

The Late Upper Palaeolithic in the catchment area of the River Saale – facts and considerations

Die späte Altsteinzeit im Einzugsgebiet der Saale – Fakten und Überlegungen

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ABSTRACT - The results summarized in this paper represent the original or renewed analyses of the archaeological sites of Bad Frankenhausen (Kosackenberg), Gera-Liebschwitz (Binsenacker), Gera-Zwötzen (Schafgraben), Lausnitz (Abri Theure), and Wallendorf (Weinberg). The intention of this study is to make a contribution to the structural clarification of the Late Upper Palaeolithic, defined chronologically to between 20 000 and 12 000 calBC and chorographically into groups and archaeological site types. The basis for this is given by the presentation of the archaeological findings and discussion of the natural environment, the investigation of life-ways and settlement within the catchment area of the River Saale and, beyond this, the regions of the Central German Magdalenian province overall, regarded seasonally and with respect to developments as a whole.

At the same time, the paper also aims to contribute to methodological developments by linking classic typological studies and attribute analysis to well defined features for distinguishing artefacts. The presented work incorporates all available information from different disciplines (archaeology, geology, pedology, zoology, physics and chemistry). Together, this allows an appraisal of the course of the Late Weichselian together with a summary of the radiocarbon chronology of the central German Late Upper Palaeolithic underpinned by numerous dates.

There follows an analysis of the content and the temporal and spatial structure of the archaeological record. Cultural transformation and settlement and life-ways generally are discussed relative to the development of the natural environment. The result is a comprehensive representation of the central German Magdalenian province within the context of the overall process of Upper Palaeolithic development in central Europe.

ZUSAMMENFASSUNG - Die hier zusammenfassend vorgelegte Untersuchung ist zunächst eine Erst- bzw. Neubearbeitung der Fundstellen Bad Frankenhausen (Kosackenberg), Gera-Liebschwitz (Binsenacker), Gera-Zwötzen (Schafgraben), Lausnitz (Abri Theure) und Wallendorf (Weinberg). Im Vordergrund steht die archäologische Bearbeitung. Es wird ein Beitrag zur Strukturaufklärung im späten Jungpaläolithikum, chronologisch zwischen 20 000 und 12 000 calBC und chorologisch in Gruppen und Fundstellentypen, angestrebt. Dazu dienen die Materialvorlage und die Diskussion der naturräumlichen Bedingungen, die Erhellung der Lebensweise und des Siedlungsganges innerhalb des Einzugsgebietes der Saale und darüber hinaus der mitteldeutschen Magdalénien-Provinz nach Regionen, jahreszeitlich und über den gesamten Entwicklungsgang. Gleichzeitig wird ein Beitrag zur Fortentwicklung der Methodik in Verbindung von klassischer Typologie und Merkmalsanalyse bei Definition klar trennender Merkmale an den Artefakten angestrebt. Die vorliegende Arbeit bezieht alle erreichbaren Informationen unterschiedlicher Disziplinen (Archäologie, Geologie/Quartärgeologie, Bodenkunde, Archäozoologie, Physik und Chemie) mit ein. In Summe erfolgt eine Annäherung an den Ablauf des Weichselspätglazials und weiterhin eine zusammenfassende Darstellung der durch zahlreiche Daten abgesicherten ¹⁴C-Chronologie des mitteldeutschen späten Jungpaläolithikums.

Schließlich wird die inhaltliche, zeitliche und räumliche Struktur des archäologischen Fundbestandes analysiert. Es werden Fragen der kulturellen Transformation und allgemein der Ausformung von Siedlungs- und Lebensweise in Wechselwirkung mit der Entwicklung des Naturraumes behandelt. Daraus ergibt sich eine umfassende Darstellung der mitteldeutschen Magdalénien-Provinz in ihrer Einbettung in den Gesamtprozess der jungpaläolithischen Entwicklung Mitteleuropas.

KEYWORDS - Late Glacial, Late Upper Palaeolithic, Magdalenian, Final Palaeolithic, Central Germany
Spätglazial, spätes Jungpaläolithikum, Magdalénien, Spätpaläolithikum, Mitteldeutschland

Introduction and Environment

Study of the central German Magdalenian (Fig. 1) has a long tradition and, as recently demonstrated, (Höck 2000; Küßner 1998, 2009; Mania 1999b), central Germany plays an important role in the investigation

of the Late Upper Palaeolithic in central Europe. However, since the 1970s (work by G. Behm-Blancke and R. Feustel) research had stagnated in Thuringia. The situation changed once more only in the 1990s (Höck 2000; Küßner 1998; Wüst 1998; Mania 1999b) and, most recently, several papers were published about the Late Upper Palaeolithic in the Saale river region (Benecke et al. 2006; Grünberg 2004, 2007a, 2007b; Küßner 2003; 2007; 2009; Mania 2004;

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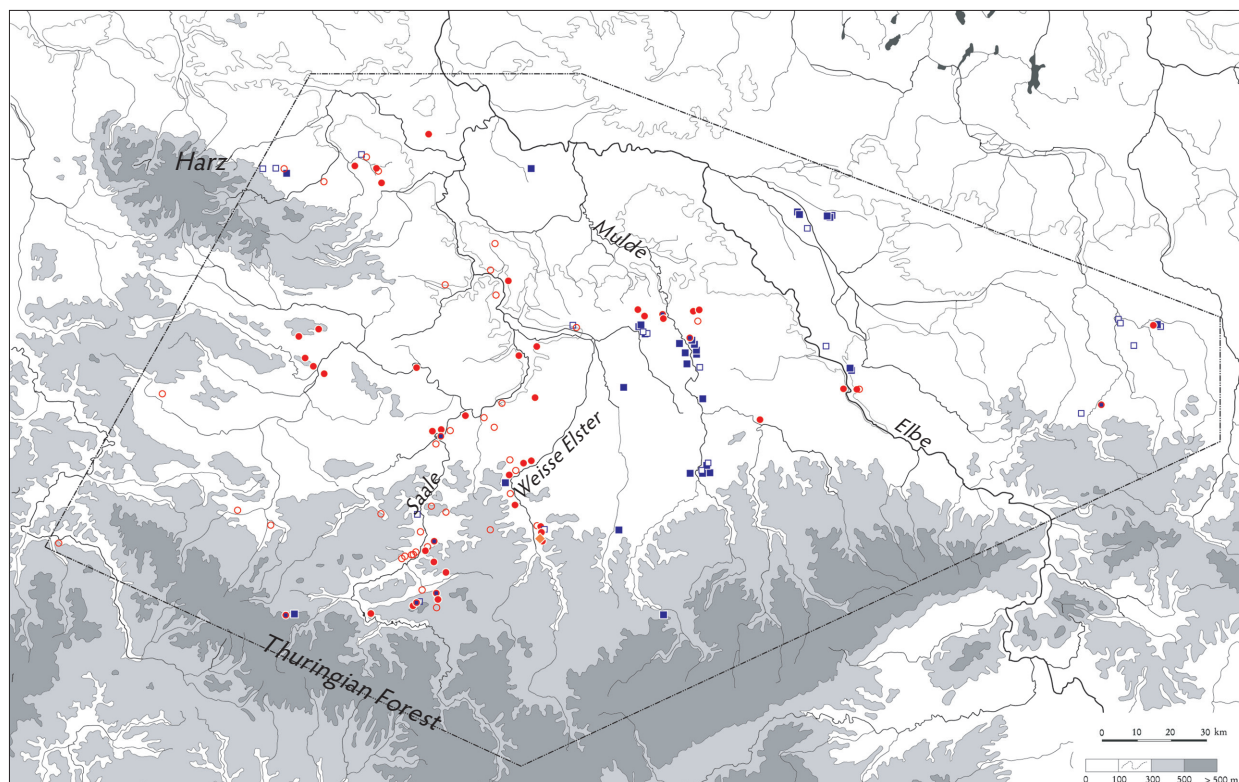


Fig. 1. Mapping of the Late Upper Palaeolithic and Late Palaeolithic in Central Germany; Legend: Circles - Magdalenian, squares - Azilian, empty signature - 1 to 10 modified artefacts, full signature - more than 10 modified artefacts (after Küßner 2007, fig. 1; 2009, fig. 3).

Abb. 1. Kartierung der Fundstellen des späten Jungpaläolithikums und Spätpaläolithikums in Mitteldeutschland; Legende: Kreise - Magdalénien, Quadrate - Rückenspitzengruppen, leere Signatur - bis zu 10 modifizierte Artefakte, volle Signatur - mehr als zehn modifizierte Artefakte (nach Küßner 2007, Abb. 1; 2009, Abb. 3).

Terberger et al. 2003; Küßner & Terberger 2006; Hemmann et al. 2008).

The study of sites excavated a long time ago and of older collections of find assemblages is generally considered difficult and often assigned little prospect of success. Having said this, the sites discussed below, although important, have been insufficiently appreciated as sources for archaeological research into the Late Upper Palaeolithic, not only of the Saale River catchment but even much further beyond this. For quite a long time, Palaeolithic research generally has waited for a comprehensive presentation of the numerous Late Upper Palaeolithic sites located in the western parts of central Germany, which have yet to be published or whose publication has until now been restricted. Our intention here is to present five Late Glacial sites excavated in the Saale River catchment (Küßner 2006, 2009). They include either primary or re-examinations of sites at Bad Frankenhausen (Kosackenberg, Kyffhäuser county), Gera-Liebschwitz (Binsenacker) and Gera-Zwötzen (Schafgraben), both city of Gera, Lausnitz-Abri Theure (Saale-Orla county: Feustel et al. 1963) and Wallendorf-Weinberg (Saale county: Hanitzsch 1956).

The Bad Frankenhausen site (Küßner 2009, 20ff.) was excavated in 1954-1956 by G. Behm-Blancke. The site is located in northern Thuringia, west of Bad Frankenhausen and on the southern fringe of the

Kyffhäuser hills. The main focus of the excavations lay on the so-called "Cult Caves" with Neolithic and younger material and the Magdalenian open air site was discovered during surveys in the surrounding area on a former loess hill. The site consists of at least three evident structures of quite different size (Fig. 2). The biggest one is a dwelling construction (Behm-Blancke 1956; Feustel 1977). Beside the material recovered by excavations there exists a large number of surface finds (collected by H. Günther from 1957-1990) which have been incorporated into the evaluation (Küßner 2009, 87ff.). The Gera-Liebschwitz (Binsenacker) site (Küßner 2009, 47ff.) was discovered by workers during the construction of houses in the middle 1930s. After acquisition of the recovered pieces by the city museum archaeological investigations were initiated. A sondage in a few narrow trenches by the museum manager A. Renz lasted two weeks during 1938. The excavations originally planned for 1939 did not subsequently take place and the archaeological site is today to a large extent destroyed. Here too, several evident structures (arrangements of stone slabs) associated with high numbers of finds were demonstrated. There is hardly any information concerning the research history of the Gera-Zwötzen (Schafgraben) site (Küßner 2009, 58ff.). A. and W. Reuter discovered the locality in 1933 and A. Reuter carried out a Sondage (1 m²) in 1934 to

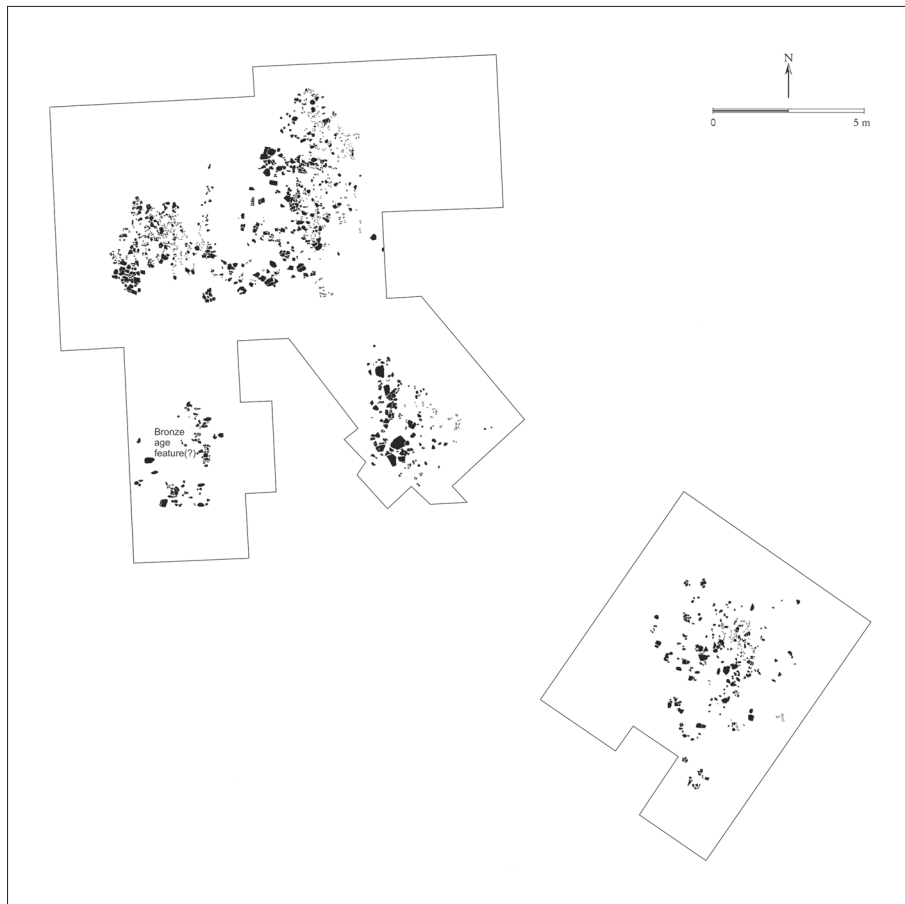


Fig. 2. Bad Frankenhausen (Kosackenberg): excavated areas with archaeological features (after Küßner 2009, insert 1).

Abb. 2. Bad Frankenhausen (Kosackenberg): Grabungsplan mit evidenten Befunden (nach Küßner 2009, Beilage 1.)

clarify the stratigraphy. All finds come from the modern surface. There were three concentrations of surface finds, but no indications of evident structures. With the Abri Theure near Lausnitz (Küßner 2009, 61ff.) a rock shelter site is also included in the study. The archaeological site was discovered by A. Rohleder, who had leased the area at the end of the 1920s and whose "examination" destroyed the site to a large extent. In 1960 R. Feustel carried out a re-examination to clarify the stratigraphy. From the different investigations there is evidence for a hearth and for artificial accumulations of rock under the Abri and in front of it. The last site examined here is Wallendorf (Weinberg), also known under the name Kriegsdorf and Friedensdorf (Küßner 2009, 69ff). It produced the smallest of the inventories. The site was discovered at the beginning of the 20th century by P. Berger who collected artefacts until 1917 and in 1911 carried a small excavation. Investigations of the surface here were carried out up to the construction of houses in the 1980s. In summary, the investigations here concern five archaeological sites which are partly very different in their character and history of discovery. They can deliver to us important new knowledge of the Late Upper Palaeolithic in central Germany.

Compared with other regions of central Europe the state of research into the Late Glacial environment of central Germany is not optimum (e.g. Weniger 1982, 1987; Pasda 1994). Investigations in the regional open-cast lignite mines are of the greatest value, above all at Königsau (Mania & Toepfer 1973) and in the Geiseltal valley (e.g. Mania et al. 1993; Mania 1999a; Litt 1994). The environmental and climatic development can thus be identified in a few points, although simply applying these results to the whole region cannot, of course, be justified. Nevertheless, the general trends are valid for the entire central German region. Investigations of the molluscan fauna were carried out by D. Mania (1972, 1973a). The pedology of the region was dealt with in particular by M. Altermann, K.-D. Jäger and D. Mania (e.g. Altermann & Mania 1968; Jäger 1998; Jäger & Kopp 1999). Synthetic studies were presented by Jäger (1995) and Mania (1999a).

To sum up these results, we must reckon with the following conditions for the western part of central Germany. Around the Last Glacial Maximum the region is characterized by tundra, with a frost rubble desert in the low mountain ranges, under extremely dry conditions and very low winter temperatures.

Subsequently there is gradual warming interrupted by cold episodes and the formation of steppe biotopes. In the younger part of this phase (Dryas Ib) occurs the highly dynamic expansion of the Magdalenian into central Europe, which reaches its maximum at the beginning of the Late Glacial Inter-stadial. The fauna of Magdalenian times seems to characterize a landscape type which can be interpreted best as changing between open woodland in sheltered areas, tundra in humid and exposed areas and steppe on plateaux poor in water, with transitional areas between all these biotopes. This corresponds to the characterization given by D. Mania (Mania 1999b, 169) on the evidence of the vegetation. The development of the Magdalenian finds its end during the chronological sequence of the Late Glacial Interstadial, with a continuous transition extending into the Azilian and linked to the shift of the hunting focus onto woodland species. It is to be noted that horses remain an important part of the prey hunted by humans at least until Allerød times (Feustel & Musil 1977b).

Lithic artefacts

By far the largest proportion of the studied find assemblages consists of stone (particularly siliceous chert) artefacts, with values approaching 100 % for the sites located at Gera and Wallendorf. The data provided by the artefacts allow us to draw a detailed and multi-faceted picture of the lithic assemblages (Küßner 2009). The major part of the chert artefact inventories is composed of flint. Only the Lausnitz site has a genuine secondary major component of chert material ("Kieselschiefer" = silicified slate/lydite). Potentially distinctive characteristics of the raw materials used, which might otherwise be reflected in their classification, are therefore limited to the quality of the selected flint or chert. In fact, the reduced mean values of artefact dimensions in the studied inventories are based not on the quality but on the limited availability of raw materials. Cretaceous "Baltic" flint from moraines dated to the Saale glaciation was the preferred lithic raw material. With increasing distance to the flint outcrops the average size of the artefacts decreases accordingly. This was an immediate result of more careful handling of the flint of the Saale glaciation and, additionally, the use of lower quality flint materials from formations of the earlier Elster glaciation.

The inventories of individual sites partly reveal substantial differences in their production methods and the types and numbers of blanks (Fig. 3) and modified artefacts (Fig. 4).

In general, the similarities are of a technical nature and dependent on the raw material. In addition to this there are indeed recognizable "levels of similarity" which can be traced back to the "technological traditions" practiced by particular groups. The Gera-Zwötzen site must be studied separately because its

inventory shows the largest differences when compared to those of the other sites. Here, the existing data lacks the characteristics of a typical Magdalenian inventory. All in all, the lithic industry of the Gera-Zwötzen area shows little standardization and is largely characterized by flakes as well as rather broad blades. The technique of blade production differs from the Magdalenian model. Burins, particularly dihedral burins, dominate the collection of modified artefacts. Forms with backed retouches are rarely represented. The four remaining inventories of finds show more similarities with each other and clearly belong to the classic late Magdalenian of central Europe. They are characterized by rectangular and narrow blanks. Blade knapping technology is very advanced and shows the typical core designs, among them substantial proportions of bipolar cores with in opposed direction knapping surfaces. The inventories of Bad Frankenhausen, Lausnitz and the Gera-Liebschwitz area indicate the partial usage of ready-prepared lithic cores, while Wallendorf is characterized by a "workshop-like" inventory and more substantially characterized by debitage of core preparation and a significantly higher proportion of cores. Contrary to the other inventories, those of Gera-Liebschwitz and Lausnitz show a trend towards the manufacture of bladelets which correlates to the greater importance of backed bladelets among the modified material at these sites.

The distribution of modified artefacts generally varies and the differences in their proportions can be traced back to functional aspects. The composition of an inventory is therefore characterized by the need for specific artefacts designed for specific activities. H. Löhner (1988, 143 ff.) and J. Richter (1990) interpreted differences in the composition of lithic assemblages at Magdalenian sites as the result of varying duration of occupancy periods and of different specializations. Accordingly, Bad Frankenhausen would have been occupied for a longer period of time, while Gera-Liebschwitz and Wallendorf, as well as the highly specialized Lausnitz site, would have been occupied for a shorter period of time. However, based on the information available at the time and using the comparison of the inventories of Bad Frankenhausen (Feustel 1977; Küßner 1997) and Nebra (Mania 1999b) M. Küßner was unable to find any conclusive confirmation of this thesis (Küßner 1998, 64). Furthermore, other evidence at the Gera-Liebschwitz site indicates a longer period of occupancy. Signs of multiple occupancies exist at the Bad Frankenhausen, Gera-Liebschwitz and Lausnitz sites. Above all, this is indicated by the extent of the Gera-Liebschwitz station combined with several concentrations of evident features, an unexcavated second zone with evident features at Bad Frankenhausen and the presence at the Lausnitz site of stratified stone slabs and the (presumably) significantly high quantities of finds in a very confined area.

	Bad Frankenhausen		Gera-Binsacker		Gera- Schafgraben		Lausnitz		Wallendorf	
	n	%	n	%	n	%	n	%	n	%
blades/crested blades	1458	35	999	31	276	19	835	37	295	33
bladelets	326	8	442	14	75	5	333	15	40	5
flakes/crested flakes	1669	40	1100	34	700	48	832	36	466	53
chips/retouch debris	73	2	154	5	13	1	62	3	9	1
cores	91	2	54	2	24	2	18	1	33	4
shatter	450	11	236	7	284	20	147	6	23	3
burin spalls	46	1	205	6	49	3	49	2	6	1
others	25	1	32	1	19	1	9	>1	10	1
total	4138		3222		1440		2285		882	

Fig. 3. Blanks – frequencies of lithic artefact categories at Bad Frankenhausen (Kosackenberg), Gera-Liebschwitz (Binsacker), Gera-Zwötzen (Schafgraben), Lausnitz (Abri Theure), Wallendorf (Weinberg).

Abb. 3. Grundformen – Anzahlen der verschiedenen Artefakte von Bad Frankenhausen (Kosackenberg), Gera-Liebschwitz (Binsacker), Gera-Zwötzen (Schafgraben), Lausnitz (Abri Theure), Wallendorf (Weinberg).

	Bad Frankenhausen		Gera- Binsacker		Gera- Schafgraben		Lausnitz		Wallendorf	
	n	%	n	%	n	%	n	%	n	%
end scrapers	141	24	50	9	22	16	38	9	9	13
truncations	21	4	13	2	3	2	12	3	9	13
burins	66	11	162	28	71	50	61	15	10	15
borers	47	8	41	7	8	6	33	8	1	2
zinkens	38	6	6	1	1	1	30	7	3	5
backed bladelets	69	12	175	30	2	1	160	39	11	16
backed points	3	1	6	1	-		14	3	3	5
microliths	1	>1	1	>1	-		-		-	
points	5	1	5	1	2	1	3	1	-	
retouched pieces	86	15	54	9	12	9	41	10	14	21
splintered pieces	28	5	21	4	5	4	4	1	-	
combined tools	66	11	41	7	15	11	15	4	7	10
indet. tools	10	2	8	1	-		4	1	-	
total	581		583		141		415		67	

Fig. 4. Modified artefacts (tools) – frequencies of lithic artefact types at Bad Frankenhausen (Kosackenberg), Gera-Liebschwitz (Binsacker), Gera-Zwötzen (Schafgraben), Lausnitz (Abri Theure), Wallendorf (Weinberg).

Abb. 4. Modifizierte Artefakte - Anzahlen der verschiedenen Artefakte von Bad Frankenhausen (Kosackenberg), Gera-Liebschwitz (Binsacker), Gera-Zwötzen (Schafgraben), Lausnitz (Abri Theure), Wallendorf (Weinberg).

Lausnitz, with its large proportion of projectile fragments, is clearly a repeatedly occupied hunting station. The Wallendorf inventory shows that activities at this station were mainly, if not exclusively, focused on the production of semi-finished flint products. According to their varied amounts of modified artefacts, both Gera-Liebschwitz and Bad Frankenhausen were settled for longer and repeated periods of time. The size of the sites and the relatively large numbers of evident features lead one to assume that they must have been used as settlements by larger communities in the cooler and cold seasons.

There are some important exceptions concerning functionality, which were partly and subjectively listed in earlier publications (Feustel et al. 1963; Hanitzsch 1969; Feustel 1974) as some inventories of modified pieces had been classified according to purely

functional reasons. Therefore, (larger) quantities of zinken and backed points, and the specific occurrence of Lacan burins as well as long and short borers do represent separate groups of inventories.

Classification of the sites

The presented sites will be classified according to the framework of Late Glacial cultural development in the catchment area of the River Saale. At the same time, this will provide a contribution to the chorology and chronology of the central German Magdalenian province. Only the stages (IV), V and VI of H. Breuil's (1912) classic categories are represented in central Germany. Claims that stage III was represented by part of the Döbritz (Kniegrotte) inventory have recently been rebutted by C. Höck (2000), according

to whom the characteristic triangles among the Kniegrotte material lack all chronological relevance. On the contrary, these triangles appeared throughout the entire development of the Magdalenian (cf. Otte 1992). Despite its occurrence in Poland (cf. Kozłowski et al. 1995), no *Magdalénien à navettes* (Allain et al. 1985) has been found in central Germany. The fragment of a spear thrower excavated at Teufelsbrücke near Saalfeld-Oberritz (Feustel 1980, 36 ff., Table XX.19) belongs to the Magdalenian IV.

A closer categorization of numerous central European inventories according to the elaborate classical French system, which is based on artefacts made from organic materials, seems quite impossible. However, in France "coarser" but at the same time safer systems were also used as alternatives (e. g. Demars & Laurent 1992, fig. 63). central European research has developed alternative chronological systems. The supra-regional debate on the chronology of cultural developments during the Late Glacial was most recently reformulated

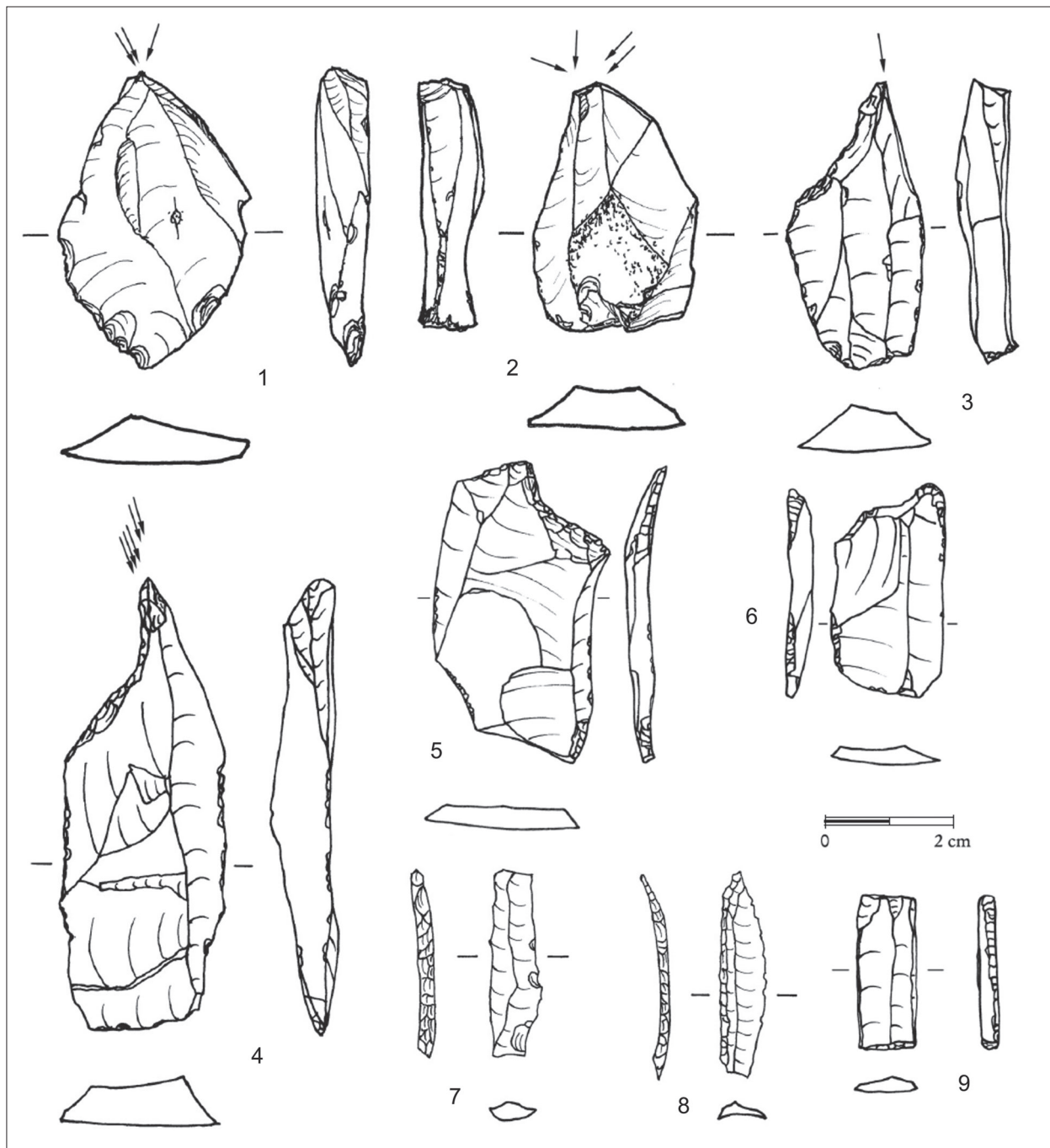


Fig. 5. Characteristic artifacts from Gera-Zwötzen – Schafraben (1, 2), Gera-Liebschwitz – Binsacker (3, 4), Bad Frankenhausen – Kosackenberg, (5, 6), Lausnitz – Abri Theure (7, 8) and Wallendorf – Weinberg (9) (after Kübner 2009, t. 53/8, 4; 36/5, 3; 62/10, 14; 73/7).

Abb. 5. Charakteristische Artefakte von Gera-Zwötzen – Schafraben (1, 2), Gera-Liebschwitz – Binsacker (3, 4), Bad Frankenhausen – Kosackenberg, (5, 6), Lausnitz – Abri Theure (7, 8) und Wallendorf – Weinberg (9) (nach Kübner 2009, Taf. 53/8, 4; 36/5, 3; 62/10, 14; 73/7).

in comprehensive form by T. Terberger (Floss & Terberger 2002, 135 ff.) in his categorization of the Magdalenian at Andernach (Rhineland).

R. Feustel (1974, 191 ff.) and H. Hanitzsch (1969) developed proposals to categorize the Magdalenian of central Germany. In R. Feustel's attempts at categorization he chose to focus on the central European and the western European frameworks, while H. Hanitzsch limited himself to the area of central Germany. Ultimately, both systems originate from a classic typological study of the modified artefacts. Whereas R. Feustel (1974, 191) refers to his approach, including the relative frequencies of tools, as "a statistical classification", H. Hanitzsch (1969) classifies material according to four chronological stages: His most ancient Stage I, supposed to be particularly characterized by a lack of key forms, includes the sites Bad Frankenhausen (Kosackenberg) and Lausnitz (Abri Theure). Stage II (the Nebra group) includes the Gera-Liebschwitz (Binsenacker) site and others. Stage III includes both the Saaleck group as well as the Groitzsch D and C groups. Stage IV already belongs to the Final Palaeolithic backed point tradition (Federmessergruppen) and includes the Groitzsch B and Etzdorf groups. Additionally, H. Hanitzsch (1969) refers to mixed inventories which cannot be categorized to within a single stage. R. Feustel (1961) identifies a Lausnitz group, and an adjoining eponymous site on the Abri Theure as well as the industries of the caves at Žitný and Pekárna (Layer i) belong to this category. According to R. Feustel, the Bad Frankenhausen (Kosackenberg) inventory might be related to this Lausnitz group. All of the sites referred to are said to date back either to the Dryas II/Allerød transitional period or to the early Allerød. Overall, we must note that both R. Feustel's and H. Hanitzsch's approaches at this time assign assemblages a far too recent chronological age. According to R. Feustel (1974, 193) the Gera-Liebschwitz (Binsenacker) inventory belongs to the the Nebra variant of the Ölknitz group, in which case H. Hanitzsch and R. Feustel share the same views on the relationships between Nebra and Gera-Liebschwitz. Finally, R. Feustel (1959, 226) identified the Gera-Zwötzen (Schafgraben) inventory as a third and therefore separate expression of the central German Magdalenian.

In the studied cases, only the lithic inventories can serve as a basis for a categorization of the sites. A comparative analysis has revealed numerous differences and similarities between the different inventories. The relevant distinctive characteristics among groups include: similarities and differences in the assemblages of blanks; frequency distributions; core knapping and blade technology; (an increase of) zinken and backed points; a specific occurrence of Lacan burins as well as long and short borers. Clearly distinct blanks were used for borers between the different groups of sites. To a lesser degree, the specific proportion of burins

also has a distinguishing function. Accordingly, the Gera-Zwötzen (Schafgraben) station must be studied separately from all other inventories. The large flake component and a barely elaborated blade technology combine with an immense proportion of burins, mainly dihedral burins (Fig. 5: 1 and 2) to leave a particular "footprint" which is highlighted by the presence of an exotic mollusc species *Turitella communis*. The significant absence in the Gera-Zwötzen inventory of backed retouched pieces and projectile points or inserts in general displays no relationship with Final Palaeolithic or Epipalaeolithic inventories. These are partly characterized by large proportions of (dihedral) burins and a diminishing blade technology as well as by small end scrapers which do also occur in the Gera-Zwötzen material. The Breitenbach site (Burgenland County), located some 17 km to the north, is a large Aurignacian station (Pohl 1958; Richter 1987; Street & Terberger 2000), however the Schafgraben inventory presents no similarities to Aurignacian assemblages (Hahn 1977). Another option might be comparison with the classic Gravettian (Otte 1981), which in central Germany is only represented by significant material at the Bilzingsleben-Simsensee site (Mania 1981). Nonetheless, this site only shows general similarities, whereas specific parallels in the artefacts are lacking. Thus backed knives only occur in individual cases, while Gravettian points and other projectile points are completely absent. Rather clear parallels in the basic character of its modified artefacts and also regarding the predominance of burins exist between the inventory of the Schafgraben site and the Brno Koněvova ulice (Václavská ulice) inventory (Valoch 1975). K. Valoch classified the inventory as Epi-Gravettian. But T. Terberger (2001, 346) sees significant problems with the radiometric dating of this Moravian station and its potential interpretation as proof that the Epi-Gravettian and Magdalenian might have existed side by side. The Gera-Zwötzen inventory shares some characteristics with the directly neighbouring station of Gera-Zoitzberg (Küßner & Terberger 2006). However, the Zoitzberg inventory has a different imprint with significantly larger sized artefacts, while the small element of large and broad blades identified within the Zoitzberg inventory is largely absent from the Schafgraben inventory. Different burins were used at Zoitzberg and the genuinely nosed end scrapers present here are absent at the Gera-Zwötzen (Schafgraben) site. Similarities have been identified in the barely standardized blade industry as well as in the declining long and narrow blanks and backed retouched pieces. The Gera-Zwötzen inventory cannot be classified together with the "Grubgrabian" (Terberger 2003); nevertheless, there are closer parallels to stations such as Kašov (Svoboda & Novák 2004) so that dating it to before the classical central European Magdalenian is the best probable choice. The Grubgrabian and Kašovian are

obviously not entirely congruent with each other. We have to reckon with an episodic advance of the Grubgrabian (Gera-Zoitzberg) into central Germany and the Gera-Zwötzen station seems similarly to signal a shorter and temporary settlement of the central German region, although this hypothesis still needs further support. If we compare the Gera-Zwötzen inventory to that of Gera-Zoitzberg, there remains an affinity with the Badegoulian and early Magdalenian (terminology e. g. Trotignon 1984; Le Tensorer 1996). In summary, the Gera-Zwötzen (Schafgraben) site should be categorized as early Magdalenian *sensu lato* and, when compared to the above mentioned sites, must be dated to sometime after the Last Glacial Maximum and to before 14 000 BP.

The categorization of the Gera-Liebschwitz site is quite definite. According to the character of its inventory of lithic artefacts, the site clearly belongs to the Nebra Group. In this context we only mention the Lacan burins (Fig. 5: 3 and 4), long borers on lamellar blanks and burin spalls as well as the excellent blade technology. This interpretation of the inventory is reinforced by the rare truncated backed bladelets and by the dominance of truncation burins among the burins. Starting from the observations of H. Hanitzsch (1969) and D. Mania (1999b, 175), the definition and content of the Nebra Group must be more closely specified. We fully agree with T. Terberger's (Floss & Terberger 2002, 136 ff.) revised definition of an "enlarged Nebra Group" (inventory type "Nebra-Andernach-Kanne") and his inherent conclusions on this. The large size of the Gera-Liebschwitz (Binsenacker) site implies that this might be another aggregation camp (Weniger 1982; Conkey 1992) although, unfortunately, only small areas have been excavated. This supposed aggregation camp probably served as a location for temporary reunions of some local groups of the extended Nebra Group, most probably (judged on the size of the site and the evident structures) during the colder seasons over the course of a year. The age of the Gera-Liebschwitz station can be calculated by analogy with the well dated sites of Gönnersdorf and Andernach, as well as with the new data obtained from horse bones from the Nebra site (Higham et al. 2007, 13), and can be dated back to the Oldest Dryas period, prior to the onset of the Late Glacial Interstadial and equating to the end of or following the main occupancy of the Kniegrotte site. In calendar years this would date Binsenacker to after 14 000 and appreciably before 13 000 calBC.

The inventories of the sites of Bad Frankenhausen and Lausnitz are relatively close to each other. The most pronounced differences are in the frequency distribution of end scrapers and backed bladelets, however the sheer number of similarities justifies that the two sites should be included in one group. We therefore agree in this interpretation with R. Feustel (1961) and H. Hanitzsch (1969) whose evaluations have

also identified a close relationship between the two inventories. The term "Lausnitz Group" which was coined by R. Feustel (1961) should remain in use. However, this new analysis has made it quite clear that this "Group" so far only includes the sites of Bad Frankenhausen and Lausnitz. Bad Frankenhausen (Kosackenbergr) presents a longer term occupation camp including diverse evident structures (Fig. 2), which was probably occupied in the cooler/cold seasons, while the special features of Lausnitz (Abri Theure) identify it rather as a larger and certainly more frequently occupied hunting station, also probably used during cooler seasons. The higher proportion of backed points (Fig. 5: 8) from the Lausnitz locality and, particularly, the zinken are proof of the younger age of the assemblage in comparison to Gera-Liebschwitz and the Nebra Group. The zinken (Fig. 5: 5 and 6) indicate that the Bad Frankenhausen and Lausnitz sites are temporally close to or even contemporary with the (classic) Hamburg culture (for a discussion of the relationship between the Magdalenian and Hamburgian see e. g. Djindjian 1988). The ¹⁴C Chronology was most recently reviewed by S. Grimm & M.-J. Weber (2008). Further investigations could show whether mutual influence can be identified here. The Bad Frankenhausen (Küßner 1998, 69) and Lausnitz stations most probably date to the end of the Oldest Dryas period and into the first part of the Late Glacial Interstadial, in calendar years from approximately 13 000 calBC up to 12 400 calBC. Certain parallel features, particularly the appearance of zinken, can be observed by a comparison with the somewhat younger facies of Cepoy-Marsangy (Valentin 1995; Weber 2006), however, the massive occurrence of lithic projectile points in the latter assemblage provides a clear difference to the Lausnitz Group. Primarily, the similarities merely reflect a time-related trend towards an increased use of zinken. The younger group of the north-western Magdalenian defined by C. Höpken (1995) is not the same as the Lausnitz Group.

Wallendorf (Weinberg) is the last site to be categorized here. The inventory has its own unique imprint and differs from the others. The station was a location for obtaining raw material and thus embedded in the logistical cycle of the Magdalenian hunters, while representing an activity separate from others, such as hunting, which is also documented by a few finds of horse remains. While the lithic inventory shows many characteristics with parallels in the Lausnitz and Bad Frankenhausen assemblages, Wallendorf differs from the two sites of the Lausnitz Group due to a large proportion of backed bladelets with retouched longitudinal edges, of truncated backed bladelets with retouched longitudinal edges (Fig. 5: 9) and of backed points. There is also one backed bladelet with retouch around all edges. Wallendorf should therefore be identified as a very late inventory of the Magdalenian. Typologically, it is

at the threshold of the Azilian and, together with the Allendorf (Fuchskirche I) inventory (Benecke et al. 2006), dates to the transitional phase "Bølling" - Older Dryas - Allerød Interstadial. In this sequence the Wallendorf site should date to before the Older Dryas period. A single, recently obtained ^{14}C -date (OxA-13849, Grünberg 2007b; Higham et al. 2007, 14; Küßner 2009, List no. 7, No. 51) suggests an age a few centuries older than this (13 360 until 13 140 calBC), but it would be desirable to check this result by an additional ^{14}C -date, since the single available one would imply a long time interval for the latest stage of the Magdalenian. Typologically, there is no doubt that the Wallendorf site must be categorized as very late Magdalenian.

Reflections on the Magdalenian of the Saale Region

Recent research has changed our image of the Magdalenian in the Saale region. At present we can identify a differentiated development that is embedded in the general cultural development of the Late Glacial (Fig. 6). The precision and reliability of the chronological classification of sites has significantly increased. Prior to the Magdalenian *sensu stricto* and following the Last Glacial Maximum there was occasional settlement assigned to the Grubgraben (Kašovien) (Küßner & Terberger 2006) followed by a period which we have named Magdalenian *sensu lato* (Gera-Zwötzen, Schafgraben). After another phase of human absence, central Germany was occupied by groups of humans representing the peak of the Magdalenian. The earliest proven evidence for the presence of the Magdalenian at an advanced stage of the Oldest Dryas period is exhibited at the Kniegrotte site (Höck 2000).

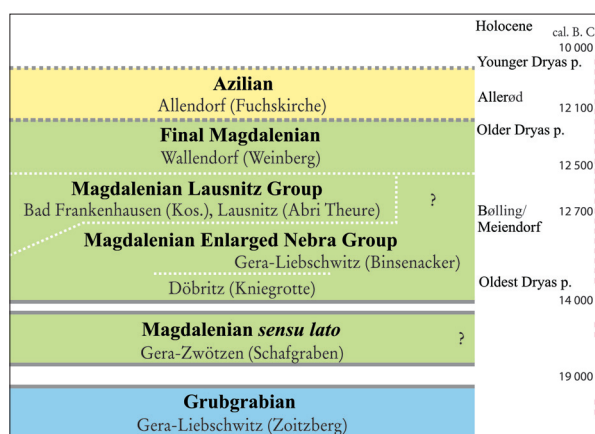


Fig. 6. Development of the Late Upper Palaeolithic and Final Palaeolithic in the catchment area of the river Saale (after Küßner 2009, fig. 190).

Abb. 6. Entwicklung innerhalb des späten Jungpaläolithikums und Spätpaläolithikums im Einzugsgebiet der Saale (nach Küßner 2009, Abb. 190).

The Extended Nebra Group was already established by the Oldest Dryas period (T. Terberger in Floss & Terberger 2002) and the site of Gera-Liebschwitz (Binsenacker) belongs to this group. The Extended Nebra Group spread throughout the northerly foothills over large areas of the central European upland zone. Closely related assemblages extend as far as the Paris Basin. The period preceding the Late Glacial Interstadial was the time of large scale occupation sites, highly advanced blade technology and the classic handicraft of the central European Magdalenian. In brief, this was the age of flourishing of the classic period of the Magdalenian of central European type as we understand it today. Later, low range cultural restructuring set in when further warming took place and conditions became more humid at the beginning of the Late Glacial Interstadial. Inventories of the Lausnitz Group have been verified in two cases at this time in the central area of the Saale region. At the same time, the large area of communication across the northerly parts of the upland zone still seems to have been intact, as shown by the evidence of similarities with late Magdalenian inventories of the Cepoy-Marsangy facies in northern France. The landscape was characterized by growing forestation but still comprised very large areas or rather regions with steppe conditions. The end of the Magdalenian development was a continuous transition from the large territories and broad landscapes of herd hunting populations using spear-throwers to the more narrowly organized world of woodland hunters equipped with bow and arrow which made up the Azilian. At the beginning of the Allerød, this process came to an end.

This means that, with the exception of its last phase, the Magdalenian *sensu stricto* can be regarded as a closed period of chronological and typological development extending from the younger part of the Oldest Dryas period up into Greenland Interstadial I. The spread of the central European Magdalenian, with the first sustained re-settlement of the western part of central Germany, is linked to a period of milder climate broken by short cold snaps. This development can be dated to approximately between 13 800 and 12 100 calBC (Fig. 7). The older phase of the central German Magdalenian shows substantial parallels with sites located in the Rhineland region. At the same time, we have also noted close relationships with Bohemia and Moravia in the entire central German Magdalenian province. This becomes obvious e.g. in the preserved artistic expressions of the population at that time (cf. Küßner 2003). In the younger Magdalenian, relationships (continue to) exist with the Paris Basin and the Hamburgian. These links are only visible in the general inventory of modified artefacts. The strong increase in the number of sites, following a scarcity of settlements at the beginning of the period, reflects a significant growth of the population during the course of the developing Magdalenian in central

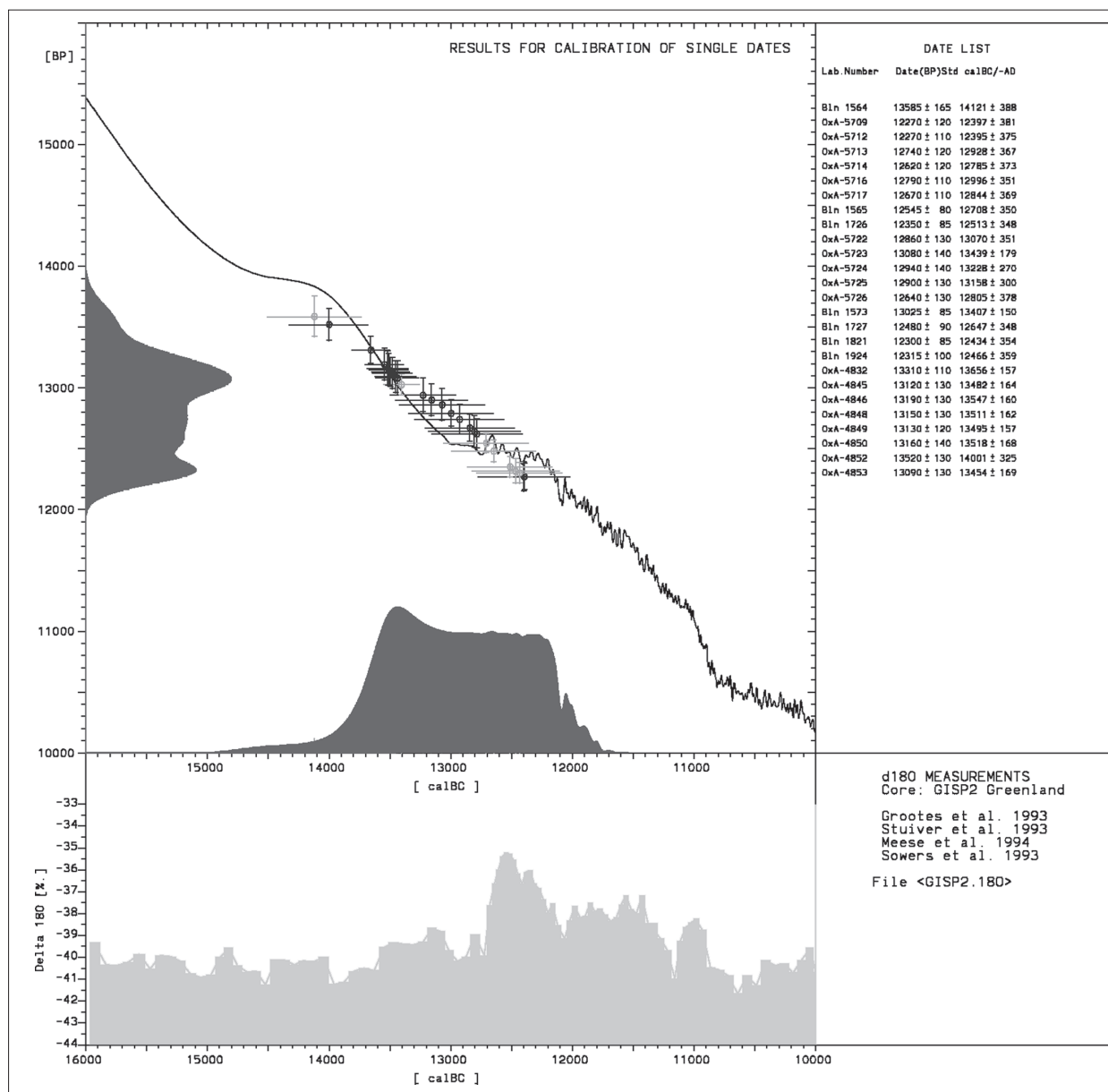


Fig. 7. Calibration of ¹⁴C-dates from Magdalenian sites in Central Germany (after Küßner 2009, fig. 189; CalPal, University of Cologne, (Weninger et al. 2001).

Abb. 7. Kalibration sicherer Daten des Magdalénien in Mitteldeutschland (nach Küßner 2009, Abb. 189; erstellt mit CalPal, Universität Köln, (Weninger et al. 2001).

Germany. The richly structured landscape of the central Saale region offered Palaeolithic foragers large scale plant and animal resources as well as lithic raw material sources for artefacts. The principal game species in the Saale region was clearly the horse (Fig. 8). Reindeer came second and often in much lower numbers. Furthermore, hare, particularly arctic hare, and arctic fox also belonged to the principal game species. Obtaining the fur of these animals was of paramount importance. In addition to these species, which were clearly hunted methodically, all other available animal resources were definitely used opportunistically. Moreover, we have to assume that plant resources were also thoroughly exploited. In the Saale region, the Magdalenian period shows clear

evidence of the keeping of tamed wolves and possibly attempts at their domestication (cf. Küßner 2009, 169 ff.).

On the one hand, settlement behaviour during the Magdalenian period is characterized by a number of large and repeatedly occupied stations which were used in the cold season and have been interpreted as aggregation camps. They provide evidence for the entire range of archaeologically verifiable human activities in the Magdalenian; an example of one of the stations of this type is Gera-Liebschwitz (Binsenacker). On the other hand, are found smaller hunting stations like Lausnitz (Abri Theure) and the smaller stops or hunting blinds whose presence is at most revealed by isolated artefacts. Finally, there were stations such as

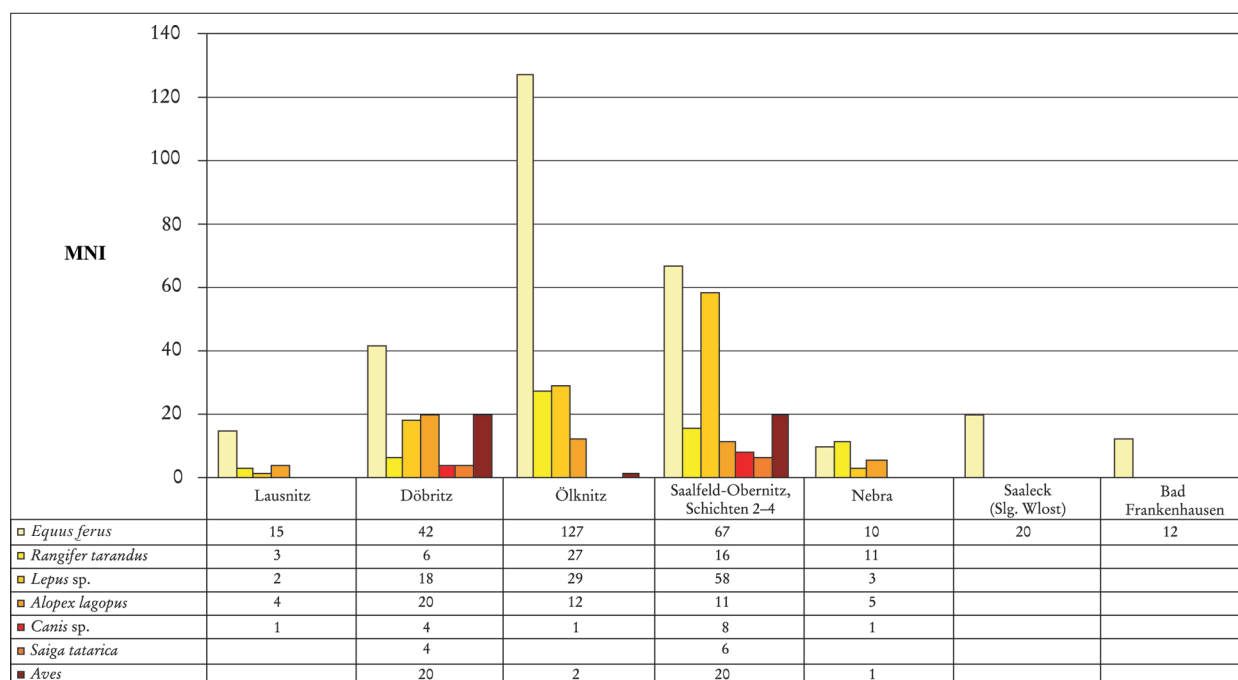


Fig. 8. The main game species (minimal number of individuals - MNI) of Magdalenian stations with faunal remains in Central Germany (after Kübner 2009, fig. 179).

Abb. 8. Hauptjagdtiere (Mindestindividuenzahlen) von beurteilbaren mitteldeutschen Magdalénienfundstellen mit Faunenerhaltung (nach Kübner 2009, Abb. 179).

the Wallendorf (Weinberg) site, which (partly) specialized in other activities, in this case the provision of prepared cores and blanks. The large aggregation camps, as their name suggests, assembled larger collectives of people, most likely groups from the region or parts of these groups, while the smaller stations were based around local groups, nuclear families or extended nuclear families and, in other cases, on small task groups. The specialization of particular sites and a general decrease in artefact size is observed as we move from sites located in the area of the Saale glaciation, rich in high quality raw material, to sites located in the area of the Elster glaciation and even further south, characterized by lower availability or lack of raw materials. Together with evidence that the large sites were rather occupied in the cold seasons, this must be interpreted as yet unclear evidence for a hypothetical seasonal annual cycle linked to certain predominant activities. The quite diverse character of the landscapes of the Saale area supports this interpretation, with hilly uplands and foothills of low mountain ranges in the south and lowlands in the north. In the Magdalenian, this landscape was already utilized up into the middle altitudes of the low mountain ranges. Evidence of this is shown by the Bärenkeller site located near Königsee-Garsitz, Saalfeld-Rudolstadt County (Feustel et al. 1971a; Feustel & Musil 1977a).

The large stations are largely missing among the Azilian/Federmessergruppen groups of the boreal birch and pine woods which followed the Magdalenian sensu stricto. This speaks for the

beginning of the downsizing of collectives, who traded among each other, and the overall density of the Saale region's population seems to have deteriorated at that time.

The following Younger Dryas stadial, marked by a significant deterioration of the climate, is far beyond the time frame fixed here and can scarcely be made out among the archaeological material excavated in the central Saale region. All in all, a highly dynamic development is recognizable at times when there is pressure to conform to changed climate conditions, whereas a much calmer pace of development is shown during relative environmental stability.

This presentation, analysis and integration of five sites intend to contribute to the determination of the structure of the central German Magdalenian. However, we were only able to hint at the many general aspects of human behaviour and cultural development in the Magdalenian and the Late Glacial, which would require more in-depth research. We should continue to use the so-called ancient inventories with their high potential of evidence as important sources. In future more in-depth presentation of further even smaller sites is advisable and necessary in order to render our knowledge about the settlement of the Late Glacial in central Germany yet more thorough and precise.

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