

# CHAPTER 14

## THE FIRST MODERN HUMANS IN THE MIDDLE DANUBE AREA? NEW EVIDENCE FROM WILLENDORF II (EASTERN AUSTRIA)

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***Abstract.** While there are no human fossil remains from eastern Austria in the period 50–30 ka BP, the archaeological finds from the early Upper Palaeolithic are well known. This chapter gives an overview of the Aurignacian/EUP sites in eastern Austria and presents preliminary results of a new analysis of finds from the well-known site of Willendorf II.*

*About 460 never-before-published lithics from Willendorf II/layer 3 serve as the main scope of the work presented here. Preliminary results of typological and technological analyses (raw material studies, attribute analysis, and refitting) are presented. The technology resembles the early Aurignacian technology of southern Germany (e.g., Geißenklösterle, AH III) and Aurignacian I in France. In comparison to the local late Middle Palaeolithic and the transitional industries (Bohunician, Szeletian), it indicates clear differences in reduction strategies.*

*In the chapter's last section, the regional sequence in the Middle Danube Area is presented, and the various cultural entities and their relationships are discussed. The Danube Corridor Hypothesis is contrasted with the regional data.*

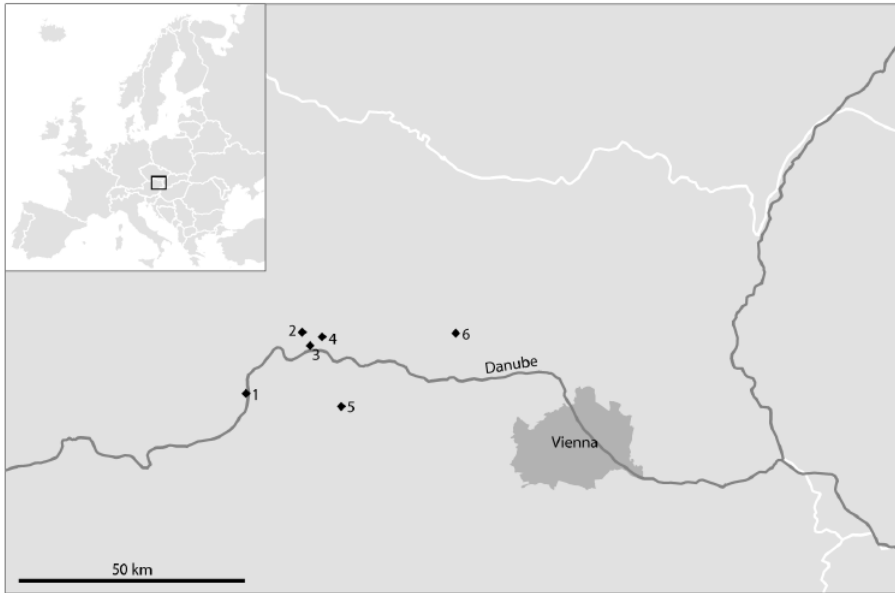
### INTRODUCTION

Together with southern Moravia, northwestern Hungary, and western Slovakia, eastern Austria forms an archaeologically rich landscape called the Middle Danube Area. Some very important sites exist here from the period 50–30 ka BP (e.g., Willendorf II, Stránská Skála and Mladeč).

If there was a migration of modern humans along the Danube into Europe—and there seems to be evidence for this—then the Middle Danube area is one of the key regions for examining the transition from the Middle to the Upper Palaeolithic in central Europe, and offers a good test case for verifying concepts such as the Danube Corridor Hypothesis.

The eastern Austrian Palaeolithic record is rich. While Middle Palaeolithic sites are nearly unknown, which might be in part due to the history of research in the area, Upper Palaeolithic sites are abundant and well preserved due to the loessic environment.

The Aurignacian/EUP sites of eastern Austria concentrate in the Krems area, about 50 km west of Vienna (see fig. 1). This is due to research in this area spanning the last 100 years.



**Fig. 1.** Map of Austria showing Aurignacian/EUP sites in eastern Austria: 1) Willendorf II; 2) Senftenberg; 3) Krems-Hundssteig; 4) Stratzing/Krems-Rehberg; 5) Getzersdorf; 6) Großweikersdorf (graphic: Ph. R. Nigst).

## **WILLENDORF II**

The site is situated in the Wachau on the left bank of the Danube. The Wachau is a narrow part of the Danube Valley, cut into the geological zone called the Bohemian Massif. Four of the nine layers, layers 1 to 4, of Willendorf II are of interest for the period in question here.

### ***Willendorf II, Layer 1***

Layer 1 was excavated in 1908 and 1909 and yielded three lithic artefacts and a certain number of unworked stones (manuports). The three artefacts are undiagnostic, so the exact chrono-cultural attribution remains questionable. For this part of the Willendorf II sequence, no radiometric or TL dates exist. Layer 1 was not present in the new section and sedimentological analysis of P. Haesaerts et al. (1996).

### ***Willendorf II, Layer 2***

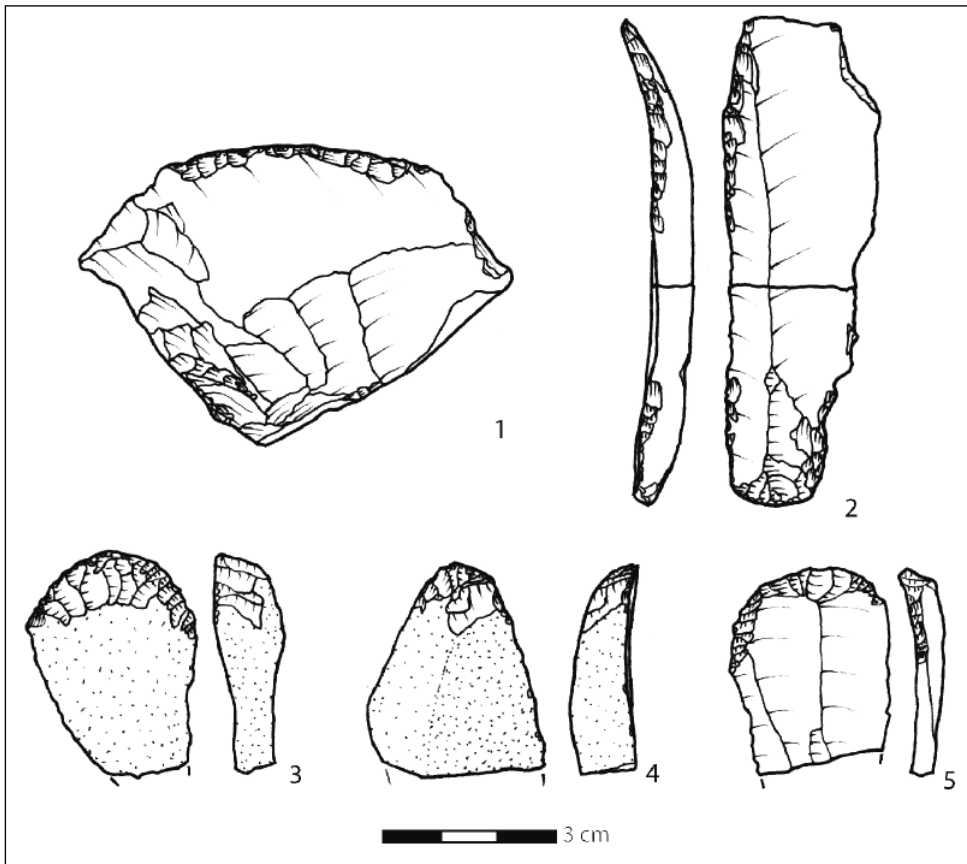
Layer 2, excavated in 1908 and 1909, contained more artefacts (fig. 2), but still too few for a secure chrono-cultural attribution. This assemblage was variously attributed to the Aurignacian (Broglio and Laplace 1966), the Bacho-Kirian (Kozłowski and Otte 2000a, 2000b) and the early Upper Palaeolithic (Teyssandier 2003; Haesaerts and Teyssandier

2003). As mentioned above, undiagnostic tools and a small assemblage make it difficult to verify the various attributions. In this chapter, we want to follow N. Teyssandier's qualification of the layer 2 assemblage as EUP.

### ***Willendorf II, Layer 3***

The assemblage of layer 3 was excavated in 1908, 1909, and 1955. The radiocarbon dates for this layer are in the range of 34–39 ka BP. The lithics are interpreted as Aurignacian by most scholars (Broglia and Laplace 1966; Felgenhauer 1959; Hahn 1977; Kozłowski and Otte 2000*a*, 2000*b*; Teyssandier 2003), although recently J. Zilhão and F. d'Errico (1999*a*) have criticized this attribution.

In the collection of the Prehistoric Department of the Museum of Natural History in Vienna, only 43 artefacts from layer 3 were inventoried and published by F. Felgenhauer



**Fig. 2.** Willendorf II, layer 2: Selected lithics. 1) side scraper. 2) retouched blade. 3-5) end scraper (redrawn after Hahn 1977 and Teyssandier 2003).

(1959). These finds are the well-known assemblage of layer 3 that most scholars have attributed to the Aurignacian (Broglia and Laplace 1966; Felgenhauer 1959; Hahn 1977; Kozłowski and Otte 2000a, 2000b; Teyssandier 2003). Additional finds were stored in a wooden transport box of the 1908/09 excavations in the cellar of the department. On 15 October 2003 the wooden box of the 1908/09 excavations was opened by the author together with Walpurga Antl-Weiser. It contained abundant lithic debitage. Additional finds originating from F. Felgenhauer's 1955 excavations were inventoried, but not analysed. In total, there are now 500 stone objects and some bones, which are not analysed in this paper. Among the 500 stone objects, we can distinguish 490 lithics and 10 other worked or used stones/gravels, such as hammerstones (Nigst 2004).

### *Brief Description of Sedimentology and Radiocarbon Dates*

The initial sedimentological analysis was done by F. Brandtner (1959) in the 1950s. In 1981 and 1993, a team led by P. Haesaerts (Damblon, Haesaerts and van der Plicht 1996; Haesaerts 1990; Haesaerts et al. 1996) made a new section and performed various analyses on the entire section. The analyses show seven sedimentological units A to G. Units E to G were not present in the sections from Haesaerts; but described by Brandtner (1959). According to the new 1993 section (Haesaerts et al. 1996), Unit D consists of heterogeneous ochre yellowish loam. Unit C is described as a complex loess set about 1.5 metres thick and subdivided into nine subunits (C1 to C9). These subunits consist of dark to light brownish humiferous horizons (C2, C4 and C8), of pale yellowish loess horizons (C3, C5 and C7) and bleached light grey horizons (C1, C6 and C9). Unit B is the upper loess cover, consisting of pale yellowish homogeneous loess layers (B1 and B3), thin lenses of pale grey loess (B4), and a light brownish horizon (B2). Unit A is formed by the thick humic horizon on top of the section.

Of special interest here is subunit C8 that contains cultural layer 3. It is present in the lower part of the Unit C and consists of brownish grey lenses stretched by solifluction. It further contains ashy stripes with high concentrations of charcoal.

Layer 3/subunit C8 is dated by three radiocarbon dates (table 1); all three originate from the same charcoal concentration in the section. The sample of the first date GrN-11192 (34,000 +1200/-1000) was collected in 1981, and was at the minimum carbon weight limit for conventional radiocarbon dating. Furthermore, it was not subject to the same strong selection criteria and laboratory pre-treatment applied to the later 1993-section samples. It therefore has to be considered as a minimum age. The other two dates (GrN-17805 and GrA-896) range between 39 and 38 ka BP (Haesaerts et al. 1996).

In the regional framework, layer 3/subunit C8 belongs to the Schwallenbach I-Interstadial. Subunit D2 (possibly with cultural layer 2) belongs to the Willendorf-Interstadial dated to around 41 ka BP that can be correlated to the Bohunice soil in Moravia (Haesaerts et al. 1996; Haesaerts and Teyssandier 2003).

### *Typology*

The modified lithics of the "old" assemblage were analysed by several researchers (e.g., Broglia and Laplace 1966; Felgenhauer 1959; Hahn 1977; Teyssandier 2003). Among the "new" finds only a few, undiagnostic modified pieces are present, which hints at a selection during the old excavations in 1908/09.

Typological studies show that the modified pieces consist of single end scrapers, carinated end scrapers, nosed end scrapers, retouched blades and flakes, truncated pieces, burins,

Table 1. Radiocarbon dates of eastern Austrian Aurignacian/EUP sites.

site	layer	lab. no.	<sup>14</sup> C age	1 sigma	material	weight (in g)	literature	remarks
Willendorf II	1?	GrN-1287	30530	250	charcoal	-	Haesaerts et al. 1996	sedimentological subunit D3?
Willendorf II	-	GrN-11195	41700	3700/-2500	charcoal	-	Haesaerts et al. 1996	sedimentological subunit D1 mid.
Willendorf II	-	GrN-17807	> 36000	-	charcoal	2.07	Haesaerts et al. 1996	sedimentological subunit D1 mid.
Willendorf II	-	GrN-17806	41600	4100/-2700	charcoal	3.53	Haesaerts et al. 1996	sedimentological subunit D1 up.
Willendorf II	-	GrN-11190	39500	1500/-1200	charcoal	-	Haesaerts et al. 1996	sedimentological subunit D1 up.
Willendorf II	3	GrN-17805	38880	1530/-1280	charcoal	5.94	Haesaerts et al. 1996	sedimentological subunit C8
Willendorf II	3	GrN-11192	34100	1200/-1000	charcoal	-	Haesaerts et al. 1996	sedimentological subunit C8
Willendorf II	3	GrA-896	37930	750	charcoal	0.32	Haesaerts et al. 1996	sedimentological subunit C8
Willendorf II	4	GrN-1273	32060	250	charcoal	-	Hahn 1977	sedimentological subunit C4
Willendorf II	4	GrA-501	31210	260	charcoal	0.74	Haesaerts et al. 1996	sedimentological subunit C8
Willendorf II	4	H-249/1276	31700	1800	charcoal	-	Felgenhauer 1959	sedimentological subunit C4
Stratzing	3	VERA-967	43115	1530/-1290	charcoal	-	Einwögerer and Neugebauer-Maresch 2004	sedimentological subunit C4
Stratzing	3	VERA-968	46790	3230/-2300	charcoal	-	Einwögerer and Neugebauer-Maresch 2004	-
Stratzing	palaeosoil underlying layer 3							-
Stratzing	2	ETH-6026	>32640	330	charcoal	-	Neugebauer-Maresch 1996	layer 2 <i>in situ</i>
Stratzing	2	ETH-6023	29950	370	charcoal	-	Neugebauer-Maresch 1996	layer 2 <i>in situ</i>
Stratzing	2	ETH-6024	31450	440	charcoal	-	Neugebauer-Maresch 1996	layer 2 <i>in situ</i>
Stratzing	2	ETH-6025	31230	430	charcoal	-	Neugebauer-Maresch 1996	layer 2 <i>in situ</i>
Stratzing	2	GrN-16135	31790	280	charcoal	-	Neugebauer-Maresch 1996	layer 2 <i>in situ</i>
Stratzing	2	GrN-15641	30670	600	charcoal	-	Neugebauer-Maresch 1996	layer 2 not <i>in situ</i> /solifluction
Stratzing	2	GrN-15642	31190	390	charcoal	-	Neugebauer-Maresch 1996	layer 2 not <i>in situ</i> /solifluction
Stratzing	2	GrN-15643	29200	1100	charcoal	-	Neugebauer-Maresch 1996	layer 2 not <i>in situ</i> /solifluction
Stratzing	2	KN-3941	28400	700	charcoal	-	Neugebauer-Maresch 1996	layer 2 not <i>in situ</i> /solifluction
Stratzing	2	KN-3942	29900	600	charcoal	-	Neugebauer-Maresch 1996	layer 2 not <i>in situ</i> /solifluction
Stratzing	1	KN-4140	29260	460	charcoal	-	Neugebauer-Maresch 1996	layer 2 not <i>in situ</i> /solifluction
Stratzing	1	KN-4141	28210	500	charcoal	-	Neugebauer-Maresch 1996	layer 2 not <i>in situ</i> /solifluction
Stratzing	?	KN-1654	35500	2000	charcoal	-	Hahn 1977	-
Krems-Hundssteig								-
Großweikersdorf	upper	GrN-16264	31630	240	charcoal	-	Brandtner 1990	-
Großweikersdorf	lower	GrN-16263	32770	240	charcoal	-	Brandtner 1990	-
Senftenberg	-	GrN-16887	36350	600	charcoal	-	Djindjian, Kozłowski and Otte 1999	-

scrapers, one borer/bec and one combination tool (burin-truncation-edge retouch). The new type list for layer 3 is shown in table 2. The assemblage is dominated by end scrapers and laterally retouched pieces. The end scrapers (figs. 3 and 4) consist of single (n=5), carinated (n=4) and nosed end scrapers (n=4). Most of them were made on flake blanks. Especially carinated and nosed end scrapers were made on generally thicker flake blanks. The carinated end scrapers can also be viewed as cores for bladelet production, although no bladelets from carinates are present. This might be due to the excavation techniques of the early twentieth century, as figure 5, showing the length distribution of all lithics, illustrates. An under-representation of objects smaller than 20 mm is visible.

Laterally retouched blanks (fig. 6) are the second largest tool type group. They consist of partially retouched flakes and blades, as well as bilaterally retouched blanks. Among the

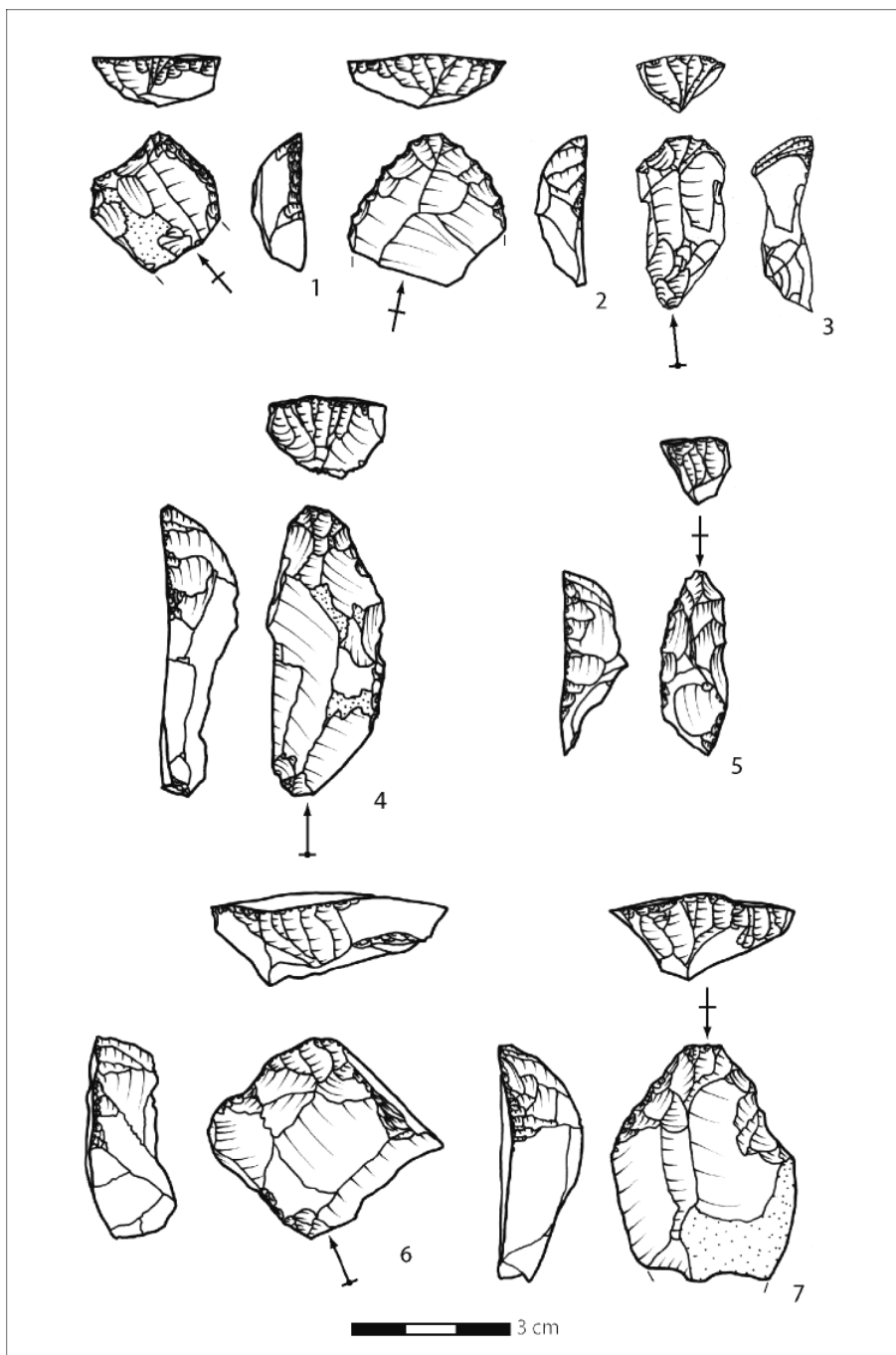
*Table 2. Willendorf II, layer 3: typological composition of modified pieces.*

<b>Tool type</b>	<b>Frequency</b>
End scraper	13
Carinated end scraper	4
Nosed end scraper	4
Single end scraper	5
Laterally retouched blank	12
Truncated piece	3
Burin	3
Side scraper	2
Borer/bec	1
Combination tool	1
<b>Total</b>	<b>35</b>

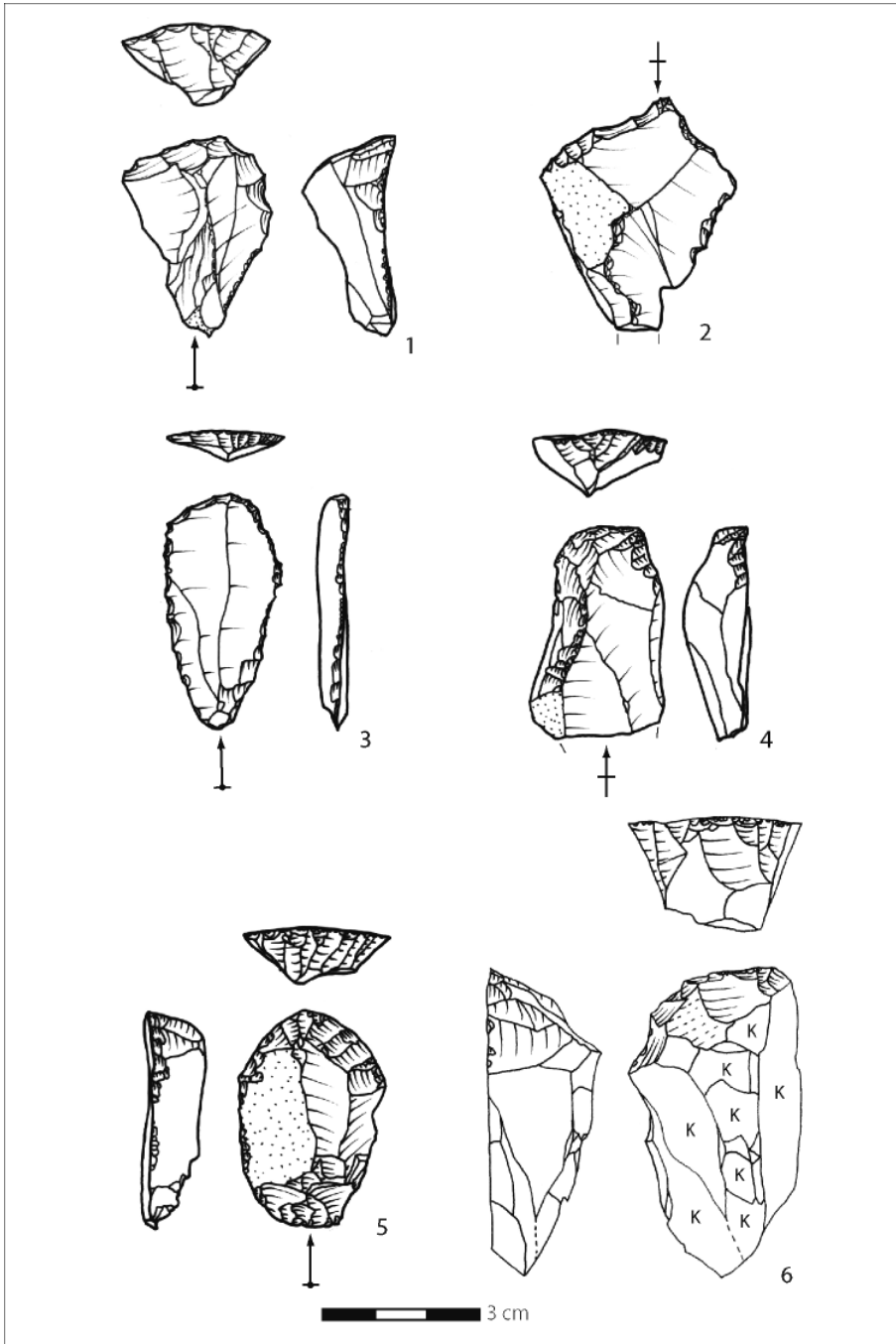
burins (fig. 7/2-5), no chronologically significant types are present. Two dihedral burins and one burin on a flake were recognised.

The only borer/bec among the finds was made on a flake blank (fig. 7/1). The three truncated pieces (fig. 7/6-8) were made on a flake, a blade, and a bladelet. Furthermore, there are two scrapers (fig. 8), for which a flake blank was utilized. The combination tool is a burin-truncation-lateral retouch combination.

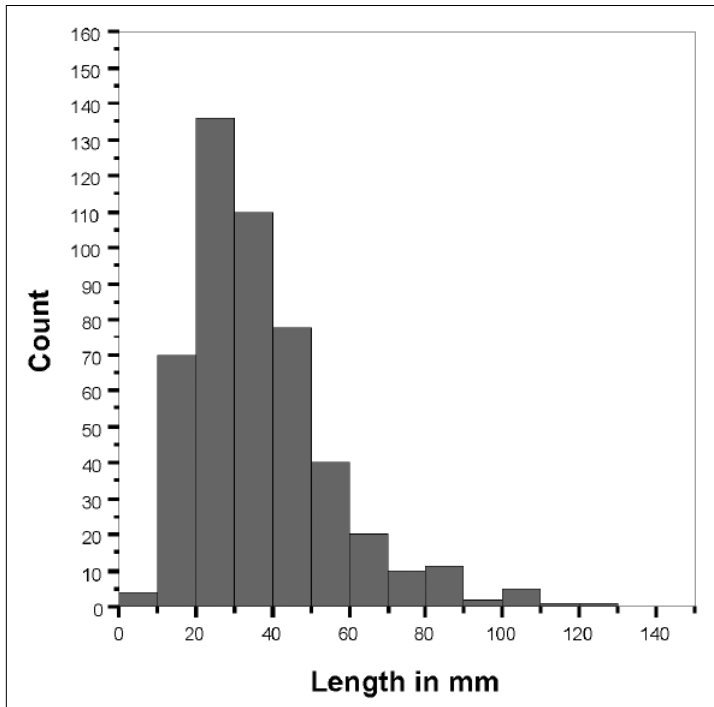
The typological composition of the modified pieces, especially the nosed and carinated end scrapers, has an “Aurignacian” appearance. Until now, layer 3 has always been interpreted as Aurignacian, although an attribution to the Aurignacian relying only on a few nosed and carinated end scrapers is problematic. We need further evidence to support this first cultural attribution.



**Fig. 3.** Willendorf II, layer 3: End scrapers. 1, 6, 7) nosed end scraper. 2) single end scraper. 3-5) carinated end scraper (drawings: Ph. R. Nigst).



**Fig. 4.** Willendorf II, layer 3: End scrapers. 1, 3-5) single end scraper. 2) nosed end scraper. 6) carinated end scraper (drawings: Ph. R. Nigst).



*Fig. 5. Willendorf II, layer 3: length distribution of all lithics (Graphic: Ph. R. Nigst).*

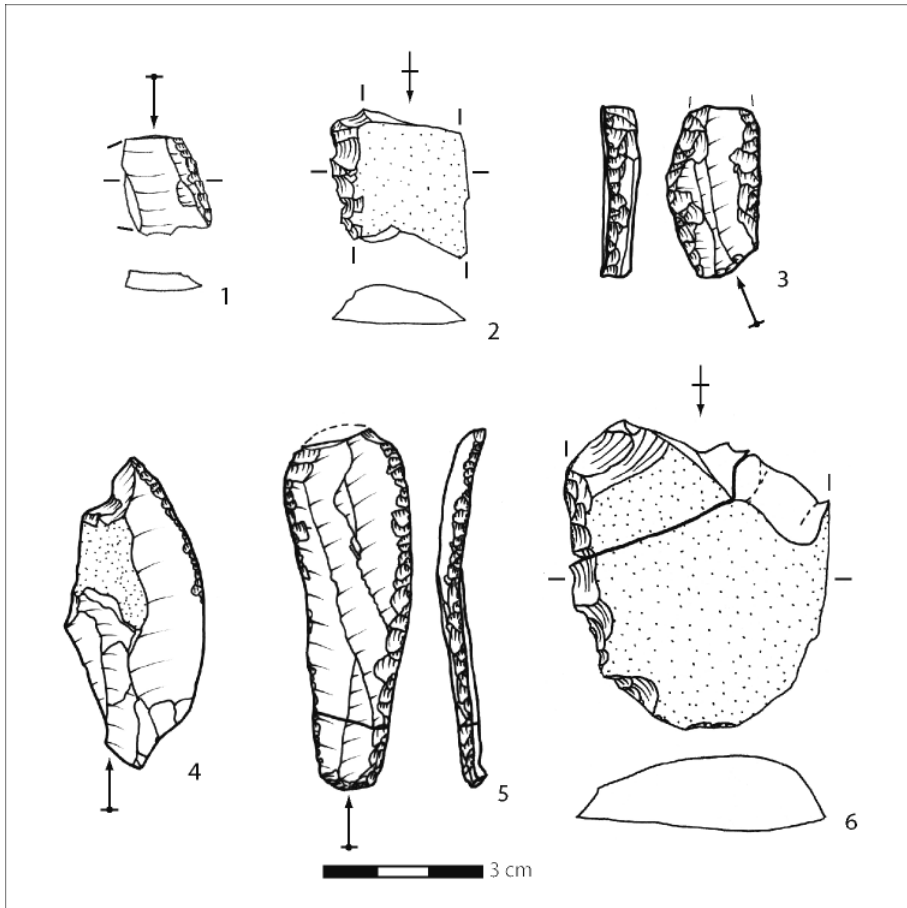
## Chaîne Opératoire

### *Raw Material Procurement*

The lithic raw materials are mostly of local (up to 1 km distance, local Danube gravels) or regional (up to 20 km distance; e.g., yellowish “Jasper” of the Waldviertel) origin. Most of the local and regional raw materials are of low quality. Only up to 5% of the raw materials were transported to the site from far away. These raw materials consist of some types of fine-grained hornstones; the supposed origin is northern Moravia or southern Poland (about 100 km distance). All the different types of raw material were more or less utilised for flake and blade debitage.

About two-thirds of blade/bladelet blanks show remnants of cortex on their dorsal surface. The same is true for flake blanks (table 3). The location of cortex on the blanks shows no distinctive pattern. All cortex locations are more or less present. Up to 7.7% (blades/bladelets) and 12.7% (flakes) are completely covered with cortex on the dorsal surface, and can therefore be considered as primary blanks.

Nodules seem to have been brought to the site more or less intact, i.e., before decortification. In addition, some seem to have been untested. The location of the site in the immedi-



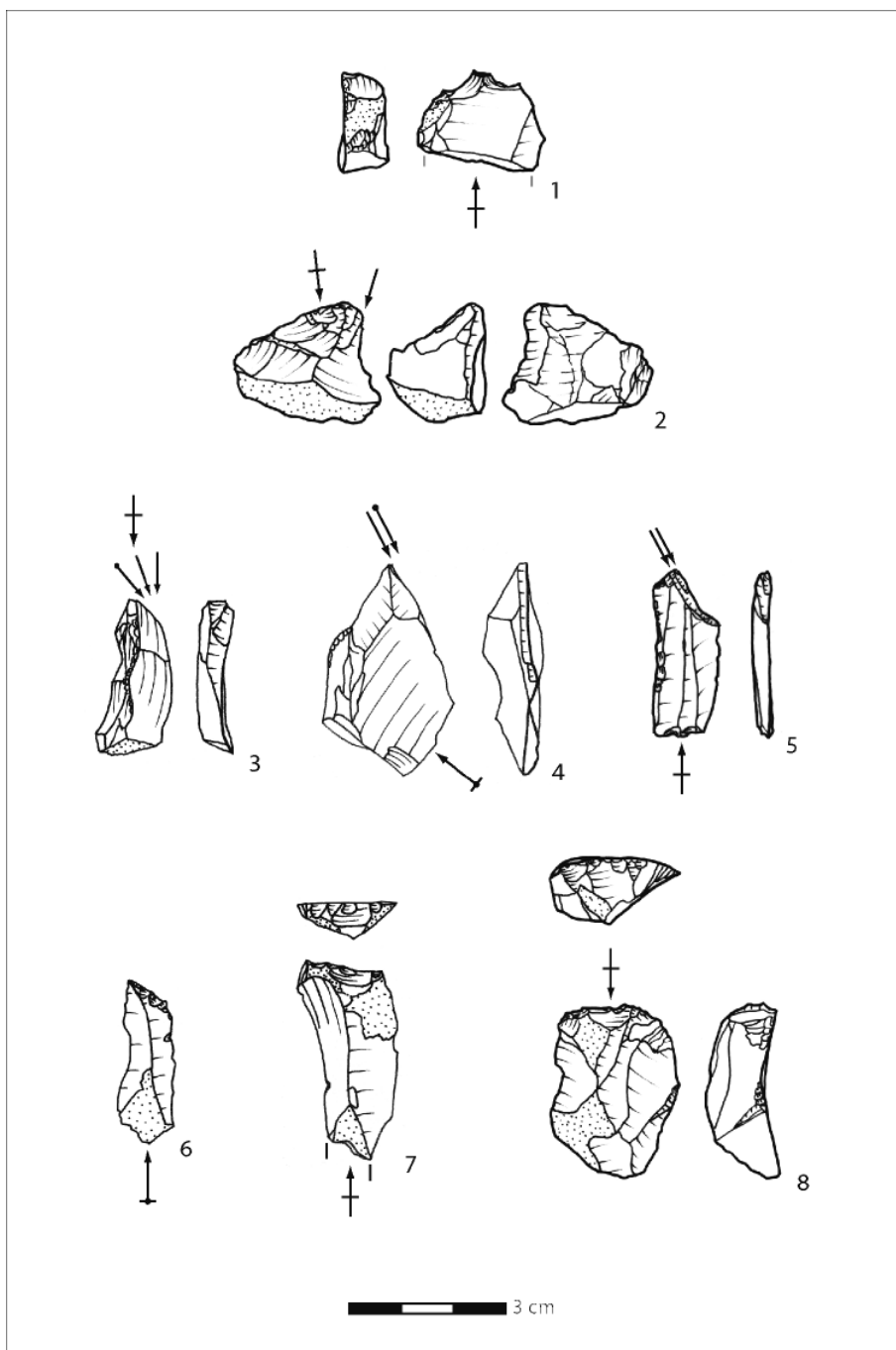
**Fig. 6.** Willendorf II, layer 3: laterally retouched pieces. 1-5) retouched blade/fragment. 6) retouched flake (drawings: Ph. R. Nigst).

ate vicinity of the Danube provided easy access to abundant raw materials of the Danube gravels.

In some refitting groups, we can recognise tested raw material nodules. These were likely collected in the Danube gravels near the site, brought to the site, and tested there for their suitability for debitage production.

Some of the nodules were of poor quality and show many joint planes. For these reasons, knapping led to uncontrolled breaking of the whole nodule; no systematic exploitation is recognizable. As most cases show, nearly all of the pieces belonging to one nodule were discarded and could be refitted.

A good example is refitting group ZG 08 (fig. 9/2). A nodule of hornstone, showing many joint planes, was tested for its suitability of knapping. The first strikes led to an uncontrolled breaking of the entire nodule. At least three quarters of the original nodule could be refitted.



**Fig. 7.** Willendorf II, layer 3: 1) borer/bec. 2-5) burin. 6-8) truncated piece (drawings: Ph. R. Nigst).

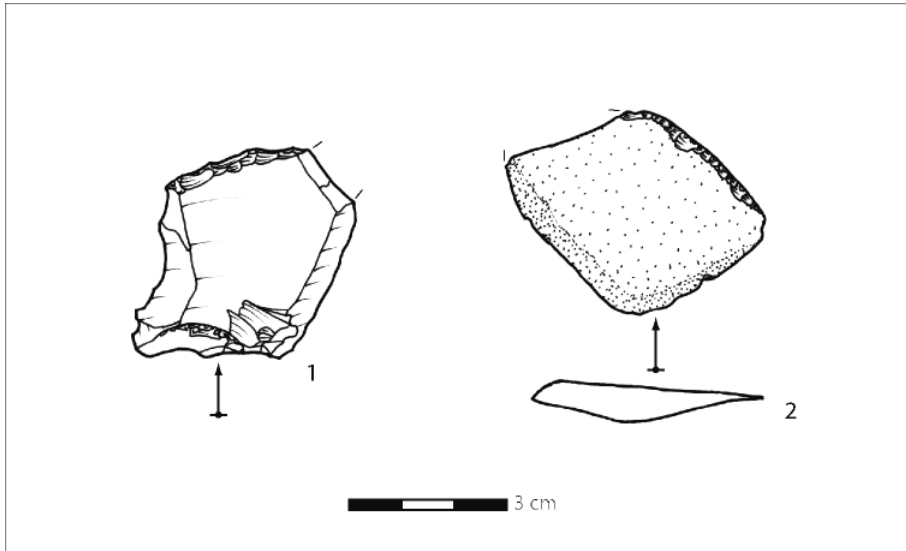


Fig. 8. Willendorf II, layer 3: 1-2) side scraper (drawings: Ph. R. Nigst).

Table 3. Willendorf II, layer 3: cortex on dorsal surface.

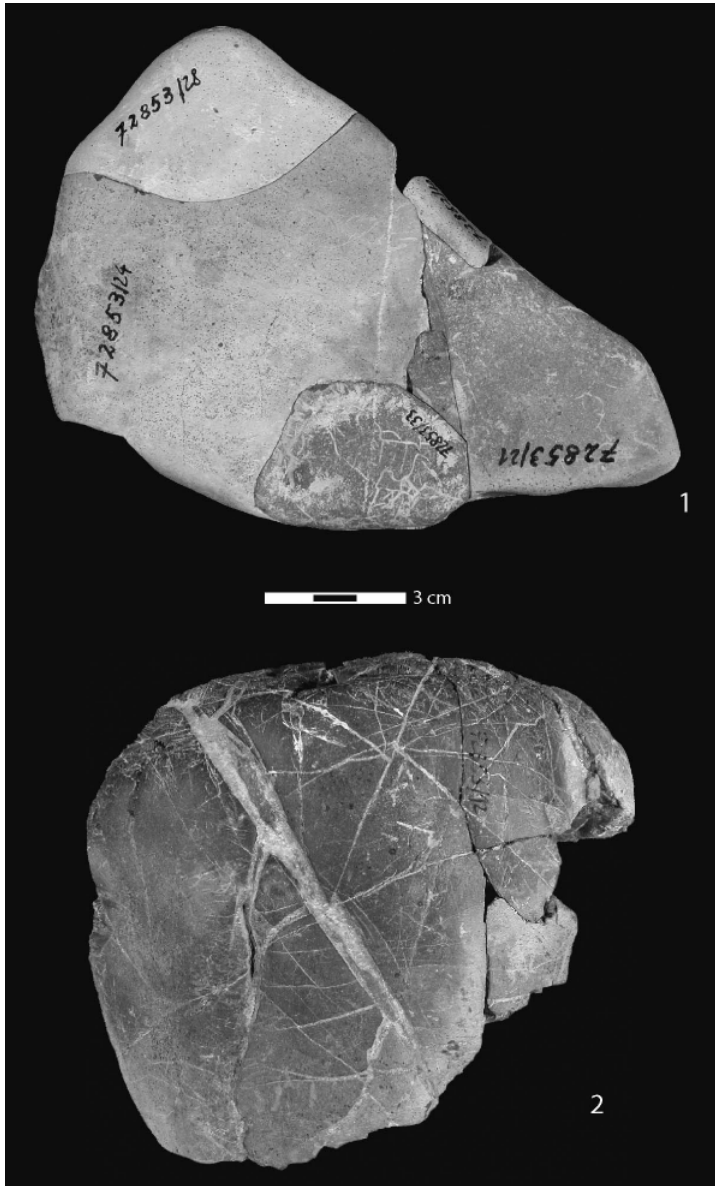
	Blades/bladelets	Flakes	Total
No cortex	24	94	118
Partial cortex	36	146	182
Completely covered by cortex	5	35	40
<b>Total</b>	<b>65</b>	<b>275</b>	<b>340</b>

Another example is refitting group ZG 05 (fig. 9/1), which is formed by six conjoining lithics. Overall, we see several reduction refits and refitted breaks that form this testing of raw material processing.

### Reduction Sequences

In general, we can distinguish three different reduction strategies. One aims at the production of blades and bladelets from unipolar Upper Palaeolithic cores, while the desired products of the second reduction strategy are small bladelets. The third strategy targets the production of flakes as blanks for small bladelet production. Whether this strategy is embedded in the first strategy or, as suggested here, is an independent third strategy, is not yet completely clear.

The first reduction strategy utilizes nodules of different raw materials with different—high and low—qualities. Preparation of cores is visible by the presence of crested debitage and a platform rejuvenation flake (*Kernscheibe*). Preparation of the platform edge is document-



**Fig. 9.** Willendorf II, layer 3: refitted nodules. 1) refitting group ZG05. 2) refitting group ZG08 (photographs: Ph. R. Nigst, © NHM-Wien, PA).

ed by dorsal reduction visible at the proximal end of the debitage. The platform remnants of blades and bladelets are, in most cases, plain and of irregular or triangular form (fig. 10). A few pieces show remnants of faceted platforms. In about 50% of the cases, a dorsal reduction of the striking platform is observed.

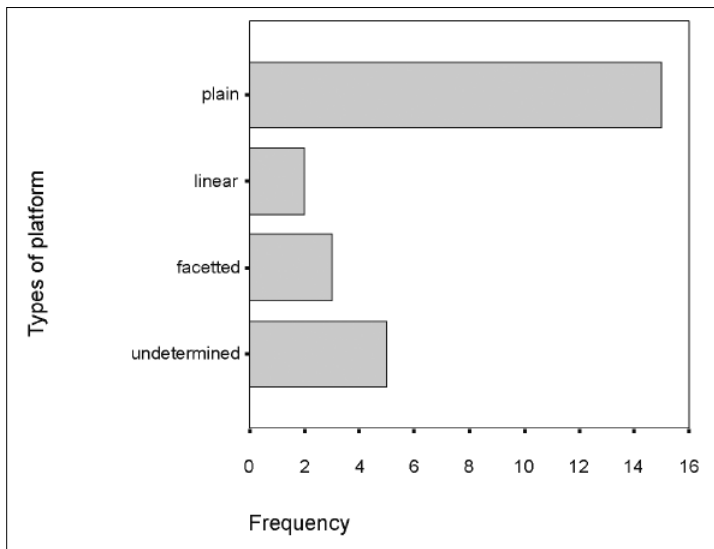
We can observe the use of natural ridges on nodules as crests for blank production, but the preparation of an artificial crest, resulting in crested blades, bladelets and flakes, is also

observed. The two different crests—natural and artificial—seem not to be exclusive, but the reduction utilizes first the natural and then the artificial crest, if a new or renewing of the old crest is necessary. A distinction in the utilization of a natural or artificial crest due to the quality of the raw material has not been observed. The only factor seems to be the presence or absence of a useable natural ridge.

Among the flakes, the majority of platform remnants are irregular in form and again, plain in type. Nevertheless, there are a certain number of flakes with cortex or a joint plane type of platform. These types were not observable among the blades and bladelets.

The majority of the dorsal scars on both the blade/bladelet and flake blanks is unidirectional (table 4). Only some crossed (on crested pieces) or bidirectional scar patterns are observed. Figures 11 and 12 show examples of blanks; the typical unidirectional dorsal scar patterns are evident.

The unipolar core exploitation is also visible in the refitted sequences. Refitting groups ZG 19 and ZG 20 are examples of sequences documented by reduction refits. Refitting group ZG 19 consists of six lithic artefacts belonging to two blades made of local hornstone (fig. 13). Blade ZG19/1 is broken into four fragments, and the other blade ZG19/2, into two frag-



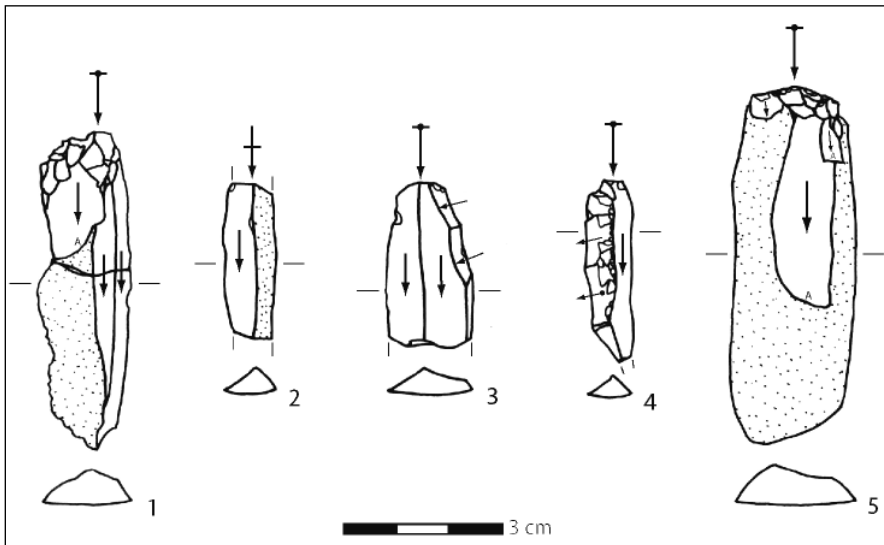
**Fig. 10.** Willendorf II, layer 3: types of platform remnants of blades and bladelets (graphic: Ph. R. Nigst).

**Table 4.** Willendorf II, layer 3: dorsal scar pattern.

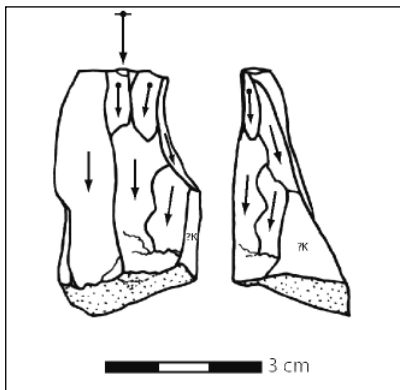
	Blades/bladelets	Flakes
Unidirectional	40	129
Bidirectional	6	12
Crossed	13	42
No dorsal scars (cortex/primary blank)	6	59

ments. The breaks were refitted, and blade ZG19/1 could be attached onto blade ZG19/2. The whole sequence makes an unipolar debitage production visible, showing the utilization of a natural ridge of the raw material nodule as a crest for blade production. This feature is quite common in the assemblage.

The second example is refitting group ZG 20. The four blade fragments are made of green-greyish hornstone most likely originating from the local Danube gravels. All four blades (fig. 14) were refitted and once again show the utilization of a natural ridge of the raw material nodule as a crest for blade production. The blade production can be characterised as unipolar.



**Fig. 11.** Willendorf II, layer 3: blade debitage; dorsal scar pattern shows unipolar core exploitation (drawings: Ph. R. Nigst).



**Fig. 12.** Willendorf II, layer 3: plunging flake; dorsal scar pattern shows unipolar core exploitation (drawing: Ph. R. Nigst).

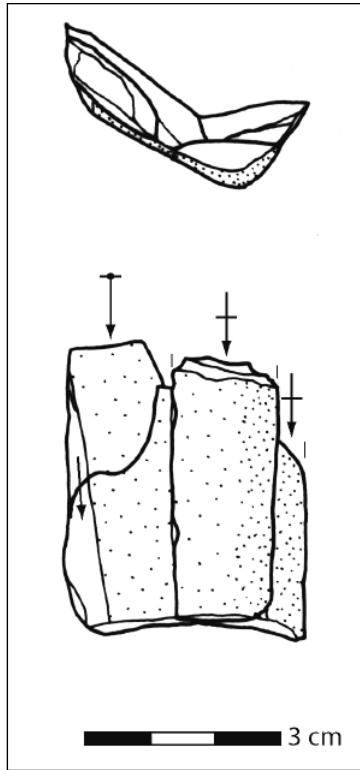


**Fig. 13.** Willendorf II, layer 3: refitting group ZG19 (photographs: Ph. R. Nigst, © NHM-Wien, PA).

The second reduction strategy is present only on cores. The cores are the thick carinated and nosed end scrapers made on thick flakes as blanks. In the inventory, no bladelets from carinated and nosed end scrapers are present.

#### *Use and Discard*

Small flakes and chips representing production, use and resharpening of tools are not present amongst the finds. Quite a number of flakes and blades are fragmented; for example, only



*Fig. 14. Willendorf II, layer 3: refitting group ZG20 (drawing: Ph. R. Nigst).*

five of the 65 blades and bladelets are not fragmented. An intentional character of these breaks cannot be demonstrated. Breaks during use or after discard are therefore the best explanation for the observed pattern. Edge damage is observed on flake and blade blanks, indicating the intense use of the objects.

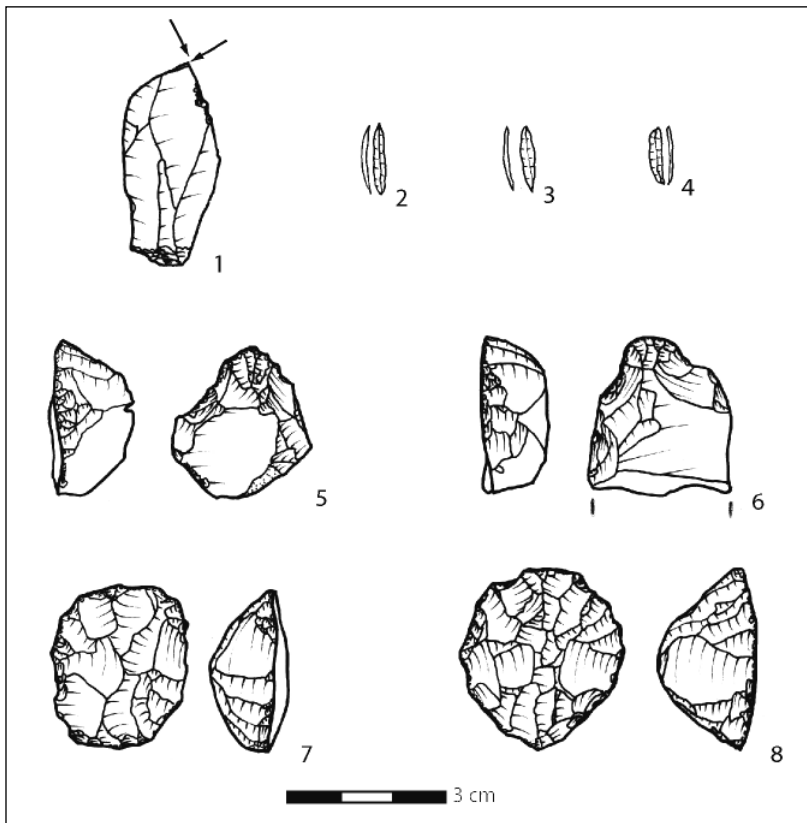
Some lithics were discarded very quickly, e.g., some of the tested nodules with debitage, while others seem to have been used over a longer period of time.

The flaking technology utilized can be characterised as unipolar debitage production from cores of local and regional raw materials. This is evident from platform types, dorsal scar patterns of the debitage, refitting sequences, and cores. The platforms of complete and proximal fragments of blades and flakes are, in most cases, plain and of oval or irregular shape. Some platform edge preparation (dorsal reduction) is visible.

All stages of core preparation are present: cortical flakes, crested flakes/blades, platform juvenation flakes, and others. Core preparation seems to have taken place at the site for all raw materials. About two-thirds of the debitage products show the presence of cortex on the dorsal surface.

**Willendorf II, Layer 4**

The assemblage of layer 4 (excavated in 1908, 1909, 1913, 1927, and 1955) is larger than the rest of the assemblages from the “lower” layers’ with more than 2,000 lithics. Radiocarbon dates are available and around 32–31 ka BP. The lithic assemblage can be labelled as evolved Aurignacian with abundant carinated and nosed end scrapers, most of them made on flake blanks (fig. 15). Technologically, the inventory seems to be concentrated on the production of small bladelets from the carinates as indicated by the majority of tools (see Teyssandier 2003). Amongst the finds are also bladelets from nosed end scrapers. The organic artefacts consist of 6 bone points, about 20 fragments of ivory batons, 5 bone awls and one fragment of a long bone with crossing lines (fig. 16).

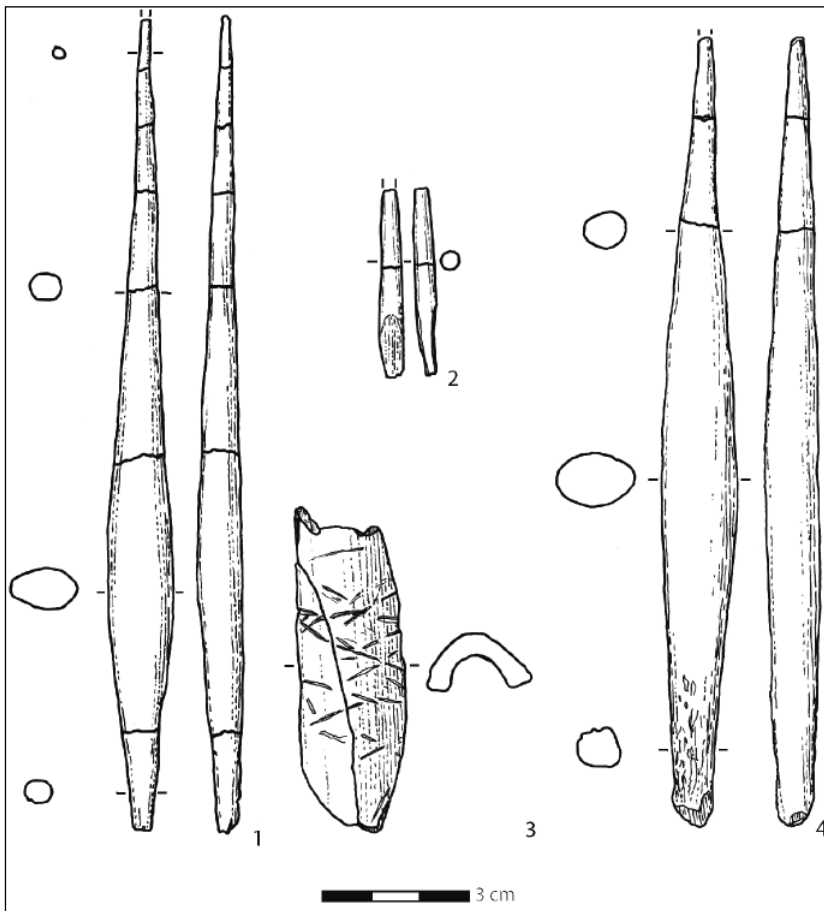


**Fig. 15.** Willendorf II, layer 4: Selected lithics. 1) burin. 2-4) bladelet. 5-6) nosed end scraper. 7-8) carinated end scraper (redrawn after Hahn 1977 and Teyssandier 2003).

## OTHER AURIGNACIAN SITES IN EASTERN AUSTRIA

### *Krems-Hundssteig*

The site of Krems-Hundssteig was never excavated, but was destroyed in the 1890s and 1900s during loess quarrying for the Danube high dam of Krems and Stein. One radiocarbon date hints at an early Aurignacian attribution. In the first site report (Strobl and Obermaier 1909; see also Brandtner 1990 and Neugebauer-Maresch 2001) three sections are published, and one of them (fig. 17) shows several layers with vertical differences of a few metres (Strobl and Obermaier 1909: plate XII). The artefacts cannot be attributed to the different layers. We are dealing, therefore, with a mixed assemblage of several cultural layers. This weak-



**Fig. 16.** Willendorf II, layer 4: Selected bone/antler/ivory tools. 1, 4) bone point. 2) fragment of an ivory baton. 3) bone fragment with crossing lines (redrawn after Hahn 1977).

ens all conclusions drawn from the Hundssteig material, as we cannot be sure with which layers/artefacts the radiocarbon date is associated. Furthermore, new excavations (Ch. Neugebauer-Maresch, Prehistoric Commission, Austrian Academy of Sciences) revealed Gravettian artefacts a short distance south of the 1890s/1900s-loess quarry area.

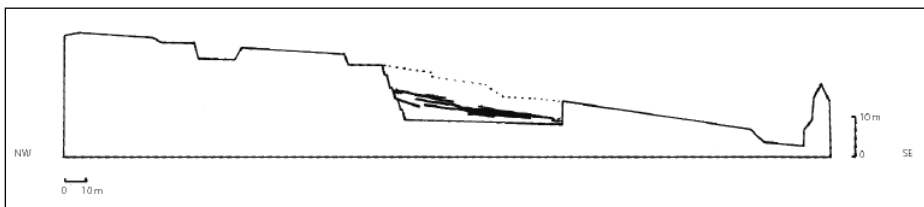
Among the many lithics (more than 20,000 pieces), about 3,300 are modified tools (fig. 18). They are dominated by carinated end scrapers. Other types of end scrapers and burins, among them carinated burins, are not as abundant. Retouched bladelets are abundant, among them Dufour bladelets. The only organic tool is an ivory baton. Hahn (1977) also reports a further 128 perforated molluscs and one pendant made of nephrite.

### **Senftenberg**

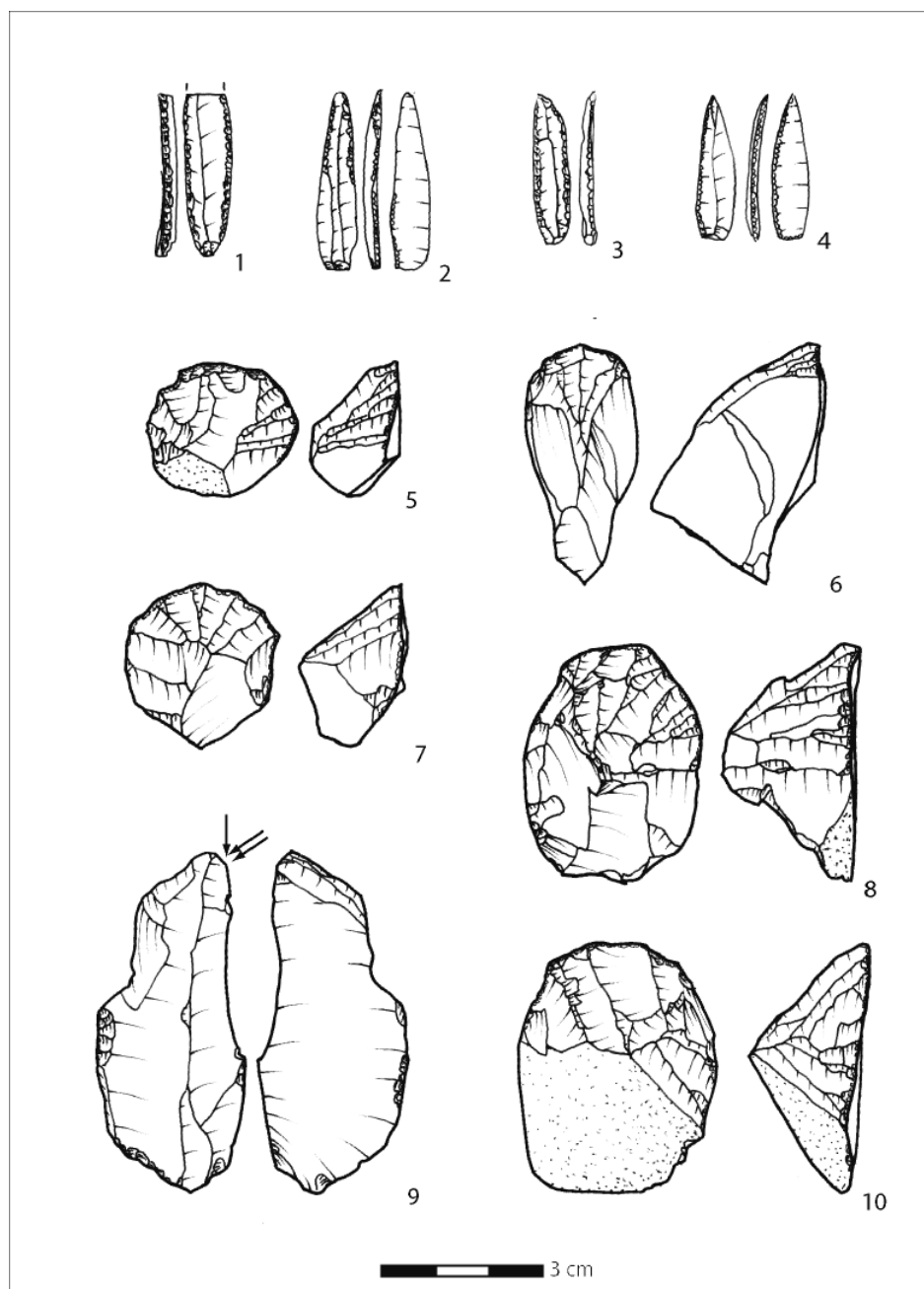
The open-air site of Senftenberg, located about 5 km northwest of Krems, was excavated in 1949 and 1953–1955. Among the 1,800 lithics are about 100 modified pieces that are dominated by end scrapers (fig. 19). Single end scrapers, laterally retouched end scrapers, carinated end scrapers and nosed end scrapers are present. While burins are not as abundant as end scrapers, there are numerous retouched blades. Besides these tool types there are scrapers, denticulated pieces and 10 partially retouched bladelets. The debitage is dominated by flakes; quite abundant are small lithics such as bladelets and especially chips. Of especial interest is the evidence for personal adornments: one perforated snail (*Turritella turris*) and 61 dentalia. Further pieces of red ochre and graphite need to be mentioned here (Hahn 1977). The layer is dated to  $36.35 \pm 0.6$  ka BP by one radiocarbon date (GrN-16887; charcoal; Djindjian, Kozłowski and Otte 1999: 179).

### **Stratzing/Krems-Rehberg**

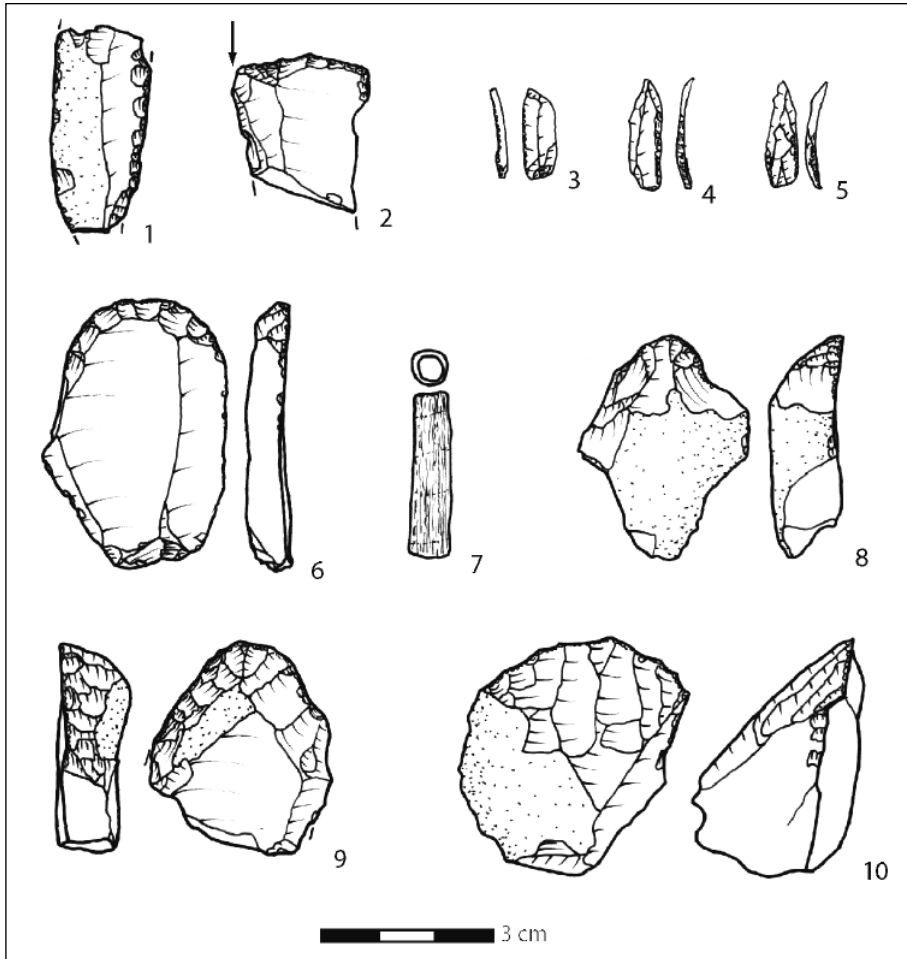
The site of Stratzing/Krems-Rehberg was discovered in 1941, and large-scale excavations were initiated in 1985 due to building activities at the site. The excavations (Neugebauer-Maresch 1995, 1996, 1999, 2001; Einwögerer and Neugebauer-Maresch 2004) continued with interruptions until 2003. The three layers are radiocarbon dated to between 33 and 28 ka BP. Layer 3 is dated between 41.9 and 50 ka BP by two radiocarbon dates (see table 1). The underlying palaeosol is dated to  $>32.64 \pm 0.33$  ka BP (ETH-6026) by one radiocarbon date. Layer 2 yielded the richest archaeological inventory and was dated to around 29/31 ka BP. In layer 2, a number of hearths with abundant lithic material were recovered.



**Fig. 17.** Krems-Hundssteig: NE-SE running section (redrawn after Strobl and Obermaier 1909).



**Fig. 18.** Krems-Hundssteig: Selected lithics. 1-4) retouched bladelet. 5-8, 10) carinated end scraper. 9) burin (redrawn after Hahn 1977).

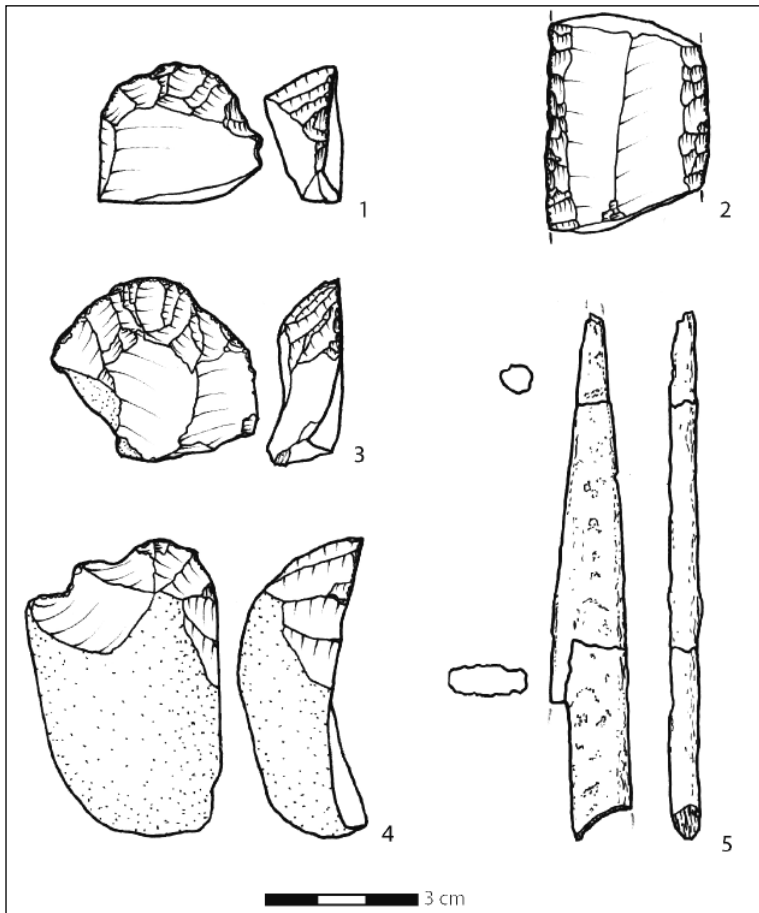


**Fig. 19.** Senftenberg: Selected artifacts. 1) retouched blade. 2) burin. 3-5) bladelet. 6) end scraper. 7) dentalium. 8-9) nosed end scraper. 10) carinated end scraper (redrawn after Hahn 1977).

Contemporaneity between the individual hearths is suggested by refitting sequences. The discovery of an anthropomorphic figurine in layer 2 in 1988 has to be mentioned. The lithic tool types are dominated by various burins followed by end scrapers (carinated and single end scrapers). The uppermost layer 1 is dated to about 29 ka BP. Among the modified lithics are end scrapers and burins. In none of the three layers are Dufour bladelets present. While some parts of the site are *in situ*, others are located on a slope, and post-depositional lateral movements (solifluction) have to be taken into account when discussing the stratigraphy.

### Getzersdorf

Getzersdorf is an open-air site located about 10 km southeast of Krems in the Traisen Valley. Its discovery in 1909 led to two small field campaigns (1910 and 1911) covering a total area of 15 m<sup>2</sup>. Among the lithics, various types of end scrapers are abundant (fig. 20): carinated and nosed end scrapers, single end scrapers, and laterally retouched end scrapers. Further burins, points, scrapers and retouched blades and flakes, blade cores, blade and flake blanks, a few bladelets, and a few chips are present. The organic artefacts consist of one fragmented and heavily corroded bone point and fragments of an ivory baton. Two perforated chalk concretions are viewed as personal adornment (Hahn 1977).



**Fig. 20.** Getzersdorf: Selected artifacts. 1) carinated end scraper. 2) retouched blade fragment. 3-4) nosed end scraper. 5) bone point (redrawn after Hahn 1977).

**Großweikersdorf**

The site of Großweikersdorf, which was discovered in 1912 and excavated in 1956–1957, is situated 25 km east of Krems (Hahn 1977; Brandtner 1990; Neugebauer-Maresch 1999). There were two cultural layers observed, the upper layer dated to  $31.63 \pm 0.24$  ka BP (GrN 16264) and the lower layer dated to  $32.77 \pm 0.24$  ka BP (GrN 16263). The lithic inventory consists of a few single end scrapers, burins, borer, and retouched blades. A fragmented, partially bifacial retouched point should be mentioned here. Not all of the finds are published and/or accessible.

**DISCUSSION*****Chrono-Cultural Attribution of Willendorf II, Layer 3***

Up until now, the layer 3 assemblage was attributed to the Aurignacian by most scholars (e.g., Broglio and Laplace 1966; Felgenhauer 1959; Haesaerts and Teyssandier 2003; Hahn 1977; Kozłowski and Otte 2000*a*, 2000*b*; Teyssandier 2003).

Recently, J. Zilhão and F. d’Errico (1999*a*: 39) criticized this attribution. They accepted the radiocarbon dates and the association of the dates with the finds, but they did not agree with an attribution of the Aurignacian to the layer 3 assemblage. When arguing that “the only thing ‘aurignacoid’ about its lithic assemblage are the thick scrapers,” J. Zilhão and F. d’Errico (1999*a*: 39) are correct and stress an important point since the appearance of “thick scrapers” and other Upper Palaeolithic tool types in the transitional industries is well known (see, e.g., Djindjian, Kozłowski and Otte 1999; Svoboda 2003). On the other hand, there are no indications in the layer 3 assemblage of typical Szeletian or Bohunician artefacts, whether concerning the tool types or the blanks and their production mode.

The absence of some characteristic Aurignacian forms, such as the Dufour bladelets or diverse organic artefacts, has repeatedly been used by J. Zilhão and F. d’Errico as an argument for rejecting the attribution of several early-dated assemblages to the Aurignacian technocomplex. But does every Aurignacian assemblage have to contain all Aurignacian tool types, or at least the significant ones as defined by J. Zilhão and F. d’Errico (1999*b*: 357), for their studies? Factors responsible for assemblage composition seem to be complex, and we are far from knowing the essential reasons for the typological composition of an inventory. The presence or absence of tool types is not only a “cultural” phenomenon, but can also be determined by chronology, site function, the fragmentary character of the areas excavated (different functional areas) or by some social, symbolic or ideological factors affecting assemblage composition. At Geißenklösterle, AH III (Hahn 1977; Teyssandier and Liolios 2003), Lommersum, Layer IIc (Hahn 1977), Willendorf II, layer 4 (Felgenhauer 1959; Hahn 1977; Teyssandier 2003; Teyssandier and Liolios 2003), and in various Aurignacian layers in the Stránská Skála site complex (e.g., Svoboda and Bar-Yosef 2003), the absence of Dufour bladelets, for example, cannot change the attribution to the Aurignacian. We should also keep in mind the early date of many excavations (for an example, in Willendorf II, layer 3, most of the assemblage was excavated in 1908/09, and additional finds were recovered in the mid-

1950s; the same is true for layer 4), thus making an under-representation of small objects (e.g., Dufour bladelets) not surprising.

All above-presented attributions of the Willendorf II, layer 3 assemblage to the Aurignacian, and the critique of this attribution, were based on 43 lithics, most of them modified. They consist of single end scrapers, carinated end scrapers, nosed end scrapers, retouched blades and flakes, a truncated piece, a burin, a side scraper, a borer, and one combination tool (burin-truncation-edge retouch).

Today we have a far greater number of objects (490 vs. 43) for the discussion of the chrono-cultural attribution of this assemblage. For the first time, some data for technological analysis are available. From the data now available, it is clear that all other analyses had to rely on a pre-sorted assemblage. This pre-sorting was done at the excavation or shortly thereafter.

Attribute and refitting analyses showed a unipolar debitage production utilizing good as well as poor quality raw materials. The flaking technology utilized for blade blank production resembles early Aurignacian technology as recognised in southern Germany (Geißenklösterle, AH III: Hahn 1988; Teyssandier 2003; Teyssandier and Liolios 2003) and in the Aurignacian I of France (Bon 2002). This technology differs significantly from the pre-dating Mousterian/Micoquian and the more or less contemporaneous transitional industries of the Middle Danube Area (Bohunician and Szeletian).

Sedimentological analysis and radiometric dating (summarised in an earlier section) place the layer 3 assemblage in the Schwallenbach I-Interstadial at around 38 ka BP, recognised in the sedimentological sections at, for example, Willendorf II, sedimentological subunit C8, and Schwallenbach, sedimentological subunit V1.

Typological, technological, sedimentological and radiometric data allow an attribution of Willendorf II, layer 3, to the early Aurignacian with <sup>14</sup>C dates around 38 ka BP.

### ***The Middle Danube Area from 50 to 30 ka BP***

The Middle Danube Area, comprising parts of Eastern Austria, Moravia, Western Slovakia, and Hungary, is one of the key regions for investigating the transition from the Middle to the Upper Palaeolithic in Europe; especially when a movement of modern humans into the continent along the Danube is suggested.

The record in the Middle Danube Area is characterised by (1) Early Aurignacian sites, (2) human fossil remains of anatomically modern humans from Mladeč, (3) variability of transitional industries (Szeletian and Bohunician), and (4) a coexistence of early Aurignacian, Bohunician and Szeletian.

Eastern Austria has a rich Aurignacian record, but up until now, no transitional industry site has been discovered. Unstratified, single occurrences of leaf points in Austria are reported by G. Trnka (1990). The same is true for the Middle Palaeolithic. The exception is the cave site of Gudenushöhle with Middle Palaeolithic finds, but the excavations took place in the 1880s and the artefacts cannot be attributed to any specific layer (Derndarsky 2001). The early Aurignacian is present at Willendorf II, layer 3, with radiocarbon dates available at around 38 ka BP. The other Aurignacian sites with early dates around 36 ka BP are Senftenberg and Krems-Hundssteig. In the latter case, the association of the date with one of the layers is not clear and must be treated with caution (see remarks in earlier section). Getzersdorf remains radiometrically undated. The assemblages of Willendorf II, layer 4,

Großweikersdorf and Stratzing, layers 1 and 2, belong to the classical Aurignacian dated to around 32–30 ka BP.

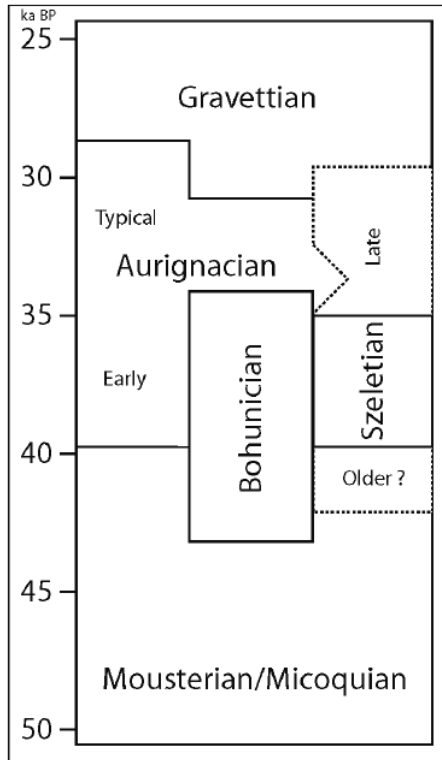
Some remarks on the Krems-Hundssteig industry and the possible occurrence of a Proto-Aurignacian in central Europe are at this point necessary: as mentioned in above, the inventory of Krems-Hundssteig is dominated by retouched bladelets, including Dufour bladelets and Font-Yves points (Hahn 1977; Teyssandier 2003). This reminds one of the Proto-Aurignacian (Kozłowski and Otte 2000a, 2000b; Mellars 2004) of some Spanish, French and Italian sites, e.g., Grotta di Fumane, layer A2 (Bartolomei et al. 1994; Broglio et al. 2002, 1998), Riparo Mochi, layer G (Onoradini 2004), and l'Arbreda, level BE 111 (Kozłowski and Otte 2000a, 2000b; Bischoff et al. 1989). All of these inventories form the first Aurignacian in these regions, dated to before 36–35 ka BP. A similar chronological position for the Krems-Hundssteig inventory might be suggested by the occurrence of similarly modified lithics. Such a chronological position is also supported by the radiocarbon date of about 35.5 ka BP (KN-I.654), but we need to keep in mind that the association of the date and the lithics is doubtful because of possible mixing of finds originating from different layers. On the other hand, there are significantly later dated 'Aurignacian of Krems-Dufour-type' inventories (*sensu* Yu. E. Demidenko and M. Otte 2001) in eastern Europe. As an example, the lithic inventory of Siuren-I, 1920s lower layer/1990s units H-G, should be mentioned here. It is radiocarbon dated to 31.5/30 ka BP (Demidenko and Otte 2001; see also Demidenko 2001).

The analysis of the Krems-Hundssteig lithics by N. Teyssandier (2003) provides evidence of carinates as bladelet cores, but there is also evidence of the utilization of unipolar prismatic cores for bladelet production. Typical of Proto-Aurignacian inventories is one *chaîne opératoire* for blade and bladelet production characterised by unipolar prismatic core reduction. For N. Teyssandier (2003), two hypotheses are possible: (1) the inventory is a mixture of two Aurignacian inventories, one Proto-Aurignacian (retouched bladelets, unipolar prismatic bladelet cores) and one Early Aurignacian (*Aurignacien ancien*; Carinates and large, thick retouched blades), or (2) the inventory is characterised by two modes of bladelet production (Teyssandier 2003).

In the Middle Danube Area in general, the transition from the Middle to Upper Palaeolithic can be described by the following sequence (fig. 21). The local late Middle Palaeolithic (Micoquian) is followed by three different technocomplexes: the Bohunician, the Szeletian and the early Aurignacian. Thereafter, a classical or typical Aurignacian is recognised beside some "Upper" or Late Szeletian around 32 ka BP. At 30/28 ka BP the Gravettian is present in the region with some early Gravettian at Willendorf II, layer 5, for example, which is dated to about 30.5 ka BP (GrN-11193: 30,5 +0,9/-0,8 ka BP).

The Szeletian (Adams 1998; Allsworth-Jones 1986; Oliva 1991; Svoboda, Ložek and Vlček 1996; Valoch 1993, 2000a, 2000b), viewed as autochthonous, shows a continuous development out of the local late Middle Palaeolithic, especially concerning the tradition of bifacial flat retouch. The typological composition of Szeletian assemblages includes some Upper Palaeolithic tool types (carinated and nosed end scrapers, carinated burins), some Middle Palaeolithic tool types and the leaf points, which have their origin in the Micoquian. The technological features (flake and blade production by non-Levalloisian methods) also relate it to the late Middle Palaeolithic.

On the contrary, the Bohunician (Svoboda 2003; Svoboda and Bar-Yosef 2003; Svoboda, Ložek and Vlček 1996; Tostevin 2003; Škrdla 2003) is characterised by a technology in the Levallois tradition mixed with Upper Palaeolithic core preparation. The aim of this technol-



**Fig. 21.** *Sequence of Middle to Upper Palaeolithic transition in eastern central Europe (graphic: Ph. R. Nigst).*

ogy is the production of Levallois blades, flakes, and points from crested pre-cores of Upper Palaeolithic style. Among the modified pieces of Bohunician assemblages are characteristic Middle (side scrapers, denticulates and retouched Levallois points) and Upper Palaeolithic tool types (single, nosed and carinated end scrapers, burins). From a technological point of view, the Bohunician has its closest similarities with the Emirian of the Near East (e.g., Boker Tachtit). Both, the Szeletian and the Bohunician, are partly contemporaneous with the early Aurignacian of the region.

The early Aurignacian (for eastern central Europe see, e.g., Svoboda 2003; Svoboda, Ložek and Vlček 1996; Teyssandier 2003) is characterised by nosed and carinated end scrapers, and by unipolar core exploitation. It cannot be related to the local Middle Palaeolithic, or to the two contemporaneous transitional industries, because the Aurignacian technology differs significantly from all previous and contemporary technologies.

Both the Aurignacian and the Bohunician show some discontinuities with the local Middle Palaeolithic and differ significantly from the Szeletian. The Aurignacian is, in gener-

al, viewed as allochthonous/intrusive. Some scholars see a local evolution of the Bohunician in eastern central Europe (see, e.g., Kozłowski 2000), while others view it as allochthonous/intrusive (Svoboda 2003; Svoboda, Ložek and Vlček 1996; Tostevin 2003).

### ***Some Questions and a Few Answers***

The evidence in the Middle Danube Area shows a highly variable picture of the Middle to Upper Palaeolithic transition period. For the author, four questions, or problems, arise concerning the Early Aurignacian, the Bohunician and the Szeletian:

- 1) Where do they come from? Where are the origins of their technologies?
- 2) Did they develop independently or was acculturation and influence by some other (more advanced?) technocomplex active?
- 3) Who made them?
- 4) Is there evidence supporting the Danube Corridor Hypothesis in the Middle Danube area?

The first question was in part answered in the preceding section. The Szeletian (Adams 1998; Allsworth-Jones 1986; Oliva 1991; Svoboda, Ložek and Vlček 1996; Svoboda and Simán 1989; Valoch 1993, 2000*a*, 2000*b*) seems to have evolved locally out of the late Middle Palaeolithic Micoquian. Some tool types, especially the leaf points, the bifacial flat retouch, and the blank production method hint at a Micoquian origin for the Szeletian. The Bohunician (Svoboda 2003; Svoboda and Bar-Yosef 2003; Svoboda, Ložek and Vlček 1996; Svoboda and Simán 1989; Tostevin 2003; Škrdla 2003) is characterised by a blank production technology that mixes Upper Palaeolithic blade production and Levallois methods. The closest similarities are observed with the Emirian in the Near East. The Early Aurignacian (Haesaerts and Teyssandier 2003; Hahn 1988; Svoboda, Ložek and Vlček 1996; Svoboda 2003; Teyssandier 2003; Teyssandier and Liolios 2003) is characterised by an Upper Palaeolithic unipolar core reduction technology, typical Aurignacian tool types and—at some sites—bone/antler/ivory working, which includes the production of personal adornments and art objects. The earliest appearance of these traits in central Europe is in the Middle and Upper Danube regions. Some older sites in southeastern Europe (Bacho-Kirian) seem to show an earlier stage of the Aurignacian evolution (Drobniewicz et al. 2000; Kozłowski and Otte 2000*a*; 2000*b*).

While the Szeletian is a local development, both the early Aurignacian and the Bohunician seem to have been introduced to the region from outside; all evidence seems to point to the Near East via southeastern Europe.

The second question is difficult to answer due to the lack of sites in the Middle Danube area for which both modern excavation and dating techniques have been used (with some noteworthy exceptions, as e.g., new excavations at Stránská Skála: Svoboda and Bar-Yosef 2003; and the new section in Willendorf II: Haesaerts 1990; Haesaerts et al. 1996). The evidence indicates that some dates for the Bohunician are earlier than the first Aurignacian dates. Furthermore, it is evident that three early Upper Palaeolithic industries existed contemporaneously in the region: the early Aurignacian, the Bohunician and the Szeletian. Contacts between the humans behind these technocomplexes are likely.

For the Szeletian and its development, three scenarios are theoretically possible. In scenario I, the Szeletian can be viewed as the product of an acculturation process of local Micoquians by Bohunicians. Although evidence from the  $^{14}\text{C}$  dates suggests that this scenario could theoretically be possible, no typical and uniquely Bohunician traits can be found in the Szeletian. Thus, this scenario does not seem very likely.

Scenario II describes an autochthonous development of the Szeletian out of the local Micoquian without acculturation (e.g., Oliva 1991). Contact with and acculturation by the Aurignacians are considered in this scenario only in a later phase of the Szeletian.

Most scholars, including the present author, favour scenario III: The Szeletian evolved out of the local late Middle Palaeolithic under the influence of contact with the first Aurignacians in the region (acculturation by Aurignacians; e.g., Allsworth-Jones 1986; Svoboda and Bar-Yosef 2003; Svoboda, Ložek and Vlček 1996; Valoch 1993, 2000*a*, 2000*b*). The earliest dates of Aurignacian and Szeletian sites hint at an appearance of both technocomplexes at around 40/38 ka BP. For the older radiocarbon dates from Szeleta Cave, layer 3 (GXO-197: > 41 ka BP; GrN-6058:  $43 \pm 1.1$  ka BP), uncertainty concerning the exact provenance of the samples is reported (Adams and Ringer 2004; Allsworth-Jones 1986).

Acculturation does not have to be a one-way process, as influences between all three technocomplexes are likely. There is also the question of whether the social stress of confrontation with other cultures and technocomplexes led to the cultural innovations of the early Aurignacian. An indication of this could be the evidence that in central Europe, the location where contact between different humans and/or different technocomplexes occurred, some of the earliest dates for Aurignacian sites are present.

The third question asks about the bearers of the industries between 50 and 30 ka BP in the Middle Danube area. The only two factors beyond doubt are that the local Middle Palaeolithic was produced by Neanderthals and the Gravettian in central and eastern Europe by anatomically modern humans. For the southern Iberian Gravettian this has to be questioned due to the Lagar Velho find (Zilhão and Trinkaus 2002). The fossil record for the period in question is in general very sparse (e.g., Churchill and Smith 2000). From the Bohunician, there are no human fossils; the situation is similar for the Szeletian due to the lack of a site containing unequivocally Neanderthal fossils. The Aurignacian is always equated with anatomically modern humans, but again the evidence is quite poor. Recently, some fossils were directly dated by AMS. The Vogelherd/Stetten fossils turned out to be Neolithic (Conard, Grootes and Smith 2004) and the Cro-Magnon find dates to the Gravettian (Henry-Gambier 2002). The only two remaining sites with human fossils are now Mladeč and Peștera cu Oase. The fossils from Mladeč are directly dated to ca. 31 ka BP (Wild et al. 2005) but originate from an old excavation (see Svoboda, van der Plicht and Kuželka 2002). Peștera cu Oase (Trinkaus et al. 2003*a*, 2003*b*) is dated to about 35 ka BP but unfortunately, is not associated with any archaeological finds and therefore, is not very useful for the discussion. It does demonstrate, however, the presence of anatomically modern humans in southeastern Europe at 35 ka BP. At least the Mladeč finds hint at anatomically modern humans as the bearers of the Aurignacian, but they seem to be of a later period (classical Aurignacian), so the question as to the bearers of the early Aurignacian remains unsolved. The only solution that will lead to an answer is new excavations.

Is there evidence supporting the Danube Corridor Hypothesis in the Middle Danube Area? The Danube Corridor Hypothesis (Bolus and Conard 2001; Conard and Bolus 2003) postulates that modern humans, with their technological and socio-cultural achievements,

entered the interior of Europe via the Danube Valley from southeastern Europe to central Europe and from there moved further westward. Contact between Neanderthals and modern humans is probable. While the problem of the bearers of the Aurignacian and the transitional industries has not been solved (see above), the following point will be accepted as a working hypothesis: the early Aurignacian was produced by modern humans. Supporting archaeological evidence for the Danube Corridor Hypothesis comes from early radiocarbon/AMS dates for some Aurignacian sites in southern Germany, Austria, and probably Hungary. Besides the sites of the Swabian Alb (e.g., Geißenklösterle: Conard and Bolus 2003), there is evidence from Germany at Keilberg-Kirche in the Danube Valley near Regensburg (Uthmeier 1996, 2000). The assemblage originates from surface collections as well as an excavation, and is characterised by Aurignacian tool types and technology. The three radiocarbon dates were made on charcoal from the excavation and range in age from 37.5 to 38.6 ka BP. Further support is provided by Willendorf II, layer 3, dated to around 38 ka BP. Senftenberg (Lower Austria, near Krems), dated to  $36.35 \pm 0.6$  ka BP, can be added to the group of early Aurignacian sites in the Middle Danube Area. The evidence from Istállóskő, Hungary, is problematic because the radiocarbon dates, ranging from about 44 to 40 ka BP, are reported to be unreliable (Adams and Ringer 2004; Svoboda, Ložek and Vlček 1996; Svoboda and Simán 1989). New dates from recent excavations range from about 33 to 31 ka BP for Aurignacian level I, and from about 32 to 27 ka BP for Aurignacian level II (Adams and Ringer 2004). To summarise, we recognise evidence in favour of the Danube Corridor Hypothesis in central Europe. Additionally, early dates for the Bacho-Kirian are often cited in support of the Danube Corridor Hypothesis. From the viewpoint of Kozłowski and Otte (2000a, 2000b), the Bacho-Kirian/Pre-Aurignacian is the earliest Aurignacian in the Balkans and along the Danube with the two most prominent sites being Temnata Cave, layer 4, trench TD-I, and Bacho Kiro, layer 11. Not all scholars agree with the Aurignacian character of the Bacho-Kirian (see, e.g., Teyssandier 2003). Kozłowski and Otte (2000a, 2000b) also place Willendorf II, layer 2, in this cultural entity. This assessment has to be questioned, because the small size of the assemblage could bias any results or chrono-cultural attribution. Based on the data available, the assemblage could represent Aurignacian, Bacho-Kirian or some transitional industry.

As outlined above, there are dates for the Bohunician that are earlier than the Early Aurignacian dates in the same region. The early Aurignacians were not the first EUP industry bearers in the region. The dates for the Szeletian show some temporal overlap between all three EUP industries.

## CONCLUSIONS

The biological evidence from the Middle Danube Area appears to be very fragmented. The only two clear facts are that the Middle Palaeolithic was produced by Neanderthals and that the Gravettians in central and eastern Europe were anatomically modern humans. Everything in between is difficult to interpret, although there are indications that the Aurignacians were anatomically modern humans (Maldeč). The archaeological record is quite different with its abundant sites of the period between the last of the Middle Palaeolithic and the first Gravettian. We can observe the first Bohunician settlement at around 43/41 ka BP. Slightly later, at around 39/38 ka BP, the first early Aurignacian and Szeletian sites appear in the

region. Both the Bohunician and early Aurignacian sites show an overlap in time and, at least for the Bohunician, in space with the Szeletian. After 35 ka BP, a typical Aurignacian is present in nearly the entire study area.

The assemblage of Willendorf II, layer 3 belongs to the earliest Aurignacian sites in Europe, with radiocarbon dates around 38 ka BP (fig. 22). This horizon of the earliest Aurignacian sites is present in three European regions: northern Spain, northern Italy and the Upper and Middle Danube Area. While the Spanish and Italian sites belong to a Proto-Aurignacian, the Upper and Middle Danubian sites belong to an early Aurignacian.

In general, the record in the Middle Danube Area between 50 and 30 ka BP shows different typo-technological/cultural entities produced by perhaps different human populations, suggesting co-existence of various lithic technologies and human groups. Multiple social contacts, interactions, and the flow of information between different human populations and various cultural entities were highly likely.



**Fig. 22.** Map of early Aurignacian (including Bacho Kirian) sites: 1) Castillo. 2) l'Arbreda. 3) Fumane. 4) Geißenklösterle. 5) Keilberg-Kirche. 6) Willendorf II. 7) Senftenberg. 8) Istállóskő. 9) Temnata. 10) Bacho Kiro (graphic: Ph. R. Nigst).

## ACKNOWLEDGEMENTS

I am grateful to Gerhard Trnka and Otto H. Urban for their support. I would like to thank Walpurga Antl-Weiser and Anton Kern for providing me with the unpublished Willendorf II finds and for a workspace at the Prähistorische Abteilung, Naturhistorisches Museum Wien.

I am also extremely grateful to Iris Ott, Bence Viola and Dieta Svoboda for their stimulating discussions and comments. During my studies in Tübingen, Nicholas Conard, Michael Bolus, Harald Floss, Philipp Drechsler, Martina Barth and Kurt Langguth were of great assistance. I especially thank Nicholas Conard for inviting me to the Blaubeuren workshop and for his encouragement to contribute to this volume. I am grateful to Louise Blundell for improving the English text. I wish to acknowledge the financial support of my research on Willendorf II through a grant provided by the Austrian Federal Department of Science (Bundesministerium für Bildung, Wissenschaft und Kultur [BMBWK]; Forschungsstipendium zur Förderung des wissenschaftlichen Nachwuchses auf dem Gebiet der Altertumswissenschaft und Archäologie 2004). Currently I am supported by the Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Leipzig (Jean-Jacques Hublin).

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