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## **HUMAN REMAINS FROM MASZYCKA CAVE (WOJ. MAŁOPOLSKIE / PL): THE TREATMENT OF HUMAN BODIES IN THE MAGDALENIAN**

For more than 100 years Maszycka Cave (com. Skała; woj. małopolskie/PL) has been known as one of the most important Magdalenian sites in Central Europe. The assemblage is characterised by a considerable number of organic tools including points and a decorated perforated antler. The presence of so-called *navettes* contributed to the definition of the facies *Magdalénien à navettes* (Allain et al. 1985). More recently, a series of four AMS dates have provided confirmation for the site belonging to the earliest Magdalenian phase of Central Europe (Kozłowski et al. 2012). During the early excavations by G. Ossowski in 1883 (1884) and later by S. K. Kozłowski between 1962 and 1966 a series of human remains (50 fragments) were found in the entrance area and on the terrace in front of the cave. Results of the re-investigation of these human remains are presented here for the first time.

### **THE MASZYCKA CAVE SITE**

Maszycka Cave is situated about 20 km north of Krakow in the Prądnik valley, a tributary to the river Vistula. The cave is about 13 m long and the cave entrance is c. 6 m wide and opens to the south/southwest (figs 1-2). Excavations were started in 1883 and G. Ossowski emptied the cave and continued his fieldwork on a part of the cave terrace. However, undisturbed layers could be identified on the terrace by S. K. Kozłowski in the 1960s during more extended excavations (Kozłowski/Sachse-Kozłowska 1993, 115). He could identify an undisturbed sequence of layers and loess layer 4, as well as the overlying thin colluvial loess layer contained the bulk of Late Upper Palaeolithic finds (fig. 3). According to the excavator, the finds formed »a homogeneous level in the profile« (Kozłowski et al. 1993, 120). Some more recent finds from the terrace were clearly separated by sterile layers.

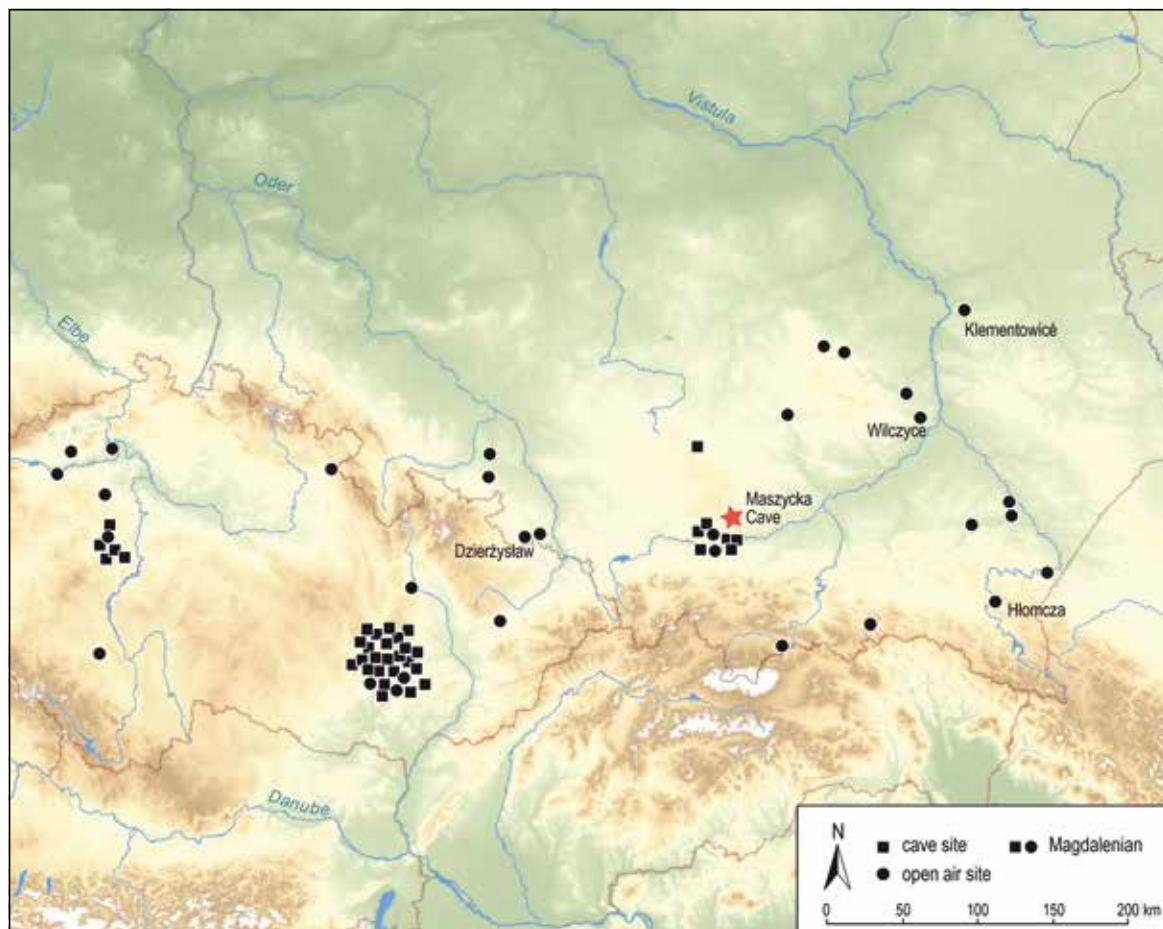
Since the late 19<sup>th</sup> century the well-defined Late Glacial find layer of Maszycka Cave has been assigned to the Magdalenian (Ossowski 1885) and some years later J. Kostrzewski (1928, 177-178) suggested an early Magdalenian context for the finds. Later, the assemblage was connected to the French Middle Magdalenian (Kozłowski/Kozłowski 1964, 186) and Maszycka Cave became one of the backbones of the *Magdalénien à navettes* facies (Allain et al. 1985, 94-99; Pozzi 2004, 17). The presence of *navettes* and *sagaies à biseau double* makes the assemblage unique in the record of the Central European Magdalenian. According to S. K. Kozłowski et al. (1993, 164), the finds demonstrate close connections to the French Magdalenian and also provide evidence for eastern relationships.

### **DATING OF THE MASZYCKA ASSEMBLAGE**

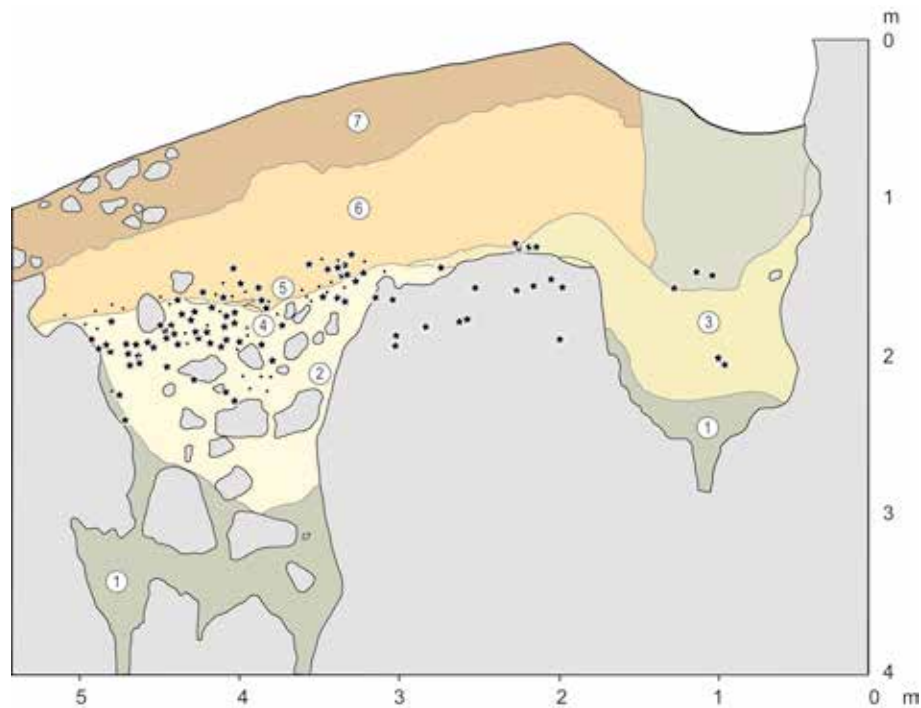
Various typological elements such as the presence of *sagaies à double biseau*, the *navettes*, special elements of decoration (*décors en cupules*) and sexual/phallic symbols support the hypothesis of a close connection



**Fig. 1** Entrance of Maszycka Cave (woj. małopolskie/PL) in 2013. – (Photo J. Orschiedt).



**Fig. 2** Location of Maszycka Cave (woj. małopolskie/PL) and Magdalenian sites in eastern Central Europe. – (Graphic D. Bobak).



**Fig. 3** Stratigraphy of Maszycka Cave (woj. małopolskie/PL): **1** clay. – **2** aeolian loess with rubble (small dots). – **3** erosional channel filled with soliflucted clay. – **4** on top and in the upper part of the loess with rubble and silt (**2-3**) isolated Magdalenian artefacts. – **5** thin colluvial loess (5-10 cm) containing the bulk of Magdalenian artefacts. – **6** degraded loess. – **7** forest soil with Neolithic/prehistoric finds. – ★ artefacts. – (After Kozłowski/Sachse-Kozłowska 1993, 119 fig. 3).

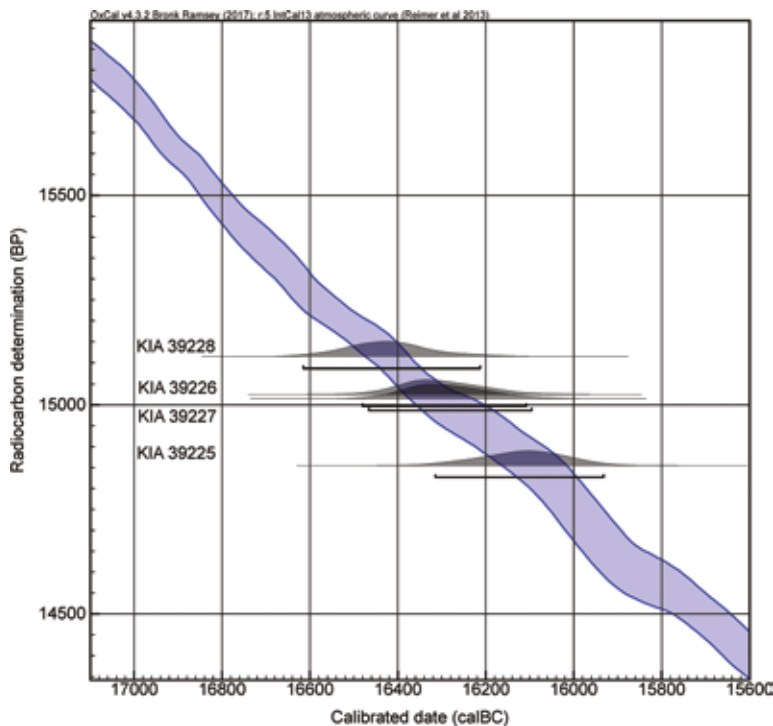
of the Maszycka assemblage with the *Magdalénien à navettes* in France (Allain et al. 1985, 94-99). First, conventional radiocarbon dates (Ly-2454:  $15,490 \pm 310$  BP; Ly-2453:  $14,520 \pm 240$  BP) were in accordance with the attribution of Maszycka Cave to an early Central European Magdalenian context (Allain et al. 1985, 81), but the considerable difference of these results demanded caution (Kozłowski et al. 1993, 120). In 2009 five objects were sampled for new AMS dating in order to receive a more precise dating of the find layer (tab. 1; Kozłowski et al. 2012). Fortunately, also human remains could be sampled.

The sample of an antler *navette* (Muzeum Archeologiczne w Krakowie, inv. no. 147) found on top of layer 2 about 4 m away from the cave entrance provided a date of  $14,855 \pm 60$  BP (KIA 39225) and an antler point with a simple geometric pattern (inv. no. 244) provided a somewhat earlier date of  $15,025 \pm 50$  BP (KIA 39226). A human skull fragment (inv. no. 328) gave an almost identical result of  $15,015 \pm 50$  BP (KIA 39227) and a sample extracted from a human mandible (inv. no. 514) was slightly older (KIA 39228:  $15,115 \pm 60$  BP). A sample extracted from a *navette* tool made of antler (Uniwersytet Warszawski collection, inv. no. 7) did not provide sufficient collagen.

All dates overlap within two standard deviations and support the proposition of a single Magdalenian layer at Maszycka Cave dated to c. 15,000 BP (fig. 4). At the same time, two dates confirm the Magdalenian context of the human remains and the calibration of the data suggests that the period of c. 16,350-16,200 cal BC is the most plausible age for the layer. The new AMS dates make Maszycka Cave the most reliably dated early Magdalenian assemblage of Central Europe (Kozłowski et al. 2012).

lab. no.	object	material	collagen C (mg)	$\delta^{13}\text{C}$ (‰)	BP	calibrated BC
KIA 39225	navette (147)	antler	3.5	-20.04±0.45	14,855±60	16,315-15,933
KIA 39226	point (244)	antler	3.3	-17.86±0.35	15,025±50	16,481-16,108
KIA 39227	human skull (328/43)	bone	3.8	-19.09±0.40	15,015±50	16,467-16,096
KIA 39228	human mandible (514)	bone	4.2	-16.03±0.25	15,115±60	16,616-16,213

**Tab. 1** Calibration was performed by OxCal v4.3.2 (Bronk Ramsey 2009; Reimer et al. 2013), two sigma (95.4 %) range.



**Fig. 4** Maszycka Cave (woj. małopolskie/PL). Calibration of the AMS dates by OxCal (v4.3.2; Bronk Ramsey 2009) based on data from IntCal09 (Reimer et al. 2013).

## THE HUMAN REMAINS: ANATOMICAL REPRESENTATION AND TAPHONOMY

The human remains from Maszycka Cave are represented by 50 fragments stored in the Muzeum Archeologiczne w Krakowie (36 pieces) and in the Uniwersytet Warszawski (14 pieces). Most of them came to light during the excavation by G. Ossowski in 1883 (41 pieces) and in 1962 and 1966 during fieldwork by S. K. Kozłowski another nine fragments were identified (Ossowski 1885; Kozłowski/Sachse-Kozłowska 1993). The exact position of the human bone fragments found by G. Ossowski is unknown. The remains found in the 1960s were recovered with Magdalenian artefacts mostly in the entrance area and scattered on the terrace in front of the cave. An association of all the bones with the Magdalenian layer seems to be plausible and is confirmed by the AMS dates (see above). Anatomical connections were not reported.

A first anthropological analysis was conducted by Z. Kapica and A. Wierciński and they identified a minimum number of 16 individuals, eight adults and eight children (Kapica/Wierciński 1966; 1993; Kozłowski/Sachse-Kozłowska 1993, 171-172). Despite the fragmentation of the bones and the fact that anatomical areas showing criteria for sex determination are largely missing, the sex ratio given is three males (two adult-mature, one infans II-juvenile) and five females (three adult-mature, two juvenile). In conclusion, Z. Kapica and A. Wierciński

anatomical element	no.	no. right	no. left	adult-matur	infans
frontal	2			1	1
parietal	25	15	10	14	11
occipital	6	1		4	3
temporal	3		2	2	1
<i>zygomaticum</i>	1			1	
mandible	3		1	2	1
isolated teeth	2			2	
<i>scapula</i>	1		1		1
<i>clavicula</i>	3	1	2	3	
<i>costa</i>	1			1	
<i>phalanx manis</i>	1			1	
<i>vert. thor.</i>	1			1	
total	50	17	14	32	18

**Tab. 2** Anatomical representation of human remains from Maszycka Cave (woj. małopolskie/PL).

suggested that the sex ratio and age distribution curve of the individuals from Maszycka Cave are characteristic for a natural population.

In January 2010 and in February 2013 a reanalysis of the human remains was carried out at the Muzeum Archeologiczne w Krakowie (Ossowski excavation) and on the remains from the 1960s excavation stored in Uniwersytet Warszawski. A more detailed analysis of an infant frontal bone (inv. no. 328) was conducted at the Landesamt für Denkmalpflege und Archäologie, Thüringen in Weimar in September 2011. In most cases, the anatomical description by Z. Kapica and A. Wierciński (1993) was confirmed.

The sample is characterised by a high proportion of cranial fragments, mostly parietal and some occipital fragments. Frontal bones or temporal fragments are rare (two or three pieces), as are fragments from the facial skeleton (**tab. 2**). The *zygomaticum* is represented by only one fragment, *maxillae* are missing. Mandibles are represented by three fragments. The post-cranial skeleton is represented by only seven fragments, among them, three *claviculae* are numerically dominant. Additionally, one fragment each of *scapula*, *costa*, *phalanx manis* and *vertebra thoracalis* belong to the assemblage. This anatomical representation is identical between adults and infants. The lower portions of the human skeleton, such as the pelvic girdle or lower extremities, as well as the upper extremities, are completely absent (**tab. 2**). Such a distribution does not seem to be natural or caused by taphonomic processes but appears to be an effect of intentional selection. The bones were probably collected on purpose and deposited at the site. The surfaces of the cranial remains and the few postcranial elements show root edging, which indicates a deposition close to the surface at least for some time before being embedded in the sediment.

Due to the size of the fragments and the high proportion of subadults, exact sex determination based on reliable criteria is almost impossible (Brothwell 1981; Mays 1998). The only piece, which exhibits diagnostic features, is a mandible fragment (inv. no. 1/5) of an adult individual. According to the robust features and the square form of the chin (*mentum*), the mandible probably belongs to a male (**fig. 5**). Our results are in



**Fig. 5** Maszycka Cave (woj. małopolskie/PL). Mandible of an adult, probably male individual (inv. no. 1/5). – (Photo J. Orschiedt).



**Fig. 6** Maszycka Cave (woj. małopolskie/PL). Right parietal fragment of an adult individual (inv. no. 1/1). – (Photo J. Orschiedt).

clear contrast with the earlier study (Kapica/Wierciński 1993, tab. 1, 248-249). Age determination is also limited by the size of the finds, which mostly consist of parietal or other small skull fragments (**tab. 1**). There are 32 fragments (64 %) belonging to adult individuals and 18 fragments (36 %) belonging to children. A more detailed age determination is impossible due to the fragmentation of the human remains. The majority of the subadult remains belong to children of the age class infans I (1-6 years).

Based on the most dominant skeletal element, the right parietal, the minimum number of individuals represented in the sample is nine (four adults, five children).

## TRACES OF MANIPULATION

### Methods

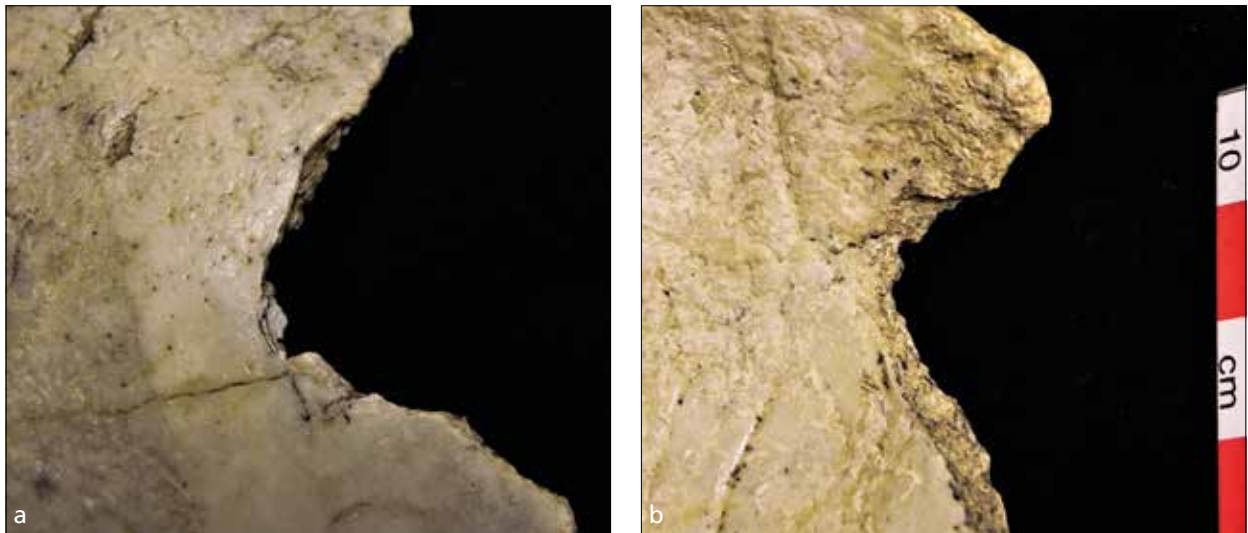
During the reanalysis of the human remains, special attention was paid to the postulated manipulation of the bone surfaces, especially to cut marks, perimortal breakage patterns and evidence for taphonomic processes. First, we inspected the bone surfaces with a hand lens with 10× magnification and used a Nikon P100 for macro images. In the next step, we applied a Zeiss Stemi 2000 binocular with cold light and an attached digital camera (ProgRes C3, Jenoptik) up to a magnification of 68× for closer inspection. Additionally, a NextEngine™ Color 3D Laser Scanner with ScanStudio HD Pro was used to generate 3D surface models of the bones.

For more detailed analysis of the frontal bone (inv. no. 328) an optical AF16 autofocus sensor integrated into the Hyperion measurement system (OPM Company) was employed for surface measurements in the sub-µm-scale. Three-dimensional (3D) digital models of potential cut marks from selected regions could be calculated.

The traces visible on the surfaces were interpreted in order to determine their antemortem, perimortem or postmortem character (Blumenshine/Selvaggio 1988; Shipman 1981; Shipmann/Rose 1983; White 1992). However, due to the degree of fragmentation, it was not always possible to achieve an exact anatomical position of the fragments and the traces found on the surfaces.

### Breakage pattern

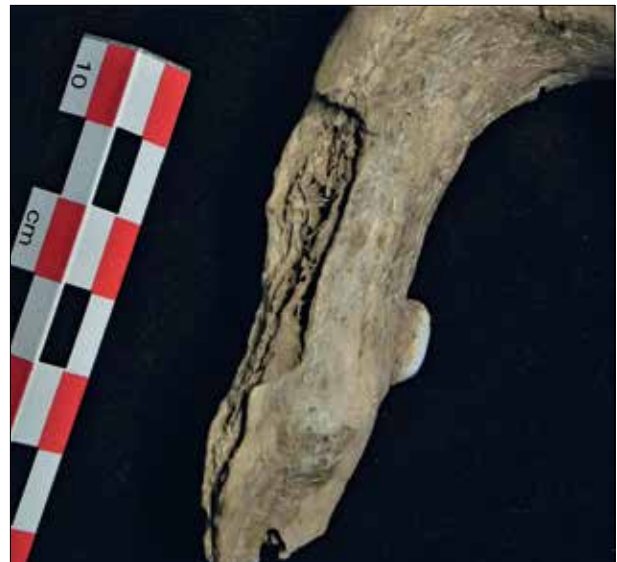
Nearly all human remains exhibit old breaks, mostly dry bone fracture. A perimortal breakage pattern was observable on only two pieces, a right parietal fragment (inv. no. 1/1) of an adult individual (**fig. 6**), and a mandible (inv. no. 1/5) of an adult, probably male individual (**fig. 5**). The breakage pattern on the right parietal fragment (inv. no. 1/1) has a rounded shape with almost 50 % of the defect preserved (**fig. 7**). The outside has a small bone flake pressed inwards preserved, the margins of the defect are smooth and show an oblique fracture angle. On the inside, the margin shows internal bevelling with delamination of the inner



**Fig. 7** Maszycka Cave (woj. małopolskie/PL). Perimortal breakage pattern on a parietal fragment (inv. no. 1/1): **a** external view. – **b** internal view. – (Photo J. Orschiedt).

surface. These endo- and exocranial features clearly indicate the perimortal nature of this penetrating defect. The location of the lesion in the area of the tuber parietale suggests a violent cause of the lesion. The position of the defect rules out the possibility of skull-cup manufacture, as for instance found at Gough's Cave (Somerset/GB; Bello et al. 2015). The 50 % preservation of the defect area, however, leaves open the possibility of interpersonal violence as the cause of the lesion. An accidental nature of the defect cannot be completely ruled out.

The breakage pattern on the mandible of an adult, probably male individual (inv. no. 1/5) is more likely of taphonomic origin. The right and a larger part of the left ramus, as well as the adjacent lower part of the corpus are missing. The irregular shape of the break at the *rami* makes carnivore activity possible. The breakage on the lower part of the corpus, however, shows clear signs of peeling (fig. 8).



**Fig. 8** Maszycka Cave (woj. małopolskie/PL). Perimortal breakage pattern on a mandible (inv. no. 1/5), peeling. – (Photo J. Orschiedt).

Undisputable evidence for carnivore damage, such as bite marks or tooth scratches on the anatomical elements, is nonetheless absent. The missing epiphyses on the three preserved clavicles with irregularly shaped ends might indicate carnivore activity.

### Cut marks

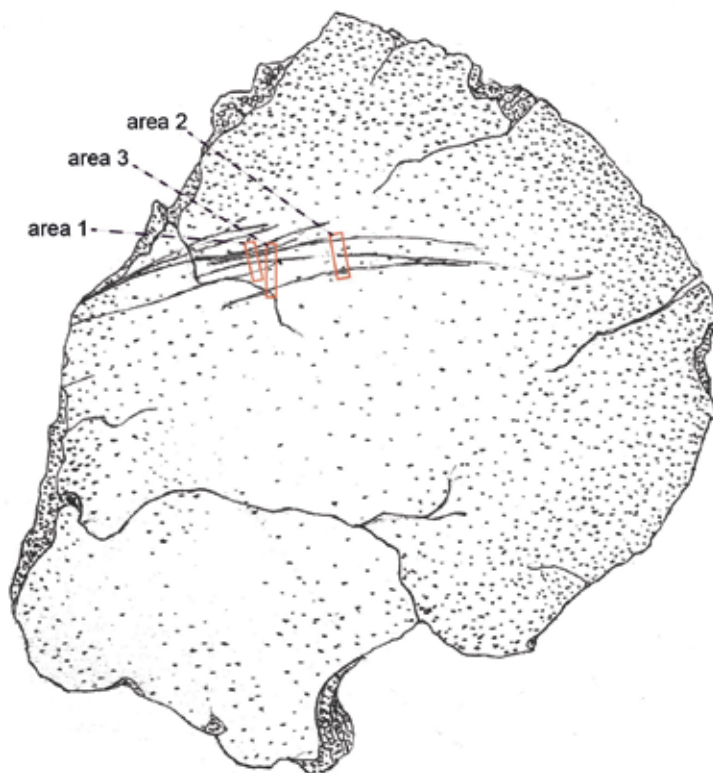
Z. Kapica and A. Wierciński (1993, 249) identified »incisions, amputations, retouch, scratches and even bite marks« on the outer surfaces of 20 bone fragments (40 %) excavated by G. Ossowski and three bones

inv. no.	anatomical element	age	verified by microscopy
328/43	frontal	infans I	x
1/5	mandibula	adult	
3/9	occipital	adult-matur	x
9/34	clavicula	adult-matur	x
9/33	clavicula	adult-matur	x

**Tab. 3** Anatomical representation and age of human remains with cut marks.



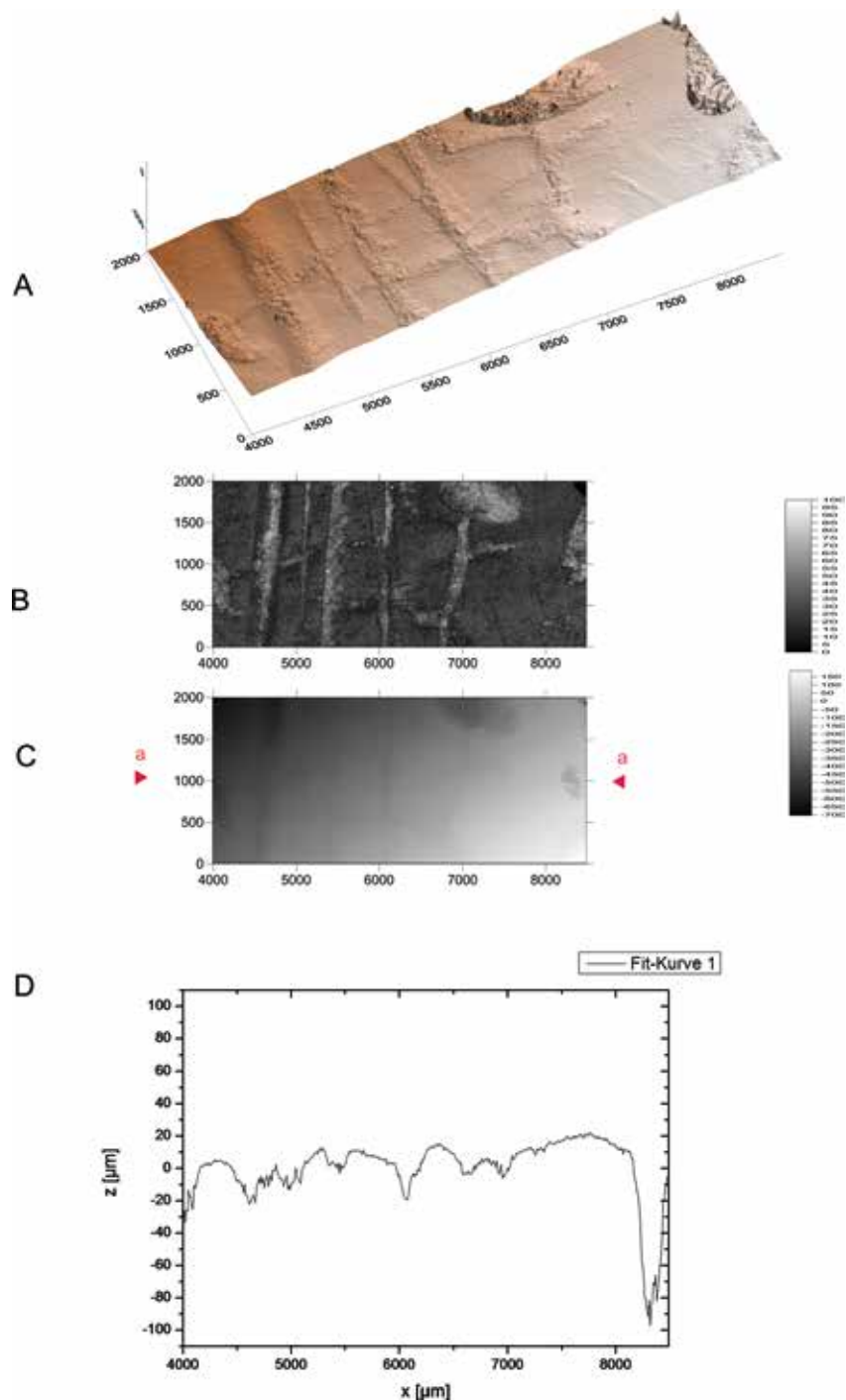
**Fig. 9** Maszycka Cave (woj. małopolskie/PL). Fragmented frontal of an infant 3-4 years old with cut marks (inv. no. 328/43). – (Photo J. Orschiedt).



**Fig. 10** Maszycka Cave (woj. małopolskie/PL). Frontal bone (inv. no. 328) with cut marks and analysed areas. – (Graphic Th. Terberger).

(21 %) from S. K. Kozłowski's excavation (see also Kozłowski/Sachse-Kozłowska 1993, 170). According to the authors, these traces originate from splitting, cutting, scalping and biting and they interpreted the evidence as showing a special kind of cannibalism »clearly focused on brain consumption« (Kozłowski/Sachse-Kozłowska 1993, 170). In their study, however, no specific arguments, differential diagnosis or detailed photographic documentation were given to verify these features. In S. K. Kozłowski's opinion, about 20-25 people were killed, processed and eaten at Maszycka Cave. Given the selection of bones, it was thought that brain extraction and consumption took place outside the cave (Kozłowski/Sachse-Kozłowska 1993, 171-172).

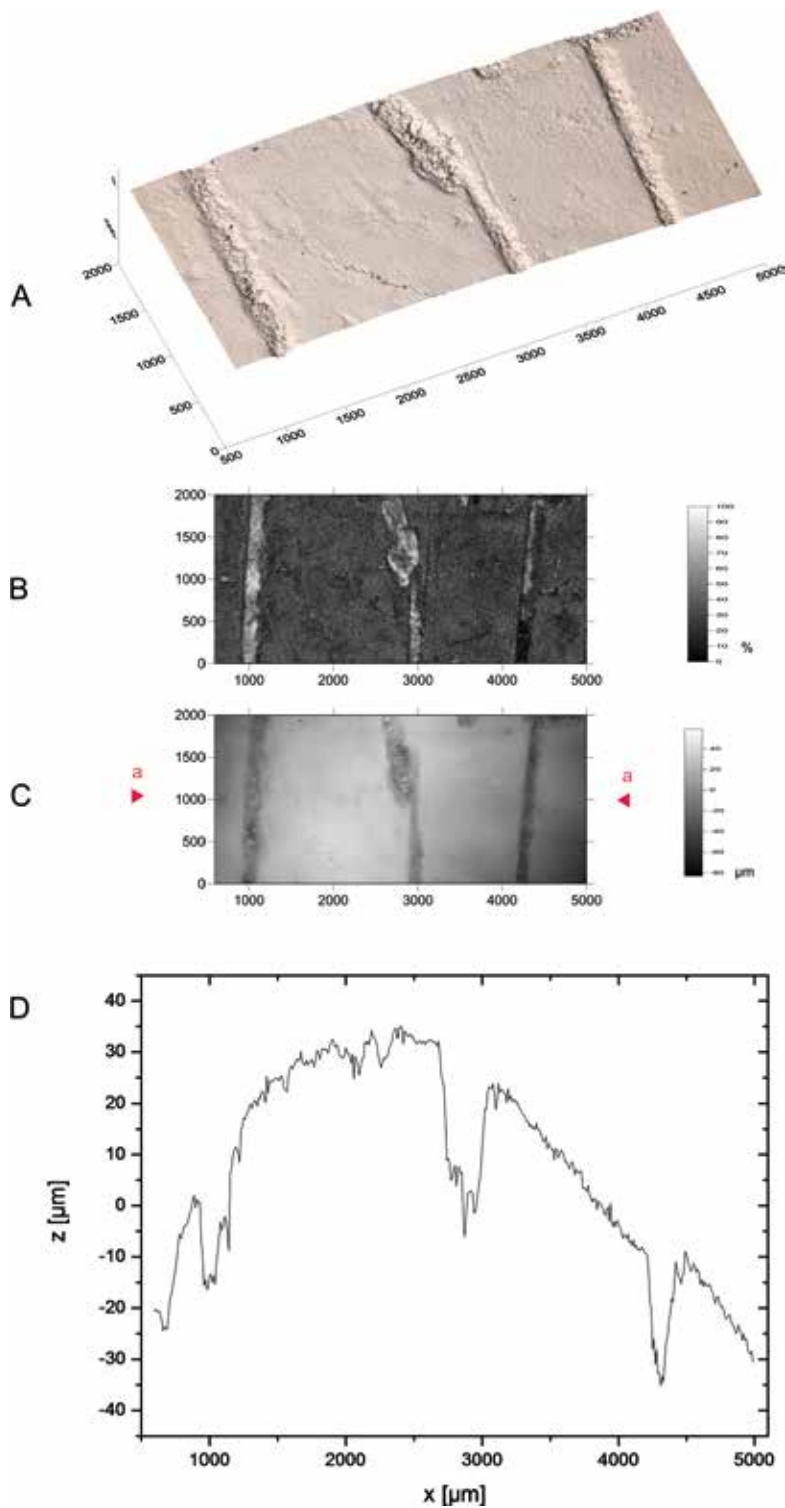
During the reanalysis, marks related to cutting activities could be identified on five fragments (**tab. 3**). The most obvious case is a fragmented frontal of an infant 3-4 years old (inv. no. 328/43) which is preserved up to 60 %, with the left side better preserved than the right (**fig. 9**). The fragment was found in the 1960s on the terrace in front of the cave (KIA 39227: 15,015 ± 50 BP; **tab. 1**). The irregular breakage pattern shows only a dry bone fracture. The black colour on the inner and outer surface was



**Fig. 11** Maszycka Cave (woj. małopolskie/PL), frontal bone (inv. no. 328). Results of an optical autofocus sensor measurement. Area 1: **A** surface model calculated by xyz data. – **B** map of reflectivity values. Black: low reflectivity; white: high reflectivity. The change of reflectivity could be caused by a change of material, e. g. from bone to calcite filling. – **C** map of the z value to localize the slice a-a. – **D** slice of the z value map to show the shape and depth of the traces on the surface. – (Graphic T. Schüler).

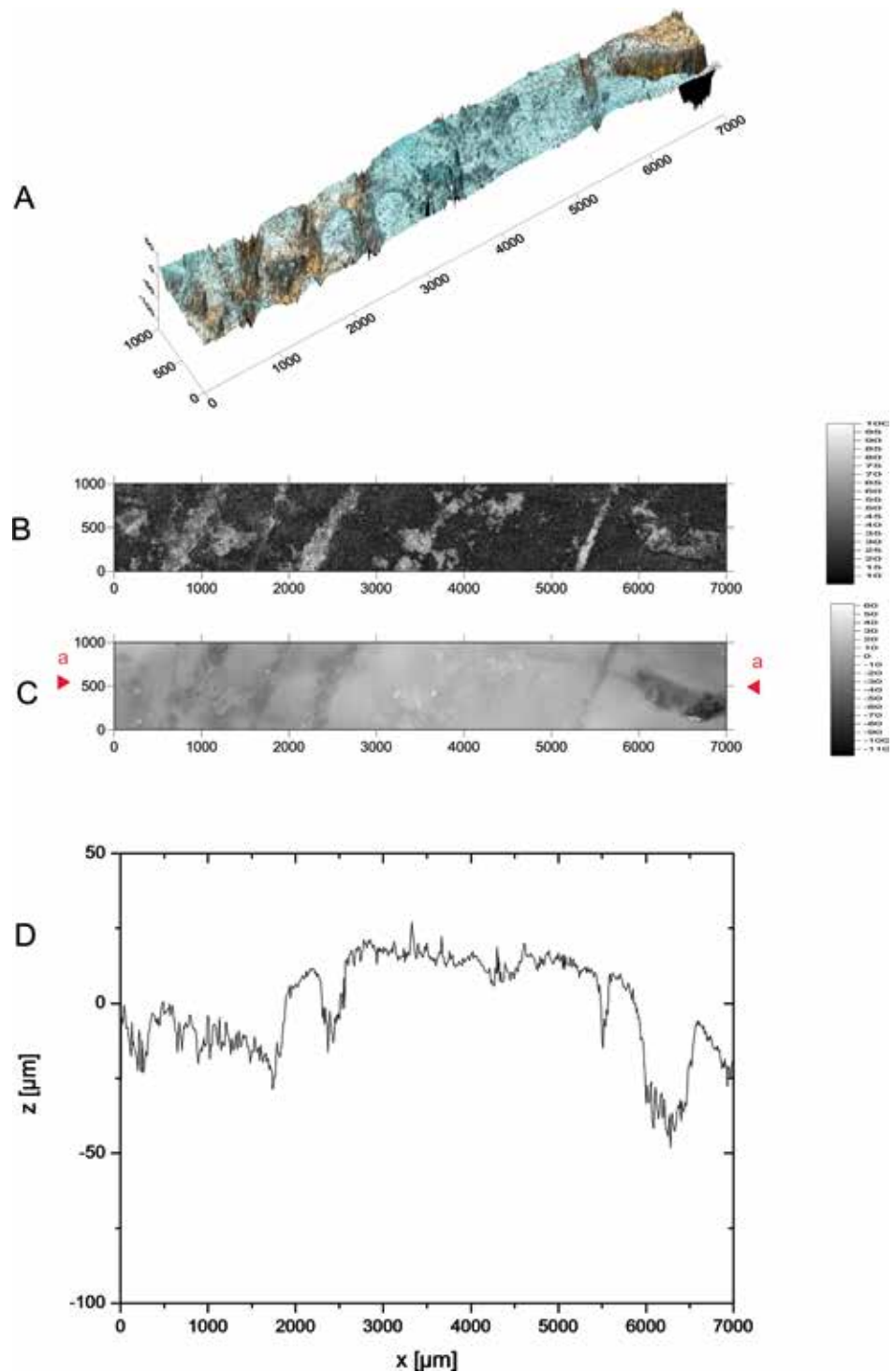
identified by EDX analyses as manganese. Weathering in the form of root edging is present mostly on the inside and on the edges of the outer surface. The root edging interrupts the manganese colour, which indicates a younger, probably Holocene date for this kind of erosion.

The cut marks are macroscopically visible to a length of about 6 cm in a transverse and parallel orientation (figs 9-13). Beside these quite dominant marks, a series of finer and shorter marks occur in different orientations. Unfortunately, the base of the marks was completely sealed by carbonatic incrustations and this makes a more detailed identification of diagnostic criteria for cut marks difficult. The larger transverse par-



**Fig. 12** Maszycka Cave (woj. małopolskie/PL), frontal bone (inv. no. 328). Results of an optical autofocus sensor measurement. Area 2: **A** surface model calculated by xyz data. – **B** map of reflectivity values. Black: low reflectivity; white: high reflectivity. The change of reflectivity could be caused by a change of material, e.g. from bone to calcite filling. – **C** map of the z value to localize the slice a-a. – **D** slice of the z value map to show the shape and depth of the traces on the surface. – (Graphic T. Schüler).

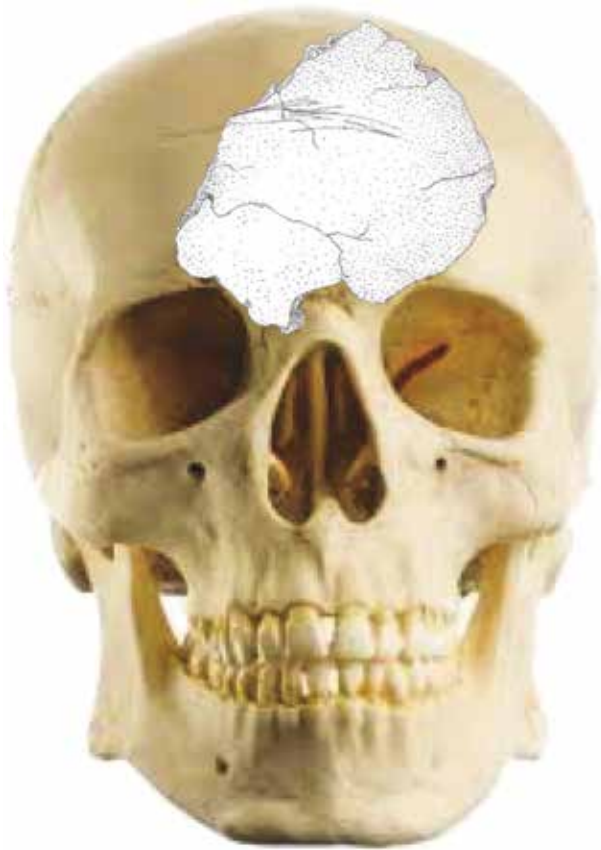
allel marks, and some of the finer ones in different orientations, both show incrustations and are therefore not of recent origin. The larger parallel and transverse marks resemble those described as typical cut marks caused by a blade with a slightly blunted edge with light pressure (Shipman/Rose 1983; Steguweit 2009). In favour of an interpretation as cut marks are the clear outline, the pointed tips, a typical depth of micrometre, and the grouping in a typical anatomically reasonable position. The position and horizontal orienta-



**Fig. 13** Maszycka Cave (woj. małopolskie/PL), frontal bone (inv. no. 328). Results of an optical autofocus sensor measurement. Area 3: **A** surface model calculated by xyz data. – **B** map of reflectivity values. Black: low reflectivity; white: high reflectivity. The change of reflectivity could be caused by a change of material, e. g. from bone to calcite filling. – **C** map of the z value to localize the slice a-a. – **D** slice of the z value map to show the shape and depth of the traces on the surface. – (Graphic T. Schüller).

tion of these cut marks suggest a removal of the skin and soft tissue from the cranium (fig. 14). The smaller finer traces are distributed in a larger area and show different orientations. We, therefore, conclude that these marks are of natural origin and were caused by sedimentation.

The occipital fragment of an adult individual (inv. no. 3/9) shows a small grouping of marks located in the upper part of the squama occipitalis above the muscle attachments. The marks are interrupted by an eroded



**Fig. 14** Maszycka Cave (woj. małopolskie/PL). Frontal bone (inv. no. 328) in relation to an adult skull. – (Graphic Th. Terberger).



**Fig. 15** Maszycka Cave (woj. małopolskie/PL). Adult mandible (inv. no. 1/5) with cut marks on the ramus. – (Photo J. Orschiedt).

zone and therefore limited to a length of 1 cm. They also show carbonatic incrustations and colouring by manganese. The cut marks are probably related to the removal of the skin from the skull. Again, smaller and more superficial marks cross the cut marks and are probably also related to taphonomic processes during sedimentation.

Cut marks are also present on the left side of the *ramus* of the robust mandible of an adult (inv. no. 1/5) (fig. 15). Their length is about 1 cm and they are partly covered by sinter. Only two or three striations are visible, as the surface is badly preserved. They were probably produced while cutting through the masseter muscle in order to remove the mandible from the cranium.

Further cut marks could be identified on two of the three clavicles, a left robust (inv. no. 9/33) and a right gracile specimen (inv. no. 9/34). Differences in size and robusticity clearly indicate that all clavicles (two left, one right) are from three different adult individuals. In both cases, the marks are located at the sternal end and on the superior (cranial) side of the clavicles. On the left robust clavicle (inv. no. 9/33), marks are additionally preserved on the posterior side of the sternal end. The marks differ from those on the skull fragments; especially on the robust specimen (inv. no. 9/33) only fine striations are visible. The marks on the right clavicle (inv. no. 9/34) are more prominent. However, the microscopic inspection was again limited by the incrustations within the marks. Their shape, parallel arrangement and location, however, clearly suggest that these marks were caused by cutting off muscle attachments. The location of the marks on the sternal

ends of the clavicles indicates the cutting of the sternocleidomastoid, the pectoralis and sternohyoid muscle, as well as the costoclavicular ligament attachments.

## **MASZYCKA CAVE AND THE PROCESSING OF HUMAN REMAINS IN THE MAGDALENIAN**

Human remains with cut marks and perimortal breakage patterns seem to be a typical feature of the Magdalenian in France and Central Europe. Most Late Upper Palaeolithic human remains are fragmentary. In France, for example, of the remains of some 232 individuals known for the Magdalenian only 5.6 % (n=9) comprise more or less complete skeletons and probably derive from burials. At the same time 94.5 % (n=223) are highly fragmentary, and 40 % (n=95) of these bear cut and scrape marks indicative of defleshing, while 54 % (n=125) show no signs of any kind of treatment (Le Mort/Gambier 1992).

The variety of practices reflected by these marks reveals the diversity of funerary practice in the Magdalenian world. Most numerous are marks indicative of defleshing, and almost all marks are found on the cranial vault and the jaws, whether adult, adolescent or infant of both sexes. The dominance of craniodental remains among modified human remains of the Magdalenian is obvious, and given the good preservation of numerous faunal elements on most of the sites this frequency cannot be ascribed to taphonomic factors. A deliberate selection of bones is therefore evident.

There are a number of sites where larger samples of human remains from Magdalenian contexts were identified. The fragmentary remains of a minimum of 24 to a maximum of 54 individuals were recovered from the Badegoulian or an early Magdalenian level in Le Placard Cave (dép. Charente/F). Direct dates are missing, which makes the cultural attribution insecure. Most dominant are cranial fragments, with only 14 % postcranial fragments, representing adults and children over the age of two (Le Mort/Gambier 1991, 190 tab. 1). However, the discovery of postcranial elements during new excavations and within the faunal collection raises doubts about the conclusion that only cranial elements were deposited (Henry-Gambier/Fauchoux 2012). Nearly all of the cranial fragments and some of the jaws exhibit cut marks and intentional perimortal breakage patterns. Traces of defleshing particularly reveal the systematic removal of the occipito-frontal, masseter and temporal muscles and the skin (Le Mort/Gambier 1991, 191-193; 1992, 33-36). Furthermore, five fragments of calvaria (skull caps) seem to have been deliberately worked, perhaps for use as containers or »drinking cups« (Bello/Parfitt/Stringer 2011).

Further evidence of the possible use of cranial remains comes from the »Grande Salle« at Isturitz (dép. Pyrénées-Atlantiques/F), where c. 100 human remains, mostly skull and jaw fragments, were recovered from the Magdalenian levels of the cave. Among these, two larger and two smaller parietal fragments bear traces of modification (Buisson/Gambier 1991). Groups of elongated parallel striations resulting from scraping are visible at the edge of the specimens. Defleshing is evident, and some kind of shaping of the cranial fragments seems to be clear as well. As a secondary activity, however, two of the cranial fragments bear engraved motifs. One of these is clearly a stylised animal, and the other a circular motif. The careful defleshing and shaping of the skulls make it likely that the engravings were intentionally added to these bones. This seems to resemble Magdalenian portable art, such as bone *rondelles* and engraved stone *plaquettes*.

Fragmented human remains from Magdalenian levels are also present in Central Europe. Within a central fireplace, in a Magdalenian layer in Brillenhöhle (Alb-Donau-Kreis/D) in the Swabian Alb, 38 cranial and postcranial remains were found (Orschiedt 1999, 101-110; 2002). The remains belong to at least three individuals, two adults and a child. An AMS <sup>14</sup>C date on a cranial fragment assigns the finds to c. 12,800 cal BC

(OxA-11054:  $12,470 \pm 65$  BP) and confirms the Magdalenian attribution. Although the bones were considered to have been burnt, discolouration on the bone is from ash and no traces of burning are present. They seem to have been placed atop the hearth containing ashes from a bone fire (Orschiedt 1999, 104-105). The study of the modifications has revealed evidence of dismemberment, defleshing, and careful »cleaning« of the soft tissue probably shortly after death and prior to deposition. There are significant differences in the number and type of cut marks on the bones compared with processed faunal remains from Magdalenian sites: the human remains from Brillenhöhle reveal a cut mark frequency of 64 %, compared to faunal assemblages with good bone preservation with a frequency of 21-26 % (Orschiedt 1999, 106-108; 2002). The considerable difference is that it has been demonstrated that the majority of cut marks on the human remains did not result from »normal« butchering but from more intense and careful defleshing (Orschiedt 2002, 247). Cut marks on phalanges, which are very rare among faunal assemblages, also indicate careful skinning of the individuals, and marks on the crania indicate detachment from the cervical vertebrae and scalping. The lack of long bones and the dominance of cranial parts indicate that deliberate selection has taken place, i. e. the removal of all but the smallest anatomical elements and fragments. All recovered bones fit into the fragment of a skull cap, suggesting that it may have functioned as a container for the transport to the hearth, which is reminiscent of the »calotte containers« from Le Placard.

Another example from Central Europe are the human remains from Burghöhle Dietfurt, Inzigkofen (Lkr. Sigmaringen/D), on the river Danube. The occipital, the maxilla and four phalanges of the hand were found close to the cave wall, postcranial fragments have not been identified so far. The preserved remains seem to represent a single individual, which is AMS-dated to  $12,210 \pm 60$  BP (KIA 3837) and  $12,420 \pm 60$  BP (KIA 3838) (Gietz 2001). A plateau effect in the calibration curve makes more precise dating between  $12,309 \pm 242$  cal BC and  $12,705 \pm 336$  cal BC (CalPal v. 1.5) difficult. Several cut marks are clearly visible on the occipital bone (Orschiedt 2013, fig. 4). The interpretation by W. Taute (1989, 41) that the marks result from scalping can be refuted because the cuts are placed below the protuberantia occipitalis and are therefore within the area of muscle attachments of the neck. Therefore, the cutting activity more likely relates to the removal of the head. A single cut mark is placed within the nasal cavity (Orschiedt 2013, fig. 5), which might be related to the removal of soft tissue from the bone. The position indicates that the cut was made when the maxilla was already separated from the rest of the skull and this again indicates a planned and systematic treatment of dead human bodies at that time.

The 205 cranial and postcranial remains from the Late Magdalenian (Creswellian) of Gough's Cave (Cheddar Gorge) represent three adults and two juveniles (Bello et al. 2015). Direct AMS dating on several of the bones indicates an age of c. 13,000-12,800 cal BC (Jacobi/Higham 2009), i. e. broadly contemporary with the Brillenhöhle remains. Some of the remains were recovered from a restricted area close to the cave's wall (Stringer 2000), where most of the traces of activity were documented (Currant/Jacobi/Stringer 1989). The origin of the rest of the material, which was found during the late 1920s and 1950s, remains unclear. The refitting of pieces from the earlier excavation with the more recent modern excavations suggests a similar context for both assemblages. Cut marks are restricted to the cranial vault, mandible and ribs, and reveal careful defleshing and dismembering. P. Andrews and Y. Fernández-Yalvo (2003) stated that the human remains from Gough's Cave show butchering patterns similar to animals, suggesting skinning, dismembering, defleshing and marrow extraction activities. The excavations during the 1986-1987 seasons showed that human remains were randomly mixed with animal bones, with no specific distribution or arrangement. The bone distribution indicates an equal treatment of human and animal remains and this is corroborated by the analysis of cut marks and other modifications like human tooth marks, which suggest that both human and animal bones were discarded food remains of the human population. This is interpreted as customary cannibalism, with a ritual treatment of the skull, creating skull caps (Bello et al. 2015).

## CONCLUSION

With an increasing number of AMS dates now available, it is becoming clear that the number of isolated and sometimes manipulated human remains increases during the Magdalenian from 5 % in the Lower Magdalenian to 19 % in the Middle Magdalenian and with the majority, 46 %, dating to the Late Magdalenian. About 29 % of the sample (Isturitz, Le Placard and Roc-de-Sers [dép. Charente/F]) are not attributable with confidence to a particular Magdalenian phase (Buisson/Gambier 1991), although it is probable that they belong to the early phase or even the Badegoulian, at least in parts. Scientific research has focused on the primary burials, although only 26 single or double burials containing 31 individuals are known from Late Upper Palaeolithic contexts (including Magdalenian and Epigravettian technocomplexes) in Europe and the Near East (Orschiedt 2013; 2016; Pettitt 2011).

The 50 human remains from Maszycka Cave show a high degree of fragmentation and a clear dominance of cranial fragments. The AMS dating links the assemblage to the earliest Magdalenian phase of Central Europe. The sample represents a minimum number of nine individuals (five adults, four subadults). Manipulation by human activity, such as perimortal breakage and cut marks, is restricted to a few fragments. The low number of manipulations found during the reanalysis is in contrast to earlier publications. Human activity is evident on cranial remains and on two clavicles indicating defleshing and disarticulation activities on at least three individuals, including adults and children. Taphonomic agents such as natural fragmentation and carnivore damage did, however, play a role in the preservation of the excavated remains. It is nevertheless clear that the absence of resistant parts of the postcranial skeleton, such as the diaphyses of the femur and tibia, is a result of selection. According to these results the Maszycka remains seem to have a close resemblance to similar manipulated and/or fragmented human remains from Magdalenian layers, and in combination with the AMS dates and the typological criteria, this underlines the close relationship of the Magdalenians from southern Poland to southwestern France.

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## Zusammenfassung / Summary / Résumé

### Die Menschenreste aus der Maszycka-Höhle (woj. małopolskie/PL): zur Totenbehandlung im Magdalénien

Menschliche Skelettreste sind aus dem mitteleuropäischen Magdalénien eher selten erhalten. In Mittel- und Westeuropa liegen menschliche Gebeine zumeist stark fragmentiert vor und zeigen mitunter auch Manipulationsspuren. Die 1884 und in den 1960er Jahren untersuchte Maszycka-Höhle liegt ca. 20 km nördlich von Krakau und gehört zu den bedeutenden Magdalénien-Fundstellen Mitteleuropas. Besonders hervorzuheben sind 50 Menschenreste, die in der Höhle und auf ihrem Vorplatz in der späteiszeitlichen Fundschicht entdeckt wurden. Es liegen vor allem Schädelfragmente und nur wenige postkraniale Skelettelemente vor, an denen bei einer neuen Untersuchung z. T. Schnittspuren zweifelsfrei bestätigt werden konnten. AMS-Daten stellen die Fundschicht mit den Menschenresten in die Zeit um ca. 16200 cal BC. Gemeinsamkeiten mit der Totenbehandlung dieser Zeit in Westeuropa sprechen ebenso wie typologische Argumente für eine Wiederbesiedlung Zentraleuropas nach dem letzten Kältemaximum von Westeuropa aus.

### Human Remains from Maszycka Cave (woj. małopolskie/PL): Treatment of Human Bodies in the Magdalenian

In Central Europe, human remains from the Magdalenian are a rare phenomenon. In Central and Western Europe, these remains are usually fragmented and often manipulated. The discovery of 50 human bone fragments from Maszycka Cave in the 19<sup>th</sup> and mid-20<sup>th</sup> century is an important source for studying the treatment of bodies in the Late Upper Palaeolithic. Skull fragments are dominating and the re-investigation of the material proves the presence of some cut marks. The re-dating of the remains and the bone artefacts to c. 16,200 cal BC together with the specific treatment of the human remains confirms the typological arguments for an early re-colonisation of Central Europe from the West after the Last Glacial Maximum.

### Les restes humains de la grotte de Maszycka (woj. małopolskie/PL): le traitement des corps humains au Magdalénien

Les restes humains du Magdalénien sont un phénomène rare en Europe centrale. En Europe centrale et occidentale, ces restes sont fréquemment fragmentés et souvent manipulés. La découverte de 50 fragments d'os humains dans la grotte de Maszycka au 19<sup>e</sup> et dans le milieu du 20<sup>e</sup> siècle représente donc une source importante pour étudier le traitement des corps au Paléolithique final récent. Les fragments de crânes dominant et leur réétude montre la présence de traces de découpe. La redatation des restes et des artefacts osseux à une date aux environs de 16200 cal BC associée aux traitements spécifiques constatés sur les ossements confirme les arguments typologiques pour une recolonisation précoce de l'Europe centrale par l'Ouest après le dernier optimum glaciaire.

Traduction: L. Bernard

## Schlüsselwörter / Keywords / Mots clés

Polen / Paläolithikum / Magdalénien / Höhlenfundstelle / Bestattung / menschliche Reste / Schnittspuren

Poland / Palaeolithic / Magdalenian / cave site / burial / human remains / cut marks

Pologne / Paléolithique / Magdalénien / site de grotte / sépulture / restes humains / marques de découpe

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