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Mid-Pleistocene Acheulean industrial complex in the Iberian Peninsula

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ABSTRACT

The fluvial deposits of the rivers on the Atlantic side of the Iberian Peninsula preserve a number of locations with Acheulean industry, frequently without associated fauna. These remains are especially concentrated on middle terraces, which can be dated to about MIS 11. The most common raw material is quartzite and these industries are characterized by the presence of bifaces, cleavers and tools made from medium and large rock flakes (>10 cm). The technological characteristics of these Acheulean localities and their chronological separation from the recognised human occupation of the Peninsula during the Lower Pleistocene (Atapuerca, Guadix-Baza depression, Murcia) by some 500 ka or more, support the possible African origin of the European Middle Pleistocene Acheulean techno-complex and the hypothesis that Gibraltar was the access route.

1. Introduction

Since the first discoveries at Condeixa (the River Mondego deposits in Coimbra, Portugal) and San Isidro (terrace of the River Manzanares near Madrid, Spain) in 1862 and 1869, research on the Iberian Peninsula early Palaeolithic has experienced phases of intense activity. Worth noting is the research carried out by Obermaier, Wernert and Pérez de Barradas in the Manzanares valley (Madrid) between 1916 and 1936 and that of Breuil and Zbyzewski along the Portuguese Atlantic seaboard in the 1940s. The excavation of Torralba and Ambrona (Soria) in 1961–1963 by C. H. Howell constitutes another crucial moment, which as for previous phases was not continued (Santonja and Vega Toscano, 2002).

The current hypotheses regarding the Acheulean of the Iberian Peninsula are supported by works started in the 1970s, and have provided relevant results throughout the Atlantic side, from Galicia to Andalucia, in the fluvial formations of the Middle Pleistocene (Fig. 1). On the other hand, the research carried out in Atapuerca (Burgos) and the Guadix-Baza Depression in the last 25 years has increased the time period of the peninsular and European early Palaeolithic age to the Early Pleistocene (Carbonell et al., 2001; Toro et al., 2003; Bermúdez de Castro et al., 2004).

This paper focuses on establishing a balance of what is currently known about the Middle Pleistocene Acheulean industries on the Peninsula in surficial formations (fluvial deposits in the majority of cases). It discusses the chronological elements, the technological characteristics, occupation of the territory, and the site formation processes, and argues the possible African origin of the Acheulean techno-complex.

2. Regional setting

The earliest human presence registered to date corresponds to two localities at Atapuerca (Burgos) and two more in the Guadix-Baza Depression, dated around 1.2–1.3 Ma in the case of Sima Elefante (Carbonell et al., 2008), Fuentenueva 3 and Barranco León (Oms et al., 2003) and 0.9 Ma in the case of Gran Dolina/TD6 (Berger et al., 2008).

The Atapuerca sites have provided human remains attributed to *Homo antecessor*, as well as all the aforementioned lithic industry defined as Oldowan (Carbonell and Rodríguez, 2006), although on other occasions (Santonja and Villa, 2006) it is argued that they are industrial series placed within the chronological range of the African Acheulean, which occurs from 1.65 Ma onwards (Roche et al., 2003; Chazan et al., 2008), with few elements that permit a sound technological definition (Table 1). In Africa and Eurasia, the existence of industries without bifaces contemporary with the Acheulean is well known in both the Lower and Middle Pleistocene, and they are considered an ecological variation of the Acheulean produced by the same populations, for example in Ubeidiya (Israel) and in Venosa (Italia) (Bar-Yosef and Goren-Inbar, 1993; Piperno, 1999). Another locality on the Iberian Peninsula to take into account in this discussion is Cueva Negra de Quípar (Murcia), a site under excavation (Walker, 2006) whose age is placed around 0.9 Ma (Scott and Gibert, 2009), and where the presence of at least one biface suggests a possible Acheulean technological identity.

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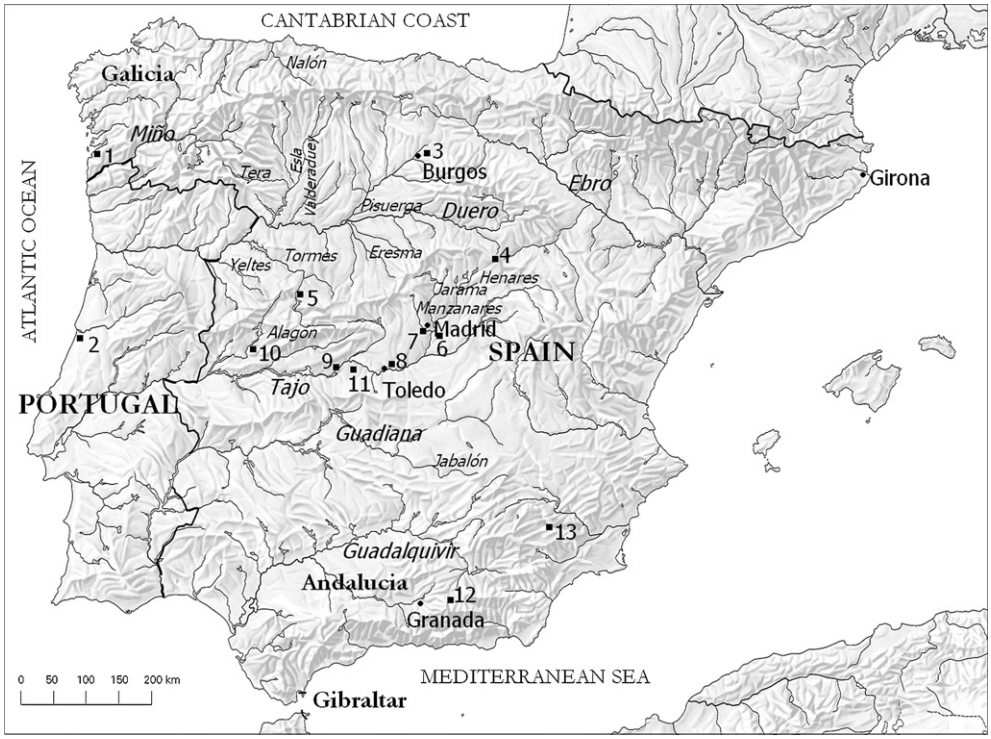

Fig. 1. Map of the Iberian Peninsula indicating the regions, rivers and sites mentioned in the text.

After intensive prospecting carried out in various river basins throughout the Iberian Peninsula (Santonja and Pérez-González, 2002; Rodríguez de Tembleque et al., 2008), no sites have been discovered in stratigraphic position on middle-high or high terraces. Above relative heights of around 40 m along the Duero and Tajo rivers, and at 14 m along the River Guadiana, rare knapped stones or flakes been discovered on terraces at +74 and +80 m on the northern Meseta in the Duero, Valderaduey, Esla and Pisuerga rivers. In the Tajo, similar elements are found at relative heights of around +100 m (Pueblanueva and Galisteo) and in the Guadiana and Jabalón rivers on high terraces at +19 and +25 m. The scarce discoveries from high terraces of the Lower Pleistocene, which can be related to the human presence marked by Gran Dolina, Elefante and the Orce sites, is in contrast to the abundance of Acheulean sites on some middle terraces in the same valleys.

The Acheulean sites discovered in the Miño, Duero and Tajo basins (Table 2) are connected to terraces on the order of +30 m. At the Guadiana the entire sequence of terraces is at a lower height, but the Acheulean is still connected to the last middle terraces (+8 and +10–13 m). The sites are very frequent in the temporal margin represented by these levels, with multiple localities in almost all valleys studied.

Table 1
Stone artifacts from Barranco León (BL), Fuentenueva 3 (FN3), Gran Dolina level TD6 (GD6) and Sima del Elefante (SE) (cf. Carbonell et al., 1999; Toro et al., 2003).

Assemblage composition	BL	FN3	GD6	SE
Cobbles with isolated scars (tested blocks, occasional cores)	3	8	18	25
Cores and core fragments	6	11	1	
Flakes and flake fragments >2 cm	124	170	159	
Flakes and flake fragments <2 cm	146	51		
Flakes with continuous or irregular retouch	16	4	27	
Total	295	244	205	25

In the Tajo basin, the Matuyama–Brunhes reversal has been located at +60 m on the terraces of the River Tajo in Toledo (Pinilla et al., 1995). In Ambrona, the lower stratigraphic units (AS1–AS5) with Acheulean industry are prior to 350 ka (Falguères et al., 2006). This chronological reference may well have significance for the sites in the Tajo and Duero basins located on terraces at a height of +30 m (Santonja and Pérez-González, 2002). Localities include La Maya II (+34 m terrace, river Tormes), El Sartalejo (+26 m terrace, river Alagón), Áridos 1 (Arganda I, Jarama valley), San Isidro (+25/30 m terrace of the river Manzanares) and Pinedo (+25/30 m terrace of the river Tajo). The faunal remains recorded at some of these sites confirm the dating (Sesé and Soto, 2000; Sesé et al., 2000). Regardless of the truly Oldowan character of the Atapuerca and Orce industries, a large interval of time, in the order of 900–500 ka, can be seen between these sites and the first well defined Acheulean sites of the middle terraces.

3. Results

3.1. General techno-economic characteristics and geography of the Iberian Acheulean

The most recent African archaeology has led to a redefinition of the European concept of the Acheulean, valuing as an essential technological element the production of medium and large sized supports, which may be used directly or, once shaped, through knapping or retouching (Isaac, 1975; Clark, 1994). The existence of Acheulean operational chains focussed on the management of large volumes of raw material has been confirmed in the Lower and Middle Pleistocene in Africa and Asia from at least the Caucasus to India and Indonesia. Likewise in SW Europe during the Middle Pleistocene, giving rise to the definition of LCT – *Large Cutting Tools* – Acheulean techno-complex (Sharon, 2009).

The formal variability is another characteristic of this techno-complex, which is made up of series almost devoid of bifaces, in

Table 2
Terrace sequences in the Meseta (cf. Santonja and Pérez-González, 2002).

Rivers	Lower Pleistocene	Middle Pleistocene	Upper Pleistocene – Holocene
GUADIANA	+22/28	+16/18 **+10/13 +8**	+5/6 +3
Jabalón	+45 +40 +31 +25	+19/21 **+10/12 +7**	+2/3
TAJO (Toledo)	From +125 to +75 (6 levels)	+60 +50 **+40 +25/30**	+15/20 +4/9 +3/5
TAJO (Talavera)	From +195 to +82 (7 levels)	+60 **+40/45 +25/30**	+18/20 +8 +2/3
Manzanares	+90 +80 +68 +60	+52 +44 +35 **+25/30 +18/20**	+12 +10 +8 +3
Jarama (Áridos)	+147 +125 +99 +82	**Arganda I and II** +52 +40	Arganda III +3/5
Jarama (Talamanca)	From +190 to +65 (11 levels)	+50 +40 +38 **+30**	+12 +8 +3/5
Alto Henares		+55 +40 +33 +25	+16 +9
Alagón	From +125 to +70 (5 levels)	+60 **+40/45** +35 **+26**	+18 + 10 +6 +2/4
DUERO	From +144 to +74 (7 levels)	+62 +54 +40/48 **+24/30**	+18 +8 +3/5
Tera	–	+35 **+20**	+12 +7 +3
Pisuerga	+130 +105 +80 +70	+60 **+40 +25/30**	+15 +7 +5
Tormes	+120 +108 +80	+62 +50 +40 **+34 +22**	+10/12 +8 +3/5
Yeltes-Huebra	+60 +40	+25 +18/20 **+8/10**	+5
Eresma	+68	+60 +54 +45 +30 **+26**	+12 + 3

Note: Major rivers are in capitals and thick lines separate the major river basins. Relative elevations in m; levels with Acheulean artifacts are indicated in bold.

which the heavy tools are in many cases limited to tools made by knapping on medium or large flakes (>10 cm) and pebbles. In any case, they are technological responses adapted to the properties of the available rock appropriate for knapping and to the function and intensity of the job, themselves devoid of any taxonomic value.

The Acheulean of the Iberian Peninsula is perfectly integrated into this techno-complex. Dominant in the technological level is the preparation of medium and large cores – monofacial, bifacial, multifacial, frequently with discoid and occasionally preferential *Levallois* configurations – which provided appropriate supports for the development of complex operational chains, including bifaces and cleavers (Fig. 2).

Fundamentally, local rocks were used, especially in fluvial areas, prioritizing the use of quartzite together with small proportions of quartz. On occasions, especially when the local raw materials are reduced to limestone, there also are cases – Torralba and Ambrona are two clear examples – where both finished tools and raw materials are introduced from distances that can exceed 30 km (Freeman, 1991; Santonja et al., 2005a).

The small number of sites known until a few years ago in Galicia, the Cantabrian coast and along the Mediterranean from Girona to Gibraltar, including the Ebro basin, led to differing interpretations, today outdated, including a limited human presence in these regions before the Upper Pleistocene or even in the case of Galicia, an aberrant chronology, based on misinterpreted dating obtained in Gándaras de Budiño (Butzer, 1967), which situated the early Palaeolithic age at the end of the Upper Pleistocene. In Galicia, the River Miño has preserved terrace sequences comparable with those

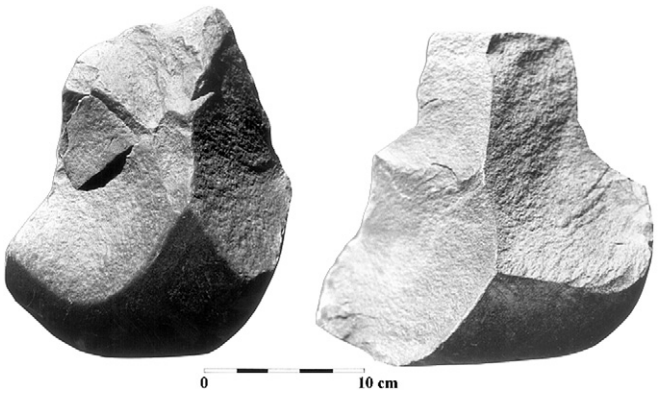

Fig. 2. Quartzite monofacial giant cores. El Sartalejo site, +26 m terrace of Alagón river.

of the Meseta rivers, made up of a high number of stepped levels, with representative Acheulean sites on the middle terraces (Méndez et al., 2007), defining a situation in line with that known in the rest of the peninsular Atlantic coast. In the case of the Cantabrian and Mediterranean coasts, however, there are natural factors which can explain the limited occurrence of sites (Santonja and Pérez-González, 2002). The majority of the Cantabrian river courses have almost failed to preserve alluvial deposits from the Middle and Lower Pleistocene. Where these terraces have survived, in the case, for instance, of the Nalón in Asturias, there are examples of Acheulean sites on the middle levels (Rodríguez-Asensio, 2000). The sharp water level rises caused by Mediterranean climate are the key to explaining the rareness of sites in the fluvial area during the Pleistocene age on the Mediterranean side, the scarce presence of Pleistocene remains in the area having nothing to do with occupation densities.

The large territory on the Atlantic side is basically divided in different river basins. Apart from the Miño basin and the rest of Galicia already considered, it includes the basins of the Duero, Tajo, Guadiana and Guadalquivir, all at different stages of investigation.

In the Northern Submeseta – the Duero basin – apart from the cave sites of the karst complex of Atapuerca, which lie outside of the objectives of this paper, the Acheulean sites in the river domain are abundant along the middle terraces, especially in the western sector, more intensively surveyed (Table 2), both in terms of surface position and stratigraphy (Santonja and Pérez-González, 2002). On the high morphological surfaces which dominate the centre of the basin (*Páramos*), surveys of the last few years have also recorded a certain density of partly-Acheulean industry, suggesting its presence in the Middle Pleistocene in these areas far from the bottom of the valleys (Díez-Martín et al., 2008). The sites at Ambrona and Torralba (Soria), excavated extensively at different stages (Santonja et al., 2005b), have become principal references in the debate concerning hunting during the Middle Pleistocene and particularly in relation to the elephant megafauna (*Palaeoloxodon antiquus*). At the lower levels of Ambrona, mainly natural settings have been found where human intervention was very limited or non-existent (Villa et al., 2005).

The Madrid region, in the Tajo basin, is worth special mention. The area was the focus of intensive study during the first third of the 20th century and over the last few years research has been resumed (Panera et al., in press). Although the majority of the sites discovered in this region correspond to the Middle and Upper Palaeolithic, Acheulean industry has also been located in the San Isidro terrace (Fig. 3), as well as sites where activities of scavenging over individual specimens of elephant have been documented,

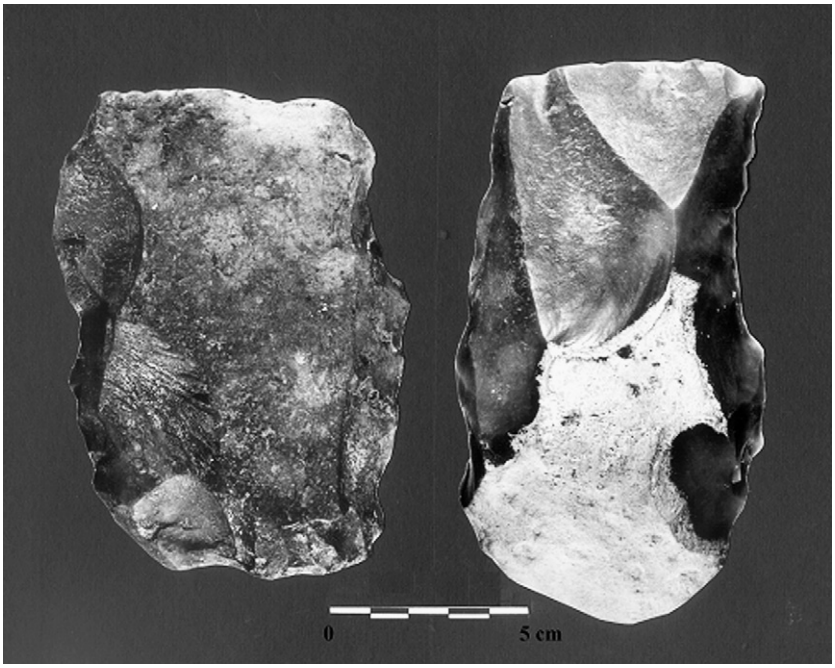

Fig. 3. Flint cleavers. San Isidro site, +30 m terrace of Manzanares River. Although the raw material generally used in the Iberian Peninsula to elaborate cleavers is quartzite, in the regions where there is flint (Manzanares valley), it was also sometimes used.

particularly in Áridos I and II, on the Arganda terrace complex in the Jarama valley (Santonja et al., 2001).

The areas surveyed in the Tajo, Guadiana and Guadalquivir basins also confirm a situation similar to that observed in the Duero, specifically the linking of the Acheulean industries with a specific middle terrace (Table 2). There was a large spread of these industries in a clearly defined moment of time (Santonja and Pérez-González, 2002). Alongside sites such as Pinedo (Toledo) and El Sartalejo (Cáceres), the Puente Pino site (Toledo) stands out, currently under excavation (Querol and Santonja, 1980; Santonja, 1985; Moloney, 1992; Santonja and Villa, 2006; Panera et al., in press).

To obtain a complete vision, from a technological perspective, of the industries recognised in the Mid-Pleistocene of the Iberian Peninsula, it is necessary to bear in mind the existence of localities characterized by reduction sequences designed for the standardised production of flakes and small tools, which can be defined as early Middle Palaeolithic. Amongst them are the Bolomor cave (Valencia), the TD10 level of Gran Dolina (Atapuerca, Burgos) and the Middle Stratigraphic Member at Ambrona, as well as Cuesta de la Bajada (Teruel). Bolomor presents a 10 m thick sequence dated between 350 and 100 ka, with industries defined as Charentian–type Mousterian at various levels (Fernández Peris, 2007). In TD10, series with a Mousterian appearance have been described, with standardised flake tools and a well-developed Levallois method (Carbonell et al., 1999: 346), with dating that places this level towards MIS 11/MIS 9 (average dates considered ESR/U-series at 372 ± 33 ka in the lower part and 337 ± 29 ka in the upper part (Falguères et al., 2001); higher values of 431 ± 59 ka have been obtained by TL/IRSL (Berger et al., 2008) for the central part of this level). The industry of the Middle Stratigraphic Member at Ambrona, dated ca. 350 ka ESR/U-series (Pérez-González et al., 2005; Falguères et al., 2006), in marked contrast with the Lower Stratigraphic Member of this same site, presents discoid and Levallois debitage, racloir, denticulate and other flake tool production and consumption chains, along with a marked absence of Acheulean bifaces and cleavers. Cuesta de la Bajada (Teruel), an open-air site like Ambrona, currently under study (Santonja and Pérez-González, 2002: 48–50), is added to this group of localities currently known on the Iberian Peninsula dated from MIS 11 and with early Middle Palaeolithic industries, helping to open an interesting problematic regarding its coexistence with the Acheulean techno-complex in the latter part of the Mid-Pleistocene.

3.2. Formation processes, location and functionality of the sites

Almost all of the sites of the studied period are recorded in fluvial, or exceptionally lake, settings. This is principally due to the capacity of this setting to generate deposits and conserve remains, and only partly due to a preference towards a specific environment, although the trophic capacity of the riverside and lake shores would without doubt exercise a powerful attraction.

The integrity of the sites in fluvial deposits is strongly conditioned by the sedimentary controls in the formation process (Table 3). Low energy in the sedimentary medium could lead, as in the case of Áridos I (Villa, 1990) or some levels of Ambrona (Pérez-González et al., 2005), to the optimum conservation of the spatial relations amongst the remains, while in other cases – Pinedo, La Maya, Torralba – the fluvial stress led to a major displacement of the entire archaeo-paleontological record.

The landscapes in which high concentrations of lithic industry have been discovered are often of the same type. Areas rich in remains are recorded in the second and third order confluences of the fluvial network, being less frequent in the principal collectors, especially in the Duero basin. There was a certain preference for the open areas of the valleys, especially in areas next to stretches where the river is entrenched.

In a large part of the sites, only lithic industry has been preserved, which provides information of an exclusively techno-economic nature. The study of the sources of the raw materials constitutes a line of investigation with interesting possibilities, once it is established that the strategy of almost exclusively

Table 3
Lithofacies and sedimentary accumulation models of some Acheulean sites in the Peninsula interior (cf. Santonja and Pérez-González, 2002, modified).

Sites	Lithofacies	Sedimentary medium
La Maya I (Tormes valley)	Gravel	Fluvial. Bars. Low-sinuosity braided channels.
San Isidro (Manzanares valley)	Gravel, sand, mud	Fluvial. Bars and overbank facies
Arriaga II a (Manzanares valley)	Mud, sand	Fluvial. Overbank facies. Sinuous channels. Subsidence, synsedimentary processes.
Áridos 1 (Jarama valley)	Mud	Fluvial. *Overbank* facies. Subsidence, synsedimentary processes.
Pinedo (Tajo valley)	Gravel and sand	Fluvial. Bars. Low-sinuosity braided channels.
Puente Pino (Tajo valley)	Sand	Fluvial. Bars.
Torralba (Northern Submeseta)	Gravel, mud and sand	Fluvial and lacustrine
Ambrona (Northern Submeseta)	Mud, gravel and sand	Lacustrine and fluvial

knapping nearby blanks has important exceptions, such as at Ambrona and Torralba (Fig. 4).

There are many areas of the Iberian Peninsula where open-air sites have not preserved an organic record, preventing the analysis of the human–fauna relationship. It has not been possible to consider this research in more than very specific cases, such as Ambrona, Torralba, Áridos and the Manzanares. Sites with examples of intervention into isolated elephant cadavers are relatively frequent in the formation of the rivers Manzanares and Jarama. Áridos 1, also in low energy deposits, is the best preserved, and probably the excavation by Graells in San Isidro in 1840 would be comparable. In Orcasitas, Arriaga IIa and Áridos 2 the remains rested upon the paleoplain covered by sandy channel deposits, and thus the smaller elements could be displaced, which explains the inexistence of lithic refittings. Associated lithic industry seems to exist in Arriaga IIa and Áridos 2, but is less patent in Orcasitas. The site described in Transfesa could occupy a different position, at the heart of an abandoned meander (Santonja et al., 2001).

The places with elephant remains on the Manzanares and Jarama rivers indicate ancient settings on the river plain, in which it would be common to find large pachyderm mammal cadavers during the dry season, particularly in times of prolonged drought, where occasionally groups of humans could arrive in time to use the remains. The repetition of localities of this type suggest that actions such as these may have been common also in other valleys on the Meseta in which fauna remains have been preserved (Santonja et al., 2001).

In Ambrona the recognised landscape reflects different environments set around a pond, with specific moments in which, probably due to periods of prolonged drought, large-scale loss of life amongst the herbivores, in particular the larger ones – elephants and bovids – resulted in an accumulation of cadavers that could occasionally attract groups of hominids with Acheulean technology (Villa et al., 2005).

Lithic industries are also known in surficial positions, on middle and high terraces, and also on Plio-Pleistocene platforms prior to the entrenching of the fluvial network. Occasionally concentrations but above all a diffuse presence of pieces can be found. The existence of these sites provides references to better understand the movements of the human groups away from the valley bottom (Díez-Martín et al., 2008), although the chronological uncertainty that affects them undermines the possibilities of study for the time being.

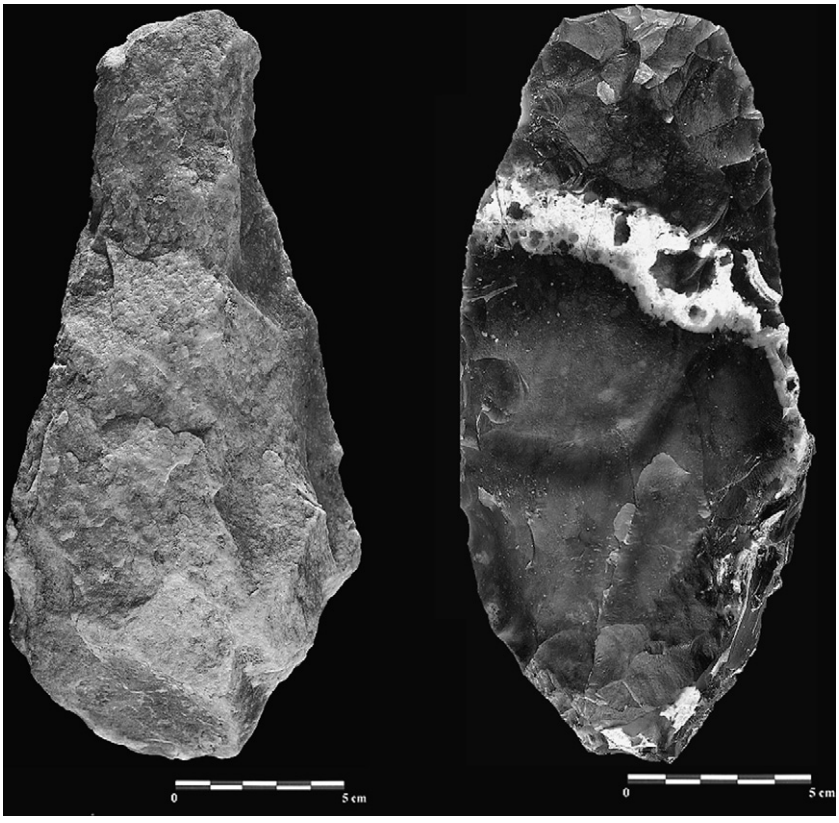

Fig. 4. Quartzite and flint bifaces. Ambrona site, AS1 level. It is rocks introduced in the site from distances between 5 and 30 km.

4. Discussion

In the current state of the early Palaeolithic research on the Iberian Peninsula, there is a first group of sites situated in the Lower Pleistocene, dated between 1.3/1.2 Ma (Fuentenueva 3, Barranco León and Sima Elefante) and 0.9 Ma (Gran Dolina TD 6 and Cueva Negra de Quípar). The lithic industry of these localities has been defined as Oldowan or Mode 1. At present, however, a higher degree of technological complexity or substantial differences compared with the African Oldowan cannot be eliminated. The presence of a biface in Cueva Negra even allows consideration of the existence of Acheulean industry in Iberia during the Early Pleistocene (Scott and Gibert, 2009), fully within the chronological range of the African Acheulean (Raynal et al., 2001; Roche et al., 2003; Chazan et al., 2008). With an important gap of time, in the order of 0.5 Ma, apparently without continuity, there are, in the fluvial setting of the Atlantic side of the Peninsula, a number of sites and industrial aggregates recognised as Acheulean LCT. The morpho-stratigraphic position that they occupy in the systems of terraces in their respective valleys is very homogeneous, and permits dating the Acheulean phenomenon on the Iberian Peninsula from MIS 11.

Comparing this situation with the rest of southwest Europe, there are similar positions in some regions, for example in northern France (Antoine et al., 2010). However notable differences appear in relation to others (Piperno, 1999; Roberts and Parfitt, 1999; Falguères et al., 2004; Despriée et al., 2009), such as those Acheulean localities dated between MIS 16 and MIS 12 – the same dates being proposed for Venosa-Notarchirico in Italy, La Noira and the lower levels of L'Arago in central and southern France or for Boxgrove in England. The only relevant Iberian element is the biface at Sima de los Huesos, in the Atapuerca complex (Carbonell et al., 2003) with an estimated date of >530 ka (Bischoff et al., 2007). The association of this piece with the human remains at Sima de los Huesos opens the possibility of a relationship between European Acheulean lithic industries with the hominids discovered in this cavity, whose integration in *Homo heidelbergensis* is under revision (Mirazón Lahr and Foley, 2009).

With respect to the origin of the European Acheulean, the hypotheses of either local or African origin have been evaluated (Molines and Moncel, 2005). The chronological separation between the Lower Pleistocene and the Acheulean LCT, in the order of 500 ka in the Iberian Peninsula, and 300 ka even when taking the chronologies suggested in localities such as Notarchirico or La Noira as references, appears an important point against an indigenous evolution in southern Europe from "Mode 1" technologies or similar. On the other hand, to suppose that an autonomous technological evolution in Europe would have produced, almost a million years later and with very different human species involved, similar Acheulean industries to those known in Africa from 1.6 Ma, is difficult to understand, even supposing that the favourable environmental conditions of MIS 11 could benefit an increase of residual populations in southern Europe.

The hypothesis of a direct African origin of the SW European Acheulean appears to be, in the current circumstances, more likely. In this sense the territorial dispersion of the Acheulean LCT outside Africa constitutes an element which invites the re-evaluation of the western Mediterranean straits and in particular Gibraltar as a possible route into Europe for hominids with this technology, well documented in the Maghreb since at least the latter part of the Early Pleistocene (Raynal et al., 2001). This is, without doubt, a long debated hypothesis whose supporters have in the past used the similarity between Acheulean industries on both sides of the straits as the principal argument (Alimen, 1975), while other authors have maintained the permanent barrier-like character that Gibraltar would represent from its opening towards the end of the Miocene age, citing the absence of a population on the Mediterranean islands until the advanced stages of the Upper Palaeolithic, and that until recent Prehistory no contact by sea within the Mediterranean region has been proven (Mussi, 2001; Straus, 2001; Derricourt, 2005). Currently however, the similarity between the African and European Acheulean industries – that would not permit the rejection of an exclusive continental expansion as Derricourt maintains – is not the argument, but indeed the geography of the phenomenon: the absence of an Acheulean techno-complex in central Europe, Greece and the Balkans constitutes a weighty element when evaluating once more the possibility of Gibraltar. These industries are recorded in Europe exclusively from the Iberian Peninsula and Italy to England and central Germany. North of 52°N and beyond 11°E, in central Europe and the Russian plains, Pleistocene industrial settlements with Acheulean flake tools and bifaces are unknown (Kozlowski, 2003; Santonja and Villa, 2006). At the other extreme of the Mediterranean they appear continuously from the Arabic Peninsula and Israel to the south Caucasus (Lioubine, 2002), stretching towards Asia (Yamei et al., 2000; Petraglia, 2005). Their chronology in this area, from the Early Pleistocene, in Ubeidiyah at 1.4 Ma (Bar-Yosef and Goren-Inbar, 1993), is another differentiating factor in relation to SW Europe.

Taking into account the age range of the European Acheulean, basically situated in the second half of the Mid-Pleistocene, with possible previous manifestations (Cova Negra de Quípar, La Noire, Venosa and other localities), the coldest stages of MIS 22, MIS 16 and MIS12, with the consequent drops in sea level, initially constitute the most favourable moments to facilitate the relationship between the Iberian Peninsula and the Maghreb. At those moments, contact would be further benefited by a reduction in the intensity of marine currents in Gibraltar, caused by changes in the salinity of Atlantic waters (Gibert et al., 2003). The hypothesis of access via Gibraltar is not incompatible with the existence in Europe of populations derived from possible continental expansions from Asia at different times since the Early Pleistocene (Carbonell et al., 2008). The benign conditions of MIS 11 (Tzedakis et al., 2006) may have favoured the expansion of all groups of hominids present in Europe and the technological diversity that from this moment is recorded on the Iberian Peninsula and the rest of the continent, on top of the increasingly clear anthropological complexity (Mirazón Lahr and Foley, 2009) could precisely be related to a variety of points of origin and movements towards Europe of the Pleistocene humanity.

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