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NEXT STOP: KNIEGROTTE? ON THE POSSIBILITY OF A MAGDALENIAN À NAVETTES IN EASTERN GERMANY

In Memory of

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ABSTRACT: Kniegrotte cave site in eastern Germany is one of the most important Magdalenian sites in Central Europe. From a red-colored Pleistocene sediment package, a rich assemblage of lithic and osseous artefacts was recovered. In the faunal record, the presence of mammoth and saiga bones is noteworthy. The weighted average of nine ^{14}C dates is 15,900 calBP, and thus the main occupation of the site pre-dates the Upper Magdalenian in Central Europe. This is in accordance with the presence of lithic triangles and the absence of osseous barbed points at Kniegrotte. However, despite the absolute dates the thickness of the find-bearing layer strongly suggests repeated occupation during a considerable time span which was not recognized in the early days of its excavation. Certain osseous artifacts and artisan craft works from Kniegrotte are without any parallels in the numerous Late Middle and Upper Magdalenian assemblages from Central Europe, but they display strong similarities to the distinct facies Magdalénien à navettes attested from around 18,500–18,000 calBP in France and at Maszycka cave in southern Poland. It is therefore possible that Kniegrotte was occupied already during the Early Middle Magdalenian. In that context, the oldest AMS date of 17,600 calBP from Kniegrotte obtained on mammoth bone could relate to human activity.

KEY WORDS: Central Europe – Magdalénien à navettes – Kniegrotte – Osseous industry – Projectiles

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INTRODUCTION

The facies *Magdalénien à navettes* was introduced by J. Allain, R. Desbrosse, J.-K. Kozłowski and A. Rigaud (Allain *et al.* 1985) as an umbrella term for certain characteristic tools and artistic concepts. It dates to c. 18.500–18.000 calBP and hence to an early phase of the Magdalenian (Maier 2015: 51, Paillet *et al.* 2017). Assemblages attributed to this facies contain the name-giving double-split antler tool, osseous projectile points

with double-bevelled bases, single dorsal or ventral grooves and geometrical decoration, three-dimensional phalliform or anthropomorphic carvings, objects decorated with so-called *cupules* (shallow carved depressions) and anthropomorphic representations (Allain *et al.* 1985: 94–99). The *Magdalénien à navettes* is so far known from nine sites only (Roc-de-Marcamps, Placard, Chaffaud, Garenne, Laugerie Basse & Haute, Piscine, Grappin, Maszycka), eight of which are located in France. Between the easternmost

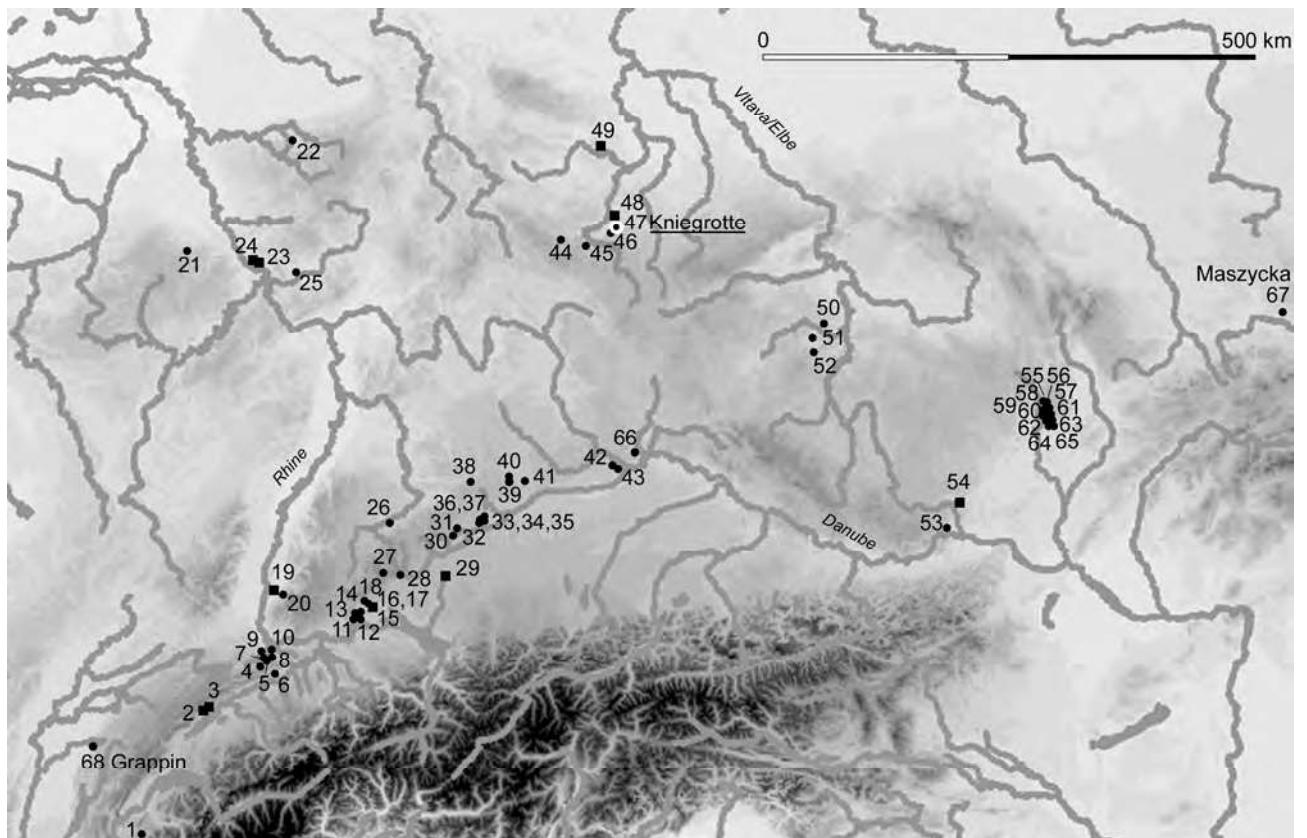


FIGURE 1: Central European Magdalenian sites with osseous projectiles. 1, Veyrier; 2, Monruz; 3, Champréveyres; 4, Thierstein; 5, Kohlerhöhle; 6, Rislisberghöhle; 7, Kastelhöhle Nord; 8, Hollenberghöhle; 9, Heidenküche; 10, Birseck-Ermitage; 11, Schweizersbild; 12, Freudenthalhöhle; 13, Vorderer Eichen; 14, Dachsenbühlächen; 15, Kesslerloch; 16, Petersfels-cave; 17, Petersfels-valley floor; 18, Gnirshöhle; 19, Munzingen; 20, Teufelsküche; 21, Kartstein; 22, Feldhofhöhle; 23, Andernach-Martinsberg; 24, Gönnersdorf; 25, Wildweiberlei; 26, Napoleonskopf; 27, Probstfels; 28, Burghöhle Dietfurt; 29, Schussenquelle; 30, Hohlefels; 31, Brillenhöhle; 32, Vogelherd; 33, Bocksteinhöhle; 34, Bockstein-Schmiede; 35, Bockstein-Törle; 36, Hohlenstein-Bärenhöhle; 37, Hohlenstein-Stadel; 38, Kleine Scheuer Rosenstein; 39, Große Ofnet; 40, Hohlenstein Ederheim; 41, Kaufertsberg; 42, Obere Klause; 43, Kastlhängenhöhle; 44, Garsitz Bärenkeller; 45, Teufelsbrücke; 46, Kniegrotte; 47, Abri Theure; 48, Oelknitz; 49, Nebra; 50, Na Průchodě; 51, Tetín Ve stráni; 52, Turské maštale; 53, Gudenušhöhle; 54, Kamegg; 55, Kůlna; 56, Křížová; 57, Balcarka; 58, Rytířská; 59, Býčí skála; 60, Kolibky; 61, Nová Drátenická; 62, Hadí; 63, Žitného; 64, Pekárna g/h; 65, Adlerova; 66, Tunnelhöhle. Dot-rock shelter/cave site, square-open-air site.

French site Grotte Grappin and Maszycka cave in the Polish Jura lies an area that stretches about 1.300 km as the crow flies, from which to date no other site of this age is known (Allain *et al.* 1985, Kozłowski *et al.* 1993, 2012, 2017, Maier 2015, 2017a, b). The absence of evidence for any human occupation of Central Europe between 18.500–18.000 calBP is astonishing, since the presence of this very distinct facies at the eastern border of the Magdalenian *koiné* cannot be the result of autochthonous development (Maier 2017b, 96). In the following, hints for a Magdalenian à navettes at Kniegrotte cave in eastern Germany shall be presented and discussed.

THE KNIEGROTTE: STRATIGRAPHY, FAUNAL ASSEMBLAGE AND NUMERICAL DATING

The Kniegrotte is located in the federal state of Thuringia in eastern Germany (*Figure 1*). Together with the well-known sites of Oelknitz-Sandberg (Bock *et al.* 2015, Gaudzinski-Windheuser 2013), Obernitz-Teufelsbrücke (Bock *et al.* 2017, Feustel 1980, Pfeifer 2015), Garsitz-Bärenkeller (Müller *et al.* 2019), Gera-Zoitzberg, Gera-Schafgraben, Gera-Binsenacker, Bad Frankenhausen-Kosackenberg (Küßner 2009), Nebra-Alteburg (Mania 1999), Saaleck (Grünberg 2004) and Groitzsch (Hanitzsch 1972), it testifies the importance of the region during the Late Upper Palaeolithic.

The cave site is situated 296 meters above sea level in a Zechstein reef south of the village of Döbritz (Saale-Orla-Kreis). Two other caves with Late Upper Palaeolithic occupations – Urdhöhle (Feustel *et al.* 1971) and Wüste Scheuer (Behm-Blancke 1961) – are located but a few meters away in the same geological formation.

The site was discovered in 1930 by post official Martin Richter who, supported by other amateurs, thoroughly excavated the cave as well as a big part of its front area until 1938 in his spare time. Altogether 354 square meters were uncovered (Höck 2000: 20, Fig. 7). A nine-layer stratigraphy was documented at both cave and front area (Feustel 1974: 17–19, Fig. 6). Magdalenian artefacts, faunal remains, mollusks and charcoal were recovered exclusively from layer eight which was 30–110 cm thick and characterized by red-coloured sediment, combustion features and numerous slabs of imported slate (*Figure 2*). The red-coloured sediment covered a total area of c. 170 square meters. Most finds were recovered from the front area. This stratigraphy is obviously idealized, too simplistic and

takes no account of the substantial kryoturbation, solifluction and relocation processes that must have taken place at the site (Höck 2000: 24). A subdivision of the finds according to their relative positions within layer eight (lower, middle, upper) was planned by Richter but, regrettably, not consequently implemented (Feustel 1974: 15). However, there are no artefacts of Middle Palaeolithic, Mesolithic or Neolithic origin in layer eight.

The rich mammal remains from layer eight have been studied by R. Musil (1974), H. Berke (1987) and N. Benecke (1994). The dominating taxon is horse (MNI 33 or 37), followed by reindeer represented by bones and c. 40 shed antlers (MNI unknown), arctic fox (MNI 20), arctic hare (MNI 18), red fox (MNI 5), saiga (MNI 5), dog (MNI 4), brown bear (MNI 2), red deer (MNI 1) and mammoth (MNI 1). All these taxa are well-documented in Central European Magdalenian context (e.g. Gaudzinski-Windheuser 2013, Maier 2015, Müller 2013, Napierala 2008, Street, Turner 2013) and together with the mollusks (Mania 1974) correspond to the cool and dry climatic conditions of the mammoth steppe during GS-2a (Kahlke 1994). According to Musil (1974: 45), the attribution of the red deer and mammoth bones to layer eight is doubtful since both seem to have been recovered from the transitioning zones to the overlying and underlying layers, respectively. The bones of horse, reindeer, arctic fox, hare and saiga frequently display anthropogenic modifications and thus can be regarded as hunted (Höck 2000: 34).

Twelve 14-C measurements performed on material from layer eight are available, eight of which have been obtained by the AMS method (*Table 1*). GrN-6649 is clearly too young for the Late Upper Palaeolithic and thus either should be an outlier, the result of intermixing or a sign of otherwise invisible Late Palaeolithic occupations. OxA-4847 on the other hand is much too old and might relate to a Gravettian occupation – a scenario supported by few lithic artefacts (Feustel 1974: 121, Höck 2000: 36, Küßner 2009: 183). Ten dates, however, correspond to the Magdalenian. The relation of OxA-4851 obtained on unmodified mammoth bone to human presence is being doubted (Höck 2000: 36, Küßner 2009: 184). The remaining dates could on the one hand represent two Magdalenian occupation episodes at Kniegrotte – one at around 16,300 calBP (OxA-4852 & Bln-1564) and another one at around 15,800 calBP as suggested by the weighted average of a very consistent set of seven dates (Höck 2000: 37, Küßner 2009: 185, Maier 2015: 241). On the other hand, with a probability of 9.9 % it is also justified

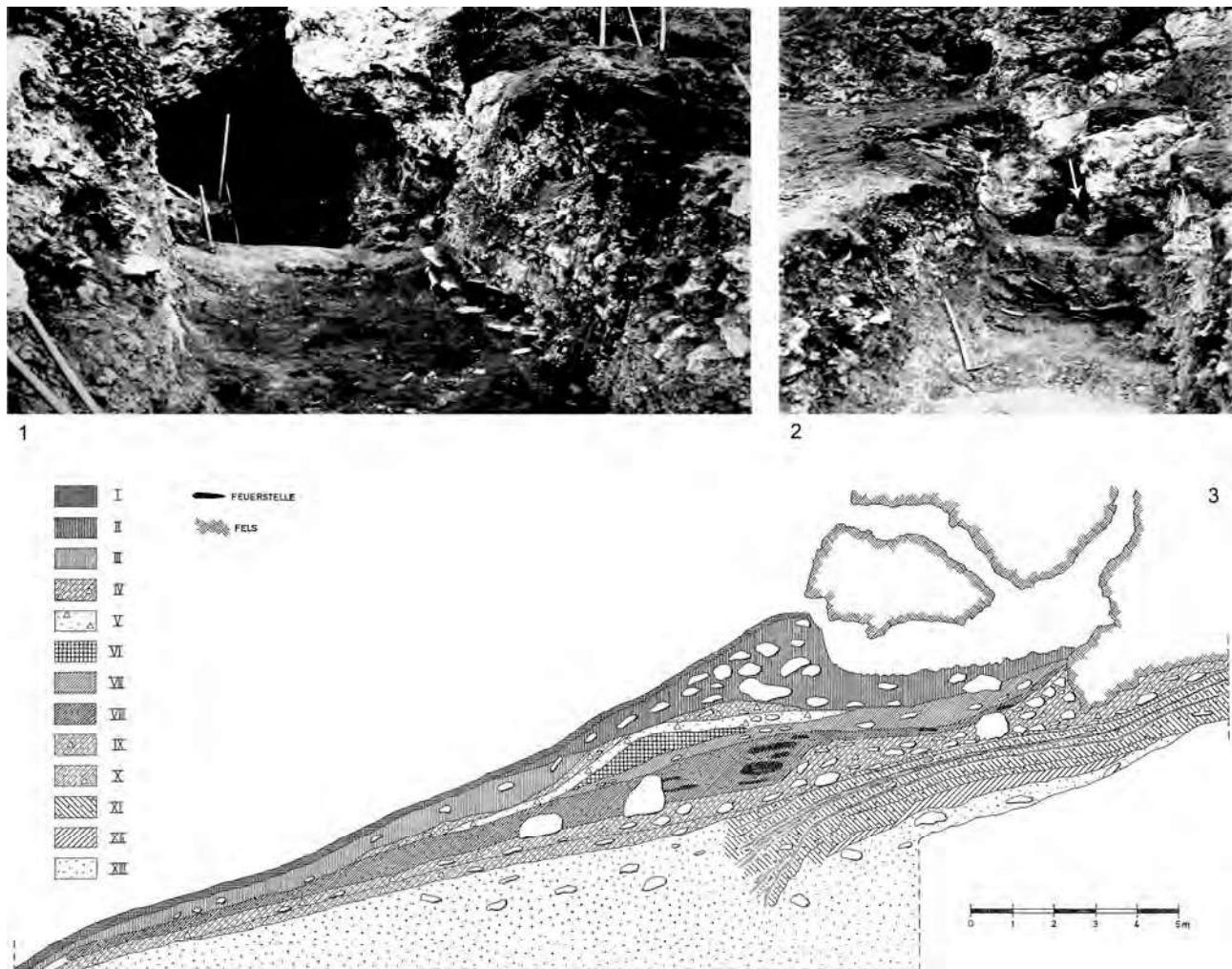


FIGURE 2: Stratigraphy of Kniegrotte. 1-2, Cave entrance and front area during the course of excavation. Note the numerous slabs of imported slate in the profiles and two persons (2-arrow). 3, Idealized profile through cave and front area. Layer VIII is the red-coloured sediment package containing Late Upper Palaeolithic finds.

to group calibrate all nine dates which results in a weighted average of $15,920 \pm 90$ calBP. In either case the main occupation of Kniegrotte pre-dates the onset of the widely-distributed Upper Magdalenian in Central Europe at around 15,800 calBP (Maier 2015, Leesch *et al.* 2012, Küßner 2009, Pasda 2019, Street *et al.* 2012, Valoch 2010, Valoch, Neruda 2005).

ARTIFACT ASSEMBLAGE

The Magdalenian layer at Kniegrotte furnished a rich assemblage of lithic and osseous artefacts which

is currently housed in the collections of the Federal Archaeological Service of Thuringia in Weimar and the Museum Burg Ranis in Thuringia (Figure 3).

The lithic artefacts in the Weimar collection comprise 13,773 pieces, 98 % of which are from moraine flint (Höck 2000: 50, 55). A few pieces are made from radiolarite, quartzite and jasper. All raw material outcrops can be found in the vicinity of the site (Höck 2000: 59–61, Küßner 2009: 101, Maier 2015: Fig. 6.12). The 2,353 tools are dominated by backed bladelets (33.5 %), burins (15.3 %) and laterally retouched pieces (14.7 %). Scrapers and borers account for 7.1 % and 6.6 %, respectively. Noteworthy is the

TABLE 1: Radiometric age determinations for Kniegrotte cave, layer eight. *Sample humanly modified (after Höck 2000). Dates were calibrated using the Intcal 13 curve.

Lab.-no.	Method	Material dated	¹⁴ C date BP	Std.-deviation	cal BP	Std.-deviation
OxA-4853	AMS	Saiga bone	13090	130	15670	220
OxA-4845	AMS	Reindeer bone*	13120	130	15720	220
OxA-4849	AMS	Saiga bone	13130	120	15740	200
OxA-4848	AMS	Horse bone*	13150	130	15760	210
OxA-4850	AMS	Arctic fox bone*	13160	140	15770	220
OxA-4846	AMS	Horse bone*	13190	130	15830	200
OxA-4832	AMS	Reindeer bone*	13310	110	16000	160
OxA-4852	AMS	Horse bone*	13520	130	16300	190
Bln-1564	conventional	Indet. bone	13585	165	16400	240
OxA-4851	AMS	Mammoth bone	14470	140	17630	180
OxA-4847	AMS	Brown bear bone*	25340	440	29521	548
GrN-6649	conventional	Charcoal	10230	90	11949	187

presence of 187 lithic triangles with straight back (Höck 2000: Tab. 23) (*Figure 3: 1*). In the small, recently investigated Ranis collection, some few more triangles are present (pers. comm. Clemens Pasda, Friedrich-Schiller University Jena, Germany). Kniegrotte is the youngest Central European site with this type, which is highly indicative for a Magdalenian older than 15,800 calBP (Maier 2015: 52–59). Eight jet pendants (*Figure 3: 2*), a fossil shark tooth and a piece of amber have also been recovered (Feustel 1974: 115). 67 perforated fossil mollusc shells can be attributed to the species *Cyrena convexa* and *Glycymeris* sp. A fossil snail is *Potamides plicatus galeottii* (*Figure 3: 11*). The molluscs originate either from Southern Germany, or from the Mainz and Paris basins, respectively (Lazar 1974).

The osseous artefact assemblage comprises 354 pieces (tools and production debris). Shed reindeer antler was the dominating raw material and obviously kept in stock, but bone and mammoth ivory – represented by 55 pieces after all – were also worked (Höck 2000: Tab. 48). The importance of ivory at Kniegrotte has frequently been stressed (Feustel 1974: 106, Höck 2000: 122). Since the mammoth skeletal remains pre-date the main occupation of the site by 1000 years (see above), and since a dated piece of mammoth ivory from the Upper Magdalenian site of Oelknitz gave approximately the same age (Gaudzinski-Windheuser 2013: Tab. 1), presumably well-preserved ivory from permafrost deposits was used – which was a formidable material for heavy-duty tools (Pfeifer *et al.* 2019). A big tusk fragment recovered by M. Richter

from layer eight (Musil 1974: 46) was probably the source for the ivory industry. Likewise high numbers of mammoth ivory implements at Garsitz-Bärenkeller (Müller *et al.* 2019) and Nebra (Mania 1999) show that the raw material was relatively abundant in Central Germany during GS-2a.

As for the osseous tool types, according to Höck (2000: Tab. 48) five perforated rods (*Figures 3: 6–10*), 13 wedges (*Figure 3: 3*), six retouchers, twelve awls and 37 needle fragments are present (*Figure 3: 4*). Perforated animal teeth are numerous (*Figure 3: 5*).

The osseous projectiles from Kniegrotte have been studied first-hand by the author (*Table 2*).

17 points bear longitudinal grooves most of which are oriented dorso-ventral, but lateral grooving also occurs (*Figures 4: 1–2, 16*). The cross sections are 40× round, 31× oval, 7× rectangular, 2× half-round, 1× triangular and 16× not determinable due to fragmentation and bad preservation. 73.5 % of the measurable fragments have mesial widths of 8–13 mm which is within the common range of Magdalenian osseous projectile points (Pfeifer 2015). The prevalence of points with double-bevelled bases at Kniegrotte (*Figures 4: 2–8, 17*) corresponds to the dating of its main occupation. In Western Europe, the double-bevelled osseous point is characteristic of Magdalenian assemblages dated to 15,900–14,000 calBP (Pétillon 2016: 120). The presence of single-bevelled points (*Figures 4: 1, 10–11*) and the half-round rod (*Figure 4: 18*), both of which are highly indicative of the Middle Magdalenian (Pétillon 2016: 113–120), as well as a single point with a massive base (*Figure 4: 12*; comp.

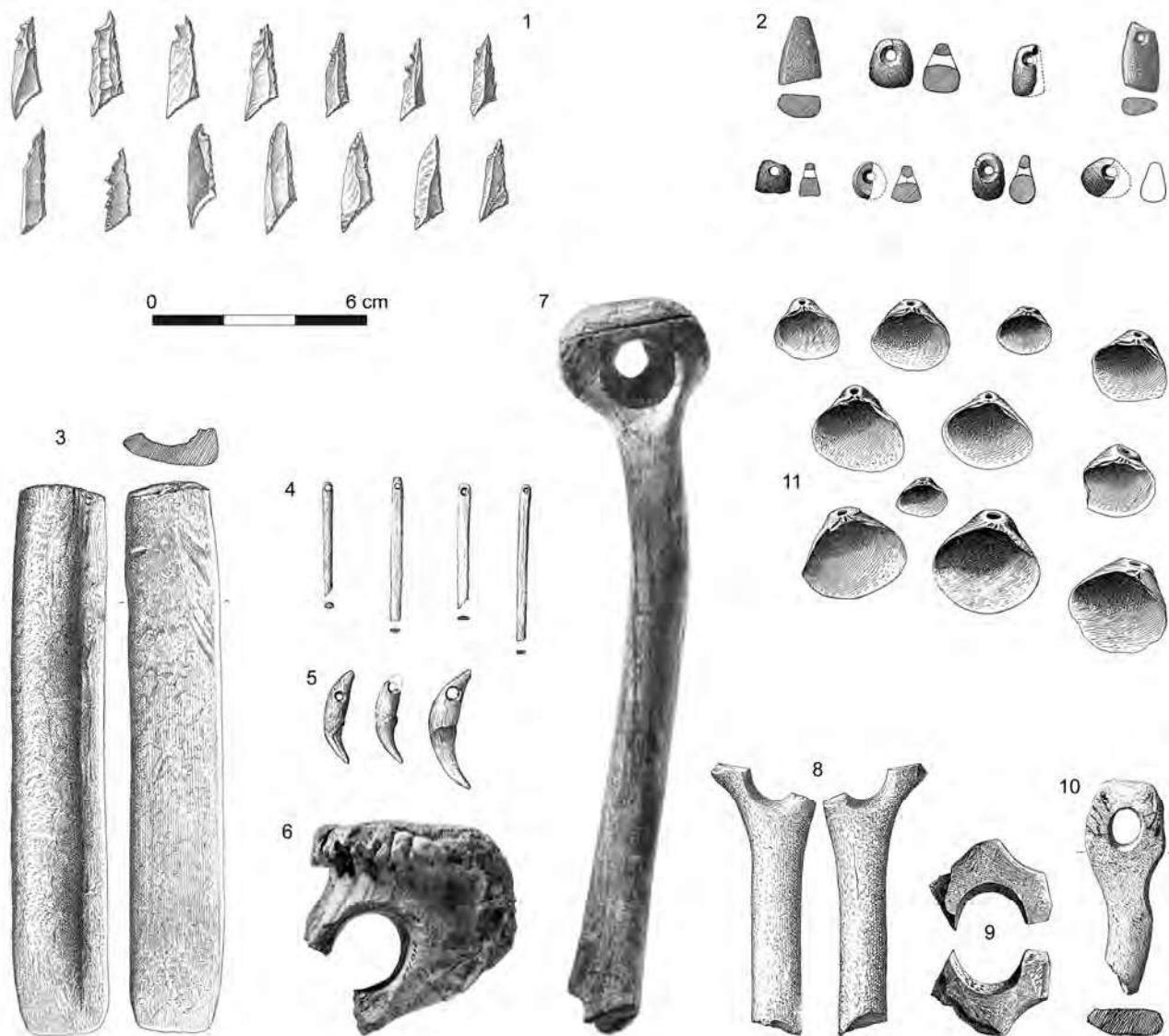


FIGURE 3: Lithic and osseous artefacts from Kniegrotte. Collections Federal Archaeological Service of Thuringia Weimar. Feustel 1974.

Pfeifer 2017) might on the one hand relate to the presumed earlier occupation phase at around 16,300 calBP (see above). On the other hand, the composition of the osseous assemblage at Kniegrotte is in accordance with what can be expected of a site occupied at the chronological hinge between Middle and Upper Magdalenian: Few points with single-bevelled or massive bases, a single half-round rod, a high percentage of points with longitudinal grooves and the absence of osseous barbed points in favour of lithic triangles all are archaic traits which fall out of

use as the development of the Upper Magdalenian progresses (Pétillon 2016: 120–125). This view is further supported by the presence of single and double-bevelled points of antler and ivory and few half-round rods at Andernach and Gönnersdorf (Rhineland-Palatinate, DE – Tinnes 1995). The earliest occupations of both sites at around 15,900 calBP are contemporaneous with the main occupation of Kniegrotte (Street *et al.* 2012: 235). Furthermore, a point with a single-bevelled base from Kesslerloch site (Schaffhausen, CH) was AMS dated to 15,730

TABLE 2: Osseous projectiles from Kniegrotte. Recorded by the author.

Points	Base geometry				Half-round rods
	Massive	Single bevel	Double bevel	Not determinable	
97	1	3	22	71	1

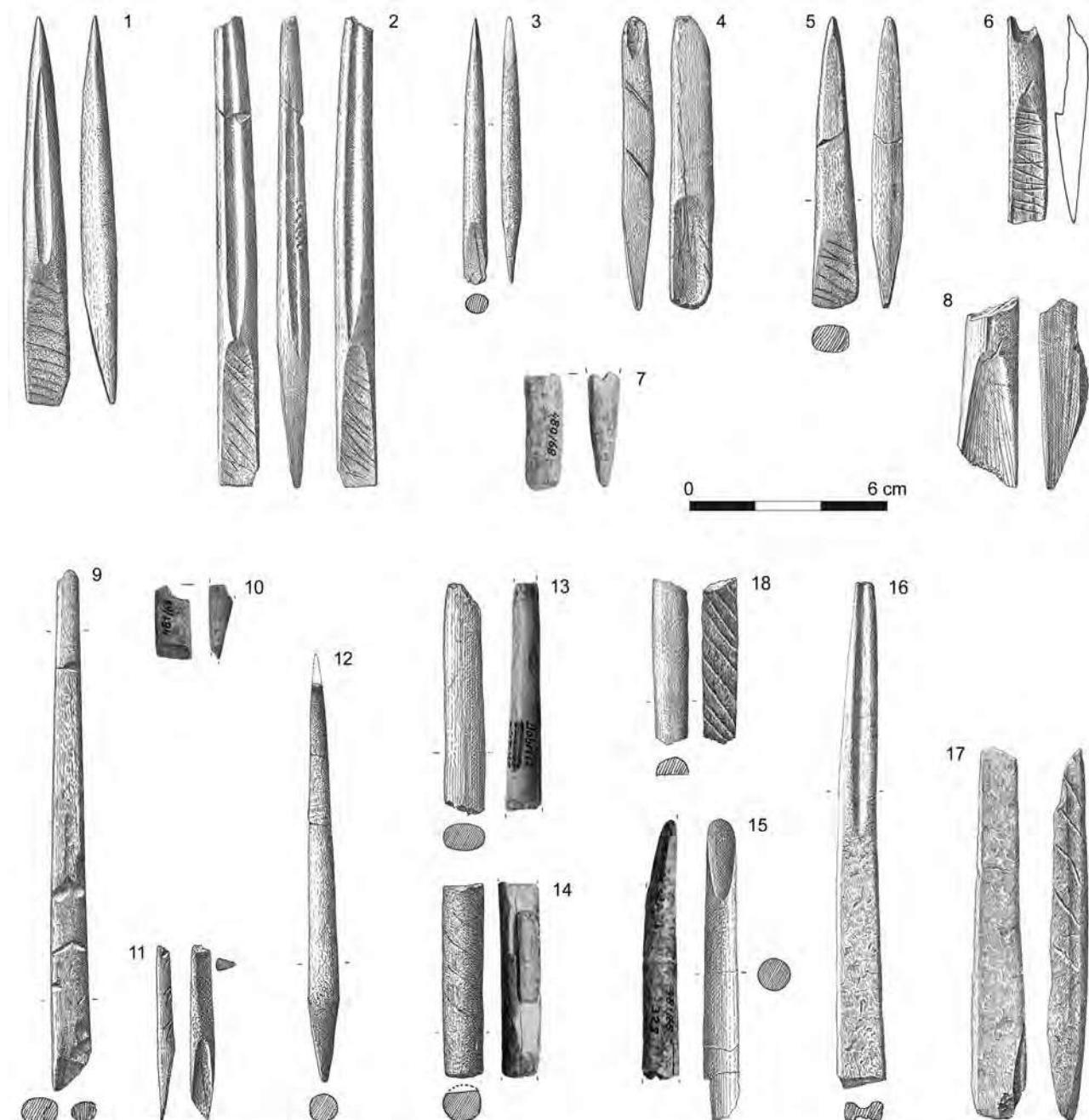


FIGURE 4: Projectiles of antler (1–6, 8–9, 11–12, 16–18) and mammoth ivory (7, 10, 13–15) from Kniegrotte. Collections Federal Archaeological Service of Thuringia Weimar. Feustel 1974; photos by the author.

± 160 calBP (OxA-5746 - Housley *et al.* 1997) while a double-bevelled specimen from Tunnelhöhle (Bavaria, DE) gave an AMS date of $16,040 \pm 90$ calBP (Erl-14814 - Steguweit, Händel 2009) which strengthens the view of a co-occurrence of both base geometries during this time period.

REMARKABLE OSSEOUS ARTEFACTS

The osseous assemblage contains some remarkable artefacts which in the following shall be described in more depth (*Figures 5–6*).

The first piece (*Figure 5: 1*, Weimar 478/68) is the well-known ivory pendant shaped like a human foot (Feustel 1974: 113–115, Höck 2000: 151). Both upper and lower side of the object bear fine incised lines and hatches which are assembled to a complex pattern of diamonds, half circles, bundles and nets. The pendant features traces of abrasion and repair attesting for relatively long use (Feustel 1974, 114). This artefact is un-paralleled in the Central European Magdalenian (comp. Maier 2015: 158–180). Another ivory sculpture (*Figure 5: 2*, Weimar, permanent exhibition), the so-called "harpoon" (Feustel 1974: 111, Höck 2000: 139–141), bears a very similar incised diamond ornament on both sides as well as bundles of lines on the barbs. Höck (2000: 141) suggests that the object represents a composite barbed point assembled from an osseous point equipped with lithic triangles attached by wrappings. This interpretation corresponds well to the numerous lithic triangles at Kniegrotte and their proposed function (Maier 2015: 59). However, it has to be stressed that the interpretation as barbed point is not unambiguous. The excavator Martin Richter (1955: 33) recognized a fish in the sculpture which seems not too far-fetched either. This artefact is un-paralleled in the Central European Magdalenian as well. The third ivory sculpture to mention (*Figure 5:6*, Weimar 478/68) is a carved rod with a thickened end perhaps representing a human face (Feustel 1974: 113) or – more likely – a phallus (Maier 2015: 172). Again, any parallels in the Central European Magdalenian are lacking.

An antler wedge (*Figure 4: 4*, Weimar 478/68) bears an incised, axial symmetric ornament assembled from straight and curved lines. In analogy to a roughly similar incision from the Gravettian site of Předmostí (CZ) (Klíma 1990: Fig. 20), it is interpreted as "extremely stylized female representation" (Feustel 1974: 113, Höck 2000: 150, Photopl. 21). Corresponding artistic representations are absent in

the Central European Magdalenian. Another antler tool (*Figure 4: 5*, Weimar 44/69), a little smoother from antler with a semi-circular cross section is decorated with a lateral row of incisions.

Lastly, three particular antler projectile points have to be mentioned: The first piece (*Figure 6: 1*, Weimar 32/69) is a distal fragment with a triangular cross section and a single dorsal groove with incised hatches. On its dorsal side, it is decorated with two *cupules* (comp. Allain *et al.* 1985: 99) which are separated by horizontal lines. The uniqueness of this object in the Central European Magdalenian has already been recognized by J. Svoboda (1976). The second remarkable piece is a fragment of a long, tongue-shaped single-bevelled base with oblique hafting striations on the ventral and an incised ornament on the dorsal side (*Figure 6: 7*, Weimar 6/69). The third piece is a basomesial fragment with a rectangular cross section, a double-bevelled base with parallel hafting striations and a single dorsal groove (*Figure 6: 2*, Weimar 16/69). According to 66 projectile-bearing assemblages from the Central European Magdalenian examined firsthand by the author (*Figure 1*), it can be stated that points with a well-preserved spongy ventral side displaying either a single dorsal or ventral groove are a very rare phenomenon in the first place. Pieces which additionally feature a rectangular cross section and a double-bevelled base are exceptionally scarce: Kesslerloch and Schweizersbild in northern Switzerland and Petersfels cave in southwestern Germany are the only further sites reported (*Table 3*).

It becomes obvious that some particular osseous artefacts from Kniegrotte have only few or no parallels at all in the Central European Magdalenian. However, they do have rather exact counterparts in assemblages attributed to the *Magdalénien à navettes*.

R. Feustel (1974: 113) recognized similarities between the phallic ivory rod and corresponding pieces at the French *navettes*-bearing sites of Placard and Garenne, ten years before the facies was defined. Since then, phallic sculptural representations have widely been regarded as a hallmark of the *Magdalénien à navettes* (Allain *et al.* 1985: Fig. 92, Fuentes *et al.* 2017: Figs. 10–12). Already J.-K. Kozłowski (1992: 150) pointed out the similarity of the incision on the wedge from Kniegrotte to ornaments at the French sites Roc-de-Marcamps, Placard and Garenne. Such axial symmetric incisions which possibly represent human figures / faces are another characteristic feature of the facies (Fuentes *et al.* 2017: Fig. 13). Osseous smoothers with lateral rows of incisions are reported from the

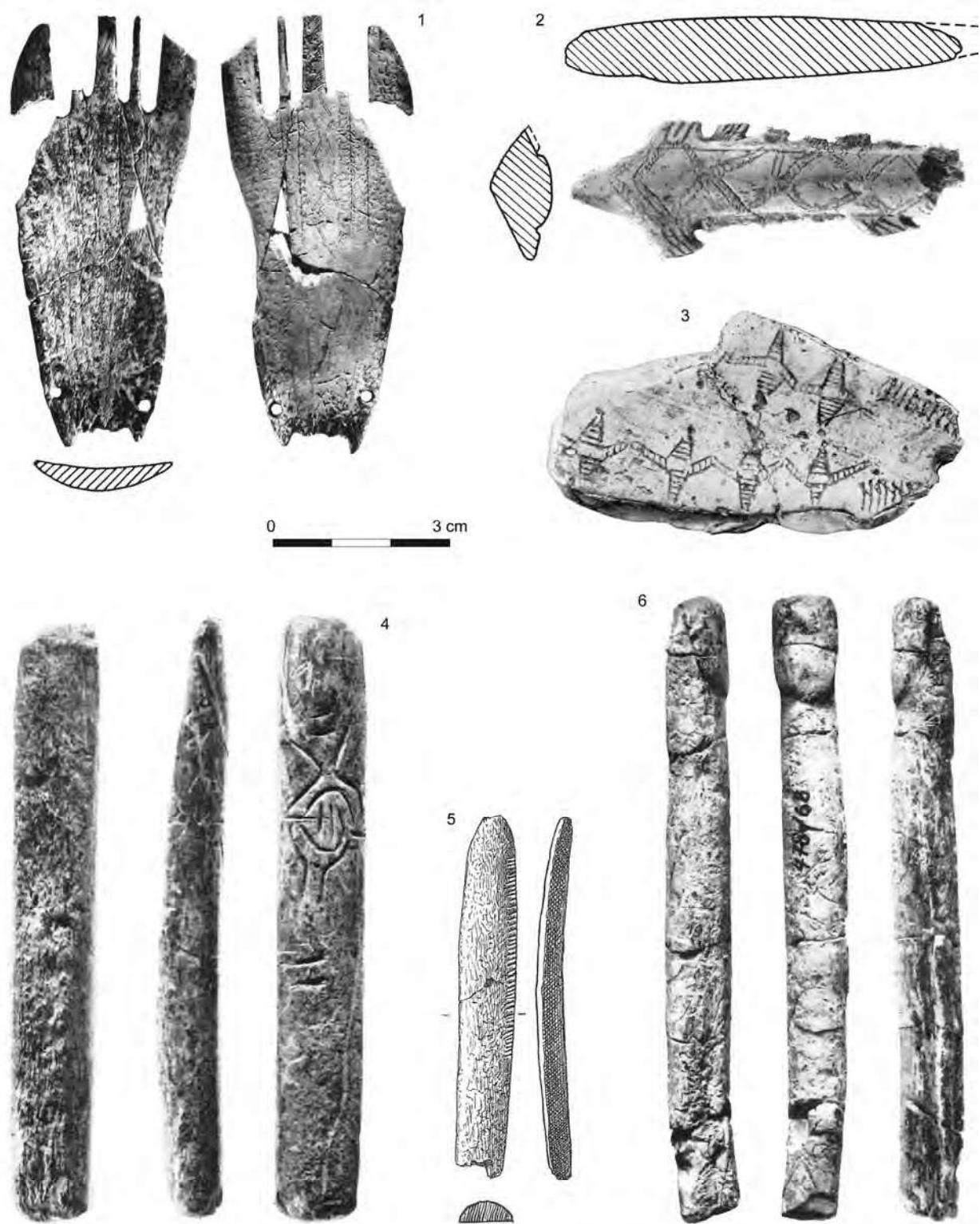


FIGURE 5: Particular osseous artefacts from Kniegrotte (1-2, 4-6) and Garenne (3). Collections Federal Archaeological Service of Thuringia Weimar and Argentomagus Museum.



FIGURE 6: Particular osseous projectile points from Kniegrotte (1-7) and Maszycka (3-5, 8-11) and a perforated rod from Garenne (6). Collections Federal Archaeological Service of Thuringia Weimar, Argentomagus Museum and Archaeological Museum Kraków. 1-2, 7: Feustel 1974; 6: Allain *et al.* 1985; 3-5, 8-11: Kozłowski *et al.* 1993; colour photos by the author.

TABLE 3: Osseous projectile points from Central European Magdalenian sites with either a single dorsal or ventral groove. Recorded by the author. LMW – Landesmuseum Württemberg; RM – Rosgartenmuseum; AHM – Archäologisches Hegaumuseum; SLM – Schweizerisches Landesmuseum; CAS – Cantonal Archaeological Service; MK – Museum der Kulturen; BHM – Bernisches Historisches Museum; MZM – Moravské Zemské Muzeum.

Site	Collection	Inv.-no.	Base geometry	Cross section
Brillenhöhle (DE)	LMW Stuttgart	V 56,9-67	No inf.	Oval
Kastelhöhle-Nord (CH)	Museum Dornach	57/12/552.1	Double bevel	Round
Kesslerloch (CH)	CAS Schaffhausen	15587	No inf.	Round
	CAS Schaffhausen	15684	Double bevel	Round
	SLM Zurich	81014	Double bevel	Rectangular
	SLM Zurich	81179	No inf.	Round
	CAS Schaffhausen	15342	Double bevel	Oval
	RM Constance	U 13	No inf.	Oval
	RM Constance	U 25	No inf.	Round
	RM Constance	U 46	No inf.	Oval
	RM Constance	U 56	Massive	Round
	RM Constance	U 68	No inf.	Oval
Kohlerhöhle (CH)	CAS Basel-Landschaft	K 1016	Double bevel	Oval
Pekárna (CZ)	MZM Brno	P 21059	No inf.	Round
		P 21074	Double bevel	No inf.
		P. 593/29	No inf.	Round
		P 21049	No inf.	Triangular
		P 21055	No inf.	Oval
		P 21056	No inf.	No inf.
		P 21060	No inf.	Oval
		P 21065	No inf.	No inf.
		P 21063	No inf.	Oval
Petersfels cave (DE)	AHM Singen	32/222	Double bevel	Rectangular
		32/230	No inf.	Round
Schweizersbild (CH)	SLM Zurich	11183.24	No inf.	Round
	SLM Zurich	11189.	Double bevel	Rectangular
	MK Basel	I 415	No inf.	Oval
	BHM Bern	No. 534	Double bevel	Rectangular
Teufelsbrücke (D)	Federal Archaeological Service of Thuringia	527/69	No inf.	Oval
		569/69	No inf.	Oval
		570/69	Double bevel	Oval
		557/69	No inf.	Oval
		553/69	No inf.	Oval
		568/69	No inf.	Oval
		532/69	Double bevel	Round
		526/69	No inf.	No inf.
		548/69	No inf.	Oval
		Z 4464/54	No inf.	No inf.
Žitného (CZ)	MZM Brno			

early Middle Magdalenian sites of Roc-aux-Sorciers and la Marche (Bourdier *et al.* 2017). The foot-shaped ivory pendant and the "harpoon" from Kniegrotte seem

to be absolutely unique. In this context it is noteworthy that Western European assemblages attributed to the *Magdalénien à navettes* regularly contain unique artistic



FIGURE 7: Osseous projectile points from Kůlna (1), Kniegrotte (2) and Nová Drátenická (3-5). Collections Federal Archaeological Service of Thuringia Weimar and MZM Brno. 1: Valoch 1979; 2 (drawing): Feustel 1974; 2-5: author.

expressions, often personal adornment (Allain *et al.* 1985, 95–97, Figs. 68: 2, 69, 72: 1–3). The composition on the famous pendant from Garenne with rows of human figures holding hands (*Figure 5: 3*) is not too dissimilar to the ornament on the Kniegrotte "harpoon".

The three projectile points all have counterparts at Maszycka cave, where osseous points with rectangular or triangular cross sections, double-bevelled or long single-bevelled bases with oblique hafting striations and single longitudinal grooves are frequent (*Figures 6: 3–5, 8–11*). One point from Maszycka with a triangular

cross section seems to bear a row of *cupules* (Figure 6: 4). The strong similarity to the piece from Kniegrotte has already been stressed by Feustel (1974: 105). *Cupules* also are present on two other points as well as on a *navette* from this site (Kozłowski *et al.* 2012: Figs. 4, 7). The best parallel to the ornament on the Kniegrotte point can be found on a perforated rod from Garenne (Figure 6: 6). Osseous points with a double-bevelled base, rectangular cross section and a single longitudinal groove are considered as very characteristic projectiles of the *Magdalénien à navettes* (Allain *et al.* 1985: 94–95, Malgarini *et al.* 2017: 142, Fig. 2, Pétillon 2016: 113–114).

Thus it can be concluded that while the osseous assemblage from Kniegrotte does not contain the name-giving double-split antler tool, it nevertheless meets three out of four defining criteria of this facies established by Allain *et al.* (1985: 94–99): projectile points with double-bevelled bases, original artistic concepts, and the *cupules* ornament.

DISCUSSION

Is a Middle Magdalenian à *navettes* at Kniegrotte a reasonable scenario? First of all, it can be stated that the existence of a site of this facies between the French and the Polish Jura would by far not be as puzzling as the total absence of evidence for any human presence in this large area (Allain *et al.* 1985: 114, Kozłowski *et al.* 1993: 193, 2017: 201, Maier 2017a: 176). Kniegrotte is favourably situated about half-way between Grappin and Maszycka and at the northern margin of the middle-range mountains. A blade from Oelknitz site which is probably made of Świeciecheów flint (Kozłowski 1987: 36) as well as similar concepts of lithic tool production (Maier 2015: 157) indicate interaction between Eastern Germany and Poland during the Magdalenian. In return, an artefact from Plattensilex chert at Maszycka cave reveals connections to the Upper Danube region as well (Kozłowski *et al.* 2017: 196, 201).

The contemporaneity of the *Magdalénien à navettes* in both France and Poland is regarded as a result of either a whole group moving from west to east (Kozłowski *et al.* 2012, 2017) or of fast-travelling individuals transmitting cultural information between the territories of regional groups (Maier 2015: 231–237, 2017a, b). In either case, a faint material echo at the places of intermediate stops should remain, like e.g. few projectile points and some personal adornment.

The small assemblage from Kniegrotte would meet this expectation. The main occupation of the site doubtlessly took place much later (see above). However, the considerable thickness of the find-bearing sediment package of layer eight speaks in favour of a longer occupation history. Human presence in the cave already during the Gravettian is indicated by few lithic artefacts and one absolute date. In this respect, of course, the possibility cannot be ruled out that the ivory "harpoon" and the foot-pendant are of Gravettian origin. The Gravettian of eastern Central Europe is famous for morphologically diverse and richly ornamented ivory objects (Klima 1983: Figs. 45, 48–49, 1990: Figs. 21–22). Also, a large, use-fractured antler point from Kniegrotte with an unusual flared and flattened tip geometry (Figure 7: 2) shares certain similarities with a set of points from Nová Drátenická cave (CZ) (Figure 7: 3–5) and – debatably though (Figure 7: 1) – an ivory point from Kůlna cave (CZ) (Valoch 1979). An attribution of the points from Nova Dratenicka to the Epigravettian has been proposed.

To conclude, on typological grounds there is the possibility that Kniegrotte cave was occupied during the early Middle Magdalenian. In that context, the AMS date of $17,630 \pm 180$ calBP obtained on mammoth bone gains some significance, since it could indeed relate to human presence. Mammoth bones at Kesslerloch are AMS dated to 18,000–17,000 calBP (Leesch *et al.* 2012: Fig. 15) and the species has been consumed by humans (Napierala 2008: 38–40). For the *Magdalénien à navettes*, the date from Kniegrotte is admittedly 500 years too young (comp. Maier 2017a: Tab. 1). However, it was obtained in the rather early days of AMS dating (in 1992) and the standard deviation is quite high. Direct dating of the conspicuous osseous artefacts, as successfully practiced for Maszycka cave (Kozłowski *et al.* 2012), would of course be the best way to proof the hypothesis, but seems problematic: The ivory specimens can have been made from collected material and the antler projectile points appear too small and badly preserved for responsible sampling. More numerical age determinations on humanly modified animal remains could be another option, but considering that the main occupation of Kniegrotte took place during the late Middle/early Upper Magdalenian, one should be rather lucky to pick the right bone.

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