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BURIAL EVIDENCE FOR THE SOCIAL DIFFERENTIATION OF AGE CLASSES IN THE EARLY UPPER PALEOLITHIC

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Résumé. Il y a 24.5-25 milliers d'années, un enfant âgé de 4.5-5 ans a été enterré dans l'abri de Lagar Velho, Portugal. Les rites funéraires sont similaires à ceux documentés dans les sépultures contemporaines d'adolescents et d'adultes connues en Europe centrale et orientale. Ceci indique que, normalement, dans le Gravettien, les individus décédés après le sevrage étaient enterrés. Aucun autre enterrement n'a été identifié à Lagar Velho, en accord avec le fait que, ailleurs en Europe, les sépultures d'enfants correspondent toujours à des occurrences isolées; jamais, dans les exemples connus de sépultures multiples et dans les différentes grottes-"cimetière" fouillées jusqu'à présent, a-t-on retrouvé adultes et enfants ensemble. Ceci, aussi bien que la discrimination contre fœtus et enfants de moins de trois ans (dont on ne connaît pas de cas clairs de sépulture rituelle dans le Gravettien), indique qu'une différentiation sociale des différentes classes d'âge est apparue après 35.000 ans BP. Dans le Paléolithique Moyen précédent, en effet, la représentation des fœtus et d'enfants de moins de trois ans dans l'échantillon d'individus enterrés approche un profil de mortalité normal, et aucune différence dans le traitement des morts selon leur âge peut être déduit des sépultures connues.

Abstract. The burial of a 4.5-5 year old child was emplaced 24.5-25 kyr ago in the Lagar Velho rock shelter, Portugal. The funerary rites are similar to those documented in the contemporary adolescent and adult burials of central and eastern Europe, suggesting that Gravettian children were considered worthy of ritual burial past weaning. No other burials were found at Lagar Velho, which is consistent with the fact that, elsewhere in Europe, children's burials are always isolated occurrences; adults and children are never found together in multiple burials or in the same cave "cemeteries". Coupled with the discrimination against fetuses and infants (seldom, if at all buried in Gravettian times), this particular treatment of children suggests that a social differentiation of age classes emerged after ca.35 kyr BP. In fact, in previous Middle Paleolithic times, the representation of fetuses and infants in the available sample of burials approaches expected mortality patterns, and no differences in treatment at death between the different age classes are apparent.

Introduction

The mosaic anatomy of the Gravettian child skeleton excavated in 1998-99 at the Lagar Velho rock shelter (Lapedo valley, Leiria, Portugal) provided major insights into the replacement of Neandertals by modern humans in the Iberian Peninsula, with implications for our understanding of the process elsewhere in Eurasia (Duarte *et al.* 1999; Trinkaus *et al.* 2001; Zilhão & Trinkaus 2001, 2002a; Trinkaus & Zilhão 2002). Integrating some diagnostic Neandertal features in an otherwise overall modern human morphology, this anatomy indicates that, at the time of contact with modern humans, one to two hundred generations earlier, the last of the Iberian Neandertals interbred extensively with the newcomers; their ultimate disappearance is best interpreted, therefore, as resulting from absorption through admixture.

In the framework of the monographic publication of the find (Zilhão & Trinkaus 2002b), an exhaustive study of its archeological features (Duarte 2002; Moreno-García 2002; Queiroz 2002; Vanhaeren & d'Errico 2002; Zilhão & Almeida 2002), coupled with the relevant comparisons with all other then known Middle and Upper Paleolithic burials (Zilhão & Trinkaus 2002c), was also carried out. In this paper, I will present a summary of the inferences on the social significance of Paleolithic burial practices derived from these studies, and I will discuss them in the light of the new evidence and interpretations published since.

The ritual burial of the Lagar Velho child

Although indications of a sporadic frequentation of the site before 27,000 BP exist, human habitation in the Lagar Velho rock shelter is not documented until ca.23 kyr ago. In the intervening period, the only record of human activity is the child's burial event, which took place ca. 24.5-25.0 kyr ago (Pettitt *et al.* 2002). Geoarcheological evidence (Angelucci 2002) suggests that, at the time, the location selected for the emplacement of the burial corresponded to a stretch of land isolated between the back wall of the shelter (to the south), the stream running through the valley (to the north), a water fall (to the east), and a karstic spring (a few meters to the

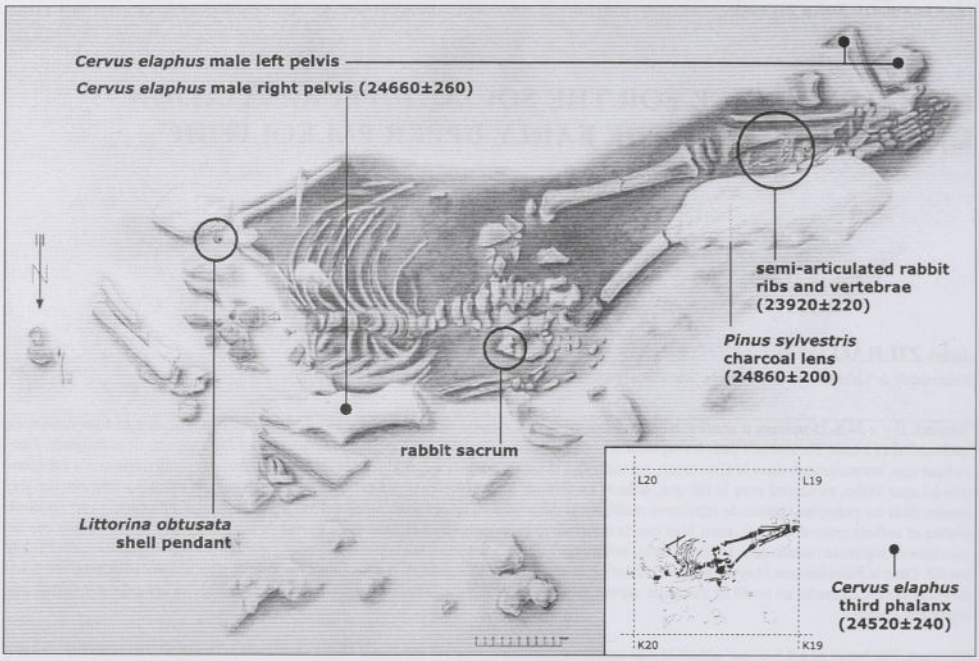

Figure 1. Composite drawing of the Lagar Velho child's burial with provenience of the dated radiocarbon samples and of the in situ items associated with the burial ritual (after Zilhão & Almeida 2002, fig. 3-7).

west). The burial pit was excavated under the protection of a shallow overhang formed by a recess of the shelter's back wall, possibly the uppermost part of a former cave entrance filled-up by the accumulation of the underlying fluviatile and mixed continental-fluviatile sedimentary succession.

Thanks to this protected location, the burial context was almost untouched when, in late 1994, terracing of the site almost completely removed the upper part of the shelter's stratigraphy. Only the skull - laying at a slightly higher elevation and, more importantly, somewhat protruding from the drip line of the shallow recess - as well as the right shoulder and upper arm, were affected by this work. The right shoulder was crushed, the right humerus missing, and the fragmented skull was scattered. However, systematic excavation of the disturbed sediments surrounding the burial pit enabled almost complete recovery of the skull and, subsequently, physical as well as virtual, computer-aided reconstruction (Zollikofer *et al.* 2002). In the 56 m² thus excavated, all the human remains recovered belonged to a single individual, of the same age as that represented by the in situ articulated skeleton and corresponding to parts missing in it. No evidence exists, therefore, to contradict the two conclusions derived from these data: that all such fragments originally belonged to that skeleton; and that no other burials existed in the terraced deposits.

The buried body belonged to a child who died during the fifth year of life. He or she was laid down in extended position, head to the east and feet to the west (fig. 1). The head leaned on the left side and the arms were alongside the body, the right hand resting, open, on the right hip. The legs were slightly flexed, rising towards the feet, which were at approximately the same elevation as the skull but well protected inside the recess. The hips were at a slightly lower elevation, on the deepest part of the pit, which, originally, was probably no more than 20-30 cm deep. Directly under the legs there was a lens of charcoal, created by the combustion of a single branch of Scots pine (*Pinus sylvestris*), suggesting that a small ritual fire was lit at the bottom of the pit before the deposition of the body. A stone cairn may have covered the burial, but the disturbance created by the site terracing, which came within a few centimeters of the articulated skeleton, precludes certainty.

Both the upper and lower surfaces of the bones, as well as the sediments filling the empty space between them, were of an intense red color, forming an extensive stain with the size of a child's body and resulting from the use of ochre in the burial ritual. This distribution, plus the disposition of the feet bones (hyperextended but preserving perfect anatomical connection between them and with the legs) and of the fibulae (in

their correct anatomical position, not rotated sideways) suggest that, before deposition, the body was tightly wrapped by a red-tainted semi-rigid skin or textile envelope. Once the shrouded corpse was laid down in the pit, a dead juvenile rabbit was placed across the lower legs before re-filling. Two red deer pelves, one by the feet, the other by the shoulder, may have been used as construction material, to mark the outline of the pit, or could represent meat offerings.

It is not known whether the child was buried naked or wearing clothes. The only ornaments found consist of two *Littorina obtusata* perforated shells, one found in situ in the neck area, the other found broken in overlying disturbed sediments. Given their size, these shells could only have belonged to the morphs *fusca*, *olivacea* or *aurantia*, that is, their original color could have been dark brown, olive green or orange. Four pierced red deer canines were recovered in association with a cluster of scattered cranial fragments in a pocket of disturbed sediments located 3 m east of the burial. Their technological and comparative study suggests that these objects of personal ornamentation were part of a diadem and formed a symmetrically arranged row: the two smaller ones (from two different females) at each end, the two larger ones (from two different males) in the middle.

Social implications of the Lagar Velho burial

The two male red deer canines associated with the Lagar Velho child were perforated by the same person and, in all probability, at the same time. The two female ones, however, display different perforation and suspension techniques, suggesting that they were made by different persons and that they correspond to objects recycled for the occasion. Vanhaeren & d'Errico (2002) argue that these observations are consistent with a model of resource sharing whereby deer canines, like selected chunks of the hunted meat, were distributed following rules dictated by tradition and likely based on kinship ties: that "fake" pairs were used in the child's diadem when "true" ones were most certainly available would suggest a deliberate reunification in the dead child's ornamentation of elements of a class of strongly symbolic items previously scattered through exchange and gift; in this way, upon a death event, society would ritually represent its own unity as well as that of the world of humans with the world of the prey upon whose hunting their subsistence relied.

The *Littorina* shells associated with the child are identical to those found in the later Gravettian habitation levels of the site and in other non-funerary Portuguese cave settlements of the same period. Thus, they do no show the tendency to bead miniaturization reported from the broadly contemporary and much later (Magdalenian) burials of pre-adult individuals of, respectively, Sunghir (White 1999) and La Madeleine (Vanhaeren & d'Errico 2001). The absence of a bead production specifically meant for children, as well as the fact that the contemporary Gravettian burials of England and Wales have grave goods similar to those of Lagar Velho, may suggest that, in southern and western Europe, at this time, personal ornaments probably reflected cultural affiliation more than social status (Vanhaeren & d'Errico 2002).

The fact that no other interments were placed at Lagar Velho is in apparent contrast with the well-known earlier Upper Paleolithic pattern of repeated burial use of the same location, as exemplified by the Grimaldi caves (Giacobini 1999), Dolní Věstonice and Pavlov (Klíma 1963, 1995; Svoboda 1991, 1997; Sládek *et al.* 2000) or Sunghir (Bader 1998). Burials of young children, however, are unknown at such funerary sites; moreover, no well-documented instances of the highly ritualized burial of such young children were previously known in the Upper Paleolithic. The significance of these facts was brought to light as soon as Lagar Velho could be set against the appropriate comparative background: a data base of Middle and early Upper Paleolithic burials compiled on the basis of a critical evaluation of the published evidence and containing the relevant information on the demographic profiles of the thanathocenoses and on the spatial and artifactual associations of the different individuals buried in the same places, sites or tombs/pits (Zilhão & Trinkaus 2002). An updated version of the list of Middle and early Upper Paleolithic buried individuals derived from that data base is provided here as table 1.

The stratigraphic and radiometric evidence shows that all burials in the data base fall into three separated time periods. An *Early Cluster*, between ca.120 and ca.90 kyr BP, comprises the earliest Shanidar burials as well as Qafzeh and Skhul. An *Intermediate Cluster*, between ca.70 and ca.35 kyr BP, comprises the early Upper Pleistocene classical Neandertal burials of both Europe and western Asia (La Ferrassie, Le Moustier, Amud, Dederyieh, Kebara, etc.), as well as the Taramsa modern human child; Mezmaiskaya was included in this cluster because the stratigraphic information (burial feature sealed under levels well dated to >40 kyr BP - Golovanova *et al.* 1998a, 1998b, 1999) was considered more reliable than the direct date of ca.29 kyr BP reported by Ovchinnikov *et al.* (2000). A *Late Cluster*, between ca.27 and ca.20 kyr BP, comprises the Gravettian burials of Moravia, Italy and western Europe, many of which are now directly dated, as well as the contemporary Gorodtsovian and "Eastern Gravettian" burials of Russia and Siberia.

Several patterns emerged from the data set when, inside each temporal cluster, the different individuals were grouped into sex and age classes. The latter were established on the basis of the most relevant ontogenetic thresholds (birth, weaning and puberty): fetuses, infants (up to 3 years), children (up to 12 years). Adolescents were separated from adults using age 15 as a threshold because, even though full skeletal maturity is not yet attained, healthy females usually become fertile around that age, past which, therefore, they are eligible for marriage; moreover, in most hunter-gatherer cultures, females and males above 15 are active participants in most if not all aspects of the group's social and economic life. Although no gender-related distinctions could be found, it became clear that the age-group composition of the thanathocenoses form-

Fetuses	Infants	Children	Adolescents	Adults
Earlier Middle Paleolithic (120-90 kyr BP)				
	Qafzeh 13	Qafzeh 10, 12, 15, 21, 22	Qafzeh 11	Qafzeh 3, 6, 7, 8, 9 , 15
	Shanidar 7, 9	Skhul 1, 8, 10		Shanidar 4, 6, 8
	Shanidar 9			Skhul 2, 3, 4, 5, 6, 7, 9
Later Middle/Early Upper Paleolithic (70-35 kyr BP)				
La Ferrassie 5	Amud 7	La Ferrassie 3, 6	Le Moustier 1	Amud 1
Nazlet Khater 1b	Dederiyeh 1, 2	Taramsa 1		Feldhofer 1
	Kebara 1	Teshik-Tash 1		Kebara 2
	Kiik-Koba 2	Zaskalnaya 3		Kiik-Koba 12
	La Ferrassie 4b, 8			La Chapelle-aux-Saints 1
	Le Moustier 2			La Ferrassie 1, 2
	Mezmaiskaya 1			La Quina 1
	Roc-de-Marsal 1			Le Régourdou 1
	Zaskalnaya 1, 2			Nazlet Khater 1a, 2
				Saint-Césaire 1
				Shanidar 1, 3
				Spy 1, 2
mid-Upper Paleolithic (27-20 kyr BP)				
	Cro-Magnon 5	Dolni Vestonice 4	Arene Candide 1	Baousso da Torre 1, 2
	Dolni Vestonice 36	Kostenki 15 burial	Baousso da Torre 3	Barma Grande 1, 2, 5, 6
	Predmosti 6, 11, 12, 13	Kostenki 18 burial	Barma Grande 3, 4	Brno 2, 3
		Lagar Velho 1	Cussac 1	Caviglione 1
		Malta 1	Fanciulli 6	Cro-Magnon 1, 2, 3, 4
		Predmosti 2, 8, 15, 16, 17	Paglicci 2	Cussac 2, 3, 4, 5
		Sunghir 3	Predmosti 7	Dolni Vestonice 3, 13, 14, 15, 16
			Sunghir 2	Fanciulli 4, 5
				Kostenki 2 burial
				Kostenki 14 burial
				Ostuni 1, 2
				Paglicci 3
				Paviland 1
				Pavlov 1
				Předmostí 1, 3, 4, 5, 9, 10, 14, 18, 27
				Sunghir 1
				Veneri Parabita 1, 2

Table 1. Clustering in age classes of the 134 Middle and early Upper Paleolithic individuals for whom there is secure evidence of burial (after Zilhão & Trinkaus 2002, modified).

ing each of the three clusters was significantly different, and that a differential treatment at death of infants and children existed in the *Late Cluster*.

In the period of the Middle Paleolithic after ca.70 kyr BP, the number of fetuses' and infants' burials is equal to that of adults, matching an expected mortality distribution for immature individuals and suggesting that there was little discrimination on the basis of age. Moreover, the evidence for ritual other than interment is as strong (or as weak…) among the youngest individuals as among older children. Besides the decoration on the lower surface of the slab covering the La Ferrassie 6 child and the controversial circle of goat horns associated with Teshik-Tash 1, both the Amud 7 and Dederiyeh 1 infants are associated with variably convincing evidence of ritual. This is all the more significant since, in the Intermediate Cluster, such evidence is remarkably fainter where adults are concerned.

In the Gravettian, however, fetuses and infants are only 9% of the total, significantly less than the 26% found in the principally Middle Paleolithic, combined *Early* and *Intermediate* sample. Moreover, those 9% correspond to only six individuals: Cro-Magnon 5, Dolní Věstonice 36, and Předmostí 6, 11, 12 and 13. Whether the first two correspond indeed to burials is questionable. Cro-Magnon 5 may well be a late fetus or newborn perinatally dead with the mother (the adult female Cro-Magnon 2?) and buried with her, not the separate, individualized burial of a fetus such as is documented in the Middle Paleolithic by La Ferrassie 5. The Dolní Věstonice 36 infant, in turn, is a set of teeth identified among faunal remains, inferred to possibly represent a burial because of the otherwise taphonomically unusual anatomical association; given the circumstances, however, the inference is necessarily weak. Where Předmostí is concerned, the infants in question are part of a collective "mass grave" containing the remains of 18 individuals. This absolutely unique feature may well be related to the simultaneous death and subsequent interment of a complete band, i.e., an entirely exceptional event that may have required burial procedures out of the ordinary. In any case, and notwithstanding the Předmostí exception, it would seem, therefore, that fetuses and infants may not have been buried at all in the Gravettian or, at least, that, when such was the case, no ritual was involved besides interment itself.

In this context, the fact that the Lagar Velho child was buried with a ritual identical or very close to that used for adults of

the same period suggests that, in the Gravettian, a significantly threshold existed between 3 and 5 years of age and was socially recognized as such. One is therefore entitled to speculate that, in normal conditions, Gravettian people did not bury fetuses and nursing infants because they may have considered that an individual existed as an independent person (and, hence, worthy of burial at its death) only after becoming independent, in terms of subsistence, from its mother, i.e., after weaning. This inference is consistent with the patterns of spatial association revealed by multiple burials and "cemetery" caves (i.e., cave sites that were repeatedly used for funerary purposes, even if settlement activities are also documented therein), which suggest a "mutual avoidance" of children and adults. All multiple burials known, in fact, associate adults with adults (Cussac, Dolní Věstonice, Veneri Parabitta), adults with adolescents (Barma Grande, Fanciulli), or adolescents and children (Sunghir), but never children with adults. The same holds for "cemetery" caves: only adolescents or adults were buried in Arene Candide, Baousso da Torre, Barma Grande, Cro-Magnon, Cussac, Fanciulli, Ostuni, Paglicci, Paviland and Veneri Parabitta.

Thus, an explanation can be suggested for why no other burials existed at Lagar Velho: adolescents and adults of the group were buried elsewhere, a special place being required for the ritual disposal of the body of such a young child. This explanation is consistent with the fact that, in the *Late Cluster*, open air burials of children (in the sites of Dolní Věstonice II, Kostenki 2, Kostenki 15 and Malta) tend to be isolated occurrences. The Předmostí "mass grave", which also contained five children, is of course exceptional in this as in almost everything else. However, in a certain sense, it also conforms to the pattern. According to Klíma's (1991) reconstruction of the distribution of the bodies, infants and children seem to have formed age-specific spatial clusters inside the grave; three nursing individuals, in particular, were reportedly found close together, clearly separated from the other members of the group and, more importantly, from their putative mothers.

It would seem, therefore, that weaning and the onset of puberty represented two major episodes in the lives of Gravettians. Past weaning, they would become "persons", i.e., independent human beings worthy of proper ritual upon an untimely death but not quite part of the same world as adults; past puberty, they would abandon the childhood "limbo" to become full members of the social group, in rights and duties, and would be treated as such, as indicated by the non-segregation of adolescents and adults apparent in the burial data. No evidence for such a differential treatment of age-classes exists where the Middle Paleolithic is concerned. Although no instances of true multiple burials are known (at Shanidar and Zaskalnaya different individuals were found together but the features are best interpreted as consecutive, not simultaneous funerary uses of the same place), cave or rock shelter "cemeteries" (most notably La Ferrassie) indiscriminately contain infants, children and adults. This contrast between the two periods suggests that age-related burial rules only emerged after ca.35 kyr BP, although it remains of course possible that, prior to that time, age classes may have been recognized even if such a recognition was not reflected in archeologically-preserved manifestations of material culture.

New evidence and interpretations

The validity of the conclusions above is contingent upon the verification of the data and assumptions underlying the organization of the burial evidence in time clusters and age classes. Moreover, the degree of completeness of the list of burials and the unbiased character of the criteria utilized to classify as intentional burial sets of human remains found in field situations for which no corroborating archeological evidence (such as features, artifact associations) exists need to be assessed against new evidence and discoveries.

Comparison of table 1 with the list previously published (Zilhão & Trinkaus 2002) shows that only three individuals not included before because of the doubts surrounding their true chronology (Gambier 1992) have meanwhile been found worthy of inclusion in the data base: Nazlet Khater 1a, 1b and 2 (Vermeersch 2002). Although direct dating of Nazlet Khater 1a failed due to the very low collagen content of the poorly preserved bones, an AMS date on charcoal associated with a piece of ostrich eggshell located by the feet of this individual yielded a result of 37,570/+350/-310 BP (GrA-20145); the association seems archeologically reliable, hints at an use of fire in the burial ritual and, chronologically, places this specimen among the later members of the *Intermediate Cluster*. Bones (part of the ribs and vertebrae) of "a new-born child, or, more probably, a fetus" (Nazlet Khater 1b) were also recovered in the burial pit. The plan supplied by Vermeersch (2002: fig. 9.2) locates these bones near the pelvic region of the adult, and the written description mentions that they were "among the adult bones". Together, these references strongly suggest that Nazlet Khater 1b may have been a late fetus or dead-at-birth child, and that this burial pit contained the remains of a pregnant woman who died as a result of perinatal complications.

Nazlet Khater 2 is a robust adult skeleton found in a second nearby burial pit. A bifacially worked ax lay right of and next to the skull. This ax is identical to the chert mining tools found in the early Upper Paleolithic mining site of Nazlet Khater 4, and the aeolian sands filling the mining pits and trenches are identical to those filling the empty spaces between the boulders lying on top of the two burial pits. Although direct dating was again impossible because of poor bone preservation, this evidence suggests contemporaneity of the burial events around ca.37.5 kyr BP, in accordance with the 14C dating of the mining contexts to between ca.38 and ca.33 kyr ago (Pinhasi & Semal 2000; Vermeersch 2002). Thus, the Nazlet Khater 2 individual was also added to the *Intermediate Cluster*. Where the issue of differential burial of age classes is concerned, the Nazlet Khater additions in no way change the statistical significance of the comparisons with the *Late Cluster*.

The Lake Mungo 1 and 3 burials are maintained outside the data base in spite of claims of a very early age, most recently by Bowler et al. (2003), who report OSL-dating work placing Lake Mungo 3 firmly in the time slot of 40±2 kyr BP (calendric age). The burial itself was intrusive in sands dated to 42±3 kyr BP, providing a maximum age, but it is argued that, since the overlying geological unit sealing the grave was dated to 38±2 kyr BP, the age of the burial event can be constrained between the two results. Moreover, the Lake Mungo 1 cremation, with a similar stratigraphic position, would also date to the same time interval around 40,000 calendar years ago. These conclusions, however, are questionable. Brown (2003) argues that, when Lake Mungo 3 was discovered, it had been exposed by erosion and that, therefore, the original deposit above the burial, and the land surface from which it was interred, are unknown; hence, no minimum age can realistically be suggested, a range of 15,000 to 50,000 BP for the burial appearing possible. Where Lake Mungo 1 is concerned, its direct 14C dating, as reviewed by Gillespie (1997, 1998, 2002), convincingly shows that the age of 16,940±635 BP (NZA-231) obtained on the insoluble humic-free residue is the most reliable age estimate for this individual. The likelihood that the Lake Mungo 1 and 3 burials are in fact <20,000 radiocarbon years old is further strengthened by the contextual evidence: such is the time period to which belong all 9 skeletons from the Willandra Lakes (including Mungo 1 and WLH-50) with direct 14C or U/Th dates.

Where issues of chronology are concerned, no new data contradict the attributions made in situations where conflictive or controversial alternatives existed at the time the original version of table 1 was compiled. On the contrary, what new data have been published confirm those attributions. The Tabun 1 Neandertal woman was considered to belong in the *Early Cluster* in spite of suggestions that it might be an intrusive interment from overlying level B. This view is supported by Kaufman's (2002) recent review of Near Eastern Middle Paleolithic burials, which concurs with Trinkaus's initial suggestion that the unquestionably in situ Tabun 4-6 remains, a set of right wrist and hand bones missing in the Tabun 1 skeleton, are mirror images of the latter's left side, and, therefore, must have originally belonged to it. Previous TL dating of level C suggested an age of ca.170 kyr BP, but a revision of that work (Mercier & Valladas 2003) concludes that in fact two clusters of results exist, one averaging 178±10 kyr BP and the other averaging 134±8 kyr BP; the latter is consistent with the U-series and ESR data, suggesting that the upper part of level C, containing the burial, was indeed deposited towards the end of OIS 6 or at the beginning of OIS 5. These results indicate that the Tabun Neandertal woman is indeed the earliest burial known at present and, therefore, invalidate claims for the precedence of modern humans in regard to this kind of funerary practices, and of the later OIS 4 and OIS 3 Eurasian Neandertal burials being imitation or adoption of an innovation of moderns by anatomically and behaviorally archaic people (Hublin 2000).

Following Bouchud (1966), the Cro-Magnon burials are considered in table 1 as of Gravettian, not Aurignacian age and, therefore, they were included in the *Late Cluster*. The indirect chronometric evidence reported by Henry-Gambier (2002) strengthens this view: a *Littorina* shell ornament associated with the human bones was directly dated to ca.27.7 kyr BP; considering the marine reservoir effect, this radiocarbon age is fully in the range of the earliest Gravettian of southwestern Europe. Direct dating of the Barma Grande 6 skeleton to 24,800±800 BP (OxA-10093), with its stratigraphic implications (this was the last burial event at the site), also confirm that all six individuals buried therein are indeed of Gravettian age (Formicola *et al.* 2004), as suggested by Mussi (2001).

A separate and more complicated issue relates to the significance of burials in terms of the way humans behaved in relation to death. The 134 individuals for which convincing evidence of burial was found are only a fraction of the total number of human beings alive during the period between 120 and 20 kyr ago whose skeletal remains have been recovered and described. It is conceivable that other kinds of funerary practices besides the soon-after-death, before decomposition interment of a complete body existed in the Middle and early Upper Paleolithic. It is legitimate to speculate, therefore, that non-interment death rituals may have existed and that the consideration of such instances would affect the conclusions on the differential treatment at death documented for infants and children after ca.35 kyr BP. Archeologically, however, such practices would produce the finding of incomplete and unarticulated skeletons, or of isolated body parts, and cannot be easily differentiated from human bone assemblages accumulated as a result of accidental death, carnivore scavenging, cannibalism or post-depositional disturbance of primary burials.

Where cannibalism is concerned, for instance, it is clear that consumption of the deceased is among the range of death rituals ethnographically documented. However, in the absence of unequivocal contextual evidence, the simple identification of cut-marked human bones is not sufficient to support the inference of a mortuary ritual, since the consumption of human flesh as emergency food is always a more parsimonious explanation. Cut-marks were recently identified in the skull of the Feldhofer 1 Neandertal type specimen (Schmitz *et al.* 2002). Given that its degree of completeness indicates that, originally, it corresponded to a burial, alimentary cannibalism can probably be excluded in this case. However, by the same token, the cut mark evidence is more likely to be related to the manipulation of the corpse in the context of interment rather than to alternative types of funerary practices. This example shows how thorny the issue is and why, given the difficulty of pursuing it at present, I will not further discuss cannibalism and cut-marked human bones here. For the purpose of the issues at stake, I believe that the assumption that the latter do not necessarily represent mortuary behavior stands and, therefore, that the documented instances should not be added to the list in table 1.

Pettitt (2002) discusses Lower and Middle Paleolithic evidence for Neandertal mortuary behaviors and evaluates the case for caching and for secondary removal or re-burial of

bodies or body parts. His two strongest cases for body caching are the Sima de los Huesos, Atapuerca, and Krapina. Both clearly pre-date the *Intermediate Cluster* and, hence, their consideration would in any case not affect the comparison of the latter with the Gravettian. Moreover, as Pettitt himself acknowledges, it cannot be excluded that the larger number of individuals represented at both sites relates to a single episode of expedient body disposal in relation to a catastrophic event (Bermúdez de Castro & Nicolás 1997; Bocquet-Apel & Arsuaga 1999). Also, the numerous cut marks in the Krapina material have been interpreted as evidence of "post-mortem processing of corpses with stone tools, probably in preparation for burial of cleaned bones" (Russel 1987:381), but may also represent evidence of cannibalism (Defleur *et al.* 1999).

Where secondary burial is concerned, the two possible cases discussed by Pettitt (2002) relate to Dederiyeh 2 and Kebara 1. Both are considered in table 1, but further discussion is relevant because, if the suggestion is accepted, the same criteria might warrant the inclusion of other individuals. I believe, however, that post-depositional processes explain the particular features of those two burials that lead Pettitt to speculate post-burial human interference and manipulation of the bones. In the case of Dederyieh, Pettitt rejects post-depositional "disturbance" as an explanation for the absence of some body parts, and his argument is convincing. However, such an absence may also relate to the in situ differential preservation of skeletal parts. Since the preserved ones were found in correct anatomic relation to each other, it would seem that differential preservation is indeed a more parsimonious explanation for Dederyieh 2 than that preferred by Pettitt of primary burial elsewhere, followed by the deposition in a pit of the scooped up defleshed body parts with a concern of placing them more or less where anatomically appropriate.

In the case of Kebara, the excavators suggest that the absence of the head was due to a deliberate removal of the cranium after the complete decay of the atlanto-occipital ligaments (Bar-Yosef *et al.* 1992:529). Pettitt points out that the morphology of the grave pit indicates that the head lay at a higher elevation and in such a posture that it might have been easily exposed on the surface, but the possibility of carnivore removal after burial is rejected by the excavators because the mandible and hyoid were recovered in correct anatomical position. These arguments, however, do not rule out the possibility that the head was lost due to such entirely natural factors as the truncation of the deposits through erosion. The Lagar Velho child burial is, in this regard, an analog worthy of adequate consideration when interpreting the "absence of the head" in Paleolithic burials; although the erosive agency was in this case anthropic (the terracing of the site), the Lagar Velho example makes it clear that a head can indeed be removed from its grave through the mechanic action of natural agencies without affecting the integrity of the anatomical positions and connections of the mandible and the articulated postcrania lying at a slightly lower elevation.

Secondary burial has also been argued by Oliva (2000-2001) for the early Upper Paleolithic of Moravia, most forcefully on the basis of a reinterpretation of the excavator's notes and the published physical anthropological evidence related to the now lost human remains from the Předmostí "mass grave". His argument is twofold. On one hand, he argues that the sets of skeletal parts forming the different "individuals" may not have existed in the field as associated skeletons and instead represent artificially creations of the excavator, K. Maška; in fact, Oliva even goes as far as suggesting that, more than scientific error, what he considers to be Maška's incorrect rendering of the excavation may have been premeditated and motivated by a desire to boost the importance of the site. Building on this, Oliva then suggests that the representation of body parts is consistent with the re-burial of selected bones and body parts belonging to corpses originally interred, or otherwise decomposed, elsewhere.

I find Oliva's case unconvincing. It is clear that the sets of bones making up the different Předmostí individuals studied by Matiegka (1934, 1938) were not recovered in the field as assembled, articulated skeletons. The excavation notes show that the methodology followed was the division of the deposit in large chunks that were removed as separate blocks for subsequent lab processing; these blocks may have contained more than one skeleton, and a single skeleton may have been divided in different blocks. A certain amount of "reconstruction" was therefore inevitable and evidently took place. However, if the situation in the field were that suggested by Oliva, one might expect significant "assembly errors" in the reconstructed individuals. As Oliva himself acknowledges, however, 1) even if Matiegka had some reservations on some of the associations between the skulls and the postcrania that Maška had assigned to them, he reported no such major errors, and 2) the absence of ribs and the under-representation of pelves are easily explained by excavation selection and differential preservation (for instance, the associated postcranial skeleton Předmostí 27, found in 1928 by K. Absolon in a different part of the site, also lacked the ribs). Thus, I see no reason to reject Klíma's (1991) reconstruction of the Předmostí "mass grave" and the inferences derived from it by Zilhão & Trinkaus (2002) (fig. 2).

The only convincing instance of secondary burial in the Paleolithic published so far is that coming from Brillenhöhle (Orschiedt 2002). At this southern German site, an ensemble of tightly grouped cut marked human bones from four adults and one infant were found inside a fire place located in the centre of the cave. The bones were intensively defleshed, and the cut marks were far more numerous than in the hunted fauna from the same levels, which, on the other hand, displayed a much better overall preservation of the surfaces. This evidence, plus the particular context of the finds, suggests that the human bones had been at a different place before their final ritual deposition at the site. The Brillenhöhle, however, is Late Magdalenian, and the only other situation where Orschiedt considers that a similar diagnostic may be warranted is in the roughly contemporary Creswellian of Gough's cave, England.

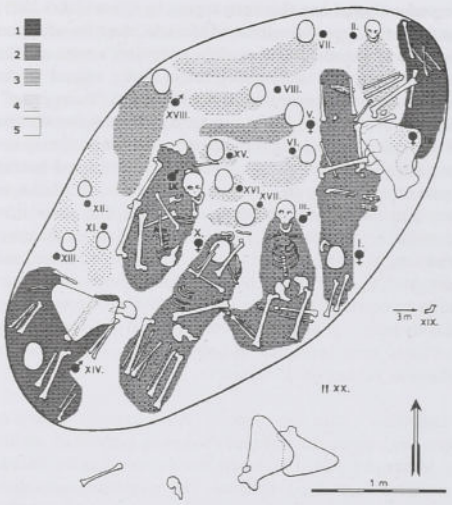

Figure 2. Klíma's spatial reconstruction of the Předmostí "mass grave", reproduced from Klíma (1991), with adaptations. The dotted areas denote the probable position of the postcranial skeletons of the different individuals. Shading codes indicate age classes: 1. the two elder individuals; 2. the two prime adult male-female couples; 3. the two young adults; 4. the "children" (ages 2-3 to 12-14); 5. the "babies" (after Zilhão & Trinkaus 2002, fig. 33-1).

Cussac (Aujoulat *et al.* 2001, 2002) shows that body deposition in natural features of the floor (such as cave bear nests) located deep inside caves, was practiced during the Gravettian. This type of ritual, however, in fact is no different from primary burial, even if the protection of the body through interment below ground surface is replaced by its deposition in places out of reach for most, if not all the disturbance agencies that operate in the outside world. Disturbance of such contexts by deep cave dwellers such as hibernating bears may explain the surface discovery of isolated, scattered ca.35 kyr old human remains recently reported from the Romanian cave site of Oase (Trinkaus *et al.* 2003a and b). If future research confirms this possibility, the gap in the evidence for burial behavior that seems to exist between ca.35 and ca.27 kyr BP would begin to be filled. At present, however, it seems that, throughout that time period, which mostly corresponds, in Europe and western Asia, to the Aurignacian, burial was not practiced, and alternative ways of body disposal were in fashion.

Conclusion

At the end of the above review, it is clear that primary burial of the deceased person immediately or soon after death is the only mortuary ritual unquestionably documented in Middle and early Upper Paleolithic times. Inferences on the behavior and beliefs concerning death held by humans during this time periods can only be derived, therefore, from the relevant documented instances. It is also clear that adding or subtracting from the list of buried individuals presented in table 1 the few instances were the criteria for inclusion are debatable will not change the overall picture. Scattered remains likely to belong to a single individual, such as those form Subalyuk, Hungary (Pap *et al.* 1996), as well as clusters of human bones belonging to different individuals, such as those identified in the Terminal Gravettian/Proto-Magdalenian levels of the Abri Pataud (Binant 1991) may well correspond to the post-depositional disturbance of primary burials. Scientific logic, however, dictates that these instances cannot be counted, and that one can only operate under the assumption that the preserved sample of cases where the inference of burial is secure correctly represents the universe of all original burials that once existed.

Under this assumption, it would seem that, where burial is concerned, Gravettian fetuses and infants were discriminated, and that children, although considered worthy of ritualized interment, were treated differently from adolescents and adults, particularly through burial in different places. This contrasts markedly with the pattern of indiscriminate burial of all age classes in the same places that pertained throughout the Middle Paleolithic and the earliest Upper Paleolithic until ca.35 kyr BP. The most parsimonious interpretation of this evidence is that such changes reflect the emergence of rules related to the social differentiation of age classes. Given that Aurignacian burial rituals remain essentially unknown, however, we can only speculate on exactly when, how and why did the Gravettian pattern emerge.

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