and III would have been derived from IIIa and, similarly, IIa and IIn were interpreted as secondarily displaced elements of IIb. Hahn then referred to horizon II as a genuine classical Aurignacian (Aurignacian I in the French nomenclature) with split-based bone points, mobiliary art and personal ornaments, while horizon III was later interpreted as Proto-Aurignacian (*sensu* Pre-Aurignacian I) with few bone industry and ornaments and without mobiliary art (Hahn 1993, 1995). This reconstruction has been contested more recently by Zilhão and d'Errico (1999), who consider the Aurignacian pieces (e.g. the carinated pieces) of horizon III as the results of contaminations with horizon II.

Lithic refittings, spatial patterns and techno-economic analyses as a key for a better understanding of archaeostratigraphy

Based on a critical taphonomic evaluation of the seven archaeological layers of the cave, on new refittings and on the comparison of lithic and organic productions, our study confirms the results of the archaeostratigraphic reconstruction of J. Hahn and clarifies the indubitable attribution of horizon III to the Aurignacian (Teyssandier 2003, Teyssandier, Liolios 2003, Teyssandier *et al*. in press). This attribution is now clearly accepted by Zilhão and d'Errico in their recent papers on the Geissenklösterle cave (Zilhão, d'Errico 2003 a, b).

First, the most typical Aurignacian pieces of horizon III, which were said to result from contaminations with horizon II are clearly *in situ* in the lower horizon (*Figure 11*). They are indeed massively concentrated within reconstructed

TABLE 1. Distribution of all the carinated pieces (including carinated and nosed "end-scrapers" and carinated preform cores) in the various levels of the Aurignacian sequence of Geissenklösterle cave (after Teyssandier 2003).

	IIa	IIb	**AH II**	IId	III	IIIa	IIIb	**AH III**	total
carinated pieces	–	–	**–**	1	4	14	–	**19**	19
nosed pieces	2	2	**4**	1	8	14	1	**24**	28
preform	–	1	**1**	–	–	1		**1**	2
total	2	3	**5**	2	12	29	1	**44**	49

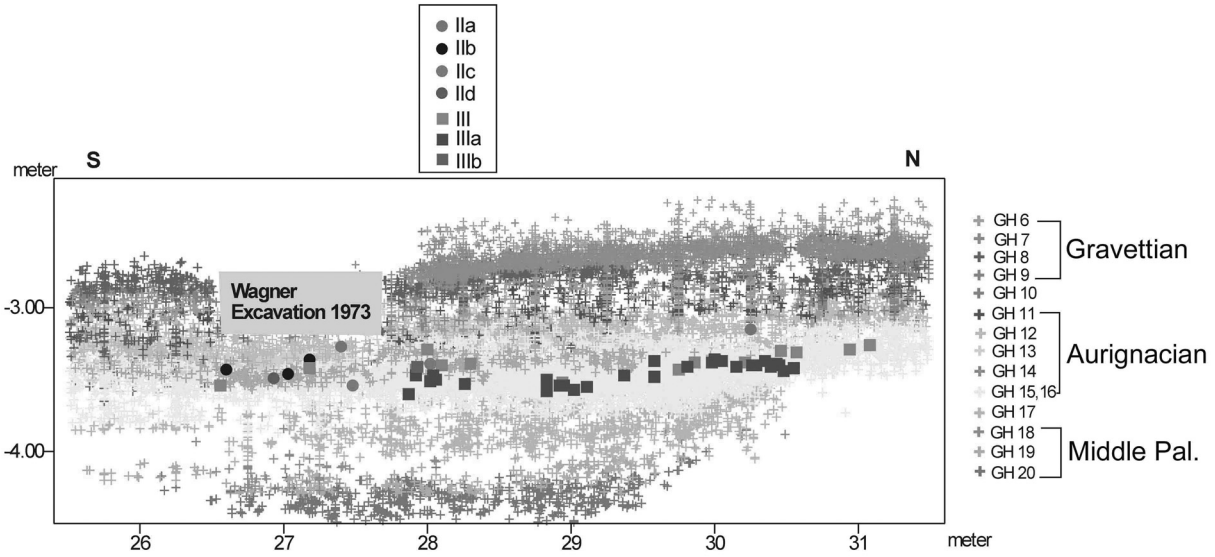


FIGURE 11. Vertical distribution of all the carinated pieces of horizons III and II of Geissenklösterle cave (after Teyssandier 2003).

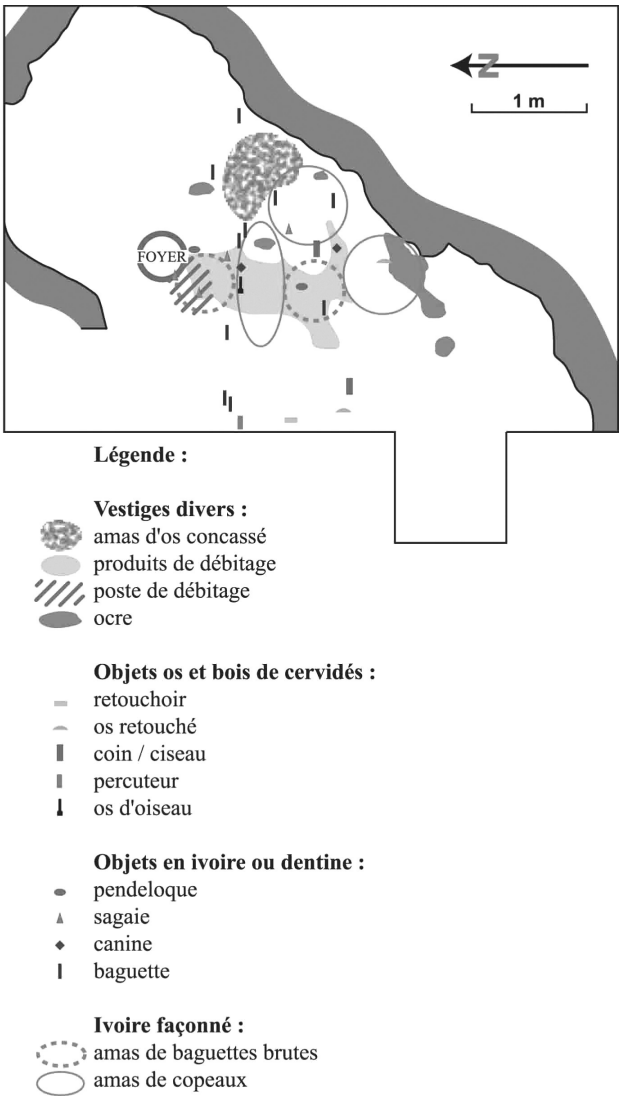


FIGURE 12. Distribution plot of bone, antler and ivory artefacts in reconstructed level III, showing the positioning of level IIIa hearth and main activity areas (after Hahn 1988 and Christensen 1999, modified).

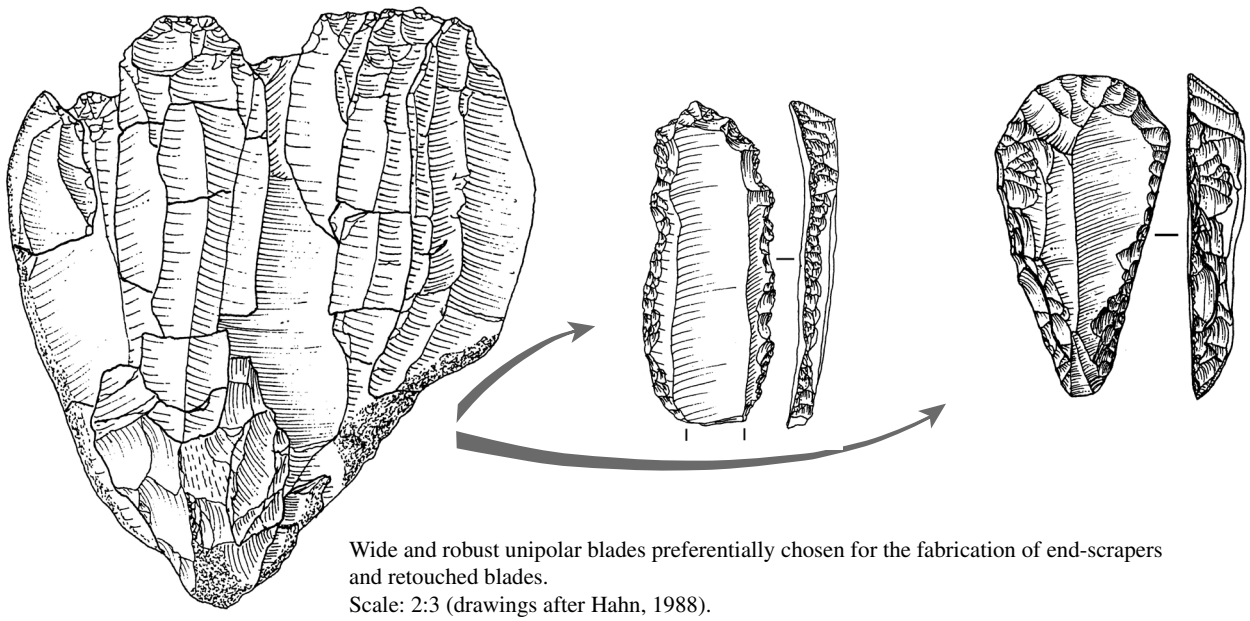
horizon III and mainly so in the original occupation of layer IIIa. This is even more clearly confirmed by *Table 1*, which shows the stratigraphic repartition of carinated pieces over the whole sequence.

More generally, the study confirms the key role of layer IIIa in the global formation of horizon III. The hearth recovered in IIIa and the clear concentration of artifacts associated to this structure illustrates well the central role played by this layer in the formation of horizon *III* (*Figure 12*). Moreover, the distribution of refitted artefacts in the area centered around the hearth indicates the clear homogeneity of this portion of the cave on a horizontal and vertical scale (Hahn 1988, Conard *et al*. 2003, Teyssandier 2003, Teyssandier *et al*. in press). Artifacts recovered around the hearth of IIIa are clearly associated by numerous refits and could then be used securely to propose a chrono-cultural attribution for horizon III.

Chrono-cultural affiliation of horizon III and its interpretation

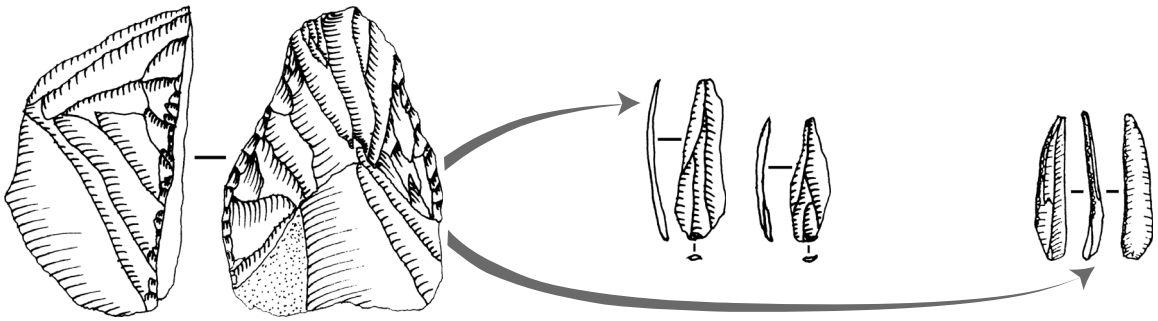
The technological results of lithic analysis have already been exposed in other places (Teyssandier 2003, Teyssandier, Liolios 2003, Teyssandier *et al.* in press). The assemblage of horizon III is mostly dominated by blade and bladelet productions obtained through the use of distinct core reduction methods: blades originate from unidirectional cores and are removed with a soft organic hammer whereas bladelets are obtained predominantly through the exploitation of carinated "end-scraper" cores (*Figure 13*). This is a typical feature of the Early Aurignacian (e.g. Bon 2002), which is equivalent to the Aurignacian I in the French nomenclature.

The affiliation of horizon III to the Early Aurignacian raises several problems at a local and Pan-European scale. First, it must be said that the uppermost Aurignacian layer (horizon II) has also been attributed to the Early



Wide and robust unipolar blades preferentially chosen for the fabrication of end-scrapers and retouched blades.
Scale: 2:3 (drawings after Hahn, 1988).

Debitage exclusively oriented towards blade and bladelet productions but related to independent technical processes.



Small bladelets with curved profile more often unretouched or transformed into Dufour bladelet.
They were obtained from the reduction of carinated pieces.
Scale: 1:1 (drawings after Teyssandier, 2003).

FIGURE 13. Synthetic view of the lithic productions of the Early Aurignacian (AH III and II) of Geissenklösterle cave (after Teyssandier 2003).

Aurignacian on a typo-technological ground (Teyssandier 2003, Teyssandier, Liolios 2003, Teyssandier *et al*. in press). It came as a conclusion of my study and previous publications of both horizons III and II that they are "culturally" similar but distinct according to economic factors related to different kinds of human occupations. This was also the position of Hahn in the late 1980's (Hahn 1988). Let me now insist more not only on the "cultural" analogy but also on the clear differences between both horizons.

First and foremost, horizon II indicates clear differences in terms of antler, bone and ivory productions (Hahn 1988, Liolios 1999, 2004, Teyssandier, Liolios 2003). The assemblage of horizon III is made up of only 20 worked artifacts, and lacks type fossils. It is mainly characterized by its lack of differentiated raw material management and is devoid of art objects. On the contrary horizon II is richer, made up of 89 worked artifacts and is clearly characterized by highly differentiated raw material management: *"Antler was chiefly selected for the production of split-based points and percussion implements, bone was used for making awls, polishers and retouchers, while ivory was preferred for mobiliary art, ornaments and projectile points with a massive base of cylindrical cross-section"* (Teyssandier, Liolios 2003: 188–189). While antler blanks were produced, in both horizons II and III, via cleaving, a

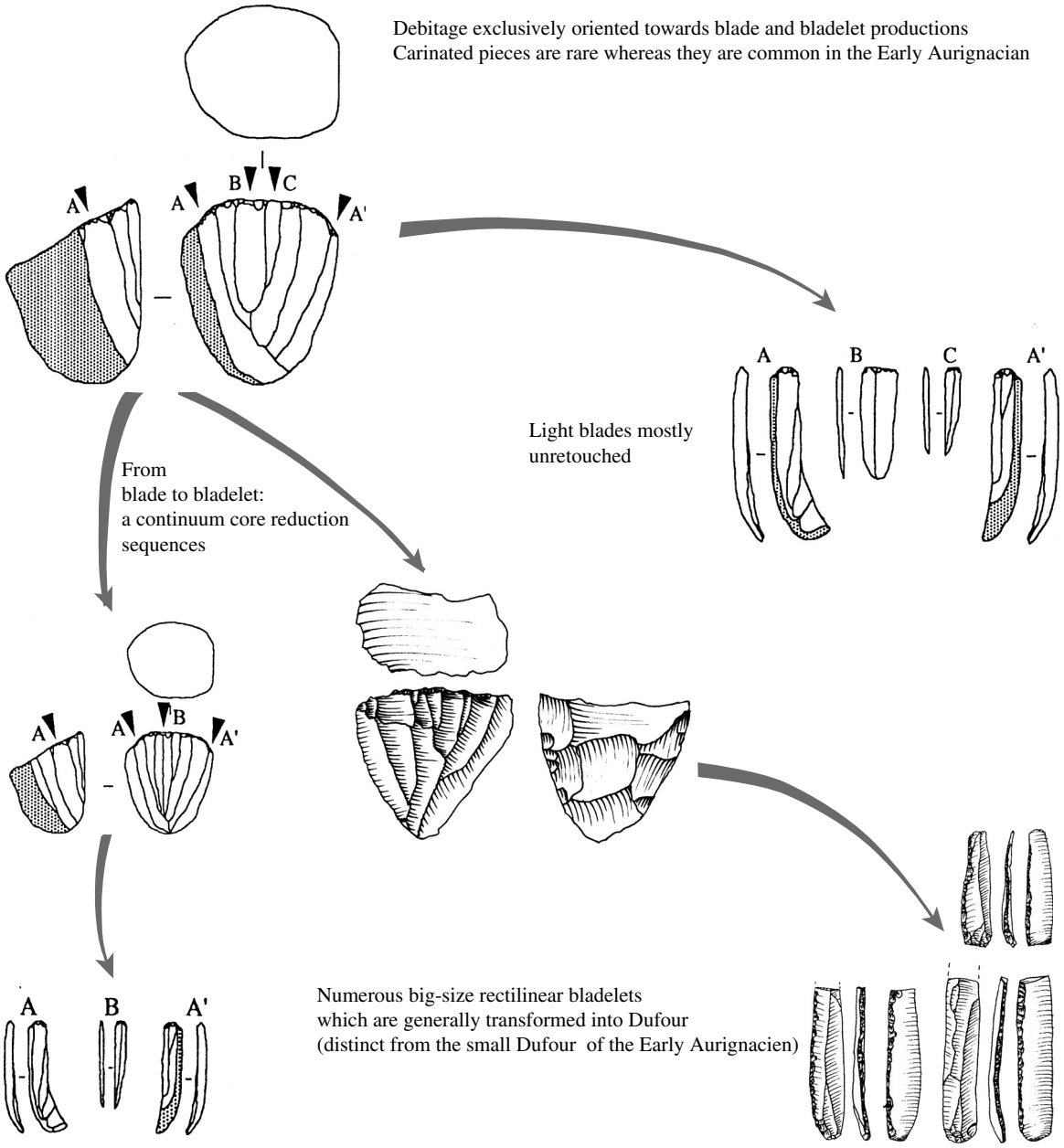


FIGURE 14. Synthetic view of the lithic productions of the Proto-Aurignacian. The schematic illustration of the continuous blade-to-bladelet reduction sequence is from Bon 2002. The pyramidal bladelet core and the associated retouched bladelets are from the Krems-Hundssteig assemblage.

technique apparently peculiar to the Aurignacian (Liolios 1999, 2004), differences between both horizons could maybe represent more than just a functional distinction. The appearance of split-based antler points in conjunction with a strict organic raw material economy, diversified and more numerous ornaments and mobiliary art in horizon II tend to distinguish it very clearly of horizon III. While we actually tend to bring together horizons III and II in a same Early Aurignacian stage, we need now more than ever to be very cautious in the interpretation of the Aurignacian sequence of Geissenklösterle. While both horizons III and II indicate a certain technical unity in the way of producing lithic and organic tools (e.g. the use of similar operative concepts in both cases), it could not be denied that something different occurred during the formation of horizon II, maybe related not only to functional differences but rather more to cultural or evolutionary ones.

One hypothesis to question in the future deals with the timing of diffusion of some of the Early Aurignacian innovations. We could for instance imagine that the lithic Early Aurignacian system with its clear dissociation of blade and bladelet productions was created and developed before the clear systematisation of the organic industry characterized mainly by raw material economy and centered around the concept of antler split-based points as a specific hunting weapon.

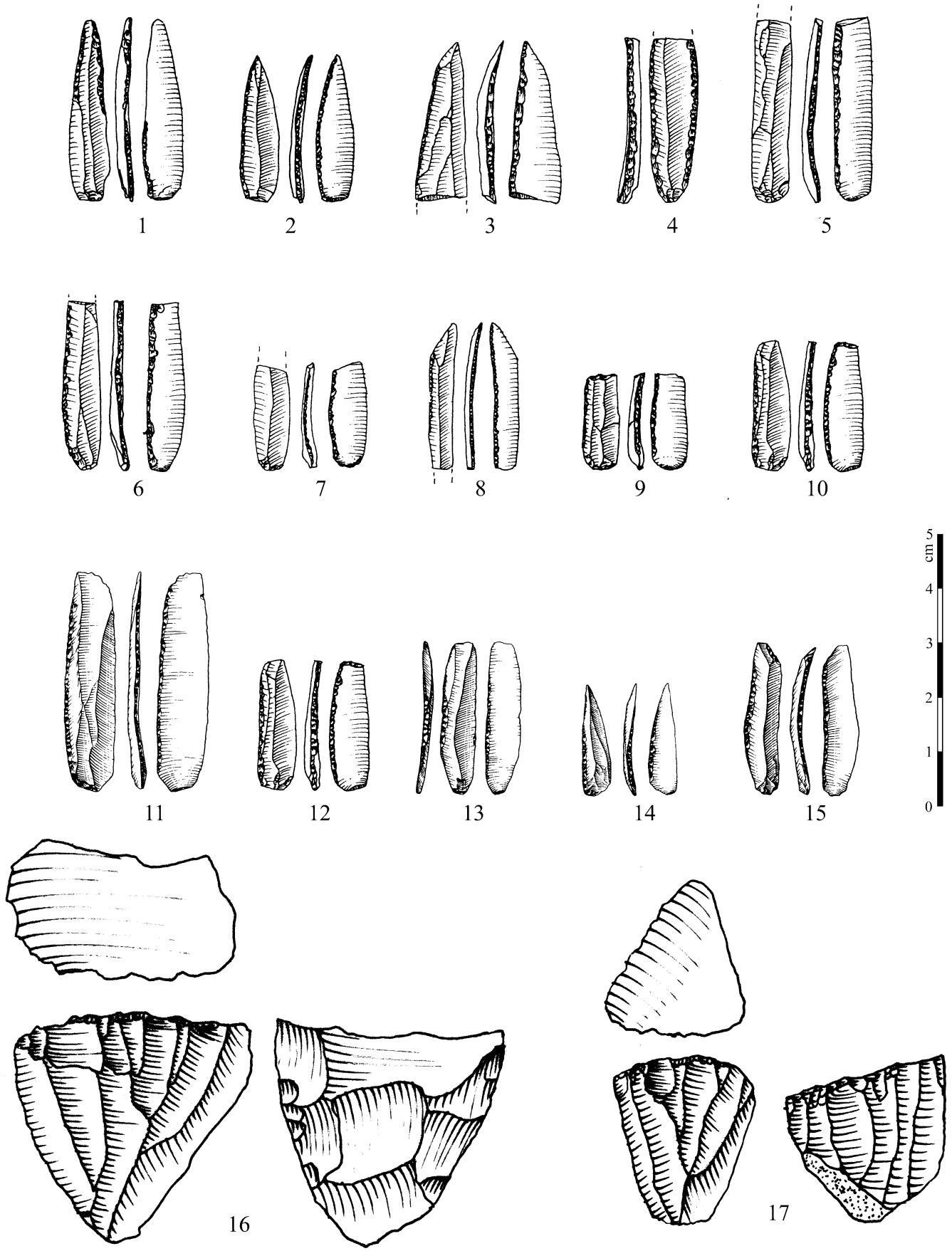


FIGURE 15. Krems-Hundssteig, 1–15: retouched bladelets. Note the global regularity of the blanks, the more or less rectilinear profile and the lateralisation of the retouch. 16–17: pyramidal bladelet cores.

The Aurignacian's unity in question

Recent technological studies have confirmed previous assessments made by typological analyses on the homogeneity of a specific stage of the Aurignacian: the classical Aurignacian I (Early Aurignacian) of the French nomenclature (e.g. Sonneville-Bordes 1960). Dominated by carinated forms such as carinated or nosed end-scrapers for the extraction of curved bladelet blanks rarely retouched and by "domestic" blade tools such as simple end-scrapers and retouched blades, the Early Aurignacian is thus easily distinguishable and covers a time-span between *ca* 35,500 and 32,000 BP (Bon 2002, Teyssandier 2003). Most of the classical Early Aurignacian sites are well-known in western Europe, more particularly in the Aquitan basin and in the Pyrenees, but also in western central Europe, especially in the Swabian Jura of southern Germany.

The homogeneity of the Early Aurignacian has masked, during a long period of time, the exact nature of the first Aurignacian testimonies in Europe and there has been a confusion between Early Aurignacian assemblages (*sensu* Aurignacian I) and the earliest Aurignacian assemblages in Europe. Indeed, other Aurignacian-like industries rich in rectilinear Dufour bladelets, designated as Proto, Archaic or Initial Aurignacian and dated between 37,000–35,000 BP are well-known for several decades in the Mediterranean area (e.g. Laplace 1966, Bazile 1974, Bazile, Sicard 1999, Broglio 1993, Soler, Maroto 1993, Bartolomei *et al*. 1994, Maroto *et al*. 1996). The main sites featuring such assemblages are located in Spain (Arbreda, Morin) France (Arcy-sur-Cure, Esquicho-Grapaou, Isturitz, La Laouza, Le Piage, Mandrin) and Italy (Fumane, Mochi). Recent field works undertaken in Le Piage, Lot (Bordes 2002, 2003) and Isturitz, Pyrénées-Atlantiques (Normand, Turq in press) demonstrate that the Proto-Aurignacian stratigraphically predates the Early Aurignacian with split-based points in southwestern France. As in the Early Aurignacian, lithic productions of Proto-Aurignacian assemblages are dominated by blades and bladelets but either the technical modalities or the end products are different. Most of the time, blades and bladelets were obtained in a continuum process on the same cores and were removed with a soft hammer (*Figure 14*). Blades are lighter and often unretouched, while rectilinear bladelets are more commonly transformed by a very specific retouch (alternate retouch, which is commonly direct on the left edge and inverse on the right edge) into big-sized Dufour bladelets of the Dufour sub-type (e.g. Demars, Laurent 1989): they are longer than those of the Early Aurignacian and with a rectilinear profile.

In central Europe, the best candidate for integration into a "Proto-Aurignacian" tradition is an open-air site located near Willendorf II in Lower Austria. In Krems-Hundssteig, a very rich lithic assemblage of more than 70,000 artifacts has been discovered but without any stratigraphic context (Strobl, Obermaier 1909, Broglio, Laplace 1966, Laplace 1970, Hahn 1977, Neugebauer-Maresch 1999). In spite of Strobl and Obermaier's (1909) claim that the assemblage came from a single layer, profiles and photos published in the original paper clearly show the presence of at least 3 distinct dark horizons (Strobl, Obermaier 1909, Neugebauer-Maresch 1999). As previously mentionned by J. Hahn (1977), typical Gravettian tools were also present in the Krems-Hundssteig assemblage and, more recently, Gravettian horizons were recovered and C^{14} dated due to the salvage work undertaken by C. Neugebauer-Maresch and her team (Neugebauer-Maresch 2005).

Personal examinations of the original assemblage clearly demonstrate that a Proto-Aurignacian component exists in Krems-Hundssteig. This could be demonstrated either from a typological or a technological perspective. Typical straight Dufour bladelets of more than 3 cm in length are well represented (*Figure 15: 1–15*). They display very homogeneous morphological and stylistical patterns that are very close to specimens well-known in Spain, France or Italy. Moreover, they could be linked with pyramidal bladelet cores commonly found in the assemblage (*Figure 15: 16–17*). These unidirectional pyramidal cores that are often made on flakes illustrate the importance of lateral bladelet removals, which make possible to then detach rectilinear and naturally pointed bladelets from the center of the debitage surface, a technological feature also observed in Proto-Aurignacian-like assemblages from western Europe (e.g. Bon 2002, in press). The association of specific bladelet blanks, big-sized Dufour bladelets and pyramidal bladelet cores ensures that one part of the Krems-Hundssteig assemblage is coherent and directly comparable with other Proto-Aurignacian assemblages of western Europe. On the contrary, and due to the absence of any stratigraphic context, it is impossible to know whether or not this bladelet component is associated with the more typical Aurignacian tools such as carinated end-scrapers or for instance Aurignacian and strangulated blades that were also found in the Krems-Hundssteig industry. The most likely hypothesis to interpret the Krems-Hundssteig assemblage is to imagine a multi-layered sequence with Proto-Aurignacian, Early Aurignacian and Gravettian industries (Teyssandier 2003). It is thus not possible to conclude on the chronological and evolutive position of the Krems-Hundssteig assemblage in the Aurignacian sequence of central Europe.

Non-conclusive thoughts on the first Aurignacian and its place in the Middle-to-Upper Paleolithic transition

The dogma of technical and cultural Pan-European homogeneity of the Aurignacian and the perception that sudden innovations appeared from the beginning of this cultural entity has led to its interpretation as the initial migration of AMH in Europe. This scenario is now contrasted with a more complex vision distinguishing at least 2 distinct traditions during the earliest stages of the Aurignacian: the "Proto-Aurignacian" and the Early "classical" Aurignacian. Though they may share certain technical modalities, these two traditions differ in the way of making blades and bladelets, in the morphology of the end-products and in the techno-economic organization of

lithic productions. Moreover, they are also clearly distinct in the intensity and the diversity of their organic and symbolic productions. In the Proto-Aurignacian, organic productions are poorly developed and personal ornaments are mainly made from shells (Vanhaeren 2002, Teyssandier 2003). On the contrary, organic productions seem to be totally systematized during the Early Aurignacian with a highly differentiated raw material economy (Liolios 1999) and personal ornaments are more diversified in using different kind of raw materials: shells, animal teeth but more particularly ivory and stones (e.g. White 1989, Vanhaeren 2002, Taborin 2004).

This leads to the idea that what is actually referred to as "the Aurignacian" includes distinct socio-cultural phenomena that may have different origins and histories (Straus 2003, Teyssandier 2003).

As first noted by Bar-Yosef (2003), *"the so-called 'proto Aurignacian' in the Mediterranean belt of southern Europe resembles the Levantine Ahmarian."* This idea also came as an informal result of the 2002 Lisbon symposium *"Towards a definition of the Aurignacian"* organized by Bar-Yosef and Zilhão, when participants had the possibility to directly examine assemblages from the Near-East and western Europe and could now be more precisely developed, since detailed typo-technological studies on Proto-Aurignacian (e.g. Bazile, Sicard 1999, Bon 2000, 2002, Bordes 2002, Teyssandier 2003, Normand, Turq *in press*, Ortega-Cobos *in press*) or Early Ahmarian (e.g. Eizenberg 2005 for a synthesis and Davidzon, Gorring-Morris 2003, Marks 2003, Monigal 2003) assemblages are available. Futhermore, a new bladelet industry that presents certain affinities with the Ahmarian and the Proto-Aurignacian has been recently described in the Balkans (Tsanova *et al*. to be published), a region situated at the intersection of Europe and the Near East. The Proto-Aurignacian-like assemblages are thus not only concentrated in the Mediterranean area since they seem now to be documented in the Aquitan basin, in Central Europe and in the Balkans.

Similarities between Proto-Aurignacian and Early Ahmarian assemblages are particularly significant in terms of blade and bladelet core reduction methods and retouched bladelet morphologies (e.g. certain El-Wad points resemble the Font-Yves points of the Proto-Aurignacian, Belfer-Cohen, Gorring-Morris 2003). The convergences are also of particular significance when examining the general "allure" of blade and bladelet blanks, often standardized and regular, narrow and elongated and with a predominant rectilinear profile. All these technological and stylistic patterns well differentiate the Early Ahmarian and the Proto-Aurignacian on the one hand from the classical Early Aurignacian on the other hand. Moreover, as in the Proto-Aurignacian, the Early Ahmarian industries include few examples of organic productions and the predominant use of shells for ornaments, as recently demonstrated in levels F–H of Üçagizli for instance (Kuhn *et al*. 2003).

The situation is very different for the classical Early Aurignacian, for which no convincing ancestor could be found outside Europe (Teyssandier 2003). This leads to formulate the hypothesis that the Early Aurignacian is in fact a European entity created on the basis of a local substrate in full mutations (e.g. Châtelperronian and more generally the so-called transitional industries, Proto-Aurignacian…). If we follow the Geissenklösterle evidences, we could also expect that all the classical characters of the Early Aurignacian (e.g. systematized organic productions, numerous and diversified ornaments, mobiliary art) were not present from the beginning of that complex.

Any attempt for a "paleohistorical" reconstruction of the Middle-to-Upper Paleolithic transition still remains an utopy. We are faced more with conceptual entities than with historically reified cultures, when speaking about "Proto", "Early" Aurignacian or Bachokirian (Straus 2003, Teyssandier, Liolios 2004). Considering the initial stages of the Aurignacian, we still do not know what are the phylogenetic relationships of the Proto-Aurignacian with the Early Aurignacian for instance. That is why we believe the term "Proto-Aurignacian" has not to be understood in an evolutionary way, while its ancestral filiation with the Early Aurignacian is highly questionable. It seems actually that the development of the European Upper Paleolithic and the cultural modernity that we lend to it, may have different histories and origins in different cultural traditions within the geographical areas considered.

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