

# The Upper Paleolithic of Cantabrian Spain

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Study of the Cantabrian Upper Paleolithic began in the 1870s with excavations by Marcelino Sanz de Sautuola in the caves of El Pendo, Camargo, and especially Altamira, where, in 1878, he discovered rupestrial paintings and recognized their relationship to the Ice Age archeological deposits he was digging in the vestibule of the cavern<sup>1</sup> (Fig. 1). Following two decades of dismissal by most of the prehistoric “establishment,” Cantabrian prehistory once again asserted its importance with the discovery, a century ago, by H. Alcalde del Río and Lorenzo Sierra, of such major art and

archeological sites as El Castillo, Hornos de la Peña, Covalanas, La Haza, El Mirón, and El Valle.<sup>2</sup> Since then, and at an intensified pace in recent years, some 100 cave art loci and many more Upper Paleolithic habitation sites have been discovered, making the relatively small Vasco-Cantabrian region of northern Spain one of the richest in the world for the archeology of the period between c. 40,000 to 10,000 radiocarbon years ago.

The purpose of this article is to review and make available to an English-speaking readership some of the most salient and distinctive aspects of the Upper Paleolithic record of Cantabrian Spain, highlighting the discoveries and developments in our understanding of major problems that have occurred since publication, more than a decade ago, of my book on the Stone Age prehistory of northern Spain, *Iberia Before the Iberians*.<sup>3</sup> In particular, this record is significant in relation to the ongoing debate about the so-called Middle to Upper Paleolithic transition; the impact of the Last Glacial Maximum on human settlement in Europe; study of Upper Paleolithic art in its broader socio-cultural-economic contexts; and the worldwide phenomenon of diverse human responses to the termination of Pleistocene environmental conditions around 10,000 radiocarbon years ago.

## THE CANTABRIAN REGION: NOW AND THEN

This is a geographically well-defined entity, bounded to the north by the Bay of Biscay, to the south by the Cantabrian Cordillera (highest summits c. 1,500 to 2,000 m) and Picos de Europa (maximum elevation, 2,648 m), to the east by the Pyrenees, and to the west by the Nalón River, which

delimits the shieldrock area of western Asturias and Galicia. Administratively, the natural region is divided from east to west among the two coastal Basque provinces Guipúzcoa and Vizcaya, Cantabria (formerly Santander), and Asturias. From the Río Bidoasoa (the French border at the western end of the Pyrenees) to the Nalón, the distance is about 350 km, while the present width of the region, from the shore to the Cordilleran crestline, ranges from about 30 km to no more than 50 km. The total area is about 14,000 km<sup>2</sup>. A strip of continental shelf only 4 to 12 km wide would have been exposed during full glacial sea-level regression, while at the same time significant areas of the Cordillera and Picos de Europa were glaciated. Dominant bedrock lithology in many parts of Vasco-Cantabria is highly karstified Cretaceous limestone, although there are also major outcrops of carboniferous limestone and earlier Paleozoic quartzite, especially toward the west. The relief is very steep, with a few stretches of significant coastal “plains,” notably around the Holocene-age Bay of Santander and in central Asturias, or broad river valleys.

Vasco-Cantabria is “green Spain.” Climatically and ecologically, it is sharply distinct from the rest of the country, the Mediterranean environment of which can be perceived immediately upon crossing the Cordillera. It is a region of sharp contrasts within short distances. Situated between 43° and 43°30′ north latitude, under present conditions it benefits from the presence of the Gulf Stream, having a moderate, equable range of temperature along the shore (annual average: c. 14°C) (Fig. 2), but with low temperatures in the adjacent high mountains (Fig. 3). During the Pleni-

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Key words: Cantabrian Spain, Upper Paleolithic, Upper Pleistocene, Châtelperronian, Aurignacian, Gravettian, Solutrean, Magdalenian, Azilian

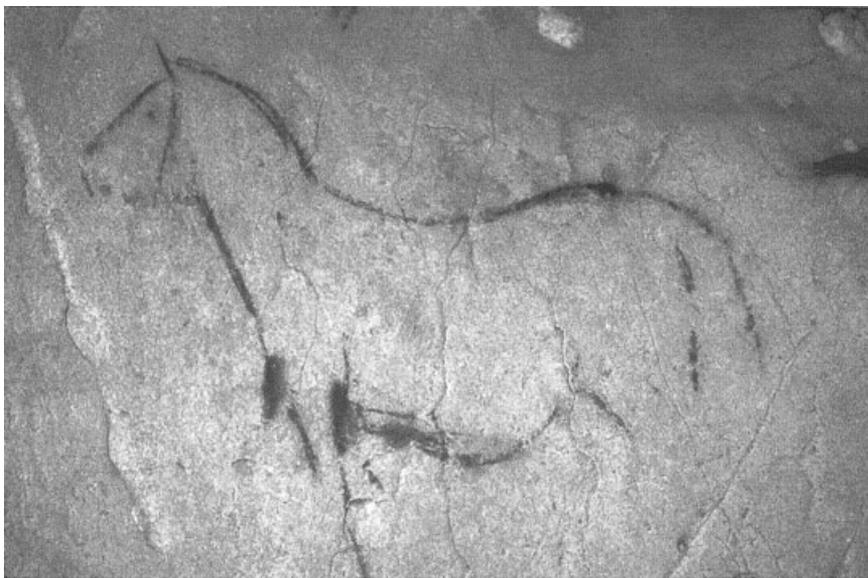


Figure 1. Cave painting of horse in La Pasiega (Cantabria)

glacial, however, the Gulf Stream was forced far to the south and surface water temperatures were lowered some 10–11°C (2). Precipitation in this oceanic strip is very high, 1,000 to 1,400 mm annually. Presently this is almost never in the form of snow in the coastal lowlands, but there is abundant winter snow in the mountains. Indeed, snow on the high northern slopes may not entirely melt until late summer, although there are now no glaciers. During the Pleniglacial, the permanent snowline was at c. 1,650 to 1,025 m; terminal moraines were formed as low as 600 to 750 m above present sea level.

Absent the intense deforestation that has repeatedly affected the region and created extensive humid grasslands and heaths since Neolithic times, Holocene vegetation would be luxuriant mixed deciduous forest. Last Glacial vegetation, in contrast, was fundamentally open, ranging from parkland dotted with limited stands of pine, juniper, and a few hardy deciduous taxa (for example, birch) under interstadial conditions to treeless grasslands and heathlands under stadial ones.

The modern large mammal wild fauna is depauperate (roe deer, boar, chamois, brown bear, wolf, fox), but was considerably richer in the Upper Pleistocene, when it also included cave bear, lion, leopard, hyena, dhole,

bison, red deer, auroch, horse, ibex, and—exceptionally, under glacial conditions—reindeer. Mammoth, giant deer, and various forms of rhinoceros were present during isotope stages 4 and 3, but seem to have become extinct early in stage 2. There is a radical contrast between Aquitaine and Vasco-Cantabria in that red deer was the main game species at non-montane sites during the whole Upper Paleolithic, while reindeer was very often the overwhelmingly dominant

prey of humans in France. In both areas, ibex, often associated with chamois, was the principal game at sites in steep, rocky montane settings. Reindeer invaded red-deer territory in northern Spain during cold and not too dry times in Aquitaine, while red deer expanded northward in warmer, wetter times.

### CHRONOSTRATIGRAPHY OF ISOTOPE STAGES 3 AND 2 AND OF THE UPPER PALEOLITHIC

The late Mousterian, Middle-Upper Paleolithic transition, and Aurignacian all fell within isotope stage 3: the Würm Interpleniglacial, c. 60 to 27 kya. This period was climatically complex, even though it was generally characterized by relatively moderate conditions with a series of temperate oscillations. Hengelo (c. 40 kya) is a period of particular interest in that the technological transition to the Upper Paleolithic seems to have occurred at this time. Pollen data indicate that at least the low coastal environment was relatively wooded.

Stage 2 pleniglacial conditions began c. 27 kya and bottomed out c. 18 kya. So extreme was the climate that the older Solutrean levels at La Riera Cave on the coastal plain of eastern Asturias have virtually no tree pollens. Controversy attends the question of



Figure 2. The coastline of Vasco-Cantabria with a moderate, equable range of temperature.



Figure 3. The coastal range and Picos de Europa in eastern Asturias

the existence of various moderating oscillations within the first part of the Tardiglacial.<sup>4–7</sup> It seems likely that such episodes, especially “Lascaux,” did occur, especially with greater humidity, as indications of limited Tardiglacial pedogenesis have been detected in long loess sequences of northern Europe, not just in the caves of southern France and Spain. The significant warming of the Late Glacial Interstadial (“Bölling + Alleröd”) began abruptly c. 13 kya, and some proxy records suggest a slight downturn in its midst (“Dryas II”). The warming trend was abruptly interrupted c. 11 kya by a severe return to cold, albeit still humid, conditions (“Dryas III,” a Heinrich event.<sup>8</sup> As abruptly as it began, this cold episode ended c. 10 kya, to be followed by rapid establishment of the interglacial conditions of stage 1.

In Cantabrian Spain, the chronological limits of the traditional Upper Paleolithic culture-stratigraphic units are currently defined as follow (all dates are uncalibrated radiocarbon ages):

Early Aurignacian: c. 40–35 kya  
 Châtelperronian: c. 35 kya  
 Late Aurignacian: c. 35–28 kya  
 Gravettian: c. 28–20 kya  
 Solutrean: c. 20–17 kya  
 Lower-Middle Magdalenian: c. 17–13 kya

Upper Magdalenian: c. 13–11.5 kya  
 Azilian: c. 11.5–9 kya

I believe that these traditional taxonomic units are merely convenient descriptive tools that permit communication among prehistorians. However, they are constructs of nineteenth-century archeologists, further reified and modified by other scholars throughout the course of the twentieth century. In addition, these units were all conceived in France and all their definitions had to be stretched to fit the Cantabrian situation. I am firmly convinced that there were local, regional, and interregional technological and artistic traditions in existence during each of the traditional Upper Paleolithic periods, with contacts between bands and individuals that constituted networks of relationships, and hence, webs of diffusion of objects, ideas, and symbols, over broad areas of Europe. But there was not, for example, an Aurignacian or even a Solutrean “culture” *per se*. These terms are abstractions. Moreover, the longer the period represented and the broader the area covered (for “the” Aurignacian, some 12,000 years and a geographic range from Portugal to Israel!), the less likely the terms are to correspond to anything remotely resembling a “culture” in the ethnographic present. On the other hand,

the later Magdalenian of Western Europe, with a very dense network of inter-area connections spanning some 2,500 years, might well come close to identifiable cultural reality at the broadest possible definition of recognizable “ethnicity.” As high-precision radiocarbon dates increase, it will become more possible to compare assemblages by calibrated age, not by traditional cultural phase. We are nearing this situation at the end of the Upper Paleolithic, but are still far from it in the earlier stages, particularly >20 kya. I continue to use the traditional Upper Paleolithic “culture” names as shorthand labels for major slices of time having some distinctive characteristics of technology and art, as well as settlement and subsistence.

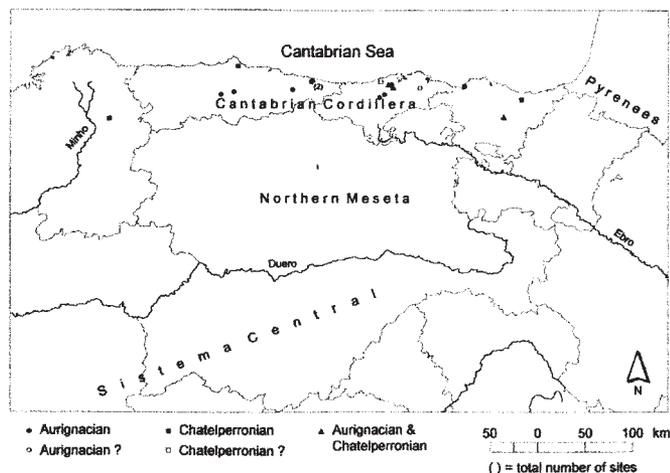
### THE MIDDLE-UPPER PALEOLITHIC TRANSITION

The record for early hominid occupation of north-coastal Spain is still very limited, despite proximity to the extraordinary complex of caves in the Sierra de Atapuerca, with Lower and Middle Pleistocene hominids and artifacts, and to the recently discovered Mousterian and Neandertal cave site of Valdegoba.<sup>9–12</sup> However, fresh evidence of Acheulean presence in Vasco-Cantabria has recently been uncovered at the open-air sites of Irrikaitz (Guipúzcoa) and La Verde (Cantabria).<sup>13,14</sup>

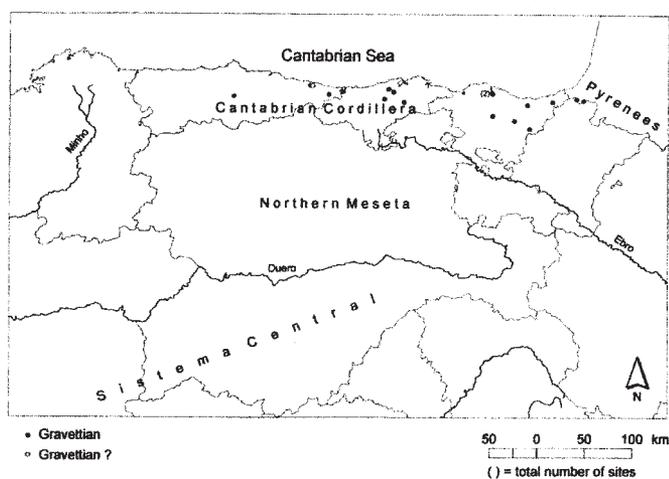
Modern-quality excavations of Mousterian deposits that build on the now-classic projects in El Pendo and Morín caves, both on the coastal plain around Santander, are few in number and none, as yet, has been definitively published. New Mousterian discoveries include Neandertal finds in Sidrón Cave in east-central Asturias<sup>15</sup> and the archeological sites of La Viña near El Conde, Llonín in the coast range in eastern Asturias, El Mirón in the montane interior of eastern Cantabria, and Amalda in the hills of Guipúzcoa. A reanalysis of the old, undated Mousterian collections from Axlór, also in Guipúzcoa, includes evidence of increasing selection of high-quality flint for toolmaking in the latest levels.<sup>16</sup>

The end of the Mousterian technocomplex and replacement of the Ne-

### Early Upper Paleolithic of Northern & Central Spain



### Gravettian of Northern & Central Spain



### Solutrean of Northern & Central Spain

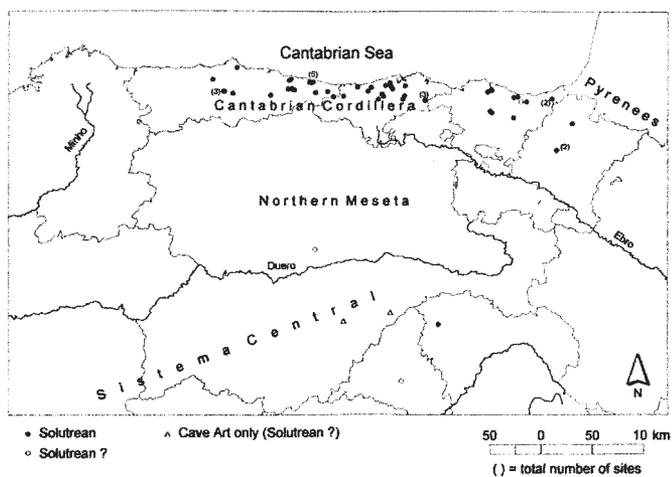


Figure 4. Archeological sites of Northern and Central Spain during the: A. Early Upper Paleolithic; B. Gravettian; C. Solutrean.

andertals on the Iberian Peninsula was staged over a c. 12-ky period, one which climatically was relatively be-

nign as compared to a Pleniglacial, albeit variable.<sup>17-19</sup> Since the Neandertals had earlier survived interglacial

(stage 5e) and interstadial (stages 5c and 5a) conditions, as well as glacial ones, especially stage 4, this begs the questions of why the transition occurred and why it happened when it did, during stage 3.<sup>20-22</sup> It is also significant that major cultural changes occurred midway through the Upper Paleolithic coincident with the Last Glacial Maximum (LGM). The Upper Paleolithic did not “arrive” as a complete package at c. 40 kya; rather, it developed, and did so in great part in response to climatic and demographic stresses (Fig. 4A).

The most important sequence is that of El Castillo Cave, which was restudied and reexcavated for a quarter century by the late Victoria Cabrera. The lowest Mousterian levels have been dated between about 89 and 69 kya.<sup>23,24</sup> Although these strata were only excavated by H. Obermaier between 1911 and 1914, late Mousterian level 20 and early Aurignacian level 18 have also been recently excavated by Cabrera. Level 20 has two accelerator mass spectrometry (AMS) and electron spin resonance dates on charcoal of c. 41 kya. Level 18 has now been AMS-dated on charcoal by three different laboratories, yielding 10 consistent readings that range between 37 and 41 kya,<sup>25,26</sup> not 36 to 36.5 kya as claimed by Mellars<sup>27</sup> and d’Errico and Zilhão.<sup>28-30</sup>

A deep sounding in El Mirón yielded a scanty lithic industry in level 130 that includes denticulates associated with charcoal dated by AMS to  $41 \pm 1$  kya. Level 128, which is also culturally poor, is AMS-dated on charcoal to  $27.6 \pm 0.2$  kya.<sup>31</sup>

The vast rockshelter of La Viña, which dominates the Nalón valley near Oviedo, has also recently yielded late Mousterian levels dated between  $>39$  and 36 kya, and an early Aurignacian dated to 32 kya.<sup>32-34</sup> All in all, these sites suggest a transition from Mousterian to early Aurignacian technology in Cantabrian Spain between approximately 40 and 36 kya, which is in line with what also seems to have occurred in Catalonia (northeastern Spain). However, a recent AMS date of  $37.1 \pm 1$  kya on bone from Arrillor Cave in the trans-cordilleran part of the Basque Country (Alava) is associated with an assemblage that is attrib-

uted to a sidescraper-rich Mousterian, but with some Upper Paleolithic tool types.<sup>35</sup> There is also radiometric evidence of possible Mousterian continuation up to about this same age in the nearby sites of Ermita and Millán in Burgos.<sup>36,37</sup> Recently a claim has been made for survival of Mousterian lithic technology in Esquilleu Cave in the Picos de Europa of western Cantabria, with <sup>14</sup>C dates between 39 and 37 kya.<sup>38–40</sup>

Analyses of lithic raw material use, technological stages, and tool typology have long pointed to considerable continuity between the local late Mousterian and the early Aurignacian, at least in the area around Santander.<sup>41</sup> The real innovations of the Aurignacian include antler points and a variety of Upper Paleolithic stone tools, but these are associated with many tools that are normally considered characteristic of the Mousterian, notably sidescrapers. Even bladelets are present in both late Mousterian and early Aurignacian levels at Castillo, although the supposedly diagnostic marginally retouched Dufour bladelets do not appear until higher in the stratigraphic sequence at that site. Keeled “scraper/cores” are also found in both Aurignacian and Mousterian levels here and at other sites. The same flints and other local lithic raw materials were used across the transition, with quartzite only phasing out later in the Santander area Upper Paleolithic.

Continuity in subsistence across “the transition” is also suggested at Castillo, Pendo, and Morín.<sup>42</sup> Horses and bovines are abundant compared to their lesser importance in late Upper Paleolithic assemblages, but red deer can also be very abundant, especially in both the latest Mousterian and earliest Aurignacian levels at Castillo. Prime-age adults were often consumed, and presumably hunted, in both periods. At other Mousterian sites there seems to be evidence of distinct concentration on certain species that may have been most abundant in the local environment: chamois at Amalda, bovines at Lezetxiki, red deer in some levels at Axlor (all in Guipúzcoa), and ibex at Esquilleu (Cantabria). However, the number of individual animals represented in

each thin, “living floor-like” level is usually quite small. Large carnivores (hyenids, felids, canids, ursids) are abundant in many Mousterian assemblages, which raises the question of the extent of hominid agency in the accumulation of ungulate remains in the sites. In contrast, the presence of large carnivores declined throughout the course of the Upper Paleolithic in those caves chosen by humans for more intense habitation. Studies of ungulate dental cementum from the Santander area sites<sup>43</sup> suggest that low-lying, highly sheltered El Pendo was used by people only in the cold season during the Mousterian and Aurignacian, while Castillo and Morín were visited during a wider range of seasons in both periods, but with some narrowing of the times of use at Castillo in rich early Aurignacian horizon 18. A novelty in this level are a few marine molluscs.

### THE CHÂTELPERRONIAN AND LATER AURIGNACIAN

This picture of local development of the Aurignacian lithic industry in Cantabrian Spain is complicated by the presence of a few assemblages attributed to the Châtelperronian. Traditionally, there had only been two Châtelperronian assemblages from the region, El Pendo and Morín, with some isolated curved backed (“Châtelperron”) points or knives at other sites. Morín Châtelperronian level 10 lay between the highest Mousterian and the lowest Aurignacian. The Châtelperronian is dated by a single conventional <sup>14</sup>C assay of 36 kya, but with a standard deviation of 6.8 ky. There is a series of similar dates on charcoal ranging from c. 31.5 to 27.2 kya for “archaic” and “typical” Aurignacian levels 8a–7, but the oldest Aurignacian level (9), with a possible split-base antler point, is undated. The Pendo Châtelperronian is undated; its integrity and putative interstratification between Aurignacian levels recently have been seriously questioned.<sup>28,29</sup>

Two new Châtelperronian sites have been excavated recently: A Valiña in Lugo (eastern Galicia) and Labeko Koba (Guipúzcoa).<sup>44,45</sup> The former, unusual for its isolation and

for being a cave in an area where caves are rare, is dated between 35 and 32 kya. This site has palynological evidence of interstadial conditions, as at Morín. Stone tools, including the supposedly diagnostic “points,” are rare. Labeko Châtelperronian level IX lower is dated to 34.2 ± 1.3 kya. The poorly preserved pollen includes a few grains from thermophile tree taxa as well as pine, suggesting attribution to an interstadial that could be Les Cottés. In contrast, the upper part of level IX was formed under markedly colder conditions, with woolly mammoth and rhinoceros. As is common in nonmontane Vasco-Cantabrian sites, Labeko, which was a cave near the floor of a relatively broad stretch of the Río Deva, had a red-deer-dominated Châtelperronian fauna, together with large numbers of remains of horses, bovines, and hyenas. Hyenas are also prominent in the Valiña fauna.

The Labeko Châtelperronian artifact assemblage is small, but includes a high percentage of blades, three or four curved backed “points,” three backed bladelets, a burin, a sidescraper, and a fragment of antler point. Neither Morín nor Pendo has osseous artifacts in its Châtelperronian and, unlike a few French Châtelperronian ensembles, contain no personal ornaments.

Sites such as Pendo, Castillo, Morín, Viña, Cueto de la Mina, Labeko, and Lezetxiki contain sequences of later Aurignacian levels. (Altogether there are only a dozen sites in Vasco-Cantabria with assemblages credibly attributable as “Aurignacian.”) Although radiometric dates are still very rare, it is fairly clear that this techno-complex lasted until around 28 to 27 kya. Some of these assemblages contain single or a few antler points, including split-base ones in older levels and flat-section ones later, and perforated teeth such as red-deer canines. Portable “art” objects are virtually absent except for a linearly engraved antler fragment from the uppermost Aurignacian at Labeko and a few engraved and perforated pieces mainly from Pendo. Carinate and nosed scraper/cores are often abundant, as Dufour bladelets sometimes are in fine-screened collections. But

classic, large, scalariform retouched or “strangled Aurignacian” blades are never really common in Vasco-Cantabria, perhaps in part because of the small size of their usual raw material nodule. On the other hand, “Mousterian” tool types such as denticulates, notches, and sidescrapers remain abundant or even very abundant in several “early” and “typical” Aurignacian assemblages.

There was still continuity in subsistence resources *vis à vis* the late Mousterian, with dominant red deer, followed by substantial quantities of bovines and horses, which, due to their larger body weight, could have provided as much or more food than deer. Some levels continue to have very large quantities of cave-bear remains, showing that even early Upper Paleolithic humans at times had to “time-share” their use of favorite caves with hibernating bears.

Skepticism as to the separate reality of the traditional Aurignacian and Châtelperronian cultural phylla, at least in Cantabrian Spain, can be based on the fact that “Châtelperron” points occur in many of the “Aurignacian” assemblages; carinate and nosed scrapers can be found in Châtelperronian assemblages; Dufour blades can be either abundant or scarce in modern-quality collections; radiocarbon dates for Châtelperronian levels at three sites postdate the earliest Aurignacian, predate the later ones, and overlap with others; and the possible interstratification of Aurignacian and Châtelperronian levels (but with much lithic content overlap between the two sets of assemblages. Alternatively, these same facts could be used to argue that the Châtelperronian was the result of “acculturation” from a previously existing very early Aurignacian. In any event, there is considerable evidence of continuity or similarity among the late Mousterian, Aurignacian, and Châtelperronian in this region. An unresolved question is who made what? Neandertal remains are not abundant in Vasco-Cantabria. Cro-Magnon remains are also scarce and poorly documented.<sup>46</sup> There are no human remains associated with the Châtelperronian in Spain, and thus no proof that this industry was made by Neandertals there. Neither

the model of autonomous Neandertal Châtelperronian development of Zilhão and d’Errico<sup>28–30</sup> nor the Aurignacian acculturation model of Mellars<sup>27</sup> is unambiguously supported by the Cantabrian evidence. But there is considerable evidence of regional adaptive continuity, irrespective of which forms of humans may have been present in the area in late isotope stage 3. A model of mosaic cultural developments across the Middle-Up-

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per Paleolithic transition and into the Early Upper Paleolithic is supported by the evidence from Cantabria in particular, as well as that from Iberia in general.<sup>47</sup>

### THE GRAVETTIAN

In northern Spain, the Gravettian is poorly represented. For the period c. 28 to 20 kya there are only about 16 known sites, about 2.0 sites per millennium. This is a very small number, but more than for the Aurignacian plus the Châtelperronian, which aver-

age about 1.25 known sites per millennium<sup>48,49</sup> (Fig. 4B). For both periods, the human population density in Vasco-Cantabria, as measured by the crude, flawed proxy of site numbers, appears to have been much lower than in the Périgord, for example. Nonetheless, there was a shift in technology in Cantabria similar to that which occurred around 28 to 26 kya in Aquitaine and many other regions of Europe coincident with the end of isotope stage 3 and the onset of the Upper Pleniglacial. There was a notable gracilization and, in some cases, microlithization, among stone tools, with an emphasis on lithic weapon tips and burins often made on thinner, narrower bladelets; there also was a marked reduction in the importance of antler points. Although many of the highly specialized stone artifact types that define the highly complex archeological systematics of the “Upper Perigordian” in southwestern France are rare or absent in northern Spain, this region is notable for the abundance and persistence of tiny, multiple truncation “Noailles” burins, especially in the Basque Country.

Radiocarbon dates for the early Gravettian are rare, although there are three identical determinations of 27.4 kya from levels rich in Noailles at Amalda (Guipúzkoa) and Antoliñako (Vizcaya).<sup>50</sup> The upper limit for assemblages of Gravettian aspect and lacking Solutrean points is c. 20 to 21 kya (dates in Amalda, Morín, La Rivera, and Lezetxiki). One of the most interesting dates, 22.3 ± 0.5 kya, is on charcoal from a hearth found on the surface of the deep interior of Fuente Salín Cave in western Cantabria.<sup>51</sup> Above this feature are handprint drawings on the cave wall with AMS dates confirming their late Gravettian age (M. González Morales, personal communication).

The environmental conditions of the first few millennia of stage 2 were still quite unstable, with at least one widely accepted moderating oscillation (“Tursac”) around 24 to 23 kya, which has been identified in some Vasco-Cantabrian pollen spectra (for example, Amalda). While red deer, together with horses, continued to be the main game species in sites near the Santander

coast, there is now evidence of remarkably specialized caprid hunting in the steep, rocky habitats of the Basque mountains, with large numbers of chamois at Amalda and ibex at Bolinkoba (Vizcaya).<sup>52</sup>

The Fuente Salín site clearly points to the existence of rupestral art made during the early Upper Paleolithic in Cantabrian Spain. It has been known or suspected for some time that engravings in some caves date to before the Solutrean, notably in the case of El Conde in central Asturias, where lineal engravings were covered by Aurignacian deposits. The same situation has now been carefully documented by modern excavations at Viña rockshelter.<sup>53</sup> An early Upper Paleolithic age had also long been suspected for the deep representational engravings in Venta de la Perra Cave, in the Carranza Valley, an eastern tributary of the Asón on the border between Cantabria and Vizcaya. This seems to have been confirmed recently.<sup>54</sup> Artifacts pertaining to both periods are claimed to have been found in the old excavations in Venta de la Perra. Experimental thermoluminescence dating has also recently been performed on calcites under- and overlying paintings of animals on the walls of nearby Pondra Cave; the results seem to suggest an Early Upper Paleolithic age.<sup>55</sup> If correct, these results would indicate the creation of at least some of the art along the Carranza Valley at a time when there was human occupation in nearby Mirón.

Portable art objects and ornaments are present, but still relatively rare in Gravettian contexts. Thus, the explosion of artistic production in the Cantabrian late Upper Paleolithic had its antecedents in Aurignaco-Perigordian times, but in a very limited and unspectacular fashion. This was in marked contrast to what was going on at this time especially in southwestern Germany, south-central France, and Czech Moravia, namely production of the ivory figurines of the Ach and Lone valleys, the paintings of Chauvet Cave, and the ivory, bone, and ceramic works of art of the Pavlovian, respectively.

## THE SOLUTREAN RESPONSE TO THE LAST GLACIAL MAXIMUM

The extreme cold and aridity of maximal conditions of isotope stage 2 forced the eventual and nearly complete human abandonment of northwestern Europe. The contraction in the human range to the area south of the Loire River seems to have coincided with a striking increase in numbers of sites in the southwestern Eu-

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ropean and Italian “refugia,” notably in the coastal peripheries of the Iberian Peninsula. The LGM climatic crisis also seems to have provoked development of a spate of new technologies in western Europe, including a variety of foliate, stemmed, and shouldered stone points, the spearthrower, the eyed bone needle and, toward the end, antler points edged with backed bladelets. The lithic points were often finished by exquisite percussion and “ribbon” pressure flaking. The LGM seems to have led to increased subsis-

tence intensification through both situational specialization and overall diversification of the food quest, albeit in environments poor in plant products edible by humans, and to possible changes in territorialism, social organization, and ideology as expressed in cave art.<sup>56</sup>

In Cantabria, the explosion in the number of known sites attributable to the Solutrean is remarkable: at least 53 sites, a three-fold increase relative to the Gravettian, and for a period only about a third as long as the Gravettian, for an average of about 18 sites per millennium (Fig. 4C). These sites are often in distinct clusters, sometimes separated by empty areas. Clearly there were areas that were favorable and favored for human habitation, presumably ones with good shelter, water, fuel, and topographic features propitious for hunting. Relatively few of these sites or clusters hold major portions of the Solutrean materials from this region. They include the La Llera cluster in eastern Asturias; Las Caldas and other sites in the Nalón valley of Asturias; Altamira and nearby sites on the coastal plain of central Cantabria; the trio of Santimamiñe, Atxeta, and Antoliñako near Guernica in Vizcaya; and the Aitzbitarte cave complex near San Sebastián.

The Solutrean of Vasco-Cantabria is currently dated by more than thirty credible radiocarbon determinations, which range from 20 to 20.5 kya and from 17 to 16.5 kya. Solutrean assemblages are defined by the presence of the characteristic stone points, with a variety of regionally distinctive subtypes, notably concave base but unfluted (spear?) points and short-shouldered (javelin?) points mainly in the eastern half of Asturias and Cantabria, and rhomboidal foliates in the Basque provinces. Solutrean points are generally much more abundant in the western sectors of the region, but rarer and associated with many backed bladelets and Noailles burins in the eastern areas. This further suggests territorial differentiation, as is true of the rest of the Solutrean *oikumene*. There are also short, single-beveled and centrally flattened, engraved antler points, especially dis-

tinctive and common in Asturias and Cantabria.

However, contacts among various parts of that world are manifested by “exotic” flints from Landes and Guipúzcoa that are found at Solutrean sites in the French Basque provinces (Isturitz, Azkonzilo),<sup>57</sup> as well as by site discoveries that are starting to close the gaps between the Atlantic and Mediterranean along the northern and southern flanks of the Pyrenees<sup>58</sup> and between Andalucía and Algarve. A few “western” concave base points in Basque and Pyrenean sites, including some beautifully ribbon-retouched examples from Antoliñako Cave in central Vizcaya,<sup>59</sup> are further evidence of human contacts throughout the Solutrean world. These objects, like the Solutrean points of Mirón, are made on a variety of colorful, excellent-quality lithic raw materials; they include intact points, which are otherwise rare, all facts suggesting that they may have been prized “trade goods” or gifts.

The Cantabrian Solutrean saw development of more massive hunting of red deer, especially on the coastal plains of Asturias and Cantabria, and of ibex in the montane interior, notably in the Basque Country. Subsistence intensification also included substantial exploitation of marine molluscs and some fish for the first time, even involving the transport of limpets and other shells about a two hours’ walk inland from the Pleniglacial shore at La Riera Cave in eastern Asturias.

Portable art includes tick-marked or notched bones and ivory plaques, perforated teeth and shells, and rare representational items, notably a pebble engraved with ibex from Bolinkoba and a bird figurine carved on a cave-bear canine from El Buxú. This Solutrean site in a steep valley on the southern face of a mountain range in eastern Asturias also has rupestral engravings.<sup>60</sup> Several other cave art loci are probably attributable to the Solutrean, although none has yet been dated directly, unlike the case in Andalucía.<sup>61</sup> Red-dot outline images of horses, bovines, reindeer, and especially red deer in a distinctive style centered at Covalanas and La Haza in eastern Cantabria, have been found within

a restricted geographic area between central Cantabria and western Vizcaya. Other possible Solutrean cave art includes a cluster of red-dot outlined rock concavities and other red-dot images in eastern Asturias or western Cantabria: Riera, Chufin, Meaza, and Mazaculos—most with Solutrean points.

In both Iberia and southern France, the Solutrean presents the impression of human groups living in relatively restricted but favorable territories, practicing intensive, hunting-based subsistence (where possible, supplemented with shellfishing) using new, deadly weaponry and other technologies. These groups developed distinctive local styles of points and art, but

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**A few “western” concave base points in Basque and Pyrenean sites, including some beautifully ribbon-retouched examples from Antoliñako Cave in central Vizcaya, are further evidence of human contacts throughout the Solutrean world.**

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clearly maintained contacts for rituals, mate search, and other social activities, as well as information transmission and object exchange, thus holding the human world of the southwestern refugium together and providing a degree of cultural reality to the notion of “the Solutrean” as a network of Pleniglacial survivors.

**MAGDALENIAN  
“FLUORESCENCE” AND  
REEXPANSION DURING THE  
TARDIGLACIAL**

The gradual and discontinuous moderation of climatic conditions during the 4 to 5 millennia after the LGM (Dryas I) seems to have contrib-

uted to immediate reactions in France, with the early abandonment of Solutrean lithic points, development of flake-based “Lower Magdalenian” technologies, and a reexpansion of human settlement into the uplands of the south and onto the plains of the north, up to the Paris Basin and eventually beyond.<sup>62</sup> The abandonment of “expensive” Solutrean point-making came more slowly in Iberia, perhaps because the environmental changes at the end of the LGM were not as marked and abrupt as at the higher latitudes of France. For about 1,000 years after Solutrean artifacts had disappeared from the technologies of people in France, the classic points were still being produced in Spain, but were gradually being replaced by the compound weapon tip formed by resilient, reuseable antler points and low-investment, replaceable backed bladelets. The Magdalenian technocomplex, with its profusion of antler implements and diverse lithics, which included both general types such as backed bladelets and specialized tools such as a plethora of burin and perforator types, spanned the period c. 17 to 11.5 kya and graded into the Azilian, an “Epimagdalenian” straddling the Pleistocene-Holocene boundary. This is the “classic” Upper Paleolithic from which many textbooks still extract most of the stereotypical descriptions of this major stage in human cultural evolution. And yet the Magdalenian artists of Altamira at c. 14 kya were separated from the early Aurignacian split-base point makers by almost twice as much time as they were from us in the atomic age!

The Magdalenian of Cantabrian Spain can most practically be divided into two technological phases: before and after invention of the true barbed antler harpoon at c. 13 kya. This was coincident with the onset of the significant climate upturn of the Bölling oscillation. The early-to-mid-Magdalenian is showing itself to have been internally quite variable, with a variety of facies defined by particular antler point types and by the relative importance of backed bladelets among lithic collections obtained with modern screening methods. However, a “Middle” Magdalenian is beginning to be defined in Vasco-Cantabria among

assemblages dating to c. 14 to 13 kya.<sup>63–65</sup> It bears similarities especially to that classic phase in the French Pyrenees marked by small ornamental heads of horses and other ungulates cut out of thin bones, rare “proto-harpoons,” and even a perforated and decorated circular bone cut-out at Llonín. In many cases there is a high degree of continuity among the lithic “substrate” artifacts between so-called terminal Solutrean and early Magdalenian assemblages, indicating an *in-situ* development of the latter in northern Spain in the same way that the transition from so-called terminal Magdalenian to Azilian was gradual, uneven, and clearly local in nature. The Cantabrian Magdalenian lacks many of the special tool and weapon types defined in the Périgord. However, it has an extraordinary wealth and diversity of decorated antler, bone, tooth, and stone objects, some clearly utilitarian but others certainly ornamental or ritual, as well as plain awls and eyed needles.

Including a few loci across the Cordillera in Navarra, there are 56 known early-mid Magdalenian sites and 49 late Magdalenian ones, which respectively translate into 17 and 24.5 sites per millennium (Fig. 5A). The density of sites (and of people?) seems to have remained like that of the Solutrean during Dryas I, but then apparently increased again during the Last Glacial Interstadial (Bölling-Dryas II-Alleröd). Equally telling is the fact that there are more sites in the uplands. As the glaciers of the Cordillera melted back, humans ascended ever higher, as they did in the Magdalenian in France and the late Epigravettian of Italy as part of the great recolonization movement that was taking place not only altitudinally, but also latitudinally throughout Europe during the Tardiglacial. By the end of the Magdalenian there is once again evidence of human settlement, albeit sparse, on the mesetas of northern Burgos and other parts of Old Castile. Many of the river valleys of Vasco-Cantabria have Magdalenian sites along their full length, from the present shore to the Cordillera.<sup>66</sup> The sites may include major, multi-purpose residential loci, often located on or near the coastal plain, and limited-activity sites such

as hunting camps, often in the montane zone. Another indication of the relative density of human population is the presence at many sites of extraordinarily thick Magdalenian occupation deposits with remnants of hearths, pits, and other features, and littered with faunal remains, tools, and lithic debris, often with no culturally sterile lenses. Examples include the Magdalenian deposits at such sites as Viña, Llonín, and Tito Bustillo (Asturias); Altamira, Juyo, Castillo, and Mirón (Cantabria); Santa Catalina and Lumentxa (Vizcaya); and Urutiaga and Ekain (Guipúzcoa). Certain sites, chosen for their propitious location and available resources, were used repeatedly, perhaps for extended periods or by large groups.

The intensification trend in subsistence continued during the Tardiglacial,<sup>67</sup> no doubt under the pressure of

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### **The Magdalenian of Vasco-Cantabria, like that of the French Pyrenees and Aquitaine, is best known for its wealth of cave and portable art.**

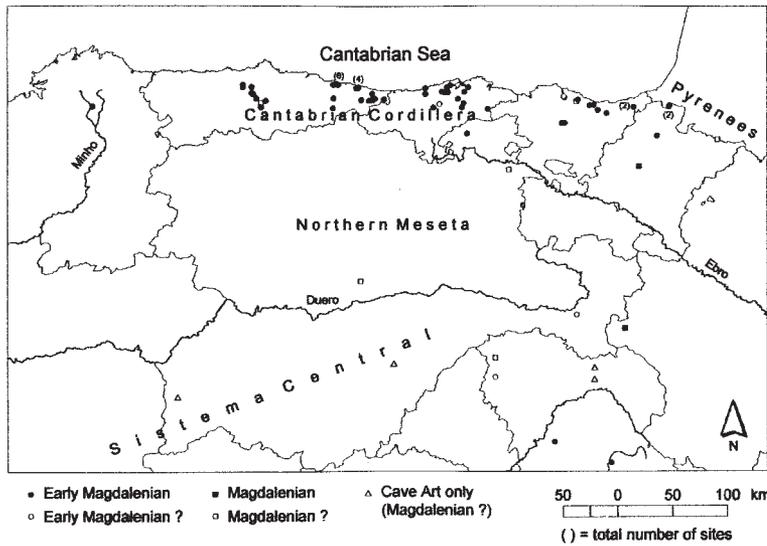
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increasing population packing. Gradual loss of a modest amount of coastal land as sea level began to rise was partially compensated for by glacial retreat in the mountains. The term “wild harvesting” can accurately be applied to the slaughter of red deer, especially hind-led herds, at many sites. Magdalenian sites on steep, rocky slopes in the mountains are usually characterized by faunal assemblages overwhelmingly dominated by ibex. Numerous sites along the coastal strip in eastern Asturias and Cantabria have large numbers of limpets and periwinkles, indicative of systematic exploitation. The remains of fish, especially salmon and trout, are very abundant in many sites, both near the coast and along rivers in the interior, in levels both with and with-

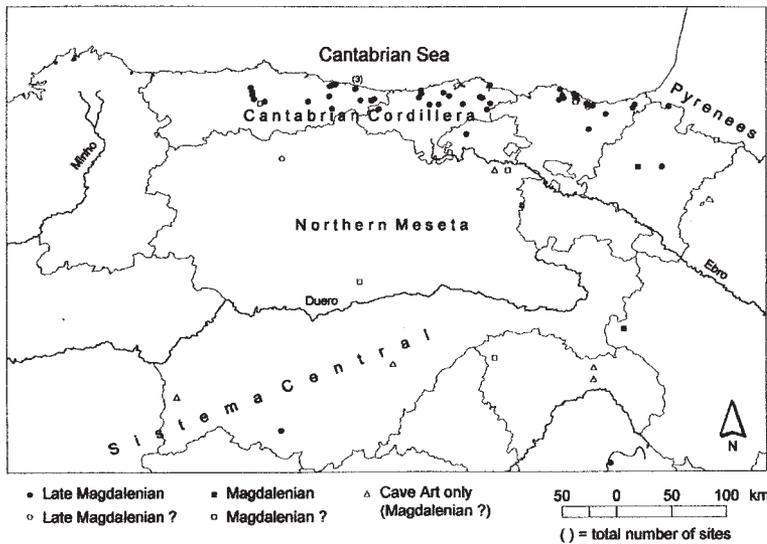
out harpoons, since fishing could also have been done with composite bevelled antler points.<sup>68</sup> The Cantabrian Sea and the rivers that flow into it may have constituted a major refugium for the North Atlantic salmon during the Last Glacial, when the Gulf Stream was absent and cold waters and ice forced the fish far to the south.<sup>69</sup> There are rare isolated remains of seals in Magdalenian sites, probably from beached animals. (The most recent of such finds, involving seals along with penguin, were at Santa Catalina.<sup>70</sup>)

The Magdalenian of Vasco-Cantabria, like that of the French Pyrenees and Aquitaine, is best known for its wealth of cave and portable art.<sup>71–73</sup> Since the work of Alcalde del Río, Sierra, and Breuil at the beginning of the twentieth century, striking resemblances in the same caves (Altamira and Castillo) between engraved images with distinctive striated “shading” on cave walls and on deer shoulder blades had been noticed and used to date the rupestral art to the mid-Magdalenian.<sup>74</sup> (Recent direct dating of an engraved scapula from Altamira originally thought to be of Solutrean age has shown that it, too, is mid-Magdalenian,<sup>75</sup> as are examples from other sites: Juyo, Rascaño, Cierro, Viña, and now Mirón<sup>76–78</sup>.) Similar stylistic dating arguments have been made in later years. Most recently we have revealed a spectacular case of radiocarbon-dated stratigraphic superposition of later Magdalenian cultural deposits over a block that had fallen from the Mirón Cave ceiling and was engraved in the earlier Magdalenian.<sup>79</sup> In addition, there are now nearly 50 credible direct AMS dates of charcoal drawings from Cantabrian caves, ranging from c. 15 to 11 kya<sup>80</sup> (Fig. 5B). Other images dated by the AMS method suggest continuation of cave decoration up to the end of the Pleistocene.<sup>81</sup> Most of the great cave art sanctuaries of the region also have Magdalenian living sites. Some are surrounded by “minor” living and art sites forming “super-clusters.” Among these are the karstic complexes around the present mouth of the Río Sella in eastern Asturias and those in La Garma hill and El Castillo mountain, both in central Cantabria.<sup>82–84</sup>

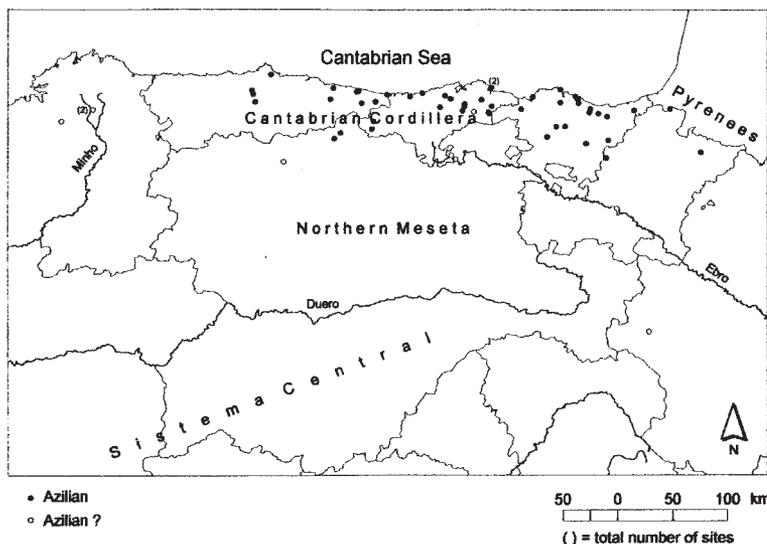
### Early Magdalenian of Northern & Central Spain



### Late Magdalenian of Northern & Central Spain



### Azilian of Northern & Central Spain



Cantabrian cave art is dominated by images of bison, aurochs, horses, ibex, and red deer. Reindeer, occasionally found in the archeofaunas of the Magdalenian, are rarely but exquisitely depicted, along with other “unusual” animals such as bears, various carnivores, fish, and birds. Anthropomorphs are not common but, when they occur, are generally unrealistic and even “grotesque.” The cave art of Cantabria and Asturias is particularly rich in “signs:” grids, tectiforms, claviforms, dots, and “vulvas.”

Besides the famous engraved scapulae, the hundreds of Magdalenian works of portable art include engraved stone plaques, of which there is a large collection from Las Caldas, including some with anthropomorphic images, and an exquisite solitary example from Ekain. There also are bird-bone tubes, notably at Valle and Torre; perforated antlers, including a pair of nearly identical ones from the late Magdalenian levels at Castillo and nearby Cualventi, and another similar pair from the somewhat more distant sites of Valle and Pendo, all in Cantabria; occasional sculptures, such as a human bust in quartzite from Entrefoces, Asturias; perforated and decorated teeth; perforated shells, a few of which are Mediterranean taxa; decorated wands; antler points; and harpoons.<sup>85,86</sup> Unusual decorative motifs at various periods within the Magdalenian include so-called “tectiform” geometric designs, stylized frontal views of ibex heads, cordons, serpentine, and zig-zags.

In contrast to the Magdalenian of France, Belgium, Switzerland, and Germany, there is not much evidence of very long-distance transport of lithic raw materials in Vasco-Cantabria, nor are there many exotic fossils or marine shells (but see Álvarez<sup>87</sup>). This is probably because this confined coastal zone was not on the frontiers of Magdalenian northward reexpansion. Flints and, especially in Asturias, quartzites used for tool-making were usually local or from sources within only a few hours’ walk of the sites.<sup>88–90</sup> On the other hand, it is ap-

Figure 5. Archeological sites of northern and central Spain during the: A. Early Magdalenian; B. Late Magdalenian; C. Azilian.

parent in the specific commonalities of cave art styles, such as the Pyrenean “black outline” mode, as at Niaux, and in peculiar portable art objects such as the Pyrenean *contours découpés*, that there were significant human contacts (for example, visits, down-the-line exchange, and intermarriage) between Vasco-Cantabria and the Pyrenees and beyond,<sup>91</sup> including remarkable artistic and artifactual similarities with Levantine Spain. There was “a Magdalenian world:” a network of relationships, shared symbols and ideas, and commonly identifiable objects, despite vast differences in environments, resources, and subsistence strategies between the extremes of this human universe that stretched from Spain to Germany and Poland.

#### THE END OF THE UPPER PALEOLITHIC: THE AZILIAN EPILOGUE

The end of the Magdalenian technocomplex was a drawn-out affair; both long and short chronologies can be argued justifiably. After the brief, little-marked Dryas II climatic downturn, moderately temperate conditions (“Alleröd”) once again became established. With them came the beginnings of a simplification of both the lithic and osseous technologies of the Magdalenian and a radical change in artistic and decorative expression. This trend goes by the name “Azilianization process.” The end product, by around the time of the Dryas III climatic crisis and then the onset of Holocene conditions c. 10 kya, is called the Azilian in the Franco-Cantabrian region.

A backed-bladelet-rich transitional stage with “Azilian” curved, straight-backed, double-backed micro-points is currently being defined in northern Spain.<sup>92–95</sup> As antler points and other classic Magdalenian osseous artifacts vanished, harpoons continued to be made, but with a flat rather than round cross-section. At first they were still rather elongated and even, at three sites in Asturias (Los Azules, Oscura, and La Lluera) geometrically engraved,<sup>96</sup> but later became squat and sometimes had a basal perforation. A decorative motif resembling barbed wire is engraved on bone objects in a number of terminal Magdalenian and early Azilian sites in

Cantabria and Asturias. The Azilian saw a sharp decrease in burins and other formal tool types except endscrapers, which tend to be made on small flakes. “Empoverishment” is a term that has sometimes been applied to the technology of the Azilian, but many more implements and weapons were probably now being made of wood as the region became reforested.

The Azilian settlement pattern is an almost exact copy of the Magdalenian one. The number of sites remains essentially identical: 51, which works out to an approximate average of 25.5 sites per millennium (Fig. 2C). Most Azilian components lie above Mag-

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**There was “a Magdalenian world:” a network of relationships, shared symbols and ideas, and commonly identifiable objects, despite vast differences in environments, resources, and subsistence strategies between the extremes of this human universe that stretched from Spain to Germany and Poland.**

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dalenian ones, but many sites were abandoned after the Azilian. There are even more high mountain Azilian sites than Magdalenian ones, no doubt due to the final deglaciation.<sup>97,98</sup> Some late (Preboreal) Azilian sites were located on or near a coastline essentially like that of the present. These sites often contain masses of molluscs in shell middens that were the precursors of the Mesolithic “Asturian culture.”<sup>99,100</sup> The molluscs are still cold-water taxa.

In addition to marine shellfish, people during Azilian times sometimes exploited substantial quantities of

landsnails, as at Piélago on the edge of the mountains and Fragua, both in Cantabria, and a variety of marine and anadromous fish, as at Riera. Birds, including waterfowl, became increasingly regular elements in archeofaunas from late Magdalenian and Azilian times on. The main animal foods during the Azilian continued to be red deer in the sites of the coastal plain and broader valleys and ibex plus chamois in montane locations. However, with reforestation substantial numbers of roe deer and boar appeared for the first time. One can suppose that, especially under the temperate, humid conditions of Alleröd and Preboreal, increasing use was made of hazel and beech nuts, acorns, and chestnuts, as well as various seeds, berries, and roots. The ongoing flotation program at Mirón, like the one at Juyo, should shed light on the role of plants in the diet.

In addition to the previously mentioned meager record of decorated early Azilian harpoons and bone plaques or pendants, there are a few geometrically engraved items of bone and antler, a spectacular bone spatula with myriad etched dots from Azules (Asturias), and some 40 examples of painted pebbles (29 of which are from the same small cave, where many of these “classic” items were associated with a human burial.<sup>101</sup> The numbers of decorated Azilian items decreased through time, presumably as the whole Magdalenian symbol system collapsed. Certainly, figurative portable and rupestral art had totally disappeared by the end of Alleröd, presumably because the world in which the ideology it may have stood for had ceased to exist.

The Azilian artifacts disappeared around the end of Preboreal (c. 9 kya). The Boreal phase in eastern Asturias and western Cantabria is marked by the formation of huge shell middens in large numbers of caves within 1 to 2 km of the extant shore, especially around inlets and estuaries. The cultural component of these “Asturian” sites is limited; cobble picks, flakes, and bone awls make up the majority of assemblages. There is essentially no evidence of “art” and only one poorly documented burial is known. Asturian middens contain masses of ma-

rine molluscs (now warmer-water topshells, as well as limpets, which are smaller at Riera and other sites, probably as a consequence of over-exploitation). They also contain sea urchin and crab carapaces, fish bones, some plant remains, and abundant mammal bones and teeth (mainly red deer, followed by roe deer, boar, and small numbers of other ungulates), as well as small carnivores and birds.

In eastern Cantabria and the coastal Basque provinces, similar emphases on marine resources are found, especially at sites around the Asón and Guernica estuaries. Here, due to distinct littoral substrates, the taxa are different, including many oysters in Boreal or early Atlantic times. The Mesolithic cultural manifestations are somewhat different (Asturian picks are absent), but the artifact assemblages are also generally poor.<sup>102–104</sup> A simple burial dated to 8,300 BP has recently been found in a shell midden in easternmost Guipúzcoa.<sup>105</sup>

There is an ongoing debate about whether or not the montane interior was abandoned during at least part of the Mesolithic.<sup>106–108</sup> What is certain is that there were numerous Epipaleolithic sites in the upper Ebro drainage in Alava to the south of the Cordillera<sup>109,110</sup> and a few sites on the northern flanks of the Picos de Europa in Asturias and of the Cordillera in eastern Cantabria and Vizcaya. Yet human population does seem to have been heavily concentrated along the shore, especially in estuaries and inlets, the richest ecotonal settings. It is into this world of broad-spectrum foragers that Neolithic domesticated animals, ceramics, megaliths, and cereals were introduced, probably via trade and some migration from the Mediterranean world via the Ebro or southern France soon after 6,000 radiocarbon years ago.<sup>111</sup>

## SUMMARY

Distinctive as a narrow coastal region with high relief and biogeographically associated with the Atlantic region of southwest France, Cantabrian Spain has a rich Upper Paleolithic record, sharing cultural characteristics with both Aquitaine and Mediterranean Spain at different

times. The technological transition from the Middle to the Upper Paleolithic came relatively early in Vasco-Cantabria, but with considerable evidence of regional adaptive continuity and no clear evidence, as yet, as to exactly when or how the Neandertals here were replaced by *H. sapiens sapiens*.

Apparently low human population density characterized the Early Upper Paleolithic, but the environmental crisis of the LGM witnessed a “boom” in human settlement in this refugium area during the innovative Solutrean period, with abundant evidence of subsistence intensification. Accompanying this was an explosion of artistic activity

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## The numbers of decorated Azilian items decreased through time, presumably as the whole Magdalenian symbol system collapsed.

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some 20,000 years after the start of the Upper Paleolithic, a phenomenon that flourished even further during the classic Magdalenian. A dense human landscape of major residential sites near the coast and in the montane interior, together with numerous smaller satellite locations and cave art “sanctuaries,” suggests the development of relatively small-band territories centered on the main (albeit short) river valleys, connected to one another and with the wider Magdalenian world of western Europe by networks of visits, intermarriages, rituals, shared benefits and symbols, and exchanges of nonlocal or even exotic materials.

The end of the Last Glacial saw, for a short time, a continuation of this pattern, but with simplified Azilian technology and the disappearance of works of art. This form of full utilization of the Cantabrian environment for broad-spectrum foraging eventually changed under densely reforested postglacial conditions into a Mesolithic pattern, heavily oriented toward

littoral residence and subsistence. This lasted until contact was finally made with the Neolithic food production systems of the Mediterranean world, rather late in the mid-Holocene, changing forever the lifeways of the inhabitants of northern Spain by their adoption of animal husbandry, cereal agriculture, and ceramic technology.

## ACKNOWLEDGMENTS

I thank John Fleagle for inviting me to contribute this review article and, along with two anonymous reviewers, providing constructive criticism and editing. The results constitute a pale reflection of the work of many Spanish colleagues, whom I thank most sincerely and to whom I apologize in advance for possibly oversimplifying, misrepresenting, or overlooking aspects of their tremendous and careful research. One of my goals over the years has been not only to contribute to the record of Cantabrian prehistory, but also to help it become better known in the English-speaking world. The maps were drafted in a GIS from my data by Ann Winegardner. I owe special debts of gratitude to Joaquín González Echegaray, Jesús Altuna, and Manuel González Morales, as well as to Leslie G. Freeman and Geoffrey A. Clark, who introduced me to Cantabrian prehistory over 30 years ago, and to my wife, María del Carmen Rapado Errazti of Santander, who, ever since, has put up with so much digging and writing. I thank Ann Braswell for skillfully and patiently dealing with the final revisions and corrections in word processing. This article is dedicated to Victoria Cabrera Valdés, the great authority on El Castillo Cave, who passed away prematurely in 2004.

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- and for Asturias, *Excavaciones Arqueológicas en Asturias* published irregularly since 1990 by the Principality of Asturias. Besides numerous monograph series published by universities and museums (notably the Universidades de Deusto in Bilbao and Cantabria in Santander, and the Museo y Centro de Investigación de Altamira in Santillana), the main continuing outlets for detailed publications of research results are the national journals *Trabajos de Prehistoria* and *Zephyrus* (respectively published by the CSIC Instituto de Historia in Madrid and the Universidad de Salamanca), the new transnational *Journal of Iberian Archaeology* (Porto), and the proceedings of the Congresses of Peninsular Archaeology that are held alternately in Portugal and Spain.
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