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The Late Upper Palaeolithic and earliest Mesolithic evidence of burials in Europe

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Burials of the Late Palaeolithic (14 000–11 600 cal years before present, henceforth BP) are a rare phenomenon in Europe. Several sites possess burials of single and double individuals. As with the preceding Magdalenian, the burial of more than two individuals in the same grave cutting seems to be unusual, but does occur occasionally. The deposition of isolated and disarticulated human remains with or without cut marks seems additionally to belong to the Magdalenian context. In the final Palaeolithic phase (13 000–11 600 cal years BP) there is evidence for cemetery-like clusters of burials, which contrast to the Magdalenian evidence, instead showing some similarities with the succeeding Mesolithic. The earliest Mesolithic burials 11 600–10 500 cal BP) are a very rare phenomenon, covering a short time span between the beginning of the Preboreal and the beginning of the Boreal phase of the early Holocene. Here the evidence includes single inhumations, cemetery-like structures and a number of isolated human remains. Caves and rock shelters were the most common places for inhumations in both the final Palaeolithic and the early Mesolithic. Although the number of sites with a chronological continuity from the LUP to the Early Mesolithic burial is low, several aspects indicate a general continuity in burial patterns over this period. Apart from this continuity, the Mesolithic burials in general seem to represent a new level of diversity in burial practices.

This article is part of the theme issue ‘Evolutionary thanatology: impacts of the dead on the living in humans and other animals’.

1. Introduction

The Late Upper Palaeolithic (LUP) begins with the late Magdalenian around 14 000 calibrated years before present (cal BP) and ends with Dryas III and the last glacial at the Pleistocene–Holocene boundary around 11 600 cal BP. Regardless of a transitional phase, the earliest Mesolithic starts with the beginning of the Preboreal and continues to the Boreal around 11 000 BP. There are a number of uncertain burials that probably belong to this period but which have not been directly dated by AMS radiocarbon, and hence which have been omitted from this review, which focuses on primary and secondary burials which are relatively well understood. Isolated human remains might additionally represent the very end of a complex ritual treatment of the deceased, and this ‘loose human bone phenomenon’ has recently been brought to the fore in a study of the Mesolithic of North Western Europe [1].

2. Late Palaeolithic burials

At the end of the Magdalenian around 14 000 cal BP, the number of burials in the sense of single inhumations varies dramatically region to region [2,3]. In Central Europe the number is extremely low, with Bonn-Oberkassel being the only secure example. In Western Europe, mainly in France, several single inhumations and a possible further multiple burial are attested for the post-Magdalenian Azilian technocomplex. In Spain only one—and possibly a second now lost—burial is attributable to the Azilian. On the Italian peninsula, however, the data on late

Palaeolithic burials belonging to the broadly contemporary Epigravettian or late Epigravettian is significantly richer than anywhere else.

Two sites in Central Europe are dated to the very end of the Magdalenian or already at the beginning of the Late Upper Palaeolithic and Federmesser Group. Two adults—a female and a male—seem to have been buried together in the same grave cutting or close to each other in Bonn-Oberkassel, Germany [4,5]. Direct dating of the skeletons indicates an age of 11 600–12 200 BP (13 500–14 200 cal BP) (table 1) for the burial of a male and female, suggesting a Late Magdalenian and/or Late Upper Palaeolithic cultural association ([36], pp. 83–84). Although details are lacking for early excavation, the remains of the two bodies were found together, each intensely stained with haematite (red ochre). The bones of the cranium and upper body of the female were particularly stained on their outer surfaces, indicating that the colorant was applied to clothing rather than to disarticulated bones. The partial skeleton of a dog, a bone pin, and a flat carving of a cervid seem to have been associated with the burial. According to the information available, it has to remain unclear whether Bonn-Oberkassel was a double burial or two single burials in close proximity to each other.

Fragmentary human remains from the open-air site of Neuwied-Irlich in the Rhineland represent an adult, two children and a neonate ([5,38], p. 568). Other details of this burial are unknown due to the circumstances of the find (in a secondary position during construction works). AMS radiocarbon dates range between 14 500 and 13 800 cal BP (table 1). The bones are ochre-stained, and the remains are accompanied by a burin spall, a backed blade, one perforated and decorated cervid tooth pendant, and an antler point [38]. According to preliminary investigation results, the adult individual might have suffered from vitamin C or D deficiency. Street *et al.* ([5], p. 568) noted how both the Neuwied-Irlich and the Bonn-Oberkassel burials seem to have been isolated—deposited away from occupation sites—which may suggest a regional tradition of separation of the dead from the world of the living, or at least a distinction between burial and domestic space. The evidence of red ochre on the bones and the discovery of objects, although in a secondary position, probably indicate a burial. It is, however, impossible to decide between a multiple or several single burials.

The Italian Peninsula has rich sets of Upper Palaeolithic burials belonging to Mid Upper Palaeolithic (Gravettian, approx. 31 000–22 000 cal BP) and Late Upper Palaeolithic (Epigravettian, less than 19 000 cal BP) context [7]. The Epigravettian examples, where they are dated by AMS measurements, seem to date to no older than 15 000 cal BP, i.e. form a relatively late Pleistocene phenomenon [9]. The sample can, however, be divided chronologically into two groups; an early (and smaller) one between 15 000 and to 14 000 cal BP and hence contemporary with the Magdalenian north of the Alps, and a later (and larger) group between 13 000 and 12 000 cal BP of post-Magdalenian age [12]. Lack of precise AMS dates measured directly on the human remains leads to several cases of uncertainty, however. Six examples constitute the earlier period; Riparo Tagliente, Riparo di Villabruna, Grotta Maritza, San Teodoro, Grotta Addaura Caprara and probably Grotta Vado All'Arancio. The burials from both chronological groups are found all over Italy with a certain trend towards a regionalization in grave goods ([9], p. 349).

In the Riparo Tagliente (Venetia), an adult male was buried in an extended position in a vast rock shelter. The burial had been partially destroyed by digging during historic times and only the lower part of the skeleton was preserved. The grave was covered by stone blocks, one bearing linear incisions and the other the outline of a lion's head and an aurochs' horn. The bones were stained with ochre, and a fragment of bison horn and a pierced shell were recovered from the grave. There are no direct dates from the burials available, but the Epigravettian occupation level that the grave is associated with dates to between $15\,070 \pm 70$ cal BP (OxA-3531) and $15\,270 \pm 170$ cal BP (OxA-3532) ([9,10,12,39,40], 28).

A single burial of an adult male around 25 years old was placed in an extended position on his back in a grave in the Riparo di Villabruna. Subsequent road works had destroyed the lower extremities. The grave pit was filled with stones, of which five were decorated with geometric motifs drawn with red ochre. Several objects—a bone point, a backed knife, a flint blade, a flint core, a retoucher and a ball of resin and wax—were found close to the left forearm. The burial is associated with a Final Epigravettian occupation of the site. A direct AMS ^{14}C measurement from the burial indicates an age of $14\,171 \pm 243$ cal BP (KIA-27004) ([9,11,40], 28–29). This dating places the burial at the very end of the first Italian chronological group.

Another burial of an adult male (A) and a nearby child (B) was found in the Grotta Vado All'Arancio (Tuscany). Burial A was placed extended on his back on a surface of red ochre within an oval grave pit, the fill of which was covered by large stone blocks. Several objects were found in the grave: a fragment of roebuck jawbone, a horse molar, an aurochs premolar, three smooth pebbles, about 10 pierced shells, two flint scrapers and a flint flake. Burial B has no evidence for a grave pit, and is represents the fragmentary remains of a child of approximately 18 months age apparently placed in a supine position. Objects found close to the skeleton, such as perforated shells and stone artefacts, may represent grave goods but it is impossible to establish this with confidence ([40], 29). No direct dates are available, but the burial presumably belongs to the late Epigravettian phase around 15 400 cal BP [12].

In the Grotta Maritza (Abruzzo), the skeletal remains of an infant of about 7–8 years (Maritza 1) were found close to the cave's wall, next to which was found the partially disturbed and partially articulated remains of an adult (Maritza 2). Maritza 2 was subsequently disturbed by carnivores, as several bones were found dispersed about the area, with the skull missing ([12,40], 29). However, the excavations did not produce clear evidence for a burial pit, nor for grave goods or the use of red ochre ([40], 29). However, it is noted that some flint artefacts and perforated shells were associated with Maritza 2 [9]. The preservation and the partially articulated remains of both individuals may indicate that it was a purposeful burial. The Maritza 1 remains derived from levels later than 14 000 cal BP ([40], 29), but direct AMS radiocarbon dates are not available. The direct dating of both individuals would be desirable to verify their association with the late or final Epigravettian.

The remains of four male adults and an individual of undetermined age and sex, in addition to two isolated crania, were apparently buried in the San Teodoro cave on northeastern Sicily, probably between 14 000 and 13 000 cal BP ([40], 35;

Table 1. The Late Upper Palaeolithic burials.

site	¹⁴ C-dating	individuals	grave features	objects	references
Arene Candide, cave, Italy	Vlb: 10 585 ± 55 BP (OxA-11000)	20 (infants, adults both sexes)	grave pits, single and double burials, secondary burials, disturbed burials	red ochre, perforated red deer canines and shells. 2 pairs of elk antlers	[6–8]
	VIII: 10 655 ± 55 BP(OxA-11001)				
	XII: 10 720 ± 55 BP (OxA-11002)				
	XIV: 10 735 ± 55 BP (OxA-11003)				
	X: 11 605 ± 445 BP (GX-16960-A)				
	XII: 11 510 ± 385 BP (GX-16964-K)				
	direct dates, Epigravettian				
Grotta Romanelli	level A: 10 320 ± 130 BP (GrN-2305)	1 adult male			[7,9]
	9880 ± 100 BP (GrN-2056)	2 children			
	11,800 ± 600 BP (R-58)				
	9050 ± 100 BP (R-54)				
	level B: 11 930 ± 520 BP (R-56)				
	level C: 9790 ± 80 BP (GrN-2154)				
Grotta Polesini	10 390 ± 80 BP (GrN-2153)	14 (MNI)—10 adults, 4 children	stone block covering, decorated w. red painted geometric motifs	red ochre on bones, perforated red deer canines, shells	[9]
	level D: 10 640 ± 100 BP (GrN-2055)				
	final Epigravettian				
	10 900 ± 80 BP (R-1265)				
	Epipalaeolithic				
	10 040 ± 120 BP (R-2022) layer;				
Riparo di Villabruna	12 140 ± 70 BP (KIA-27004)—direct date,	Adult, male ~25 years	grave pit		[9–11]
	final Epigravettian				
Grotta Maritza	13 000–10 000 BP final Epigravettian	1: adult male, partially preserved and articulated	close to the cave wall	flint tools, perforated shells	[7,9,12]
		2: 7–8-year-old child—partial skeleton			
Riparo di Tagliente	13 070 ± 70 BP (OxA-3531)	1: adult male	covered by stone blocks with red ochre,		[9,10,12,13]
	13 270 ± 70 BP (OxA-3532)	2: child	one with engravings (lion)		
	direct dates, final Epigravettian				

(Continued.)

Table 1. (Continued.)

site	¹⁴ C-dating	individuals	grave features	objects	references
Ripato di Romito	10 250 ± 450 BP (R-298) 11 150 ± 150 BP (R-300) 4: 11 340 ± 90 (LTL3032A) 5: 10 862 ± 70 (LTL3033A) 9: 13 915 ± 70 (LTL3034A) Epigravettian	9 (MNI) in 7 graves (5 single, 2 double burials)	grave pits, stone block with engraving		[9,13–16]
Grotta Vado all'Arancio	~ 13 400 BP Epigravettian	adult male with 1–2-year-old child in extended position	grave pit	flint tools and perforated shells	[7,12,17]
Grotta dei Fanciulli	level C: 11 130 ± 100 BP (GfA-94197) direct date, Epigravettian level B: younger than 11 000 BP Epigravettian	two infants, 2 and 3 ± 1-year-olds, extended position adult female, poorly preserved	grave pit grave pit	several hundred perforated shells on the waist and pelvis area perforated shells in level, association unclear	[9,12]
Grotta di San Teodoro	12 200 ± 400 BP (charcoal from overlying hearth) Epigravettian 12 580 ± 130 BP (ETH-34451) direct date, San Teodoro 1	5 (MNI), 4 male and one female (?)		use of red ochre, antler small cobbles	[7,13,18–20]
Grotta Addaura Caprara	12 890 ± 60 BP (KIA-36055) direct date, Addaura 1	1 adult female			[20]
La Madeleine	10 190 ± 100 BP (GfA-95457) direct date, Azilian	2–4-year-old infant	grave pit, stones around the head	use of red ochre, perforated shell pendants, 2 perforated deer canines, 2 fox canines	[21,22]
Roc de Cave	11 210 ± 140 BP (GfA-95048) direct date, late Magdalenian or Azilian	juvenile incomplete skeleton		perforated deer teeth necklace	[21,23]
Rochereil	Azilian (1 + 2?) and probably late Magdalenian (3)	1: male, 40–50 years 2 unknown, fragmented/ cremated? 3 child skull		red ochre	[24–26]
Le Peyrat (Saint Rabier)	11 430 ± 140 BP (GfA-99117) Azilian level	5: adult male		red ochre on the bones	[27,28]

(Continued.)

Table 1. (Continued.)

site	¹⁴ C-dating	individuals	grave features	objects	references
Los Azules	9540 ± 120 BP (SIC-260) layer above 9430 ± 120 BP (SIC-216) – layer below Azilian	male, 40–50 years	grave pit	red ochre, painted cobbles, atypical animal remains, shells, harpoons, endscrapers, burins and debitage (tool kit)	[29–31]
La Paloma (lost)	Azilian	young child	grave pit		[31]
Aven des Ibousnières	10 210 ± 80 BP (OxA-5628) Fauna from layer 4C Azilian	4 adults 5 children (MNI) fragmentary remains (426 fragments)		red ochre on bones (layer 4C), red ochre, flint artefacts, faunal remains within layer, engraved animal bones, fish vertebrae, shells, perforated animal teeth (197 red deer canines), perforated stones and bones within find horizon	[32–35]
Bonn-Oberkassel	11 570 ± 100 BP (male) (OxA-4790) 12 180 ± 100 BP (female) (OxA-4792) direct dates, Late Palaeolithic	adult male and female		red ochre, domestic dog bone or antler animal figurine, bone pin	[4,5,36,37]
Neuwied-Itlich	12 310 ± 120 (OxA-9736) 11 910 ± 70 (OxA-9847) 11 965 ± 65 (OxA-9848) 12 110 ± 90 (UIC-9221) direct dates, Late Palaeolithic	4 (MNI) adult female (?), 2 infants, 1 neonate		red ochre, perforated red deer incisor with carvings on the root, 2 flint tools, 1 antler point	[5,38]

[13]). Although the burials are rather insecurely dated, an overlying hearth was dated by AMS to $12\,200 \pm 400$ BP ([2], Tab. 7.1), which would indicate a late Epigravettian age. The exact chronological position of the burials remains unclear, however; only San Teodoro 1 is dated directly. The age of $12\,580 \pm 130$ BP (approx. 14 500 cal BP) places it in the older group of Late Upper Palaeolithic Italian burials ([19], 538, [20]). If the dates of the other burials at the site are consistent with this dating of San Teodoro 1, this would indicate that burial groups were already present on the peninsula before 14 000 cal BP. Little information is available for these burials, however, since they were disturbed by unauthorized individuals before excavation was carried out under difficult circumstances. Burials 1 and 4 were the most complete, and while San Teodoro 2 and 4 were placed in an extended position, burial 1 seems to have been placed on its left side. Burial 5, which may have been inhumed a little later than the rest, may have been a secondary burial, i.e. having been collected from another location before being buried here. Burials 1–4 were grouped below an approximately 5-cm thick layer of red ochre, although it remains an open question as to whether it was used as a deliberate covering ([40], 35; [41], 550). San Teodoro 4, the probable adult female, was buried with a cervid antler and with several stone cobbles. A flint flake, probably the distal part of a geometric microlith, was embedded in its pelvis [18]. San Teodoro 1, an adult male, seems to have been equipped with a set of 12 red deer canines, although the context is not indisputable ([40], 35; [41], 550).

An amateur discovered the remains of Addaura 1 in 1916, and any documentation relating to this is missing. The remains consist of several postcranial elements (scapula, ulna, ilium and fibula) and seem to belong to an adult female ([20], 3096). This attribution is supported by the similar state of preservation of the bones and by the same colour of deposit encrusting them, which suggests that they might derive from a burial. A radiocarbon date of $12\,890 \pm 60$ BP, $15\,472 \pm 300$ cal BP (KIA-36055) places this individual in the older LUP group ([20], 3096).

The second group of Italian Epigravettian burials dates between the final Epigravettian and the beginning of the Sauveterrian or early Mesolithic (Preboreal and Boreal) industries. The sites representing this group are: Grotta Romanelli, Grotta Polesini, Riparo di Romito, Grotta dei Fanciulli and Arene Candide. No direct dating is available for the sites of Grotta Romanelli and Grotta Polesini, so their stratigraphic position remains unclear although they were found within a final Epipalaeolithic sequence. In the case of Grotta Romanelli several radiocarbon measurements were produced by different laboratories, with somewhat contrasting results, even if a quick rate of sedimentation of Levels A–D is accepted ([9], 296). Any details on the burials themselves, excavated at the beginning of the twentieth century, are lacking. The Grotta Polesini remains are also undated, but a single radiocarbon date of $10\,090 \pm 80$ BP (R-1265) from the middle of the sequence (level 7) provides a direct indication of the final Pleistocene age of the bones. The remains of a minimum of 14 individuals (4 children, 10 adults) seem to have been found dislocated, and isolated from the main anatomical context. However, the bones show red ochre staining, which might indicate a funerary ritual. Additionally, some of 260 fish vertebrae also showed traces of red ochre and were possibly associated with the human remains, as were 80 perforated deer canines and more than 200 perforated shells ([9], 292–293).

Nine skeletons were discovered at the Grotta or Riparo del Romito (Rom 1–9). The skeletons are generally well preserved and belonged to young adults between 20 and 30 years (Romito 1, 3, 5, 7, 9) and adolescent or nearly adult individuals (Romito 2, 4, 6, 8). Determination of sex revealed three females (Romito 1, 4 and 5), one probable female (Romito 2) and five males (Romito 3, 6, 7, 8) [16,42]. Romito 2 was affected by a serious genetic disease which caused a form of acromesomic dwarfism [15]. Unfortunately direct dates are only available for two burials so far; one of $11\,340 \pm 90$ (LTL-3032A) for the single inhumation Romito 4 from inside the cave and another of $10\,862 \pm 70$ (LTL-3033A) for the double burial. Indirectly, measurements of $10\,250 \pm 450$ BP (R-298) and $11\,150 \pm 150$ BP (R-300) from charcoal associated with Romito 5 (and 6) from the rock shelter confirm the direct dates [16,42]. At least one new burial (Romito 9) seems to be older than 14 000 cal BP [42], but further information on the burials is sparse.

One of the best known Late Palaeolithic burials is probably that of the double burial of two infants from the Grotte des Enfants (Grotta dei Fanciulli) discovered in 1874/1875. In fact two burials are known from the site, with a less well-known adult female found in level B, stratigraphically slightly higher than the double burial of the children at a depth of 1.90 m from the surface ([26], 63–64). The burial is not dated but may belong to the final Epigravettian or Azilian. A few objects might be associated with the burial, notably two perforated shells, several unperforated shells, faunal remains and a flint scatter. The two children, aged between 2 and 3 years, were found lying side by side in level C at a depth of 2.79 m from the surface ([26], 63). Several hundred perforated shells were found in the area of their waist and pelvic girdle, probably arranged in parallel rows. It seems convincing that the shells were sewn on the clothing; the children were wearing as they were buried. Apart from these ornaments some faunal remains were found in association with the burials, but no use of red ochre was recorded. Surprisingly, a triangular flint projectile was found embedded in a thoracic vertebra of the older infant; presumably the cause of the individual's death. Apart from the deadly injury probably caused by an arrow shot, both children had suffered from periostitis, and the younger individual showed bone deformation most probably caused by vitamin D deficiency [17].

These examples of single and double primary burials of adults and children clearly indicate a Late Pleistocene/Late Epigravettian burial tradition across Italy. Simple inhumation with the body lying extended on its back and with little or no grave goods, except basic equipment such as flint tools and personal ornamentation such as perforated shells, is dominant. In most cases, adults and children were buried in the same way, sometimes even together in the same grave. However, due to the lack of documentation of the early excavations this is not confirmed in every case. By contrast, isolated human remains do not seem to be frequent phenomena in the Italian Epigravettian. More direct AMS radiocarbon dates of the Italian Epigravettian burials would be highly desirable.

By contrast, the evidence for late Palaeolithic burials on the Iberian Peninsula is extremely rare. The single inhumation of Los Azules in Asturias and the lost grave of a child from La Paloma are the only apparent examples [43]. The burial of Los Azules was discovered in 1975 within the entrance area of the cave and with some degree of damage in the area of the skull. There are no direct dates available, but the stratigraphic evidence places the burial in the first half of the ninth

millennium cal BC. There is evidence for a grave pit, and the body was associated with several objects that have been interpreted as grave goods. There were some Azilian painted cobbles, red ochre, the skull of a badger (*Meles meles*), a fragment of a deer antler, an accumulation of unperforated shells with remains of ochre inside, and several harpoons, endscrapers and burins, as well as some production waste. This inventory of different objects has led to the idea that the deceased was equipped with a tool kit, raw material and symbolic items [30,43].

Late Upper Palaeolithic burials in France are represented only by a couple of single burials. One of them is the famous burial of a 2–4-year-old child found in a grave pit during excavations in the large rock shelter of La Madeleine in 1926. The burial was found within a Magdalenian level (Magdalenian IV) and attributed to this period. A direct date on the human remains, however, revealed an age of $10\,190 \pm 100$ BP (GifA-95457), according to which the burial belongs to the subsequent Azilian and was presumably intrusive (dug down) into the underlying Magdalenian occupation level. The very rich body ornamentation of at least 1275 perforated shells, as well as 2 perforated deer canines and 2 fox canines, is reminiscent of some of the richly equipped burials of the broadly contemporary Italian Epigravettian [22]. The small size of the objects indicates that they were collected and selected for the child on purpose, i.e. to distinguish it from adults, again in accord with the Italian Epigravettian burials. The La Madeleine child could be interpreted as a high status individual who received a complex burial ritual, additionally indicated by the use of red ochre and its large grave pit.

A Late Magdalenian (Magdalenian VI) cranium and mandible of a 2–4 year old with supposed evidence of post-mortem trepanation on a hydrocephalus was found in the Rochereil cave, Dordogne [44]. However, the supposed trepanation of the child (Rochereil III) was later identified as a pathological lesion (lacuna) of unknown aetiology and the hydrocephalic nature of the skull was not confirmed [45]. The placement of a child's head within the Magdalenian levels, however, presumably reflects a deliberate treatment/deposition of the human remains, as the postcranial bones were absent. An AMS date of $13\,159 \pm 93$ cal BP (OxA-16932) places the skull chronologically in the Late Palaeolithic/Azilian. Two further burials have been found in an Azilian context. Rochereil I, an older male, was found in a 'hyper flexed' position lying on its right side and lacking any obvious grave goods. Only red ochre was visible in the area of the head. The second burial has been described as a cremation but further details are unfortunately not available [26], 121). The dating of Rochereil II is insecure, as no cremation for the European Late Palaeolithic is otherwise known; it is probably of Mesolithic age. Rochereil I, although similarly undated could belong to the Azilian.

In 1928, the partially incomplete skeleton of a juvenile, a 13–15-year-old probable female, was excavated in Roc de Cave (Saint-Cirq-Madelon, Lot). Given the lack of information on the excavation, little is known about the position of the body or the existence of a grave pit. Several perforated deer teeth may belong to a necklace worn by the deceased. A direct AMS date of $13\,107 \pm 166$ cal BP (GifA-95048) once again indicates a final Magdalenian or earliest Azilian age, or perhaps a transitional period between the two [23]. The burial from Le Peyrat (Saint Rabier) is dated to the same period. The remains of an adult male (Peyrat 5), which were found close to a

partially preserved adult female (Peyrat 6) and within Azilian levels, has been dated to $13\,330 \pm 180$ cal BP (GifA-99117). The female individual was, however, dated to the Middle Ages and is, therefore, intrusive ([27], 35–36). No grave goods were reported, but the human remains seem to have been covered with red ochre ([26], 122).

At the site of Aven des Iboussières (Drôme), a karstic sinkhole in the Rhône valley, approximately 426 human remains were recovered during rescue excavations in 1994 in the cave's 'salle supérieure'. Further excavations were cancelled due to the partial collapse of the roof. The remains of four adults and four juveniles and a new-born (MNI = 9) were found in layers 4B and 4C. These were mostly fragmented and mixed with archaeological material. Anatomical connections were not recorded. Some of the human remains from layer 4C and the sediment itself were stained with red ochre. The human remains were found mixed with faunal remains deriving from the occupation of the cave. A large number of personal ornaments were also recorded, as well as a few flint tools [32]. The assemblage of personal ornaments contains engraved and perforated pebbles of small size, naturally perforated fish vertebrae, perforated and ornamented animal long bones and some other mostly fragmentary animal bones bearing decorations, decorated animal mandibles, more than 1000 perforated shells, alongside approximately 200 incised and perforated red deer canines. The human remains may be attributable to the Azilian, although confirmation of this in the form of direct dates on the human remains is still lacking. An isolated date from faunal remains from layer 4C revealed a terminal Palaeolithic date of $10\,210 \pm 80$ BP, $11\,911 \pm 200$ cal BP (OxA-5628) ([32]; [33]). The material could date to a transitional period between the end of Dryas III and the beginning of the Preboreal. Other than a palaeopathological thesis and a general description of the human remains [34,35], a taphonomic analysis is still lacking. The find situation could indicate that the human remains of Aven des Iboussières represent a multiple and/or secondary deposition. However, the existence of primary burials which were subsequently disturbed by taphonomic factors cannot be excluded. The funerary character of the material seems to be indicated by the use of red ochre and the various personal ornaments within the find layer.

With regard to the objects associated with the burials—mostly personal ornaments—the grave from La Madeleine and the remains from Aven des Iboussières are comparable to those of Arene Candide and Grotta dei Fanciulli from Italy. The mode of deposition of Aven des Iboussières could also be comparable to the remains of Grotta Polesini. Although both sites lack a precise date for the human remains, there are similarities concerning the fact that the human remains were found without anatomical connection were stained with red ochre. Additionally, the occurrence of a number of personal ornaments, such as perforated red deer canines, fish vertebrae and shells, in both sites might indicate a similar funerary behaviour at the very end of the Pleistocene or the transition to the Holocene.

3. Early Mesolithic (Preboreal and early Boreal) burials

The Preboreal/early Mesolithic evidence for burials is exceptionally sparse across Europe. However, several sites between

10 300 and 9300 BP (12 000–10 200 cal BP) contain a number of individual burials ranging from single inhumations to ‘collective burials’ of isolated and mostly fragmented human remains. Probably due to the narrow time span of the Preboreal—between the end of the Final Pleistocene and the beginning of the Boreal phase—the number of sites containing human remains is exceptionally limited. This need not indicate a low population density, however. The oldest dates for the Preboreal are from the Arene Candide cave in Liguria, Italy. The calibrated values of two individuals (III and V) are just on the border between the Final Pleistocene and the earliest Holocene, falling between 11 700/11 600 and 11 500/11 400 cal BP. Burial III seems to be slightly older than burial V, which is a double burial of an adult and a child. Burial III is an accumulation of bones, which is interpreted as a secondary burial rather than a disturbed single inhumation [13]. The intact double burial V, which contains an adult male and a child of 4–5 years of age on its left side, is one of the earliest examples of human burial in the Holocene/Preboreal (table 2). This double inhumation disturbed the double inhumation of another adult and child, burial VI, leaving only their lower limbs in place. Burial VI was organized in the same way, however, with the bodies extended on their backs with the child on the left side of the adult. The fact that this double inhumation dates to the very end of the Pleistocene, $10\,585 \pm 55$ BP, $12\,549 \pm 131$ cal BP (OxA-11000) (based on a date on the remains of child VB) shows a continuity of funerary patterns between the final Pleistocene and early Holocene. This scenario is supported by the older date of double burial VI [8]. No grave goods or personal ornaments were recorded on the possible secondary burial III, but a considerable number of objects have been found in close context with double burial V ([62], 277–279). However, there is uncertainty, not only in the case of this double burial, about whether the personal ornaments were worn by the deceased person or were deposited as grave goods, i.e. as ‘offerings’ for the dead ([62], 278–279). In fact, double burial IV is among the richest in the ‘necropolis’ of Arene Candide, indicating the continuity of this burial tradition from the Late Palaeolithic to the early Mesolithic. In addition to fragments and powder of red ochre, several pebbles, some bearing traces of red ochre, and a flint scraper have been found close to the right hand. A similar set of objects was found in the pelvic area alongside two beaver mandibles and a bone point in other areas of the body. Personal ornaments were found both in close contact with and further away from the body. Several perforated red deer canines were lying below the skull and the right shoulder, one shell together with the pebbles in the pelvic area. Several perforated red deer canines along with a perforated shell close to the right hand, where other objects noted above had been discovered. The objects associated with the child were similar. Various small pebbles, some with traces of red ochre, in addition two small pieces of red ochre were found close to the body of the child. Several shells lay close to the skull and the ribs. On the child’s thorax, some 80 squirrel vertebrae were deposited together with another shell. In close contact with the right hand, 26 shells, and in the area of the feet, two perforated shells, were discovered. Finally, together with the pieces of red ochre, 22 shells were found on the left side of the body. This set of body ornaments is not only among the richest in Arene Candide but links this double burial to the Epigravettian and Gravettian burials in Italy, and also to the La Madeleine burial in France.

According to the radiocarbon dates from the cemetery of VasilEvska III in the Ukraine a series of three burials seems to be older than originally supposed [59]. Although the necropolis had been divided into an older and a younger phases (both however attributed to the Late Mesolithic), the three burials from the older burial area have calibrated ages similar to those of Arene Candide burials V and III, i.e. between 11 700 and 11 500 cal BP (table 2). These burials were all placed in a crouched position within oval grave pits. No grave goods or personal ornaments were reported, although sporadic traces of red ochre were found within grave 6 ([59], 281, 350–357). This clearly indicates that either the whole cemetery is earlier than previously thought or at least that the burials were accumulated over a considerable period of time. Further dates from VasilEvska III and other cemeteries from the area are, therefore, highly desirable.

A similar situation is found at Padina in Serbia. The dating of several burials revealed that the dates of the various inhumations on the site, sometimes close to housing structures and concentrated in three sections, were chronologically distinct. While several dates reveal a middle and Late Mesolithic attribution, at least six dates represent an earlier inhumation in the late Preboreal and early Boreal time range [60]. For these burials two phases are, therefore, evident. The first and oldest group (burials 11, 15 and 21), is dated between 12 100 and 11 500 cal BP (or between 11 700 and 10 900 cal BP when corrected for freshwater carbon reservoir effects on the dating). The second group (burials 12, 14 and 39) falls between 11 300 and 11 200 cal BP (corrected around 10 500 cal BP). All burials are single inhumations and none was accompanied by grave goods. The mode of deposition is quite diverse, however; within the older group are two rare seated burials, while the remainder were buried in extended positions, with only burial 12 flexed.

Another example of Mesolithic cemeteries originally dated to the Boreal or even Atlantic phases, but which have now been shown to have older origins, is Olenij Ostrov in Karelia, Russia. Burial 100—a seated adult male—dates to 9910 ± 80 BP (GIN-4836) ($11\,413 \pm 145$ cal BP), and was accompanied by a rich set of animal teeth, 126 lamellae of beaver teeth, 303 elk incisors and 2 perforated bear canines. This grave is the only one of the cemetery dated to the Preboreal; all other dates are much later, i.e. between 7700 and 5700 BP (8600–6600 cal BP) ([59], 250). If this date is correct we have to suggest that the largest Mesolithic cemetery so far with more than 160 graves has its origins in the Preboreal around 11 400 cal BP.

This shows that Arene Candide III, V, VasilEvska III graves 6, 7 and 16, Padina graves 11, 15 and 21, in addition grave 72 at Vlassac, Serbia, are in fact the oldest known burials to date to the Preboreal. At Worm’s Head (South Wales, UK), some isolated bones relating to a minimum number of four individuals were found. It is, however, unclear whether these belong to burials, as they were found isolated within the cave’s sedimentary fill. A scapula was dated to 9920 ± 160 BP, $11\,489 \pm 252$ cal BP (OxA-13 131) indicating an imprecise date between the early Preboreal and early Boreal. The other bones were dated to the late Preboreal or early Boreal (table 2) ([47], 32–33; [63]).

A radiocarbon date of $10\,879 \pm 164$ cal BP (ETH-6668) was measured on a calvarium found close to the Höhlesbuckel rock shelter near Blaubeuren-Altental in Baden-Württemberg [57]. The remains were discovered between 1949 and 1951 during the construction of a car park, unfortunately without

Table 2. Early Mesolithic (Preboreal and early Boreal) burials. *Commingle sample (46 fragments).

site	chronology direct dates	individuals	grave features	objects	references
Aveline's Hole	8890 ± 45 GrA-22421	~ 50 Individuals	single inhumations double burials? Secondary burials?		[46,47]
	8925 ± 45 GrA-22431				
	8960 ± 50 GrA-22938				
	8980 ± 50 GrA-22605				
	9020 ± 50 GrA-22555				
	9060 ± 50 GrA-22546				
	9075 ± 45 GrA-22428				
	9090 ± 45 GrA-22433				
	9095 ± 45 GrA-22422				
	9100 ± 45 GrA-22429				
	9120 ± 50 GrA-22557				
	9130 ± 60 GrA-22621				
	9155 ± 45 GrA-22432				
	9170 ± 50 GrA-22547				
	9170 ± 50 GrA-22548				
9180 ± 50 GrA-22607					
9200 ± 50 GrA-22552					
9210 ± 70 GrA-22558					
Gough's Cave	9100 ± 100 (OxA-814)	1 (Cheddar Man)	single inhumation		[47–49]
	9080 ± 150 (BM-525)				
Badger Hole	9360 ± 110 (OxA-1459)				[47–50]
	9060 ± 130 (OxA-679)				
Worm's Head	9920 ± 160 (OxA-13131)	isolated bones, 2 femur, ulna, scapula, 2 crania			[47]
	9450 ± 50 (OxA-11128)				
	9420 ± 55 (OxA-11083)				
	9360 ± 50 (OxA-11129)				
	9294 ± 49 (OxA-16607)				
	9255 ± 45 (OxA-19844)				

(Continued.)

Table 2. (Continued.)

site	chronology direct dates	individuals	grave features	objects	references
Greylake	9118 ± 37 (Wk-30930) 9134 ± 37 (Wk- 30931) 9170 ± 40 (OxA -25666)	2 skulls, mandible, postcranial remains	burials?		[51]
Grotte Margaux	9190 ± 100 (Lv-1709)* *9590 ± 110 (GifA-92345) 9530 ± 120 (GifA-92355) 9260 ± 120 (GifA-92362) 9530 ± 120 (OxA-3533) 9350 ± 120 (OxA-3534)	MNI: 9 adult females	collective burial in a pit	red ochre on bones	[52]
Abri des Autours	9500 ± 75 (OxA-4917) 9090 ± 140 (OxA-5838)	1 mature female collective burial, MNI: 6 (1 cremated)	grave pit pit		[53]
Grotte des Sarrasins (Loverval)	9640 ± 100 BP (GifA-94536)	2 adult female burials	disturbed		[52–55]
Fissure de Claininforge	9090 ± 100 (Lv-1506) 9525 ± 60 (OxA-10552)	MNI: 5	disturbed by modern activity (collective burial)		[54,55]
Faille du Burin	9320 ± 75 (OxA-5451) 9520 ± 55 (OxA-10585) 9345 ± 75 (OxA-8938) 9335 ± 65 (OxA-10595) 9315 ± 50 (OxA-10564)	3 adults, 2 children 8–9 years MNI: 6 4 adults, 2 children	collective burial		[54,55]
Bois Laiterie	9515 ± 65 OxA-8910) 9445 ± 60 (OxA-8878) 9420 ± 65 (OxA-8911) 9235 ± 85 (GX-21380)	MNI: 6 4 adults, 2 children (one~2 years)	collective burial	red ochre on some bones	[54,55]
Grotte Lombeau	9410 ± 70 (OxA-6441) 9360 ± 75 (OxA-6440) 9015 ± 80 (OxA-6445)	several individuals	collective burial	red ochre on some bones	[54,55]
Grotte de Petit-Ri	9270 ± 90 (OxA-5042)	MNI: 4 (adult)	collective burial		[54,55]

(Continued.)

Table 2. (Continued.)

site	chronology direct dates	individuals	grave features	objects	references
Bourg Charente	9330 ± 50 BP (Beta-283143)	1: adult	single inhumation	2 flint flakes	[56]
Houleau	9250 ± 50 BP (OxA-5683)	2: bone remains	grave pit flexed position	1 limestone pebble (usewear)	[27]
Blaubeuren-Altental	9520 ± 80 BP (ETH-6668)	adult male			[57]
Blätterhöhle	9700 ± 30 (KIA-45012)	MNI: 7 (2 children, 5 adults) individuals			[58]
	9475 ± 50 (OxA-14466)	isolated remains			
	9435 ± 40 (KIA-26265)				
	9470 ± 45 (OxA-14463)				
	9460 ± 45 (KIA-37515)				
	9390 ± 35 (KIA-24689)				
	9370 ± 45 (KIA-37509)				
	9355 ± 40 (KIA-37516)				
	9275 ± 45 (KIA-37511)				
Arene Candide, cave, Italy	III: 10,065 ± 55 BP (OxA-10998)	III: 1 Ind.	double burial,	red ochre, grave goods?	[6–9]
	Vb: 9925 ± 50 BP (OxA-10999)	V: 2 Ind.	secondary burial		
VasilEvska III	V6: 10,060 ± 105 BP (OxA-3807)	6: adult	all flexed positions	6: red ochre	[59]
	V7: 9980 ± 100 BP (OxA-3808)	7: infant	all single inhumations		
	V16: 10,080 ± 100 BP (OxA-3809)	16: adult/mature female			
Olenij Ostrov	100: 9910 ± 80 BP (GIN-4836)	100: adult male	sitting position	126 lamellae of beaver teeth, 303 elk incisors, 2 perforated bear canines	[59]
			single inhumation		

(Continued.)

Table 2. (Continued.)

site	chronology direct dates	individuals	grave features	objects	references
Padina	12: 9331 ± 58 BP (BM-1146) 14: 9198 ± 103 (BM-1147) 39: 9292 ± 148 (BM-1404) 11: 10,000 ± 60 (OxA-11104) 15: 9480 ± 55 (OxA-11105) 21: 10,095 ± 55 (OxA-11106)	12: mature male 14: adult male 39: infant 11: infant 15: – 21: –	12 flexed 14, 39, 11 extended 15 and 21 seated single inhumations		[59,60]
Vlassac	72: 9850 ± 130 BP (OxA-5824)	72: late adult – mature female	extended single inhumation	dark red sediment with charcoal	[61]

any proper excavation. It, therefore, remains unclear whether the remains from the Höhlesbuckel site represent a disturbed inhumation of one to three Mesolithic individuals or an accumulation of isolated remains.

Several Belgian sites with human remains fall within this time range from 9500 to 11 300–11 000 cal BP are known from the area between the rivers Meuse and Sambre, close to Namur and Dinant [55,67]. Grotte des Sarrasins (Loverval), Grotte de Claminforge, Grotte de Petit Ri, Grotte du Bois Laiterie, Abri des Autours and the Grotte Margaux, for example, contained human remains in early Mesolithic (Preboreal and early Boreal) contexts. These sites have been excavated during the last 30 years of the twentieth century, but some have suffered from damage by construction and quarrying or have been excavated by speleologists. In these cases, there has been a considerable loss of information, and additionally bioturbation has limited the archaeological information available in some cases. Modern archaeological excavations have been carried out at the Grotte Margaux and Abri des Autours that makes them key sites for an understanding of early Mesolithic funerary behaviour in the region [52,65].

Most of the identification of the remains as Mesolithic is due to direct AMS radiocarbon dating carried out on a number of the sites [54,55]. Remarkably most of these sites dated to the Preboreal or early Boreal, and there is a considerable lack of sites dating to the subsequent middle or even late Mesolithic. The early Mesolithic sites show various characteristics; remains were typically found within small cavities, the only exception is the site of Grotte Margaux where the human remains were found in the narrow rear part of the cave [52], and usually little or no archaeological (i.e. occupation) material was associated with them. This is probably because these sites simply were too small to be occupied. Any kind of personal ornament in association with the human remains is completely absent, and the use of red ochre on the human remains was recorded in only a few cases. One of the main similarities of the Mesolithic remains in the Meuse area is the lack of anatomical connection between skeletal elements. Bones are mostly found in fragmented state, although some complete bones and skulls have been recorded. Occasionally, the remains of several individuals (MNIs = 4–9) were deposited in pits, but mostly the bones must have been deposited on the surface (i.e. floor) inside the caves. Although fragmented, manipulations on the remains are rare; exception is a skull from Grotte Margaux with perimortal cut marks on the cranium. This activity seems to be linked with the funerary practice at the site [66].

The Blätterhöhle at Hagen, Germany contains a number of Mesolithic human remains similar to the Belgian sites, radiocarbon dates for which range between 11 500 and 11 300 cal BP (table 2). An MNI of seven individuals (five adults and two children aged between 5–6 and 8–10 years) was recovered from the narrow cave, scattered within the sediment of the cave's interior in a very good state of preservation, if generally fragmentary. The deliberate placement of three boar skulls in context with the human remains is so far unique for the Mesolithic [58].

The newly discovered isolated burial of Bourg Charente, southwestern France falls within the same period. The body was found in a tightly flexed position within a grave pit. The AMS date of 10 544 ± 78 cal BP (Beta-283143) (table 2) places it in the late Preboreal between 10 700 and 10 400 cal BP. Three objects—two flint flakes and a used limestone pebble—were found close to the body and can reliably be regarded as grave goods [56]. Owing to missing information,

the Houleau 2 burial in the Gironde remains largely uninformative. The remains were dated to 9250 ± 80 BP (10 600–10 400 cal BP), i.e. the transitional phase between the Preboreal and the Boreal ([27], 16) (table 2).

Despite the ‘Cheddar Man’ skeleton found in Gough’s Cave in 1903, another site that is of great importance for the early Mesolithic burials is Aveline’s Hole, both in Somerset, UK. The human remains from Gough’s Cave seem to belong to a single inhumation or deposition in a side chamber of the cave [47,48,50]. The situation at Aveline’s Hole is, however, more complex [46]. The site has suffered from a rather early discovery beginning in the eighteenth century, with successive activities inside the cave including the removal of sedimentary material. Of greater importance are the excavations of 1914 and between 1919 and 1930. Reports on these suggest a relatively simple stratigraphy and human and faunal remains in large numbers, whereas lithics only represented in lower numbers, suggesting less of an occupation of the cave. The human remains were mostly preserved in form of a bone scatter, but at least two burials of complete bodies were recorded. A double burial (A) was found below a hearth, whose relation to the burial is unclear. The bones of the two adult individuals were unburned, although 18 red deer incisors, which were found in a possible relation to the burial, showed signs of burning. The dating of this double burial is unclear, and it could even be late Upper Palaeolithic in age ([46], 171–181). A second inhumation of a single adult individual (B) was found near the double burial (A). Although heavily affected and destroyed by a massive rock fall, a number of objects were recorded in close contact with the skeleton, including six flint blades, numerous red deer teeth and the tooth of a young brown bear. Nearby, close to the cave wall, three red deer antlers with cranial fragments attached to them were found. As the collection of the human remains was heavily damaged during the Second World War, the number of individuals is rather vague. Based on the surviving collection of 860 bones the MNI is 21, but the real number could originally have been much higher, possibly up to 50. If correct this would make the Aveline’s Hole collection the largest sample of human remains from the early Mesolithic of Europe. The dating of the assemblage is based on 18 AMS radiocarbon measurements on 17 left ulnae and 1 cranium, therefore representing an MNI of 17 individuals. The dates between 11 200 and 10 900 cal BP indicate a use of the cave as a burial place in the transitional period between Preboreal and early Boreal. This relatively short time span and the fact that subadult individuals, especially small children, are underrepresented, could indicate that the cave was selectively used as a burial place by a larger group or by several smaller groups over 100 or 200 years.

Similar radiocarbon dates have been found at two skulls and a mandible from a sandpit at Greylake, Somerset, UK (table 2). The human remains including postcranial fragments representing a minimum of five individuals were excavated in 1928, but dated only recently to the early Boreal. The facts that skulls and long bones, together with some smaller skeletal elements were preserved might indicate the presence of complete burials at the site.

4. Conclusion

This review of the Late Upper Palaeolithic and early Mesolithic (Preboreal and early Boreal) European funerary record

may be incomplete, as several burials are still undated or insecure and were, therefore, omitted from the study. In various cases, new AMS radiocarbon dates have changed previous attributions to the Late Upper Palaeolithic (LUP) or the Mesolithic and further direct dating will inevitably bring more changes to the sample.

The occurrence of burials from the European LUP is relatively diverse. It is quite obvious that the sample from the Italian peninsula is the richest one. In this case, the single and double inhumations of adults and children clearly reflect an Epigravettian and (earlier) Gravettian tradition. In most cases, adults and children were buried in the same way, occasionally even together in the same grave. The dominant rite was of inhumations with the body lying extended on its back and with little or no grave goods excepting basic equipment such as flint tools and personal ornamentation such as perforated shells.

Burials in other parts of Europe (Spain, France and Germany) are quite rare. Where present they seem to follow the general pattern, although there is a considerable lack of information on several of these. However, the use of red ochre, the occurrence of a limited number of personal ornaments and rare provision with stone artefacts seems again to have been a common practice. An exception to this pattern is the La Madeleine burial, which was richly equipped with personal ornaments, and that of Los Azules, with its possible tool kit. Concerning the objects associated with the burials, the personal ornaments from the La Madeleine burial, the objects from Aven des Iboussières are comparable to those from Arene Candide and Grotta dei Fanciulli in Italy, and furthermore the mode of deposition of Aven des Iboussières could be comparable to the remains of Grotta Polesini. Although both sites lack a precise date for their human remains, there possess similarities in that the human remains were found in disarticulated state and were stained with red ochre. Additionally, the occurrence of a number of personal ornaments, such as perforated red deer canines, fish vertebrae and shells, at both sites could indicate a similar funerary behaviour at the very end of Pleistocene or the transition to the Holocene. These two sites can also be interpreted as a form of cemetery where the incomplete remains of several humans were deposited in what could be interpreted as secondary burials. Additionally, such ‘cemetery-like’ structures are also visible in other cases, with a considerable number of single and double inhumations involved at San Teodoro, Riparo di Romito and most convincingly Arene Candide.

For the early Mesolithic burials of the Preboreal and early Boreal, it seems obvious that single inhumations in either flexed or extended positions within caves and rock shelters still played an important role. As this is comparable to the traditions of the Late Upper Palaeolithic, we could suggest that this is an important aspect to argue for continuity in traditions between these environmentally distinct periods. There are, however, several nuanced differences between the LUP and early Mesolithic burials. It seems quite striking that there is an almost complete lack of personal ornaments and a much reduced inventory of objects which can be identified as grave goods in the latter. Grave 100 at Olenij Ostrov—so far the only one from this large Mesolithic graveyard dated to the Preboreal—and the double burial V from Arene Candide are the only exceptions to this. The use of red ochre is recorded in several cases, but descriptions emphasize the fact that the red ochre was found mostly on the bones

themselves and not within the fills of the graves on the level of the burials. Possible secondary burials of individuals were identifiable at Arene Candide III for the Preboreal and possibly also at Aveline's Hole in the early Boreal phase. A new aspect in these burial traditions is the occurrence of assemblages of human remains, often of adults and infants alike. These assemblages were found mostly within caves and rock shelters in the Meuse region in Belgium and in the Blätterhöhle in Germany almost 300 km distant. These so-called 'collective burials' contain the disarticulated and sometimes fragmented remains of a minimum of 4–10 individuals. Grave goods are not identifiable, but the use of red ochre was recorded several times in the Belgian sites. Whether these collective burials can be seen as an equivalent of cemeteries is an open question. Cemetery-like structures with single and double inhumations have not been identified in the Preboreal. In the early Boreal, by contrast, sites such as Aveline's Hole, and maybe the open-air site of Greylake as well can be seen as one of the first Mesolithic cemeteries [67]. The Mesolithic double burial V and the secondary burial III at Arene Candide clearly show that the LUP tradition of a cemetery was transferred to the postglacial period, at least at this site. According to the AMS radiocarbon dating of later cemeteries, it becomes evident that sites such as Olenij Ostrov, VasilEvaska III, Padina and Vlasac all had earlier

origins in the Preboreal. Further dating of other burials from these sites and AMS radiocarbon dates from as yet largely undated Mesolithic cemeteries may yet reveal that the tradition of burials within cemeteries is also linked with the Preboreal. The fact that the first cemeteries can be dated to the LUP links this burial tradition with the Final Pleistocene. Most certainly we are dealing with local burial traditions in the LUP and the early Mesolithic, but given the sparse findings these are sometimes hard to identify. The LUP burials in Italy and the Mesolithic collective burials in the Meuse area seem to be part of such a tradition. Further on it is important to note that the Mesolithic burial practice is not only to be seen in the tradition on LUP burials, but shows a high amount of variation. The Mesolithic burial practice is highly diverse including single, double, multiple burials, cremations, manipulation of bodies, secondary single and collective burials, burials in cemeteries, in caves, rock shelters and open air sites, as well as water burials and head burials. This diversity is in many aspects already visible in the Upper Palaeolithic, but reaches a new level in the Mesolithic.

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