

Human Palaeontology and Prehistory

The emergence of a symbolic behaviour: the sepulchral pit of Sima de los Huesos, Sierra de Atapuerca, Burgos, Spain

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Abstract

Sima de los Huesos is one of the most complex Pleistocene sites at Sierra de Atapuerca (Burgos, Spain). This pit has yielded a number of 28 hominids dated around 400 kyr. This is the most complete collection of Middle Pleistocene *Homo heidelbergensis* around the world. Sima de los Huesos was never a hominid occupation place, since no traces of habitation have been discovered, nor a carnivores net, because there are not herbivores remains. However, it contains a large variety of carnivores, such as foxes, large felidae, wolves, mustelids, and bears. The presence of these specimens may be explained as several events of natural falling, hibernation and catastrophic death, particularly clear for the bears' case. This may be supported by the fact that all these specimens are present along the whole sedimentary sequence. On the contrary, human remains are mostly concentrated inside a quite discrete sedimentary level, which cannot be explained by any kind of catastrophic nor attritional event, according with the age's profile. The recent finding of an Acheulean handaxe at the Sima de los Huesos cave site casts light on the evolution of human behaviour during the Middle Pleistocene. It is a finely flaked quartzite handaxe, which is associated with the hominid assemblage. The particular nature of the deposit involving its taphonomy, palaeontology, and technology points to a symbolic meaning both of the tool and the human accumulation. This would support the hypothesis of human mortuary practices performed at the Sima around 400 kyr ago. This discovery allows us to extend human complex behaviour and symbolism of mortuary rituals 300 kyr earlier than broadly heretofore accepted. **To cite this article: E. Carbonell, M. Mosquera, C. R. Palevol 5 (2006).**

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Résumé

L'émergence d'un comportement symbolique : la grotte sépulcrale de Sima de los Huesos, Sierra de Atapuerca, Burgos, Espagne. Sima de los Huesos est l'un des sites pléistocènes les plus complexes de la Sierra de Atapuerca (Burgos, Espagne). Il a fourni les restes de 28 hominidés datant d'environ 400 000 ans. Ceci représente la plus riche collection d'*Homo heidelbergensis* du Pléistocène moyen dans le monde. Sima de los Huesos n'a jamais été un lieu d'occupation humaine, puisqu'il n'y a pas de trace d'habitat, ni un piège à carnivores, étant donné qu'il n'y a aucun reste d'herbivore. Cependant, il contient une grande variété de carnivores tels que renards, grands félidés, loups, mustélidés et ours. La présence de ces espèces peut être expliquée par différents événements, tels que chute naturelle, hibernation et mort catastrophique, particulièrement dans le cas des ours. Ceci peut être corroboré par le fait que tous ces animaux sont présents dans l'ensemble de la colonne sédimentaire. En revanche, les restes humains sont, pour la plupart, concentrés dans un niveau sédimentaire tout à fait discret qui ne peut être expliqué par quelque

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événement de type catastrophique ou attritionnel que ce soit, d'après l'âge du profil. La découverte récente d'une hache acheuléenne dans la caverne du site de Sima de los Huesos nous éclaire sur l'évolution du comportement humain durant le Pléistocène moyen. C'est une hache sur un fin éclat de quartzite, qui est associée à l'assemblage des restes humains. La nature particulière du dépôt du point de vue taphonomique, paléontologique et technologique indique une signification symbolique à la fois de l'outil et de l'accumulation des restes humains. Ceci corroborerait l'hypothèse de pratiques humaines mortuaires développées au site de Sima, il y a environ 400 000 ans. Cette découverte nous permet de faire remonter un comportement humain complexe et un symbolisme des rituels mortuaires à 300 000 ans plus tôt que ce qui a été largement admis jusqu'à présent. **Pour citer cet article : E. Carbonell, M. Mosquera, C. R. Palevol 5 (2006).**

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Mots clés: Comportement symbolique; Symbolisme mortuaire; Caverne sépulcrale; Hache de quartzite; Assemblage de squelettes humains; Espagne

1. The Sima de los Huesos deposit

The Sima de los Huesos cave site (SH) is located within the Sierra de Atapuerca karstic system, 15 km east of the city of Burgos (Spain). It is a small cavity of around 27 m², adjacent to a ramp of ca. 12 m², which in turn directly connects to a 13-m-deep shaft (Fig. 1). Sima de los Huesos current entrance is 600 m far, along several speleological passages of the karstic system of Cueva Mayor – Cueva del Silo. However, some rock fallings are visible from the area around the Sima, which suggests that the Middle Pleistocene entrance may have been near the pit.

This site is now well known for the exceptional number of fossils attributed to *Homo heidelbergensis* recovered from systematic excavations. These specimens make up about 80% of the Middle Pleistocene hominid remains in the world [3–5,7]. Recent radiometric dating situates the hominid deposit as between 400 and 600 kyr ago [11].

This site has yielded a MNI of 28 hominids with the following age profile: one child (4–5 years), nine adolescents (10–15 years), nine prime-age adults (18–20 years), five other adults (21–30 years), and four individuals older than 30 years ([9] and Bermúdez de Castro, pers. commun.). An estimation of the sex profile has been possible just from 19 individuals: eight males and 11 females. All skeletal parts are also represented, including weak, soft bones such as the hyoid and the middle ear bones. Many skeletal parts were found close to one another, although no demonstrable anatomical connections have been recorded. The absence of human habitation traces is a remarkable feature, as well as the absence of herbivore bones. However, the deposit includes a MNI of 23 foxes, 3 large felidae, 1 wolf, 4 mustelids, and parts of 166 bears (*Ursus deningeri*) [17].

The lowest breccia and layers of the Sima infilling are sterile. Clay breccias predominate in the overlying deposit, which contain both sterile and fossil-bearing facies [10]. Bear and carnivore remains appeared throughout the sequence, but hominids mainly occupy a lower layer of the deposit. This fact suggests that these hominids were deposited during a time-span shorter in duration than that of the bears. Some remodelling of depositional conditions may have occurred, which would explain the fact that the hominids dominant layer is nowadays partially mixed together with bear bones. This would also explain the microscopic erosion observed both on several broken bones and on the edges of the handaxe, as explained below (Fig. 2).

Interpreting the human bone accumulation at the Sima de los Huesos is a difficult issue. There are two main issues that require resolution: the composition of the accumulation, and the agent(s) that caused it. Regarding the former, all skeletal parts are well represented. Preservation has not biased the record to a significant extent, as proved by the presence of soft and weak bones in the deposit. It must thus be presumed that human remains reached the Sima as corpses (not skeletons). In addition, Bocquet-Appel and Arsuaga [12] have pointed out that the age profile is not attritional, and also it does not fit one produced as a result of a natural trap, since the requisite proportions of the entire population are not present (scarcity of infants and old individuals). Furthermore, there is no additional evidence to suggest any other sort of natural phenomenon that would have resulted in that particular age profile. Therefore, this kind of composition must be both human and culturally biased since the beginning [15].

The agent(s) responsible for that accumulation must be also re-examined. Clearly, it is not a by-product of the action of carnivores, as most of the tooth marks identified belong to foxes [2]. Moreover, no carnivore

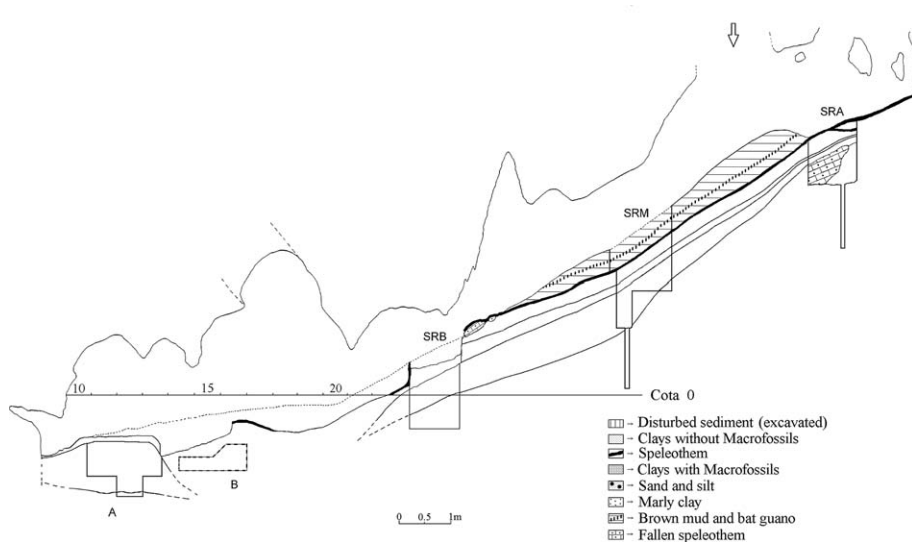


Fig. 1. Sima de los Huesos (Atapuerca, Spain) profile. The figure shows the morphology of the cavity: the chamber, the ramp, and part of the shaft. Fig. 1. Profil de Sima de los Huesos (Atapuerca, Espagne). La figure montre la morphologie de la grotte : cavité, pente et une partie de la cheminée.



Fig. 2. Quartzite handaxe found at Sima de los Huesos (Atapuerca, Spain). For the first time, a tool has been found associated with remains of 28 individuals of *H. heidelbergensis*, who lived in Atapuerca at least 400 000 years ago. The white arrow points to a molar of a hominid (© Madrid Scientific Films).

Fig. 2. Hache de quartzite en provenance de Sima de los Huesos (Atapuerca, Espagne). Pour la première fois, un outil a été trouvé associé aux restes de 28 individus de *H. heidelbergensis*, qui vécurent à la Sierra Atapuerca, il y a au moins 400 000 ans. La flèche blanche indique une molaire d'hominidé (© Madrid Scientific Films).

is specialized in human hunting (excepting sometimes those inhabiting some currently densely populated areas of the world). Further, the Sima was not an occupation place, as no archaeological item – ranging from knapping waste to herbivore remains – has ever been recovered. A natural trap, into which humans might have fallen over the years, is also unlikely, as hominid fossils

occur in a quite discrete sedimentary band [6 (p. 120)]. On the contrary, the bear assemblage seems to correspond to a trap situation, as its demographic structure reflects a catastrophic age profile of this sort, and bear remains extend along the sedimentary sequence.

The human age profile could suggest a sudden catastrophe occurred to a group of hominids [12]. This hypothesis is unlikely however, as the number of individuals ($n = 28$) is too great by far to have fallen in, together and simultaneously, and perished in the Sima. Although humans might have suffered the hypothetical accident elsewhere in the Cueva Mayor cave system [1], it remains difficult to account for the large number and their completeness in the Sima occurrence.

Overall, hominid ages represented at the Sima concentration do not fit in with a natural death profile. Hence, it must be a cultural one, and the agent(s) that in all probability caused this accumulation must also have been humans. This culturally biased accumulation may correspond either to some diachronical behaviour involving differential treatment of corpses in respect to the age of the dead, or to a discrete episode of death that occurred outside the cave and affected only a segment of the community. This segment could fit with individuals in high-risk age groups, according to their particular social organization [15].

Other occupations elsewhere in the Sierra cave complex were contemporaries of the Sima situation. Unit GII of the Galería site yielded an isolated temporal bone of an *H. heidelbergensis* individual and a lithic assemblage belonging to the Mode-2 technology. Galería was

always occupied for human butchering activities [13, 14]. Additionally, mid–upper levels of the Gran Dolina, roughly contemporary with Galería Unit GII, contain traces of human occupations devoted to biomass processing and to campsite activities, although no human skeletal remains are represented. It must be best considered that the particular human accumulation of the Sima belongs to a period during which some other occupations – mainly devoted to subsistence activities – were being carried out in other surrounding caves. However, the composition of those groups of records is radically different, for neither the Galería nor Gran Dolina situation bears any resemblance to the Sima assemblage.

2. The handaxe

Sima de los Huesos has yielded a single lithic item: a finely flaked handaxe on quartzite (Fig. 3), which again permits the scientific community to confirm a relation between *H. heidelbergensis* and Acheulean (or Mode-2) technology. This handaxe was made from a cobble of good quality, reddish-light brown veined quartzite. It weighs 685 g, measures 155 × 97 × 58 mm, has an amygdaloid shape, with one side flat and another convex. It seems to have been made by means of soft ham-



Fig. 3. Frontal surface view of the handaxe found at Sima de los Huesos (Atapuerca, Spain).

Fig. 3. Vue frontale de la surface de la hache trouvée à Sima de los Huesos (Atapuerca, Espagne) (©Atapuerca Research Team).

mer percussion, following an initial reduction sequence of two main phases. The first was devoted to forming the volume, through flat, invasive extractions around both of its surfaces; the second was implemented by shaping the edges of the biface, in order to achieve a convex distal conformation, and a straight, sharp perimetral edge [15].

Although there is no macroscopically visible erosion on the specimen, use-wear analysis¹ revealed microscopic natural abrasion of its entire surface, and particularly around the edges and on the prominent ridges bounding the extractions. According to experimental data, this abrasion seems to have been produced by sandy sediments. This phenomenon may have thus obliterated the possible use-wear traces on the edges of the piece [15].

This artefact must be ascribed to an Acheulean (or Mode 2) technology, which was the first to produce good quality, large tools made through different stages of extraction, knapping and retouching. Another example of association between Acheulean handaxes and fossils of *H. heidelbergensis* occurs at the Galería cave site, in the Trinchera locality, Atapuerca [14].

3. Symbolism during the Middle Pleistocene and the earliest mortuary practices

Middle Pleistocene is extremely poor in symbolic traces. Regarding language, studies about both hyoid bones and mid-ear bones [19] of *Homo heidelbergensis* from the Sima de los Huesos seem to point to the existence of a language at this stage of the human evolution. Other traces of Middle Pleistocene symbolism may be found at the so-called figurines of Berekhat-Ram (Israel) [18] and Tan-Tan (Morocco) [8].

Next symbolic traces seem to occur at Upper Pleistocene times, such as the mortuary practices among Neanderthals [16]. These practices have been recorded at several sites in the Levant, including Tabun and Amud (Israel), and elsewhere in western Asia Shanidar (Iraq), central Asia Techik-Tash, Uzbekistan), and also at sites in western Europe (Spy, Belgium; La Ferrassie, La Chapelle-aux-Saints, Le Moustier, in France). Most of the corpses were deposited in a curled-up position. Several of these burials were carried out in oval-shaped graves, as well as with blocks (Le Régourdou, France) or slabs (Ferrassie I, Shanidar II) placed under the

¹ For microscopic analysis, a JEOL JSM-6400 S.E.M. was used. Due to the large dimensions of the artefact, silicone moulds (Provil-L Hydro Activ-Bayer Dental) and polyurethane resin high-resolution casts (Syntesia-55) had to be used in order to perform the analysis.

corpse, or even covering the dead with blocks as in tumuli (Shanidar I). Many of them also contained seemingly votive elements, such as goat horns (Techik-Tash), ivory tusks (Le Roc-de-Marsal, France), and even red ochre enshrined with or alongside the buried corpses (La Chapelle-aux-Saints), and the most famous flowers offering already known, although the latter is still under debate (Shanidar IV). Hearths are also usual near to or covering the graves, and most of the corpses were associated with flint tools – some of high-quality manufacture-, the abundance of which in the surrounding archaeological records makes it difficult to state their symbolic meaning [16].

4. Conclusions

The discovery at Sima de los Huesos of the quartzite handaxe in the midst of this human assemblage hence appears to be particularly significant. Obviously, it may eventually move to have fallen into the Sima shaft while being carried by someone close to the site. However, other implications are worth consideration. Firstly, there is no lithic waste, or tool whatsoever in the Sima; this handaxe is the only such object accompanying a hominid assemblage which should be considered unusual, if not unique, in world-wide terms – one composed of about 3000 *H. heidelbergensis* skeletal parts. A use-wear analysis could not demonstrate conclusively as to whether this object was actually used, due to erosion of piece's edges; however, it would seem quite clear that it was not made to be used in the Sima, since the latter was clearly not employed as an occupation site. Moreover, the tool was elaborated in a high-quality quartzite, a rock type rarely selected for use at the Gran Dolina and Galería situations, according to their known technological records. Moreover, the Sima instrument evinces a complex manufacturing process, having two phases of configuration that are bound to have been made by soft percussion. Handaxes represent the most complex and significant tools in Mode-2 or Acheulean technology. Thus, the possibility that the Sima handaxe was intentionally associated with the human skeletal assemblage, at some point of the hominids' deposition, must be considered. In such an event, the concept of complex symbolical behaviour by *H. heidelbergensis* populations at 400 kyr obviously emerges. This complex behaviour would be reflected in the fact of depositing a handaxe – the most widespread Acheulean tool –, into a context of intentional deposition of dead. This may have occurred 300 kyr before Neanderthals buried their dead, which places

Sima de los Huesos at the first case of mortuary symbolism in human evolution.

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