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## THE MAGDALENIAN OCCUPATION OF LOWER BAVARIA

*ABSTRACT: The recolonization of Central Europe after the Last Glacial Maximum is tight-knit with the Magdalenian techno complex. So far several important Magdalenian site clusters across Central Europe are known and well examined. South eastern Germany, respectively Lower Bavaria, is not considered one of them, although it represents one of the regions along one of the supposedly major communication axes during the Palaeolithic – the Danube. Therefor this region bears the potential to close a gap between the eastern and western Magdalenian. Unfortunately not all of the Lower Bavarian Magdalenian sites aren't comprehensively analysed and/or published yet. The aim of this paper is therefore to render an overview of the current state of knowledge concerning the Lower Bavarian Magdalenian.*

*KEY WORDS: Magdalenian – Upper Palaeolithic – Late glacial – Bavaria*

### INTRODUCTION

The first occurrence of the Magdalenian techno complex in Bavaria marks at the same time the onset of the recolonization of this area after the Last Glacial Maximum (LGM). Questions concerning the Magdalenian expansion model, regional diversity and cultural tradition were therefore always an integral part of Magdalenian research. Due to the high amount of rich Magdalenian sites in Europe an internal classification seemed eligible from a very early stage of research. H. Breuil developed a classification of the

Magdalenian in six different stages, based on typological characteristics on organic and lithic artefacts (cf. Breuil 1937). Stage I can nowadays be related to the so called Badegoulian, which is dated to the LGM and should be regarded as an independent techno complex (Maier 2015: 51). Therefore Breuil's stages II to III have to be considered as an Early Magdalenian. Stage IV marks the Middle Magdalenian and stages V and VI the Late Magdalenian (cf. *Table 1*). Unfortunately Breuil's classification cannot be exerted unrestrictedly to the Central European, respectively Bavarian sites, since it is mostly based on the typology

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TABLE 1: Internal Magdalenian classification (according to Breuil 1937: 46 and Maier 2015: 50).

Stages acc. Breuil	Fossile directeurs	Stages acc. Maier
I	multiple borers, lithic industry based on flakes, single bevelled points	<i>Badegoulian / LGM</i>
II	Scalène bladelets, multiple burins, backed bladelets, thick single bevelled points	<i>Early Magdalenian</i> <i>(Lower Magdalenian)</i>
III	Scalène triangles, points Lussac-Angles, single bevelled points	<i>Early Magdalenian</i> <i>(Lower Magdalenian)</i>
IV	proto-harpoons, baguette demi ronde, <i>navettes</i>	<i>Middle Magdalenian</i>
V	single-row barbed points, double bevelled points	<i>Late Magdalenian</i>
VI	Double-row barbed points, short endscrapers, backed points	<i>Late Magdalenian</i>

of organic tools and many of the Bavarian Magdalenian sites did not yield such artefacts. Therefore the Bavarian sites shall be – as far as possible – subdivided into an Early respectively Lower, Middle and Late Magdalenian according to Maier (Maier 2015: 51).

The last overview of the Lower Bavarian Magdalenian sites was given by W. Weißmüller in 2002, who assigned the cave sites Kastlhänghöhle, Obere Klaus, Mittlere Klaus and Sesselfelsgrötte to the Late Magdalenian (Weißmüller 2002: 184). Furthermore he points out the possibility of classifying the surface collections of Metten as Magdalenian (*ibid.*). The last site in this context is the open-air site of Vilshofen-Kuffing. Due to its typological composition Weißmüller argues for an early Magdalenian date for this site (Weißmüller 2002: 185). In order to understand Weißmüller's classification the Lower Bavarian Magdalenian sites shall be introduced briefly.

### Kastlhänghöhle

A Magdalenian occupation is known from the Kastlhänghöhle cave site. It is located in the Altmühl valley, district of Kelheim and was initially excavated by J. Frauenholz in 1888. Further research was later carried out by H. Obermaier and took place until 1907 (Kaulich *et al.* 1978: 83). Apart from a neolithic and some palaeontological layers a paleolithic layer with rich Magdalenian material was discovered (Kaulich *et al.* 1978: 83). A single barbed point as well as bone points were found among various lithic artefacts as burins, end scrapers, borers and backed bladelets. Two C14 dates prove an age of  $14.077 \pm 253$  respectively  $13.475 \pm 134$  years cal BP ( $12.060 \pm 90$ , OxA-5755 und  $11.590 \pm 90$  BP, OxA-5756, Housley *et al.* 1997: 30) for the Palaeolithic layers, which is in perfect accordance with

an attribution to the Magdalenian. Furthermore due to the occurrence of a single barbed point is possible to assign the site to a Late Magdalenian according to Maier respectively a Magdalenian V/VI according to Breuil (*cf.* Breuil 1937: 46, Maier 2015: 50).

### Mittlere und Obere Klaus

The Klausenhöhlen cave complex is as well situated in the Altmühl valley, district of Kelheim. The three caves and one abri were investigated since the early 20<sup>th</sup> century. Since the Magdalenian occupation is limited to the Mittlere and Obere Klaus, only these two shall be described in detail. The Mittlere Klaus was initially excavated in 1912/1913 by H. Obermaier, who discovered a Magdalenian layer in superposition of several Middle Palaeolithic layers. Only niche B within the Mittlere Klaus cave yielded two distinct Magdalenian layers, namely an older and a younger Magdalenian occupation (Kaulich *et al.* 1978: 65). Unfortunately it is not possible to retrace these layers nowadays. Besides lithic artefacts, among which burins and end scrapers prevailed, bone tools like barbed points and bone points were discovered (Kaulich *et al.* 1978: 66). Furthermore painted stones and engraved lime stones, as well as a "Lochstab aus Rengewei mit anthropomorpher Gesichtsdarstellung" were found (Kaulich *et al.* 1978: 65). A C14 date from the Mittlere Klaus with an age of  $16.088 \pm 425$  years cal BP ( $13.160 \pm 130$  BP, OxA-5718 Housley *et al.* 1997: 30) assures the Magdalenian age of the inventory. Since barbed points occur the earliest from Magdalenian V on (Maier 2015: 59), the typological attribution of the Mittlere Klaus assemblage to a Late Magdalenian seems likely.

Connected through a natural chimney the Obere Klaus is located directly above the Mittlere Klaus.

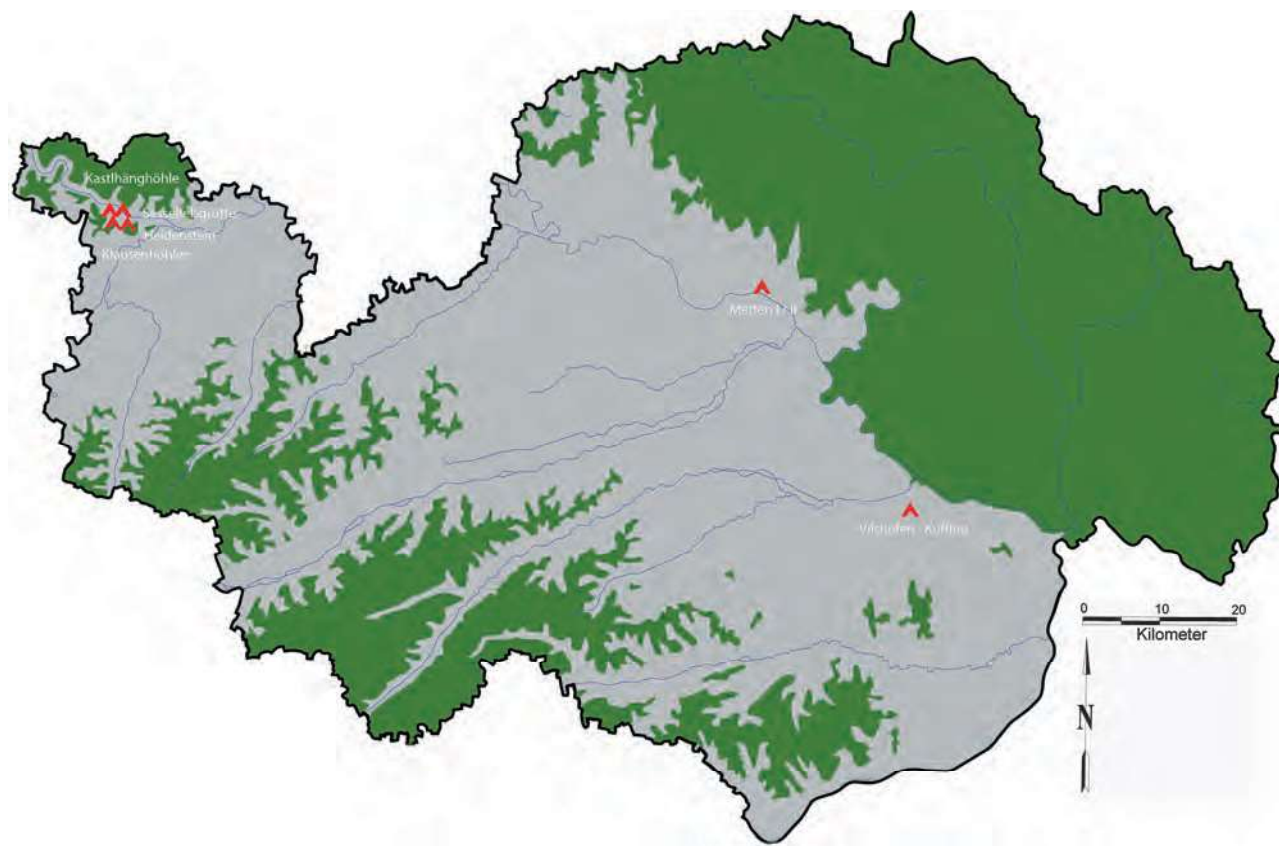


FIGURE 1: Magdalenian sites in Lower Bavaria.

The earliest excavations here were carried out by J. Frauenholz between 1905 and 1908. They yielded middle Palaeolithic, two Magdalenian and two Neolithic layers. This time however the Magdalenian layers were separated through a sterile layer (Kaulich *et al.* 1978: 65). Similar to the Magdalenian assemblage from the Mittlere Klause lithic and bone artefacts as well as portable art were found. The Upper Magdalenian layer yielded a typical Upper Palaeolithic lithic tool spectre as well as single barbed points and bone points. Comparable to the Mittlere Klause the occurrence of single barbed points proves the attribution of the Upper Magdalenian Layer from the Obere Klause to a Late Magdalenian respectively a Magdalenian V/VI according to Breuil (Breuil 1937: 45). The Lower Magdalenien Layer provided a very similar tool spectre. A mammoth depiction on a mammoth tusk represents a special feature within the inventory, although its stratigraphic attribution is not unproblematic, since the mammoth tusk was found between the Lower Magdalenian level and a Solutrean

[nowadays rather Middle Palaeolithic] level (Freund 1964: 109f.; Kaulich *et al.* 1978: 72). Two C14 samples from the lower Magdalenian layer yielded dates with an age of  $14.541 \pm 394$  and  $14.683 \pm 396$  years cal BP ( $12.350 \pm 130$ , OxA-5719 und  $12.440 \pm 140$ BP, OxA-5720; Housley *et al.* 1997: 30), which is in perfect accordance to an attribution to a Late Magdalenian. All of the Magdalenian material from the Klausen cave complex is being analysed in course of a PhD thesis at the University of Erlangen-Nürnberg at the moment. The classification on basis of typological features of both inventories as Late Magdalenian material will however not change (personal communication L. Geyer). The painted stones from the Klausenhöhlen were reanalysed in 2014 in context of a BA thesis by N. Huber at University of Tübingen (cf. Huber 2014). Interestingly Huber was not only able to show stylistic similarities between the painted stones from the Klausenhöhlen and the ones from the Hohle Fels site in the Swabian Jura, furthermore the occurrence of cherts from the Kelheim region in Lower Bavaria in

Magdalenian sites of the Swabian Alb proves a connection between these two regions (Huber 2014: 118). Although not being directly connected to the Magdalenian complex in the Klausenhöhlen, the find of a human skeleton from the Mittlere Klause shall nevertheless be mentioned. The anatomically modern human was found embedded within the Middle Palaeolithic layer (Kaulich *et al.* 1978: 67). Apart from a cover of red ochre no grave goods were discovered. The stratigraphical position of the human remains therefore raised questions. Although an attribution to the Magdalenian was ruled out by the excavators from the beginning, a Middle Palaeolithic age seemed also very questionable since the skeleton showed no Neanderthal features (Kaulich *et al.* 1978: 68). A C14 dating of the human remains however yielded a surprising result. With an age of  $22.219 \pm 439$  years cal BP ( $18.590 \pm 260$  BP, OxA-9856, Terberger, Street 2002: 694) the skeleton witnesses an occupation of Bavaria during the Last Glacial Maximum. It is therefore so far the only evidence for the presence of people in Bavaria between the Gravettian and the Magdalenian recolonization of this area.

### Heidenstein

Situated only 700 m east of the well-known Klausenhöhlen cave complex, the cave site of Heidenstein was discovered in 1932 by F. Birkner (Birkner 1933: 55). Among the approximately 3000 lithic artefacts that were discovered in the Heidenstein site, numerous blanks but also tools like burins, borers and backed bladelets were found. Additionally Birkner reports two lithic points (Birkner 1933: 55). The typological composition of the inventory might speak in favour of a Magdalenian – taking into account the lithic points maybe a Late Magdalenian – nevertheless the site cannot be assured as of Magdalenian age, since a comprehensive analysis of the inventory was not provided so far. Therefore the Magdalenian character of the Heidenstein cave site has to remain questionable.

### Metten

The open air site of Metten is situated above the Danube valley approximately 1 km south of Metten, district of Deggendorf. F. Weinschenk discovered the site and collected finds from the surface over several years (cf. Schmotz 2001). The site comprises two distinct find concentrations (Metten I and Metten II), which are located in approximately 250 m distance to each other. The inventory consists of roughly 800 artefacts (Weißmüller 1995a: 100). Weißmüller stated that "die

Fundstelle Metten [...] eine Palimpsest-Fundstelle, mit in einander vermischten, verschiedenen Zeitstufen stammenden Resten" and is therefore difficult to evaluate (Weißmüller 1995a: 99). The inventory of Metten I consists of Middle and Upper Palaeolithic artefacts. The Upper Palaeolithic pieces however were divided into an older Upper Palaeolithic – based on a similar degree of patination compared to the Middle Palaeolithic artefacts – and a younger Upper Palaeolithic part (Weißmüller 1995a: 102). Metten II also yielded Middle and Upper Palaeolithic artefacts. The Upper Palaeolithic part was attributed to a Late Upper Palaeolithic by Weißmüller based on typological features. Furthermore, according to Weißmüller the relatively high amount of supra-regional raw materials within the Upper Palaeolithic artefacts, speaks in favour of an attribution to a Late Upper Palaeolithic since this raw material spectre is a direct result of a relatively high mobility (Weißmüller 1995a: 112). An extensive raw material analysis did not take place so far, the only hint towards an identification of the origin of the supra-regional raw material, was also provided by Weißmüller who suspects the outcrops within the southeastern Franconian Alb (*ibid.*). In that case raw material from approximately 150 km distance, following the course of the Danube, would be on hand in Metten. Unfortunately both Upper Palaeolithic inventories from Metten are of rather insignificant nature in terms of typology. They mostly consist of end scrapers, burins and backed pieces (Weißmüller 1995a: 104, Weißmüller 2002: 184). The material is undoubtedly of Upper Palaeolithic nature, but so far an attribution of Metten I and II to the Magdalenian must remain questionable. A revaluation of the material, taking into account possible new surface finds could however provide further information concerning the chronological assignment of the Upper Palaeolithic finds from Metten. So far the classification of the Metten material as Magdalenian can be accepted conditionally, following also Maier's classification of the site as of "probably Magdalenian" age (Maier 2015: 305).

### Sesselfelsgrötte

Another Magdalenian occupation in Lower Bavaria is reported from layers C2 and C1 of the Sesselfelsgrötte cave site in Essing, district of Kelheim (cf. Dirian 2003). The site was excavated repeatedly between 1964 and 1977 as well as 1981 by the Department for Prehistory of University of Erlangen. The Upper and Late Palaeolithic layers were analysed by A. Dirian in course of his PhD thesis in 1996 (cf. Dirian 2003). The lower layer C2 is attributed to an older phase of the



central European Magdalenian, whereas the overlying layer C1 is described as a Late Magdalenian (Dirian 2003: 199). Latter yielded typical Upper Palaeolithic tools including burins, borers, end scrapers and backed bladelets (Dirian 2003: 120ff.). Although the C1 inventory comprise also Late Palaeolithic tool types as backed points and short scrapers, Dirian claims "Form und Größe der Rückenspitzen und Stichel [und] Art und Anzahl der Rückenmesser" being indicators for the Magdalenian nature of the material (Dirian 2003: 133). Furthermore he reports that blank production "steht noch eindeutig in der Tradition des Magdalenien"

(ibid.). The inventory from layer C2 however is marked by a relatively high amount of backed bladelets, end scrapers (mostly on blade) and burins, among which burins on truncation clearly prevail. Furthermore Dirian mentions scalene triangles among the backed pieces which shall prove the older Magdalenian character of layer C2 (ibid.). Judging by the paintings of the mentioned scalene triangles however it is highly probable that these pieces represent in fact rather irregularly shaped truncated backed bladelets than scalene triangles (cf. Dirian 2003: Taf. 2). Another piece that might be of chronological significance is

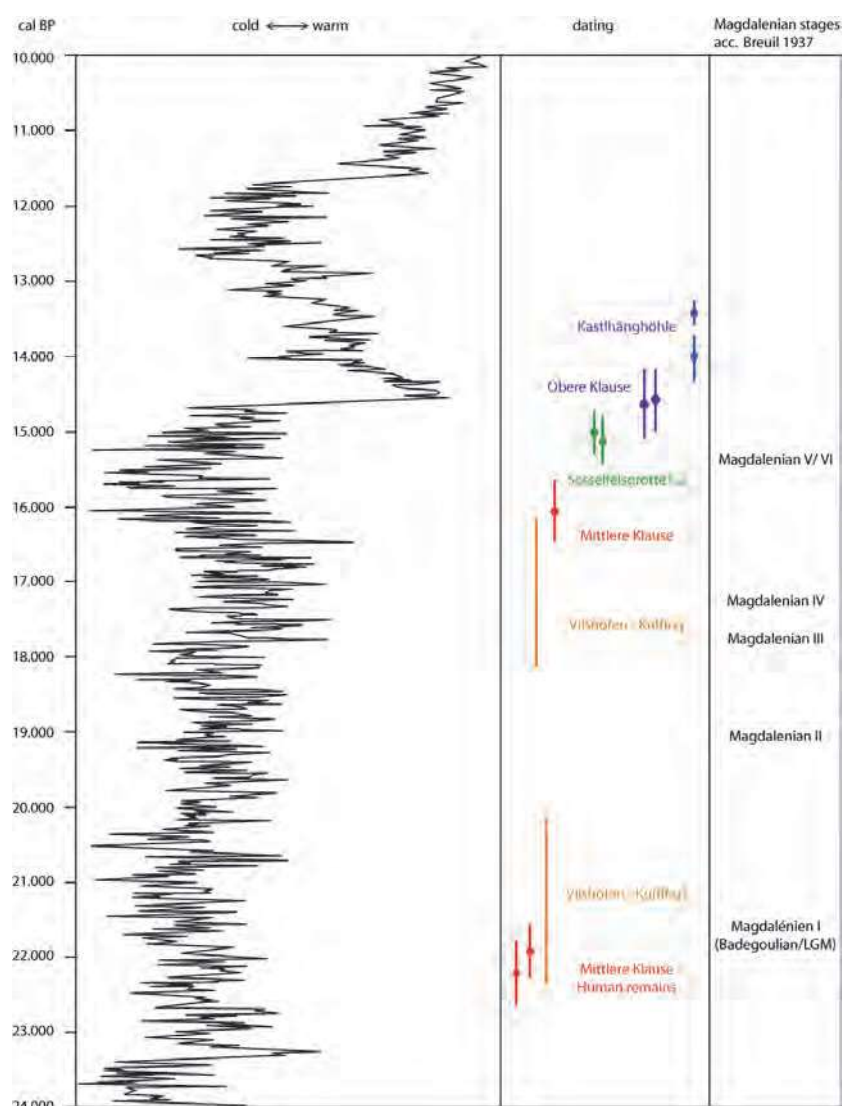


FIGURE 2: Chronology of Magdalenian sites in Lower Bavaria (Data:  $\delta^{18}\text{O}$  curve of NGRIP core from CalPal 2007, Weninger *et al.* 2012).

a burin that was transformed into a Zinken (Dirian 2003: 77). Zinken are broadly connected with the onset of the Late Glacial, since they occur in Late Magdalenian as well as in Late Palaeolithic context (Floss 2012: 479). Furthermore Dirian describes a burin on truncation that approaches towards a Lacan - type burin (Dirian 2003: 77). Burins of the Lacan - type are usually seen as marker for the Late Magdalenian (Pasda 2012: 422). Nevertheless the crucial point about Lacan - type burins (and consequently also their chronological significance) is not (only) the shape of the tool but more important the Lacan technique (cf. Adaileh 2019: 42). Whether the mentioned burins from the Sesselfelsgrötte inventory are indeed Lacan - type burins or only shaped close to Lacan - type burins cannot be judged on base of the present information. Layer C2 however also yielded two C14 dates on worked horse and reindeer bones. The age of  $15.150 \pm 318$  and  $15.054 \pm 332$  cal BP ( $12.740 \pm 90$ , OxA-5753 and  $12.680 \pm 100$ , OxA-5754; Housley *et al.* 1997: 30) points rather towards an attribution to the Late Magdalenian for both Magdalenian horizons from the Sesselfelsgrötte.

#### **Vilshofen-Kuffing**

The open air site was discovered by the heritage service of the district of Passau in 1994. When Weißmüller listed Magdalenian sites in Eastern Bavaria in 2002, several hundred up to thousand lithic artefacts were known from this site (Weißmüller 2002: 185). Due to an immense collecting activity of several volunteers during the past 25 years, the present surface collection comprises approximately 70.000 artefacts. Since the analysis of the material is still ongoing, the following has to be considered as preliminary results or impressions. At least 90% of the cores are blade and bladelet cores, what shows that blades and bladelets were the targeted blanks. The tool spectre comprises typical Upper Palaeolithic types as burins, end scrapers and borers. A Gravettian component within the material - as stated by Weißmüller (Weißmüller 1995b: 25) - cannot be confirmed so far. Nevertheless there are some artefacts that are at least in their quantity unusual in Magdalenian contexts: carinated pieces, nosed end scrapers or star shaped borers. Those pieces might speak in favour of a LGM dated component within the inventory. The most significant artefacts in terms of chronology are however the numerous scalene triangles from Vilshofen-Kuffing. The debate whether those artefacts are of chronological significance within the Magdalenian or not, has a long history (cf. Höck 2000, Demars, Laurent 1992). According to new

researches scalene triangles within reliable context occur only before 16.000 cal BP, so that their typological and chronological significance cannot be neglected (Maier 2015: 59). That also corresponds with H. Breuils subdivision of the Magdalenian (Breuil 1937: 46), where scalene triangles mark Magdalenian stage III, which reflects an Earlier Magdalenian, in terms of Central European Magdalenian chronology (cf. Maier 2015: 51). Therefore Vilshofen-Kuffing so far represents one of the oldest Magdalenian occupations not only in Lower Bavaria, but also in Southern Germany.

#### **CONCLUSION**

Four Cave sites and one open air site with Magdalenian occupations are so far known from Lower Bavaria. Additionally, one cave site as well as another open-air site provided possible Magdalenian material. The Klausenhöhlen cave complex and the Sesselfelsgrötte yielded not only very rich inventories, but also proof that certain areas were occupied repeatedly throughout the (Late) Magdalenian. A comprehensive analysis of the Kastlhänghöhle, Heidenstein and Metten material could provide further information. The site of Vilshofen-Kuffing marks the earliest Magdalenian occupation in Lower Bavaria. Thinking about the recolonization of Central Europe after the Last Glacial Maximum (cf. Maier 2015: 231ff.), this site might play an important role within the discussion about a unidirectional or a bidirectional recolonization model. As Maier states (Maier 2015: 233) in case of a unidirectional recolonization model of Central Europe the dates should become gradually younger from the postulated starting point, which is classically located in Western Europe, respectively Southern France and Northern Spain, to the Eastern Magdalenian periphery in Poland. This is clearly not the case with some eastern Central European sites providing C14 dates "that are older than the oldest dates from the Magdalenian sites in the Rhineland and Danube region" (cf. Maier 2015: 233). Hence they would rather speak in favour of a bidirectional recolonization model. But since the amount of Early and Middle Magdalenian sites in Eastern Central and Central Europe is still relatively low, compared to the quantity of younger Magdalenian sites, Maier still argues in favour of an Magdalenian occupation of Poland, Czech Republic and the eastern part of Germany that is somewhat later than the early Magdalenian dates from France (cf. Maier 2015: 240f.).

In case of Bavaria, respectively Lower Bavaria, he sets the beginning of the recolonization of this area by Magdalenian people to a date roughly between 16.000–15.500 cal BP (Maier 2015: 241). Accordingly, Bavaria would be one of the latest recolonized areas (ibid.). Vilshofen-Kuffing, with an estimated age of 18.000–16.000 years cal BP, therefore assembles the necessity to adjust this model. Taking into account other Bavarian sites as well, the references densify towards an at least temporal occupation of Bavaria before 16.000 cal BP (cf. Adaileh 2019, Sauer 2011). The burial from the Mittlere Klause and the site of Vilshofen-Kuffing might speak in favour of a scenario that points at least towards temporal occupation or short term stays in Lower Bavaria already during the Last Glacial Maximum. The scalene triangles from Vilshofen-Kuffing however prove an age of between 18.000–16.000 cal BP for this site (cf. Maier 2015: 59) and presumably the bigger part of the surface collection. Therefor Vilshofen-Kuffing marks the earliest Magdalenian occupation of Lower Bavaria. With the Late Magdalenian (Breuil's stages V and VI) the number of sites in Lower Bavaria increases significantly. Consequently this may represent the completion of the recolonization after the Last Glacial Maximum. The internal chronology within the Late Magdalenian sites is however difficult. The absolute dated sites show a sequence, which cannot be traced on basis of typology by no means. According to Breuil's chronology single and double rowed barbed points are crucial for the assignment to either stage V or VI within the Magdalenian (cf. Breuil 1937). And although there might be a tendency for double rowed barbed points to occur somewhat later than single barbed points, according to Maier both can be dated to a time around 16.000 cal BP (Maier 2015: 59). The Lower Bavarian Magdalenian sites that yielded both kind of barbed points can all be dated between 16.000 and 13.000 cal BP. Generally it becomes apparent that the Western European Magdalenian typology (and subsequently also the chronology) cannot be applied to the Bavarian Magdalenian sites. So far – for the bigger part of Central Europe and subsequently also for Lower Bavaria – it is only possible to distinguish between an Earlier and a Late Magdalenian. The current state of research differs from site to site, which significantly hinders a comparison of the inventories and consequently also the identification of similarities and/or differences in blank production and typology on a small scale. This again gets in the way of a reliable internal chronology for the (Lower) Bavarian Magdalenian. This on the other hand is a problem that concerns most of Central

Europe, where traditionally the French respectively Western European Magdalenian chronology is applied on the Magdalenian sites to the extent to which it may be applicable. Again a comprehensive analysis of the present inventories might help to gain further insight into the chronology of the (Lower) Bavarian Magdalenian. On the other hand the disproportion between one Early Magdalenian site and three Late Magdalenian sites with multiple occupations can be explained with several reasons. In the first place early Magdalenian sites as Vilshofen-Kuffing for instance might represent rather first (only temporal?) approaches towards a region that was not inhabitable (at least not fairly long-term) during the Last Glacial Maximum. Acting on the assumption of a bidirectional recolonization model for Central Europe that would mean, that the number of Early Magdalenian sites in Central Eastern Europe should be significantly higher, since this would be the hypothetical starting point for hunter gatherer groups recolonizing Bavaria. This is not the case. Therefore a generally lower population density during the Early Magdalenian might explain the lower number of contemporaneous sites. According to I. Kretschmer's work on population density, mobility and land use patterns during the Late Upper Palaeolithic a continuous increase in population is comprehensible from the Early to the Late Magdalenian (Kretschmer 2015: 118). Accordingly, this is not a phenomenon that concerns only the Bavarian respectively Lower Bavarian Magdalenian sites. Unfortunately connections between the Lower Bavarian Magdalenian sites and Magdalenian regions to East and West are so far relatively scarce. As mentioned previously, raw material transports are known from the Kelheim region to the Swabian Jura (cf. Huber 2014, Thaller 2014). Additionally, raw material from the outcrops in Ortenburg and Flintsbach in the vicinity of Vilshofen-Kuffing, was reported in the Czech sites of Hostim, Putim and Žďár I (cf. Přichystal 2006, Maier 2015). The site of Metten is so far the only possible hint towards an import of supra-regional raw material into the Lower Bavarian region (cf. Weißmüller 1995a: 112). Given the fact, that this site cannot be doubtless attributed to the Magdalenian, it is questionable whether Metten can serve as a first prove for raw material imports to Lower Bavaria. The few in terms of raw material analysed sites however give the impression of a mostly regional based raw material procurement pattern, which was also already observed by Maier for the Magdalenian sites along the Danube (Maier 2015: 94). As Maier states "the almost ubiquitous availability



of high-quality raw materials is probably the reason for a marked trend towards local acquisition, the range of which usually does not exceed 40 km" (Maier 2015: 94). In contrast to Maier's theory, that "banded chert [from Abensberg Arnhofen, district of Kelheim] is distributed almost exclusively west of the Regensburg basin" (Maier 2015: 94), this kind of raw material can also be found in Vilshofen-Kuffing. Therefore, a comprehensive raw material analysis of the Lower Bavarian Magdalenian sites could yield further insights. Typological comparisons within the Lower Bavarian Magdalenian sites, but also with other regions are difficult, due to the highly variable state of research from site to site. Further questions concerning internal characteristics, land use pattern and possible relations of the Bavarian Magdalenian sites to neighbouring areas are therefore completely depending on a preceding initial respectively re-analysis of Lower Bavarian Magdalenian assemblages.

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