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An Offprint from
The Mediterranean
from 50 000 to 25 000 BP
Turning Points and New Directions

Edited by
Marta Camps and Carolyn Szmidt

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Ana C. Pinto-Llona, Geoffrey Clark, Alexandra Miller and Kaye Reed

Abstract
Possible relationships between the hominids involved in the Middle to early Upper Paleolithic transition in northern Iberia are hotly debated, and much of that debate focuses on a small number of controversially-dated sites, most of them excavated during the early decades of the 20th century. Here we describe the Sopeña rock shelter, a new archaeological site in eastern Asturias, where a 2002 test trench has revealed a sequence of at least 16 well-stratified levels spanning this critical interval in human evolution. The issues posed by the Middle to Upper Paleolithic transition in the region are summarized briefly, and preliminary results and new 14C AMS dates are presented. The application of new technologies and methods at sites with high contextual integrity like Sopeña offer the possibility of adding significantly to our understanding of these issues.

The Late Middle to Early Upper Paleolithic Transition in Western Europe
It has long been recognized that, around 40,000 years ago, the west European archaeological record shows an increase in the rate of technological innovation manifest in the production of bone and antler tools and other artifacts, personal ornaments, portable and parietal art, sculpture, musical instruments and blade technologies. These innovations appear to suggest that significant changes in human behavior took place over the Middle-to-Upper Paleolithic transition interval, generally reckoned to correspond to the ten millennia on either side of 40 kya. While the changes themselves appear real enough, what is causing them to occur remains the subject of lively (and sometimes heated) discussion.

Some suggest that the changes represent the entry and spread throughout Europe of anatomically and behaviorally modern Homo sapiens – which in turn influenced existing Neanderthal technologies (e.g. Mellars 1989, 1996; Harrold 1989; Kozłowski and Otte 2000). Others think that newly arrived Homo sapiens copied the Upper Paleolithic transitional technologies (e.g. and especially the Châtelperronian) developed earlier and independently by Neanderthals, or that the industries themselves are not demonstrably ‘hominid specific’ (Clark and Lindly 1989 a, b; Rigaud 1989; Otte and Keeley 1990; Clark 1997; Straus 1995, 1997; d’Errico et al. 1998; Zilhão and d’Errico 1999). Neanderthals are suggested as the makers of the Early Aurignacian as in El Castillo (northern Spain, Cabrera et al. 2000, 2001) and Vindija (Croatia) (Karavanic 1995). It has also been suggested that there were direct exchanges of objects between Mousterian and Aurignacian populations at Vindija (Karavanic and Smith 1998).

At the base of these discussions are dating and calibration issues that make it difficult to accurately pinpoint the transition interval (van Andel 1998; van der Plicht 1999; van Andel and Davies 2003). Radiocarbon becomes highly susceptible to contamination for samples older than c. 35 kya, at which point <1% of the initial 14C activity remains and the introduced error may be of the same order of magnitude as the time scale of the transition (Schwarz 1997). Also, radiocarbon dates near 40 kyr bp appear to be 1.5–3 kyr younger than more accurate but less generally applicable uranium series determinations (e.g. Bischoff et al. 1994).
few human fossils dated to 45–35 kyr bp do not allow for general correlations of particular archaeological industries with particular hominine types.

The Transition in the Iberian Peninsula

As elsewhere, much debate surrounds some dates published for the MP–EUP transition in Spain. Several works offer very early dates, *circa* 40 kyr BP, for the Aurignacian in the north (*e.g.* Bischoff *et al.* 1989; Cabrera and Bischoff 1989; Straus 1992, 1997; Bischoff *et al.* 1994; Fortea Pérez 1995, 1999). Others offer very recent dates for allegedly Mousterian sites in southern Spain (Hublin *et al.* 1995, 1996). Some propose an abrupt replacement in the north, as at l’Arbreda in Catalunya (*e.g.* Bischoff *et al.* 1989), others suggest that the early Upper Paleolithic (EUP) was a local, *in situ* development (*e.g.* Straus 1992), and still others propose that the EUP originated in the eastern Mediterranean and spread across Europe from east to west in a progressive wave (*e.g.* Otte and Keeley 1990; *cf.* Clark and Lindly 1991). The debate on the transition in northern Spain turns on a handful of sites, some of them originally excavated in the early part of the last century (*e.g.* Arbreda, El Castillo). In addition, significant finds were sometimes lost during the Spanish Civil War (*e.g.* human remains from El Castillo), recovery methods were often inadequate or biased in other ways, and publication was frequently insufficient. Recent work explores the remaining sequence at El Castillo (Cabrera *et al.* 2001) and witness sections at Abric Romani have been dated (Bischoff *et al.* 1994). There may also be transitional layers in new sites currently being investigated and analyzed with modern techniques (*e.g.* El Mirón, Straus and González Morales 2003).

The investigation with modern techniques of the rare sites with well stratified cultural deposits spanning the MP-EUP Transition will shed light on these issues, allowing us to improve our understanding of the actors, circumstances and behavioral shifts involved, and to help clarify the debated chronology of the transition interval in northern Spain.

Sopeña and its Regional Setting

North-central Spain comprises a massive series of Cretaceous limestones most evident in the Picos de Europa, a mountain chain that parallels the coast in the southern parts of Asturias and Cantabria. Sopeña is a rock-shelter in in eastern Asturias at c. 450 m above sea level and c. 250 m above the valley of the Río Güeñá, which it overlooks. The shelter is approximately 60 m², it opens to the southwest, and affords an unobstructed view of the adjacent valleys to the west. Figure 16.1 shows the surface
In 2002 we excavated a 2 × 1 m. test trench, reaching a depth of c. 3 m. below datum without encountering bedrock. Sixteen well stratified and very fertile archaeological levels were exposed in the walls of the trench, ascribed to the late Middle and early Upper Paleolithic. The west section of the test is given in Figure 16.2. Finds are very abundant and well preserved, with faunal remains outnumbering lithic remains by a ratio of 3:1. Regarding the fauna, a very preliminary overview shows that most of the assemblage throughout the sequence is formed by shaft fragments, and epiphyses and teeth are quite rare, thus limiting taxonomic identification. Species present (Table 16.1) in the levels analyzed thus far are the familiar ones for this time span and geographic area (Table 16.1). The levels that have a larger number of finds also offer (as expected) greater taxonomic variety. Carnivores seem to be more frequent in the

Figure 16.2. Stratigraphic sequence in the west wall of the 2002 test excavation.
upper levels, particularly in Level III, and their possible contribution to the faunal composition of the site must be analyzed and accounted for prior to making inferences about the human behavioral component.

### The Early Upper Paleolithic Sequence (Levels I–XI)

One Gravette point from Level I, another from Level III and some fragmentary bone points and antler awls in Levels III, V and VII, as well as a keeled endscraper in Level VII suggest assignment of the three uppermost levels to the Gravettian, and Levels IV–XI to the (so far undifferentiated) EUP. One uncalibrated ¹⁴C AMS date on a bone from Level XI (32,870 ± 530 BP [Beta 171157]) marks the earliest EUP at Sopeña. Levels III, V and VII are almost black, with much charcoal and burnt bone; hearths, ochre and quartz crystals are well-documented. Although of limited extent, Levels I–XI yielded 3476 stone artifacts and 104 retouched pieces, suggesting a very considerable cultural component in the formation of at least some of these deposits.

As for the raw materials, the same four types are represented throughout the EUP sequence (Table 16.2). In descending order of importance, they are, by weight, (1) quartzites, (2) limestones, (3) flints and cherts, and (4) quartz. In Levels I–XI, 50.7% of the artifacts are made on quartzite; 23.6% on various kinds of limestone, 20.3% on flints and cherts, and 5.4% on quartz. Although there are marked differences in the relative frequencies of retouched pieces, and in some debitage categories, there is little change over time in the ratios of raw material (see below). The fundamental raw material dichotomy between relatively large retouched pieces like denticulates and side scrapers made on quartzite flakes, and smaller, relatively delicate retouched pieces like backed bladelets made on flints and cherts (Clark 1989), is also apparent in the Sopeña test excavation. About 4% of the Level I–XI total comprises heavy-duty tools like choppers, chopping tools and hammerstones, all of them made on quartzite pebbles and cobbles (Figures 16.3, 16.4).

Debitage (Figure 16.5) was classified according to 25 categories developed by Clark in order to monitor the various phases in the reduction process, which—in turn—should allow for some fundamental distinctions between whether primary reduction was taking place in any given level, compared with secondary retouching, which indicates weapon and tool manufacture and maintenance. Cores were also classified according to nine categories, and were scored as ‘exhausted’ if it appeared that no additional flakes could be detached from them (Clark et al. 1986). The debitage and core
data from the 2002 test are summarized in Figure 16.5. Both are en bloc comparisons of the Upper Paleolithic with the Middle Paleolithic levels.

The debitage fraction in Levels I–XI comprises 97% of the artifact total, and is dominated by plain and trimming flakes (30% and 25% respectively), suggesting considerable secondary reduction. Shatter – indicative of primary reduction – accounts for 28% of the debitage total, however, and there are also substantial numbers of cortical flakes, single and multiple platform flakes and blade cores, and core renewal flakes. Although not numerous, blades and bladelets are more common in Levels I–XI than they are in Levels XII–XVI. Nevertheless, the debitage frequencies in the two major analytical units are strikingly similar.

Retouched pieces accounted for 3% of the Level I–XI artifact total, which falls within the range typical of most European Upper Paleolithic assemblages (2–5%). Although there were substantial numbers of generic tools like notches and denticulates (19%), endscrapers and burins accounted for 14% and 13% of the retouched tools, significantly higher than in Mousterian Levels XII–XVI. Retouched blades and pièces esquillées were also more prevalent in these Upper Paleolithic deposits than in the Middle Paleolithic sequence. However, sidescrapers made on quartzite flakes and closely resembling their Mousterian counterparts account for 10% of the Upper Paleolithic retouched tool total.
The Middle Paleolithic Sequence (Levels XII–XVI)

The transition to the Middle Paleolithic in Level XII is marked by a change in the retouched component of the lithic assemblage, and stratigraphically by a change in color and texture from overlying Level XI. A typical Mousterian point was recovered from Level XII, and sidescrapers are prevalent throughout it and in the underlying levels (especially in Levels XIV, XV). We have only one \(^{14}C\) AMS date on a tooth from Level XII of 38,630 ± 800 uncal. (Beta 198146).

Levels XII–XVI yielded 604 stone artifacts and 45 retouched pieces. The smaller number of pieces (604 vs 3476) and lower mean level counts (121 vs 225) and weights (1203 vs 2241 gms) are usual for Mousterian deposits in northern Spain, and suggest a more ephemeral Mousterian use – on average – of caves and rockshelters than is typical for the Upper Paleolithic. This could mean that Mousterian populations were generally smaller than those of the Upper Paleolithic, and/or that they were spending less time in caves and rockshelters, as has been suggested by a number of authors (e.g. Jelinek 1988, 1994) although further research will shed more light on this.

Raw material in the Mousterian levels is dominated by the same fine-to-medium grained gray quartzite found in the upper part of the sequence. Although a more in depth analysis of these is pending, we can say now that in Levels XII–XVI, 72.8% of the artifacts by weight are made on quartzite, 17.6% on limestone and other materials, 9% on flints and cherts, and 0.6% on quartz. Quartzite is even more important than in the Upper Paleolithic levels (50.7%), but quartz drops out of the picture almost entirely. By far the most important levels in the Mousterian sequence are Levels XIV and XV, which account for 45.5%, by weight, of the worked stone recovered from the levels.

Despite significant differences in the retouched tools, the debitage fraction (Figure 16.5) from Levels XII–XVI closely resembles that from Levels I–XI (Table 16.2). There is more evidence for primary reduction in that primary and secondary decortication flakes are slightly more numerous, accounting for 13% of...
the debitage total. Plain flakes are significantly more prevalent, accounting for 40% of the debitage total (vs 27% in the Upper Paleolithic levels). The only disk cores in the sequence come from the Upper Paleolithic levels, however. In keeping with evidence from El Castillo (Cabrera 1984), El Pendo (Freeman 1980) and Cueva Morín (Freeman 1971, 1973), there is little evidence of Levallois technique, perhaps because of raw material constraints. In other words, the main raw material type consists of quartzite pebbles and cobbles, whereas good flint in large ‘packages’ is practically non-existent in northern Spain.

Retouched pieces accounted for 7.4% of the Level XII–XVI artifact total, which is a little higher than the average for the regional Mousterian, and more than twice as high as the corresponding statistic (3%) for Levels I–XI (Table 16.2, Figure 16.6). Forty-seven percent of the retouched total consists of sidescrapers made on quartzite flakes. Notches and denticulates account for an additional 27%, and there is a modest
representation (11%) of retouched flakes. Classic Upper Paleolithic tools like endscrapers and burins are rare, lending additional confidence that the basic cultural stratigraphy exposed in the test is essentially correct. Sidescrapers are generally unilateral, convex and steeply retouched, conforming to the Quina variant of the Charentian facies, as defined by Bordes (Figure 16.7). Although this observation carries with it no chronological or behavioral implications, it is interesting to note that Cabrera et al. (1996) also remark on the prevalence of Quina-type Mousterian industries at El Castillo and in Cataluña. They point out that, at present, no Ferrassie-type Charentian facies nor MTA Mousterian sites or levels are known with certainty from northern Spain, and that the most prevalent Mousterian facies are the Denticulate variant, best represented at Cueva Morin, and the Typical Mousterian, regarded by many as a ‘catch-all’ category which lacks an adequate definition. Unlike Morin, however, where ophite cleavers are well-represented in Mousterian deposits (Freeman 1971), the Sopeña test did not yield any cleavers, nor the characteristic transverse flakes detached to produce them. In a recent and comprehensive empirical study, Freeman (1994) questions the technological and typological discreteness of the Bordesian facies in Cantabria and comes to the conclusion that the facies are arbitrary constructs, and that formal variation is more or less continuous across the ‘key’ north Spanish Mousterian sites (i.e. El Castillo, Cueva Morin, El Pendo, La Flecha).

**Concluding Remarks**

New data and recent analyses from Iberian sites that appear to date to the Middle-Upper Paleolithic transition suggest a very early arrival of Upper Paleolithic technologies in the north – seemingly precluding an Early Upper Paleolithic diffusion from east to west (e.g. Clark and Lindly 1991). This, and the very late survival of Neanderthal associated Middle Paleolithic technologies in the south, continue to make the Iberian Peninsula a major focus of research on modern human origins. In this context, Sopeña is relevant because of its long and probably intact sequence of Middle and Early Upper Paleolithic deposits. Clearly, we need more dates. Although there is a long hiatus between the dates from levels XI and XII, both these levels are of considerable thickness. However, no Châtelperronian diagnostics have been identified from the 2002 test. For the present, we can say that Sopeña has a long Gravettian and Early Upper Paleolithic sequence in Levels I–XI, postdating 33 ky bp (uncalibrated). The EUP levels overlie at least six well-preserved Mousterian levels, although the bottom of the cultural deposits in the cave has not so far been reached. Our top priority is to get more radiocarbon and ESR determinations in order to be able to establish an absolute chronology of the site. With its abundant and well preserved lithics and fauna, excavated, recorded and analyzed with modern methods, we hope that on-going research at Sopeña will shed light on the important behavioral changes that separate us from our archaic predecessors.
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