

# **The Upper Palaeolithic settlement of Iberia: first-generation maps**

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*Modelling of Upper Palaeolithic occupation in Iberia (one of the most important refugia of the last Ice Age) has enabled mapping of human occupation against an improving chronology of absolute dates. Important patterns emerge from the still uneven data of Iberia, providing a basis for new hypotheses.*

*Key-words:* Iberia, Upper Palaeolithic, population modelling, mapping, AMS dating

## **Introduction**

Any reasonable attempt to model human distributions and movements in prehistory must rely on maps of human settlement that are as complete and accurate as possible. The study of human territories, social interactions, and responses to the environmental changes of the Pleistocene all require site distribution data that are credible in terms of both precision and evenness of coverage. For most of the Palaeolithic in much of the Old World, these are still elusive goals. However, for the European Upper Palaeolithic, the possibilities for establishing fairly representative maps of human settlement are respectable for two reasons:

- 1 About 150 years of research in many countries have provided good coverage of sites;
- 2 the period in question lies completely within the range of radiocarbon dating, and chronologies are well established. The environmental fluctuations of oxygen isotope stage 2 and late stage 3 are well known.

The European Upper Palaeolithic is particularly interesting for the study of human settlement, since the areas between 36°–56° N latitude which were inhabited at different times between c. 40–10,000 BP, witnessed vast differences in climate, glaciation, vegetation and animal resources. Although small in area, Europe has a complex geography, in terms of relief and coastlines, which afforded a wide variety of habitats to organisms including humans, even under pleniglacial conditions. The potential to study broad patterns of human adaptations against

the backdrop of great environmental diversity and change in late Last Glacial Europe is one of the benefits of the long record of Upper Palaeolithic research.

To that end, a working group on European Late Pleistocene Isotopic Stages 2 and 3 was formed within the INQUA Commission on Human Evolution and Paleoecology. A workshop organized by P. Vermeersch and J. Renault-Miskovsky (1999) in Leuven (Belgium), began the work of building a database for mapping of human settlement of Europe during the late Upper Pleistocene. In that meeting, Straus (1999) and Bicho (1999) presented preliminary observations on the distributions of Upper Palaeolithic sites in northern Atlantic Spain and Portugal respectively. (Readers are referred to those articles for discussion of our methodology and for critical source references, which are omitted here due to lack of space.) The next step involved creation of a GIS database and production of maps by Winegardner. It also required the creation of a much more complete dataset on site distributions in Mediterranean Spain, than could be presented at the Leuven meeting (Burjachs 1998). This was done by Straus, who also 'mined' the available archaeological literature and consulted with Spanish colleagues to include as many points as possible for the interior in the resultant database for all of Spain.

No recent attempt has been made to map the distributions of Upper Palaeolithic sites for the whole Iberian Peninsula, an area of nearly

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600,000 sq. km. Yet Iberia was one of the richest macro-regions of continuous human settlement in Pleistocene Europe, the scene of Mousterian–Aurignacian coexistence for at least 10,000 years, a major refugium for human populations during the crisis of the Last Glacial Maximum, and the setting for the creation of a wealth of rupestrian art both in caves *and* in the open air during much of the Upper Palaeolithic. Although the Iberian Peninsula is a well-defined geographical unit which should lend itself well to the creation of site distribution maps, this has not been done for at least two reasons, in our opinion. First, the Peninsula is divided between two nation states whose prehistorians have often had scant contacts across national borders. Second, Spanish prehistorians have increasingly concentrated their research on *regional* records, a fact which has been exacerbated by the post-Franco constitution which divided the country into 17 regions, each supporting its own universities, museums, archeological research and publications (some of which are in non-Castilian languages: Basque, Catalan, Galician). The fragmentation of research in Spain has tended to limit a broader vision of the Peninsula as a whole, especially since some of the autonomous regions (notably in the northern Atlantic sector) are of a scale that may be small from the standpoint of hunter–gatherer mobility and social networks. Thus, Iberia is not only divided by national borders and by the language barrier of Spanish *versus* Portuguese, but also by the growing strength of political and linguistic boundaries within Spain itself. The present work seeks to cut across these boundaries, not so much to concentrate on the ‘trees’, as to try to ‘see the forest’ as a whole.

### Caveats

Any such endeavour involves difficulties, the principal one being evenness of representation. This is affected by differential preservation and visibility (including the difference between open-air and cave/rockshelter sites, as well as regional differences in geomorphological processes) and by local variations in the history and intensity of archaeological prospecting and excavation. In the case of the Iberian Peninsula, with its great diversity of lithology and relief, there are large areas with few or no caves (e.g. the granitic shield rock regions of Galicia and northern Portugal), others (e.g. major ba-

sins such as the broad valleys of the Ebro and Guadalquivir) with deep burial of late Pleistocene materials by Holocene colluvial or alluvial deposits, others (e.g. tilted uplands such as the *mesetas* of Castile, the plains of Alentejo or montane Algarve) with on-going erosion, and still others with dense vegetation. Only recently have archeologists begun to learn ‘where to look’ to find Upper Palaeolithic sites in such regions as Galicia, northern Portugal, Algarve, Aragón, and the Spanish *mesetas*. This fact is beginning to make a major difference, with such discoveries of open-air rock art as the Côa Valley complex in northeastern Portugal, Siega Verde and Domingo Garcia in west-central Spain, as well as of Upper Palaeolithic habitation sites in those same areas, on the northern *meseta* of Castilla-León, on the flanks of the Sierra de Guadarrama in Guadalajara, in the Ebro Basin and in the interior of Andalucía. The other major problem, however, is the still very uneven distribution of prehistorians and of research within the Peninsula.

Traditionally and until quite recently, Spanish Upper Palaeolithic research had been concentrated in north Atlantic Spain (coastal Basque provinces, Cantabria and Asturias) and only secondarily in limited areas of Catalunya and Valencia — each of the latter with only a few significant excavated sites such as Bora Gran, Cau de les Goges, Parpalló and Les Mallaetes. Knowledge of Andalucía was essentially limited to Ambrosio in Almería and Gorham’s Cave in Gibraltar, plus a few long-known, but rather isolated cave art sites such as La Pileta and Nerja in Málaga. Knowledge of the interior (with the exception of ill-defined finds in sandpits now under Madrid) was virtually nil until recent years. The Upper Palaeolithic of Portugal was, until the late 1980s, only known from Estremadura. We still probably know of only a fraction of the once-existing Upper Palaeolithic sites of Iberia.

There is a vicious cycle whereby research has been the most active and sustained in precisely those regions where the record is richest, thereby enriching it further — to the detriment of less favoured regions. The result of this is the obvious fact that the distribution map of Upper Palaeolithic sites is highly determined by inter-regional variations in the longevity and intensity of prehistoric research. On the other hand, work conducted principally

over the last quarter-century has quickly changed the map; although discoveries continue to be very frequent in Vasco-Cantabria, they have been most spectacular in Mediterranean Spain, in the interior, and in new regions of Portugal.

Nevertheless, certain facts about the geography and environments of the Iberian Peninsula make it likely that, especially under glacial conditions, the principal areas of hunter-gatherer settlement would have been in the peripheral, peri-coastal regions. With the exception of major river basins such as those of the Ebro, Duero, Tagus, Guadiana and Guadalquivir, the interior of the Peninsula is dominated by high tablelands and mountains, often with poor soils. Significant areas of the centre and south are arid and are likely to have been so under ice age conditions. The oceanic limestone regions would have been favoured in terms of more moderate temperatures, more abundant precipitation, shelter and diverse resources. We would not expect that Upper Palaeolithic sites were ever nearly as dense in the interior of the Peninsula as they were in the most favoured peri-coastal regions. On the other hand, it is certain that many sites had existed during the Last Glacial on the now-inundated continental shelf, although it is generally fairly narrow in most coastal sectors (c. 5–15 km). Thus, the regions that are *sure* to be underrepresented on our maps are precisely the peri-coastal ones *in sensu lato*. But these now-subaquatic sites are not likely ever to be found, whereas the sites being discovered in the interior *are* showing which periods were more or less likely to have seen some human use during the late Upper Pleistocene in those hinterland regions.

Our strategy has been to maximize the numbers of sites per period (at the risk of perhaps accepting some questionably dated sites). In particular, partially to compensate for the historic research emphasis in the peri-coastal regions, we have included rock-art sites in the Iberian interior and Andalucía that lack associated, excavated residential deposits, assigning them the ages proposed by relevant specialists. These sites *do*, after all, imply the presence of humans on the mesetas in the Solutrean and, especially, Magdalenian timeframes. (We did not include such sites in Vasco-Cantabria, since to do so would further inflate the numbers for that already 'favoured' region, at the 'expense' of the others.

## Chronology

The ideal situation would be to make maps of distributions of sites defined by radiometrically defined time-slices. Unfortunately, it is still the case that relatively few sites are radiocarbon-dated, and even those that are often have only one or a few dates, frequently not covering all occupation layers. Most sites can only be 'dated' with reference to cultural period. This in itself poses special problems of definition. The earliest Upper Palaeolithic (EUP) in Iberia includes horizons attributed to the Chatelperronian (only in north Atlantic Spain and, problematically, in Catalunya) and Aurignacian. Radiocarbon ages for this period range from c. 40–27,000 BP. Several sites attributed to the Aurignacian, especially in Mediterranean Spain and Portugal, are done so on questionable grounds and may be very late in age (as in the case of Gorham's Cave). The Gravettian, generally with a rather distinctive suite of lithic tools including a variety of backed elements and burins, dates from c. 27–21/20,000 BP. Radiocarbon dates, however, are still few. For the purposes of these maps, we have included most sites attributed to the 'Proto-Solutrean' in Portugal within the 'Solutrean' timeframe, unless they are dated to >21,000 BP.

The Solutrean is lithically the most distinctive Upper Palaeolithic industry, defined by the presence of various styles of leaf-shaped, shouldered and — in Iberia — stemmed projectile points. Depending on region, this technocomplex ranged from c. 20,500/20,000–17,000/16,500 BP, as dated by many radiocarbon determinations. The fact that Solutrean points (although sometimes confused with Chalcolithic ones) are so distinctive and easily 'datable' even in the case of isolated finds, may mean that Solutrean site numbers are 'inflated' *vis à vis* those of other complexes. On the other hand, it is also the case that many small assemblages of Solutrean age, but — for reasons of sampling or site function — lacking Solutrean points, may be incorrectly assigned to the Gravettian or Magdalenian periods in the absence of radiocarbon dates. This fact may approximately balance out the former 'inflating' effect.

The Magdalenian is dated between c. 17,000/16,500–11,000/10,500 BP and can often at least be divided into two major phases: early and late. By definition, the late Magdalenian began c. 13,000 BP with the appearance of promi-

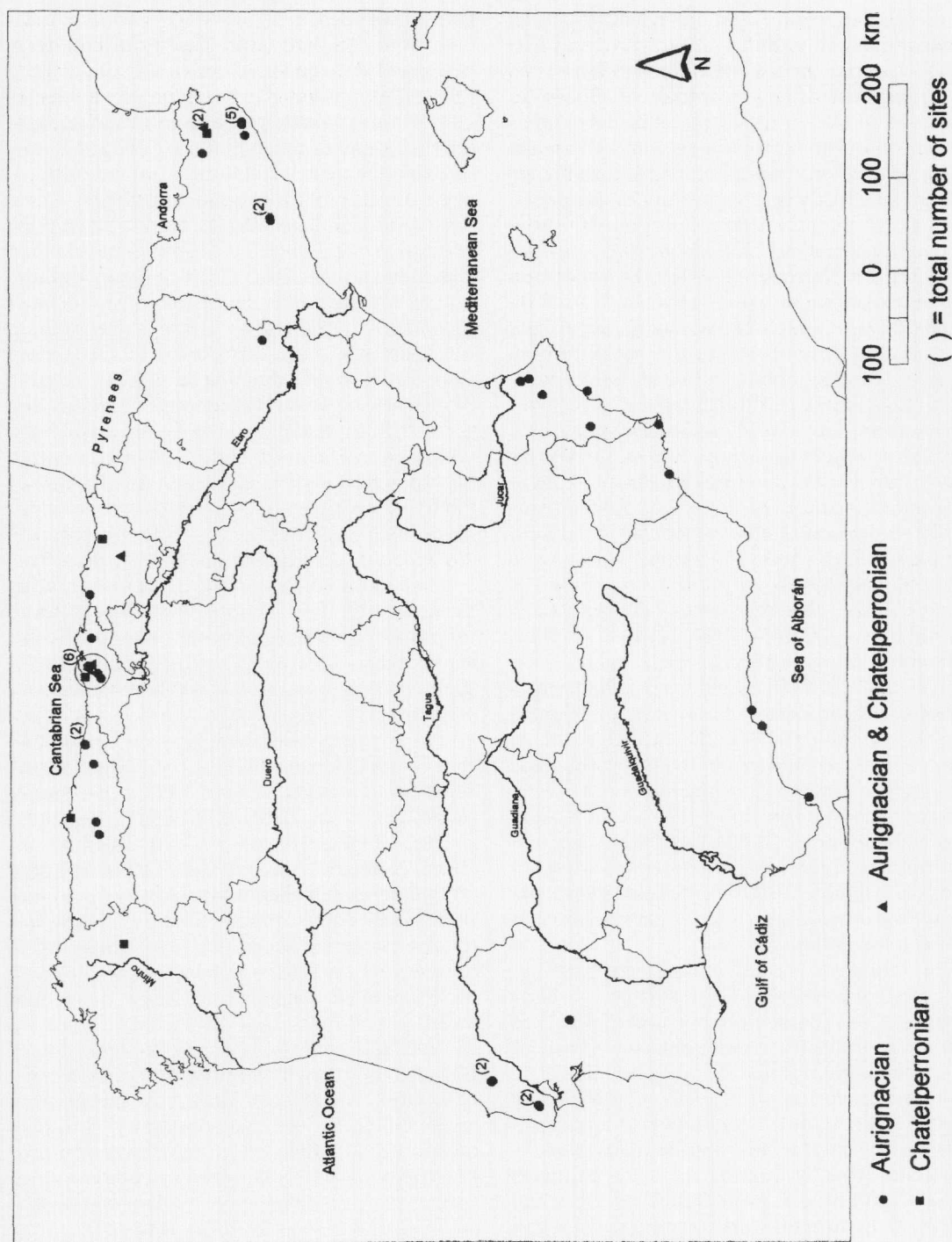


FIGURE 1. Map of distribution of Early Upper Palaeolithic (Aurignacian & Chatelperronian) sites in Iberia.

nently barbed, round-section antler harpoons. However, due to sampling, functional and antler artefact preservation problems, many sites can only be classified as 'Magdalenian' *in sensu lato*. Use of the term 'Magdalenian' in Portugal is problematic, given the scarcity or absence of antler artefacts, ornaments and portable art objects so characteristic of this cultural horizon elsewhere in western Europe. Similarly, there is no 'Azilian' in Portugal (i.e., no flat-section antler harpoons), where bladelet-rich Epi-palaeolithic industries between c. 11,000–9000/8500 BP are labelled 'Terminal Magdalenian'. In fact, the classic Azilian is only found in Asturias, Cantabria and the coastal Basque provinces. Epipalaeolithic industries with backed micro-points and bladelets, small endscrapers, limited numbers of burins and other Upper Palaeolithic stone tool types, but few or no geometric microliths, however, are found throughout Mediterranean Spain and, in increasing numbers, on the northern meseta. Our maps end with this Azilian/Epipalaeolithic period; what follows is fully Holocene in age and is classified as Mesolithic or Geometric Epipalaeolithic.

The maps represent archeologically defined periods of unequal approximate temporal length: Early Upper Palaeolithic 13,000 years, Gravettian 6000, Solutrean 3500, early Magdalenian 3500, late Magdalenian 2000, Azilian/Epipalaeolithic 2000. There are definitional differences within these archeological constructs, but here our goal is simply to begin to look at the 'big picture' in terms of human distributions throughout the Peninsula across the whole of the last third of the Upper Pleistocene.

#### Early Upper Palaeolithic (FIGURE 1)

The early Aurignacian of northern Spain has now been well dated radiometrically both in Vasco-Cantabria at El Castillo (10 determinations from 3 accelerator labs averaging c. 39,000 BP and at La Viña (one conventional radiocarbon date of c. 37,000 BP) and in Catalunya at L'Arbreda (6 determinations from 2 accelerator labs averaging c. 38,000 BP), Reclau Viver (1 AMS determination of 40,000 BP) and Romaní (2 AMS dates averaging c. 37,500 BP and 37 uranium series dates averaging c. 43,000 BP). There is no typologically credible 'Aurignacian'

material of such antiquity in the southern three-quarters of the Peninsula. The earliest dates for supposed Aurignacian materials in southern Spain (Les Mallaetes in Valencia, Cova Beneito in Alicante, Gorham's Cave in Gibraltar,) are on the order of 28–30,000 BP. Dating of the putative Aurignacian at the now-destroyed cave of Bajondillo in Torremolinos (Málaga) is currently being attempted (J.L. Sanchidrián pers. comm.). Most claims for the existence of even late Aurignacian sites in Portugal are problematic, since the supposedly diagnostic Dufour bladelets and carinated endscrapers from these old excavations are also found in Portuguese Gravettian and Magdalenian contexts. The most likely candidate is recently dug Pego do Diabo Cave in Estremadura, but the relevant level yielded a total of only 11 lithic tools (of which one is a backed bladelet and 6 are Dufour bladelets — hence the 'Aurignacian' attribution) and a banal sagaie tip. This assemblage is associated with dates of 28,000 and 23,000 BP.

On the other hand, there are now numerous Mousterian sites (some with undoubted Neandertal remains) from southern Spain and Portugal that are dated geologically and/or radiometrically to c. 30,000 BP or even slightly more recently. Mousterian sites are abundant not only in the peri-coastal regions, but also in the interior of the Peninsula. Unfortunately, very few of the latter have been dated with any degree of precision. However there are some suggestions (e.g. the caves of Jarama IV in Guadalajara radiocarbon dated at c. 30,000–33,000 BP, and La Ermita and Millán in Burgos at c. 31,000 and c. 37,000 BP respectively) that there was a terminal Mousterian occupation of the mesetas during late isotope stage 3, when climatic conditions were still relatively favourable.

The distribution of the few credible Aurignacian sites in Spain (both early, 40,000–30,000 BP and late, 30,000–27,000 BP) is strictly peri-coastal and lowland. The scarcity and spatial restriction of sites is suggestive of a very low population density of whatever hominid type(s) was (were) responsible for making and using the distinctive 'Aurignacian' stone and antler tools and weapons. In fact, we do not know for certain 'who' the makers of the Spanish Aurignacian were, since the only significant

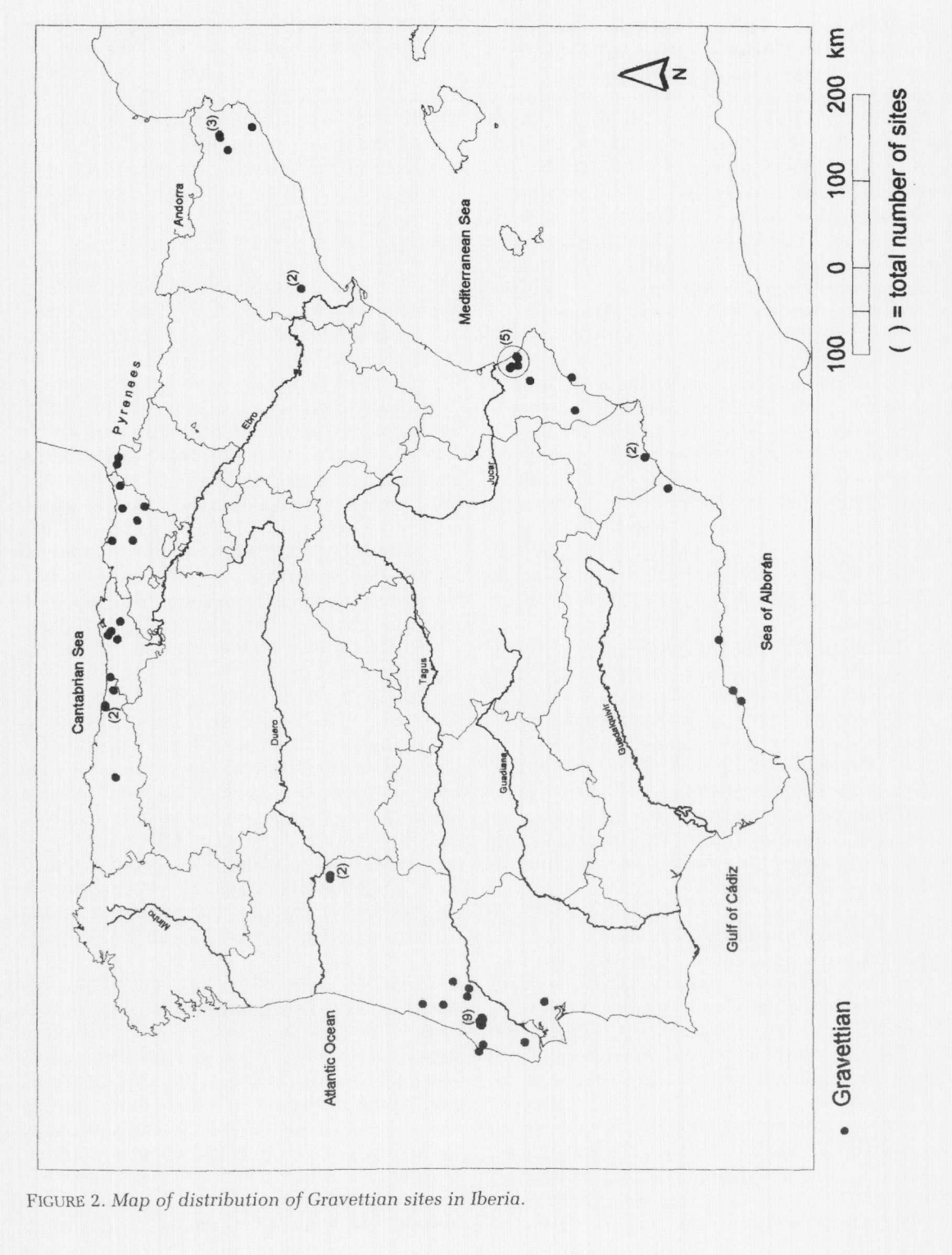


FIGURE 2. Map of distribution of Gravettian sites in Iberia.

region	Vasco-Cantabria +Navarra+Galicia	Catalunya-Valencia +Aragón	Andalucía-Murcia	Portugal	León-Castilla +La Mancha
<i>period</i>					
EUP	15	20	5	5	—
Gravettian	17	15	6	21	—
Solutrean	53	28	34	31	3
Early Mag.	56	7	1	5	5
Late Mag.	49	16	14	15	3
Indet. Mag.	5	9	4	1	2
Azilian/Epipal.	51	26	8	26	4

*Notes.* Sites with only rock art are not included. EUP = Aurignacian+Chatelperronian. Indet. Mag. = indeterminate Magdalenian. Epipal. = Microlaminar Epipalaeolithic. Sites with multiple components of the same period are only counted once, given vast disparities among excavation methods and stratigraphic resolution therein. Andalucía includes Gibraltar and Catalunya includes Andorra.

TABLE 1. *Numbers of habitation sites per period.*

region	Vasco-Cantabria +Navarra+Galicia	Catalunya-Valencia +Aragón	Andalucía-Murcia	Portugal	León-Castilla +La Mancha
<i>period</i>					
EUP	1.15	1.54	0.38	0.38	—
Gravettian	2.83	2.50	1.00	3.50	—
Solutrean	15.14	8.00	9.71	8.86	0.86
Early Mag.	16.71	3.29	0.86	1.57	1.71
Late Mag.	24.50	10.25	8.00	7.75	2.00
Azilian/Epipal.	25.50	13.00	4.00	13.00	2.00

*Note.* Indeterminate Magdalenian sites are distributed evenly between Early and Late Magdalenian categories for the purpose of calculating these averages.

TABLE 2. *Average numbers of sites per millennium per period.*

hominid remains to be found apparently clearly associated with such an artefact assemblage were the child mandible fragment, a few small adult and child cranial fragments and an adult molar found by Obermaier and Breuil in the basal Aurignacian layer of El Castillo, but subsequently lost. None of these remains are diagnostic as to human type. Indeed, it is only after c. 30,000–32,000 BP that there are any anatomically modern human remains associated with Aurignacian materials anywhere in Europe, leaving open the question as to the 'authorship' of the early Aurignacian either in Spain or elsewhere.

The other EUP industry represented on the Peninsula is the Chatelperronian, but its distribution is strictly limited to the far north (mainly Vasco-Cantabria: sites of Cueva Morín, El Pendo, Labeko; but also Galicia: A Valiña; and possibly northern Catalunya: L'Arbreda, Reclau Viver, Pau). Although two French sites

have associations between Neandertal remains and Chatelperronian artefact assemblages, there is no such evidence from Spain.

All-in-all, given the very long period of time represented by the industries of the Early Upper Palaeolithic, the preserved, visible evidence of human settlement of the Iberian Peninsula is very sparse: 20 sites in eastern Spain (many of which are highly problematic), 15 in north Atlantic Spain, 5 each in Andalucía and Portugal, and none in the vast interior of Spain (TABLE 1). Translated into numbers of sites per millennium, in order to provide a standardized basis for comparison with later periods of shorter duration, the range is from 0 to only 1.5 sites per millennium (TABLE 2).

#### **Gravettian** (FIGURE 2)

The distribution map of Gravettian sites is not significantly different from that of the EUP; nor

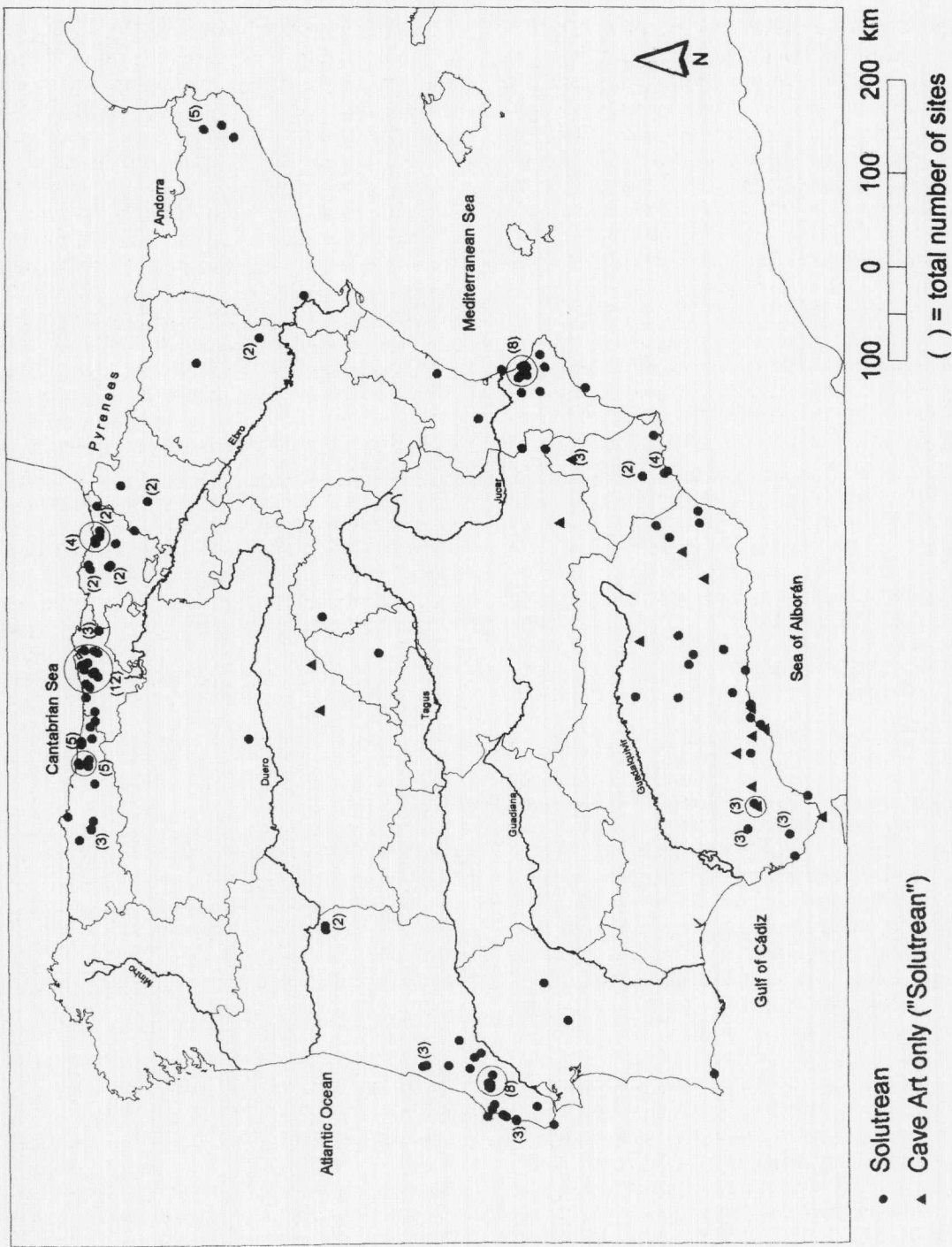


FIGURE 3. Map of distribution of Solutrean sites in Iberia.



(except in Portugal) are site numbers dramatically greater, although it is true that, because the Gravettian techno-complex represents a much shorter period of time an argument could be made for a somewhat more substantial human population. There is now much more evidence of human occupation of Portugal, with a departure from the strictly peri-coastal distribution of settlement in the recent discoveries of typologically Gravettian sites that have been made in the Côa Valley in Beira Alta, about 125 km from the Atlantic shore. Numbers of sites per millennium do increase nearly ten-fold *vis à vis* the Aurignacian in the Portuguese Gravettian. It is for this period that 'hybridization' between late-surviving Neandertals and anatomically modern humans has recently been argued on the basis of an apparently 24,500 BP juvenile burial at Lagar Velho in west-central Portugal. The Upper Palaeolithic settlement of southern Spain, apparently begun only very late in the Aurignacian, continued in the Gravettian, but remained sparse, compared to the relatively more dense settlement of Vasco-Cantabria. The interior of Spain seems to have been largely unoccupied.

### **Solutrean** (FIGURE 3)

The situation changes radically during the Last Glacial Maximum, when there is an apparent explosion in the number of sites, which, especially when translated in sites per millennium, may have represented a real increase in population size relative to the earlier periods. The 'boom' in Solutrean site numbers affected all the regions of Iberia where humans seem to have been living before the LGM, but especially Andalucía, where a nearly empty Gravettian map is transformed into a densely dotted one. If, as has been argued, Iberia was one of the critical refugia for human populations during the climatic crisis of the LGM when northern Europe was abandoned, then Andalucía may have been a most favoured refuge within a refugium. In all regions except Castilla, numbers of sites per millennium jump from a range of 1–3.5 to a range of 8–15 in the Solutrean, and, for the first time since the late Mousterian, there is limited evidence of human use of the interior.

In general the pattern of settlement is peri-coastal (and some Solutrean sites may have been

on the now-inundated coastal shelf), with most sites being within c. 50 km of the present shore. However, there are some interesting departures from this generalization, particularly given the harsh climatic conditions of the time. There are two open-air Solutrean sites (Olga Grande and Cardina) in the Côa Valley of northeastern Portugal, a cave site (Peña Capón) in northwestern Guadalajara near the centre of the Peninsula on the edge of the Sierra de Guadarrama, a more problematic open-air site (Fuente de Porcillas) in the Pisuergra Valley of Valladolid, and old reports of at least one (El Sotillo) found in sand pits now buried under the city of Madrid and whose collections were recently reanalysed. Much of the open-air rock art of the Côa Valley (and perhaps some of that of Siega Verde and Domingo Garcia in Old Castile) may be of Solutrean age. Finally, the art and habitation site of Escoural Cave and the 'cache' at Monte de Fainha are 65–115 km from the Portuguese coast in Alentejo and some of the Solutrean sites of Andalucía are located rather deep in the interior — up to c. 130 km from the present shore of the Alborán Sea at Peña de la Grieta (Jaen). The existence of all these hinterland sites suggests that there were at least occasional uses of or ephemeral visits to the less oceanic parts of the Peninsula during the LGM *in sensu lato*. And, as indications of human contacts across the less hospitable regions, they may help to explain the presence of similar types of stemmed stone points in both Mediterranean Spain and in south-central Portugal and of invasively retouched shouldered points in both Cantabrian Spain and Portugal, as well as of similar conventions and styles of portable and wall art attributable to the Solutrean in all the major areas of human settlement. A key to being able to attribute much open-air (e.g. Côa) and cave rock art to the Solutrean is, after all, the existence of close similarities to engravings on thousands of stone slabs recovered from the Solutrean levels in Parpalló Cave in Valencia, suggesting human contacts which coincided with the existence of stemmed points like those of Parpalló in several Portuguese sites such as Casa da Moura and Caldeirão. Recent direct AMS dating of charcoal drawings in two Andalusian caves — Nerja and La Pileta — confirms their Solutrean age (J.L. Sanchidrián pers. comm.).

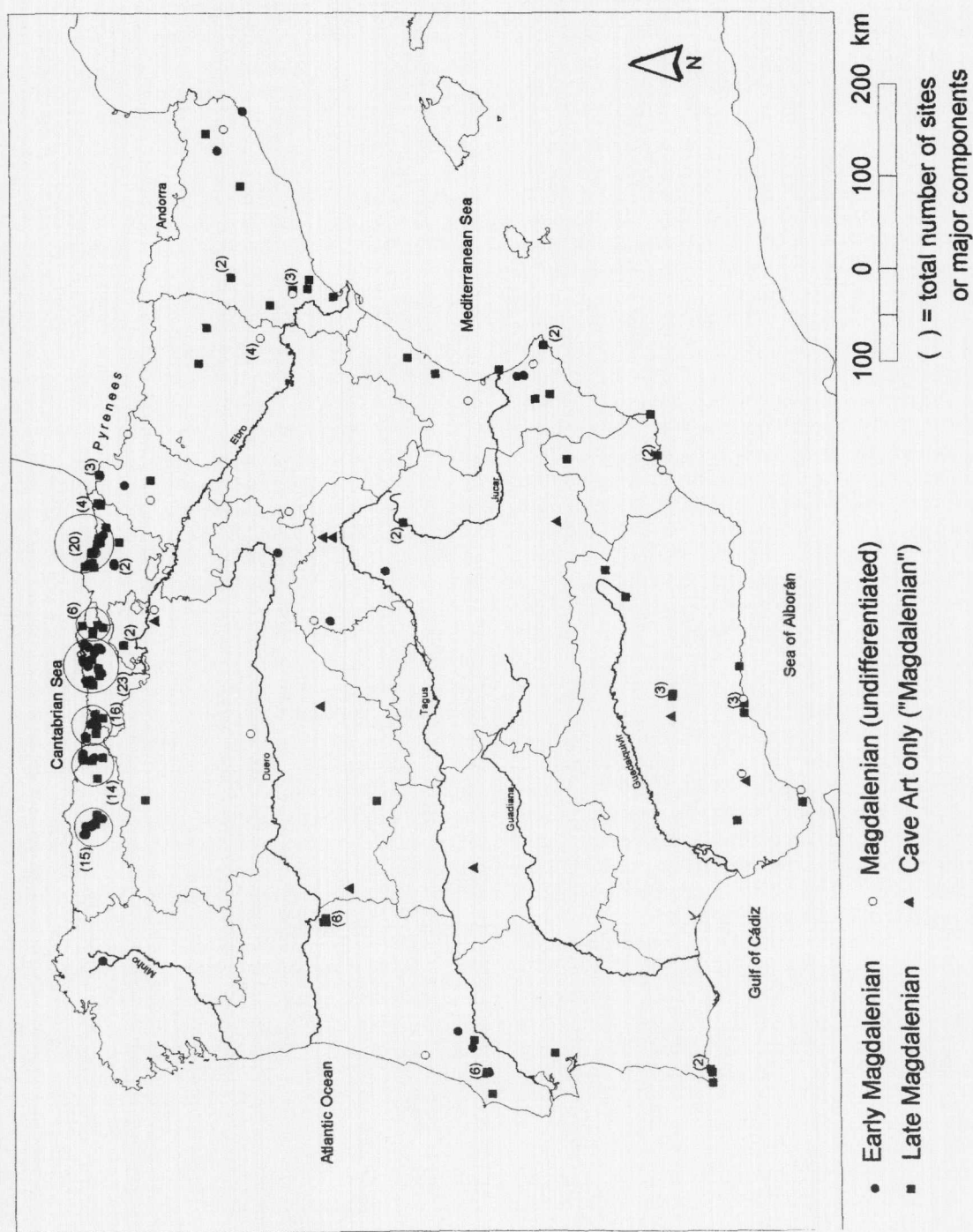


FIGURE 4. Map of distribution of Magdalenian sites in Iberia.

Nonetheless, despite the apparent human connections, there are very clear geographic concentrations of Solutrean sites, presumably in areas which were repeatedly preferred for settlement due to their combinations of diverse, reliable food sources, shelter, fuel, lithic raw materials, etc. Some Solutrean site clusters are highly localized, such as the strings of sites along the Llera ridge in eastern Asturias or along the Serinya stream in Girona. Between the concentrations of sites there are often empty areas, sometimes punctuated by only one or a few sites (such as Chaves in Huesca) that do testify to human passage across these less favoured areas, but not intensive occupation.

#### Magdalenian (FIGURE 4)

So many Magdalenian-age sites cannot be positively attributed to a specific phase, that we have chosen to display all 'Magdalenian' sites on one map. This means that sites utilized under cold Dryas I conditions are being grouped with more temperate, humid ones during Bölling.

The same areas that had been fairly densely settled in the peri-coastal regions of Vasco-Cantabrian Spain during the Solutrean continued to be very rich in sites during the Magdalenian. The number of sites per millennium does not increase dramatically in the early Magdalenian in north Atlantic Spain. However, at least with our present state of knowledge, there do seem to be *decreases* in sites per millennium in eastern Spain and especially Andalucía, which may have lost its earlier favoured status, perhaps due to relatively greater climatic ameliorations in the north after the LGM. The same observation may also apply to Portugal, where it seems that known early Magdalenian-age sites are relatively few and highly clustered. Whether these apparent decreases were real and, if so, what the causes may have been will have to be determined by future research.

Numbers of sites per millennium do increase in the late Magdalenian in all regions, but especially in Vasco-Cantabria and Levantine Spain, where they now exceed even the remarkable Solutrean numbers. However, despite increases, the numbers of late Magdalenian sites per millennium in Portugal and Andalucía did not reach the Solutrean levels for those regions.

On the other hand, although still small in both absolute and averaged terms, there is a dramatic increase in site numbers in the northern, central and eastern *interior* regions of Spain in both early and late Magdalenian periods. In Vasco-Cantabria and Navarra, Magdalenian sites are found at high elevations of the Picos de Europa, Cantabrian Cordillera and Pyrenees, which had heretofore been devoid of human settlement (or only slightly used). As the glaciers retreated and temperatures moderated, upland environments became more habitable. People moved higher up on a more permanent basis. In conjunction with the definite increase in living sites in the provinces of Burgos, Soria, Salamanca, Guadalajara and Cuenca, there is a clear increase in cave and open-air rock art sites stylistically attributed (and in one case — Ojo Guareña — AMS-dated) to the Magdalenian on the mesetas, and even in provinces where no other Upper Palaeolithic sites have (yet) been found (Cáceres — Maltravieso Cave and Albacete — El Niño Cave). This occupation of the uplands in Iberia is matched by similar developments during the Tardiglacial in mountainous areas of France and Italy, as well as the recolonization of northwestern Europe.

#### Epipalaeolithic (FIGURE 5)

Epipalaeolithic sites are defined as ranging in radiocarbon age between c. 11,000–9000/8500 BP: Alleröd, Dryas III and Preboreal. In Vasco-Cantabria the substitution of round-section Upper Magdalenian antler harpoons by flat-section Azilian ones occurred over the first few centuries of this period, with considerable continuity in lithic technology — notably including high percentages of backed bladelets and small endscrapers — despite trends toward simplification in both the lithic and osseous industries. Azilian harpoons (and the other diagnostic artefact type, painted cobbles) are absent in Mediterranean Spain and Portugal. In those areas, much as in Vasco-Cantabria, by c. 11,000 there are industries with abundant backed bladelets and micropoints, sometimes known as 'Microlaminar Epipalaeolithic'. In Vasco-Cantabrian and Mediterranean Spain, the Azilian or Microlaminar Epipalaeolithic industries are replaced c. 9000 BP by others dominated by geometric microliths, while in Portugal

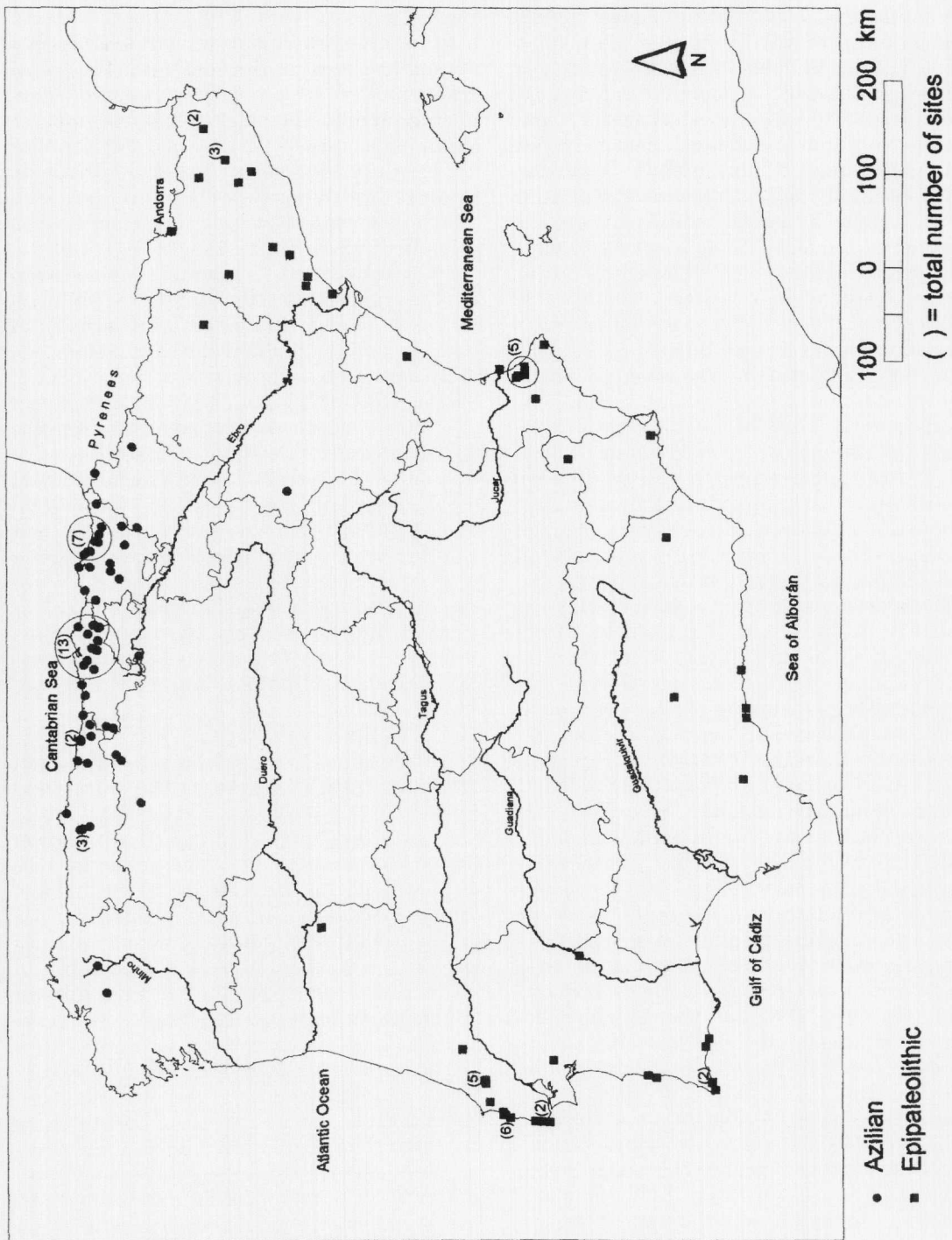


FIGURE 5. Map of distribution of Azilian/Microlaminar Epipalaeolithic sites in Iberia.

this happened c. 8000/8500 BP. However there were also macrolithic industries (defined by cobble picks, choppers or hoes) especially in coastal regions of Atlantic Spain and Portugal in the Boreal and early Atlantic periods. These initial Holocene cultural manifestations are beyond the scope of this paper.

Not surprisingly, the geographic distribution of Azilian sites in Vasco-Cantabria closely mirrors that of the Magdalenian, with still more evidence of utilization of high mountain and mesetan habitats all along the Cordillera, Picos de Europa and beyond, in León and Burgos. Total and time-averaged numbers of sites remained stable relative to the late Magdalenian in north Atlantic Spain. The continued human conquest of the highlands even included settlement of Andorra in the Pyrenees during this period (site of Balma Margineda). Although poorly dated, there is also evidence of Azilian-age settlement in Galicia, a region that had not seen Upper Palaeolithic occupation since Chatelperronian times. Otherwise, Microlaminar Epipalaeolithic site numbers and distributions are similar to those of the late Magdalenian in Eastern Spain, with a slight increase in numbers per millennium. In Andalucía, settlement evidence is still much less abundant than in the Solutrean. The record in Portugal seems to suggest a marked increase in site numbers, although much recent research may have tended to focus precisely on pre-geometric Epipalaeolithic sites in certain survey areas in the southern three-quarters of the country. Coastal sites are relatively abundant in both Portugal and Andalucía, as in Vasco-Cantabria — pointing to the existence of considerable marine resource dependence, in addition to exploitation of *some* deep interior upland habitats by terminal Pleistocene-initial Holocene forager groups. A major question that remains open is whether there were *still* substantial areas empty of human occupation in the Iberian interior at the time of appearance of Neolithic food production systems. Some of the coastal areas (notably the southern Portuguese estuaries and Cantabrian littoral) were so rich in food resources, that foraging lifeways could continue long after the adoption of agriculture and pastoralism in other regions of the Peninsula.

## Conclusions

This first attempt to map the distributions of Upper Palaeolithic sites in the entire Iberian Peninsula, while fraught with the difficulties posed by uneven geomorphological contexts and research histories, has produced some clear results.

- 1 The early Aurignacian and Chatelperronian are strictly restricted to northern Spain, while the Mousterian continued to exist in southern Spain and Portugal until at least 30,000 BP. Even the late Aurignacian is exceedingly rare throughout the Peninsula, suggesting a very low density of human population, with little real change in the Gravettian.
- 2 With vast areas of northwestern Europe abandoned by humans, there was a genuine explosion of sites during the Last Glacial Maximum in the Solutrean period. This is true of all the peri-coastal regions: Vasco-Cantabria, Levantine Spain, Portugal, and especially Andalucía. Recent work shows that the interior was not entirely empty of human settlement, but this was thin and discontinuous compared with the favoured peripheral regions, with their more moderate climate, abundant resources and shelter. The pattern of site concentrations *versus* empty areas coincides with evidence of regionally distinctive Solutrean point styles; yet enough social contact was maintained to mitigate territorial and cultural fragmentation, as is attested by widespread, pan-Peninsular similarities in portable and rupestral art. Human population levels in 'favoured' areas within the Iberian refugium may have been relatively high, with restricted annual mobility in regions combining high local relief and access to marine resources.
- 3 The Tardiglacial Magdalenian represents a period of (re-)conquest of the highlands — both mountains and mesetas — very much in line with what was occurring in other regions of western Europe. Site numbers per millennium increased moderately in some regions (e.g. Vasco-Cantabria), but seem actually to have declined in others (e.g. Andalucía, Portugal), perhaps reflecting the relative favourableness of differ-

ent environments within and outside the Peninsula under fluctuating Late Glacial conditions.

- 4 The situation stabilizes during the Epipalaeolithic, with some continued use of the interior uplands and heavy concentration on certain favoured coastal zones.

These maps are certain to change rapidly with the increasing pace of survey and excavation (especially in the interior) in both Portugal and Spain,

but we are confident that this first approximation will serve as a baseline for the testing of various hypotheses on the changing human settlement of Iberia between 40,000–10,000 BP.

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