LIMITLESS ART

CÔA & SIEGA VERDE

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EXHIBITION

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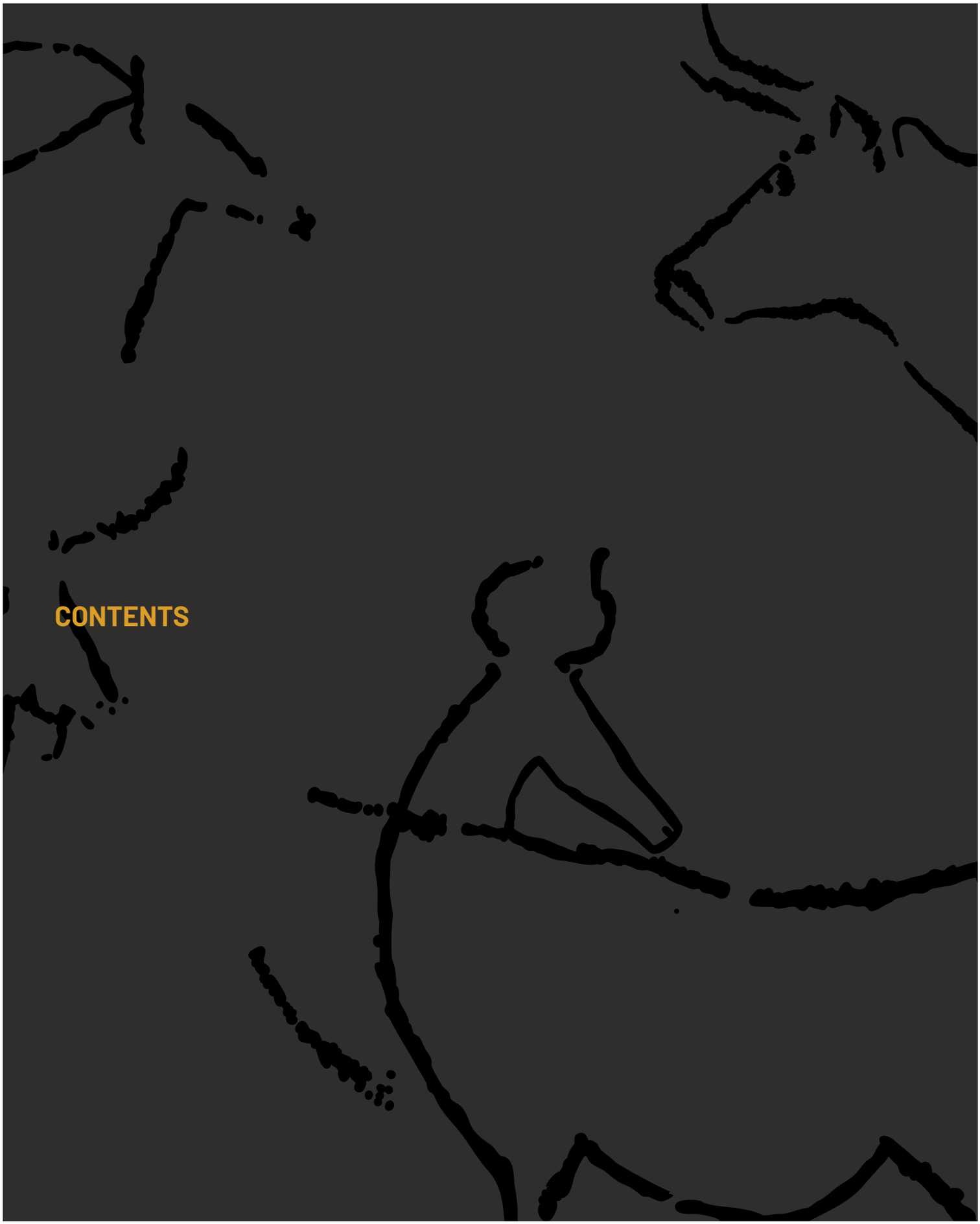

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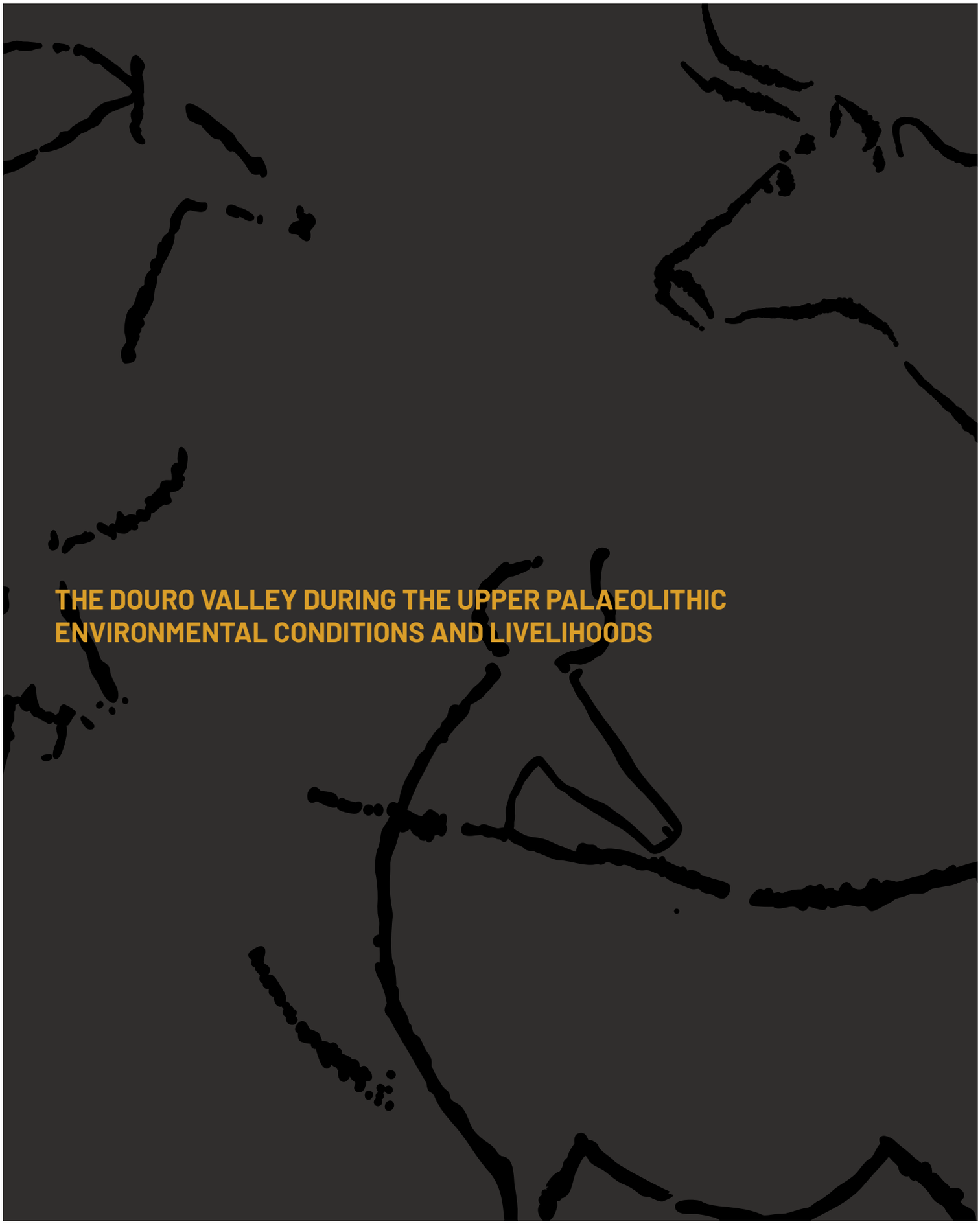

THE DOURO VALLEY DURING THE UPPER PALAEOLITHIC
ENVIRONMENTAL CONDITIONS AND LIVELIHOODS

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The Iberian Peninsula, located in the extreme south-west of Europe, is a privileged geographical area to study the human population on this continent through time. Since the appearance of the first hominins in Africa, climate change and its consequences on animal and plant species have influenced migrations and the adaptation of the lifestyles of hunter-gatherer groups.

The facts related to current global warming remind us that the climate has not always been the same as we know it and can fluctuate in a short time. During the Last Glacial Maximum (LGM), ca. 24,500 BP, the Atlantic coast was more than 100 metres below its present-day levels and some areas of northern Europe were uninhabited, being occupied at the onset of the early Holocene period, ca. 11,700 BP.

Due to its geographical location, the Iberian Peninsula is generally considered as one of the possible refuges of human groups from the northern territories and as a territory that is conducive to biodiversity mosaics. The Douro River basin, which extends almost 900 km from east to west, represents about 20% of the surface area of the Iberian Peninsula. This hydrographic network that converged towards the centre of the peninsula during the Cenozoic, limited to the west by the Variscan mountain range, opened up towards the Atlantic during the Quaternary period. This territory comprises two distinct climatic zones. The final, less extensive section belongs to the Atlantic zone, with oceanic influence, mild temperatures and winter rainfall, while the rest of the basin is of continental influence and experiences very cold winters and very hot summers.

About 75,000 BP, small groups of Neanderthals, established hundreds of thousands of years ago in the Iberian Peninsula (see chap. 1), had to adapt to a drastic climate change. The Earth's climate began a long period of cooling: the last glaciation called Würm. On the European continent, the extension of glacial ice caused the disappearance of extensive forests, replaced by steppe-tundra

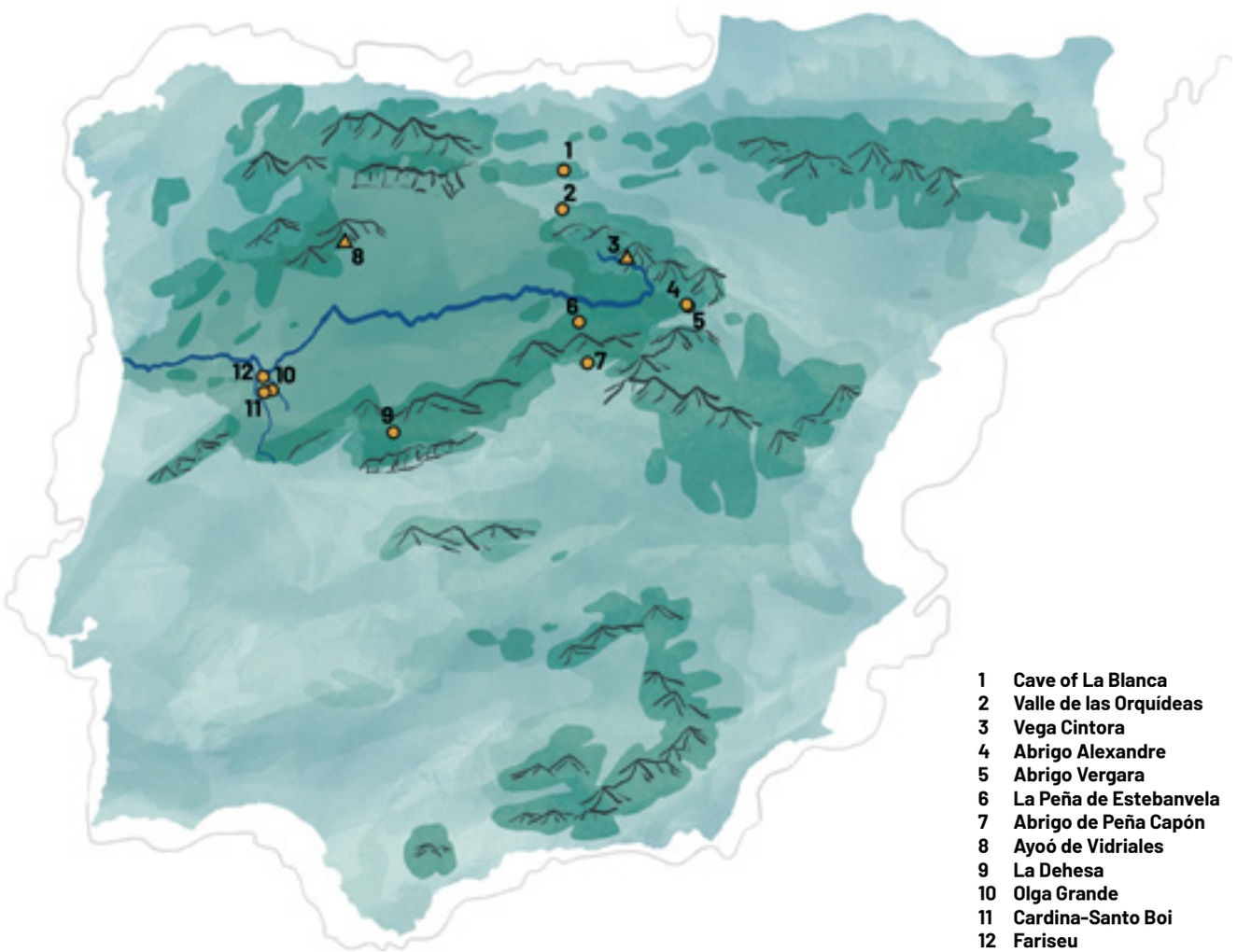

Fig. 1. The Douro Valley in the Upper Palaeolithic. Main sites and related sites.

landscapes and frozen deserts in the periglacial domains. This last glacial cycle of the Pleistocene, witnessed the arrival of the first modern humans, like us, and lasted until ca. 11,700 BP, characterised by a marked climatic instability with periods of extreme cold, such as the so-called Last Glacial Maximum, between 27,500 and 23,300 BP, and episodes of less climatic rigour.

In this globally colder environment than the current one, Upper Palaeolithic hunter-gatherer groups had to adapt to climatic and environmental fluctuations together with the implications this had for animal and plant populations. Studies of Greenland ice deposits show that these climatic changes can occur, sometimes rapidly, in about 50 years, conditioning the biotopes and lifestyles of the human groups that lived in these territories. In the Iberian Peninsula, the maximum extension of glaciers in the mountain systems of the Meseta is recorded between 26,000 to 23,000 BP. However, deglaciation begins with the end of the Last Glacial Maximum, with the abrupt, rapid succession (sometimes barely a millennium) of periods of climatic improvement

interrupted by a return to cold conditions, some of them very harsh, such as those recorded between 12,900 and 11,700 BP.

Detecting and interpreting the real impact of these global climatic drifts in the Douro Basin is essential to be able to reconstruct the hunting and gathering strategies and population dynamics of the last Upper Palaeolithic foragers in these regions of the Iberian Peninsula. In general, we can affirm that in the cold periods, the steppe vegetation ecosystems, practically treeless, would have been dominant, and that mountain glaciers, together with periglacial phenomena, would have influenced the landscape, probably placing the level of perpetual snow between 1,600-1,700 m above sea level. However, the knowledge we have of the environments and ecosystems that would have characterised the different territories that make up the Douro basin throughout that time is scarce and very local. For example, the presence of pine and birch has been reported in the eastern part of the Douro basin (Vega Cintora, Soria) ca. 30,000 BP, without being able to assess its real importance on the landscape.

In the far west of the Meseta, some fragments of teeth and burned bones, found in an occupational setting dating to 30,000 BP at the Cardina-Salto do Boi site, do not allow a reliable reconstruction of the animal species consumed during this period. However, analysis of fauna remains, preserved in contemporary sites excavated in caves in Central Portugal, shows that the large herbivores hunted during this phase were mainly horses, with ibex, aurochs (wild bulls) and red deer, in smaller amounts.

The results of the archaeological works of the Peña Capón rock shelter (Guadalajara), outside the northern Meseta, but on the northern border of the southern Meseta, confirm data from central Portugal, which reveal, together with some rabbit remains, there was hunting of horses, aurochs or bison, Pyrenean goats, red deer and chamois between 26,000 and 24,000 BP. These animals are also the most represented in the early stage of the rock art of the Côa Valley (see chap. 6). It is likely that, between 34,000 and 19,000 BP, the Côa region was occupied by the same species identified in these nearby territories.

On the north-western edge of the basin, the pollen sequence studied in Ayoó de Vidriales (Zamora) provides a more detailed environmental reconstruction. Towards the end of the Last Glacial Maximum, the presence of trees (pines, birches and perhaps oaks), although scarce, maybe in small forests scattered among heaths, in a steppe environment, suggests moderately cold, dry climatic conditions. Shortly thereafter, ca. 16,400 BP, the cold, dry climate is accentuated giving way to a practically treeless ecosystem, with the presence of a few junipers, and the dominance of a poor steppe vegetation of grasses and heaths. These harsh weather conditions will remain until ca. 13,600 BP, when the increased presence of trees, mainly pines and birches, seems to indicate an improvement with an increase in temperatures and rainfall. Barely a millennium later (ca. 12,800 BP) the climate deteriorated again, with all traces of wooded formations disappearing in a once again steppe-like landscape. The climatic instability that characterised the end of the last glacial cycle is shown by the fact that after only a few centuries (ca. 12,500 BP) a

sudden expansion of pine and birch forests was detected, associated with a rise in temperatures and rainfall, to which deciduous trees such as oaks were progressively incorporated.

Practically at the other end of the Douro valley, the Peña de Estebanvela site (Segovia), located in the south-eastern sector of the Douro basin in a mountainous environment at about 1,065 m above sea level, also provides palaeoenvironmental data from inferences obtained from the study of microfauna, charcoal and phytoliths (biomineralisations of plant origin) recovered in the occupations of this rock shelter by groups of Magdalenian hunter-gatherers. Between 17,700 and 17,190 BP the environment of the site would have been dominated by a steppe vegetation of grasses with the presence of some trees such as willow and to a lesser extent pine and hazel, probably concentrated in watercourses such as the Aguisejo River, which currently flows at the foot of this rock shelter. The landscape of grasses and heather is maintained between 15,150 and 13,980 BP with perhaps more temperate conditions given the presence, albeit still sporadic, of willow together with pine, alder, hazel and wild apple trees. The increase in temperature appears to consolidate ca. 13,720 BP when a greater variety of trees is detected in the site. The best represented in the settlements is still the willow (probably because of its use as fuel for homes), but next to it appear hazel, ash, alder, yew, oak-type deciduous trees, and other native species of Mediterranean environments such as pine, juniper, cherry, blackthorn or wild apple trees. In fact, the presence of this variety of trees at that time may reflect a greater diversity and increase in forest formations in the environment, but it may also be the result of larger timber catchment areas by Magdalenian groups or even changes in the activities carried out at the site. Finally, between 13,300 and 12,610 BP, the association of micromammals, reptiles and amphibians allows us to reconstruct a landscape that would not be very different from that existing today in the Aguisejo river environment, flanked by a riverbank woodland, perhaps with a greater development of vegetation cover with some wooded areas and transition to an open landscape of forest perimeters, shrub areas and both wet and dry grasslands (Table 1). The charcoal and phytoliths support this environmental reconstruction and suggest a high diversity of forest formations.

Peña de Estebanvela also provides a picture of the exploitation of animal and vegetal resources by the Magdalenian groups that inhabited this eastern point of the Douro basin, their lifestyles and their ability to optimise the resources present in the different habitats in the area closest to the site between 13,980 and 12,610 BP. Zooarchaeological and taphonomic studies regarding their fauna point to the recurrent use of open, wooded and mid-mountain environments for hunting hoofed animals (horses, roe deer, red deer, goats or chamois), including some carnivores (lynx), trout fishing and possibly the collection of wild fruits. Similar remains have also been detected in other sites of the Northern Meseta. For example, goats, red deer, horses and lynx are recorded in the La Blanca cave, located in the Oca River canyon (Oña, Burgos), very close to its confluence with the Ebro River, and horses in the rock shelters of Alexandre and Vergara (Deza, Soria), in the Henar River

SPECIES	HABITATS
Garden dormouse Wood mouse	Wooded areas
Greater mouse-eared bat Western barbastelle	Open woodland, shrubland, wooded grassland
European hedgehog Greater white-toothed shrew Greater horseshoe bat Brown long-eared bat – Grey long-eared bat	Wooded areas, vegetated open areas, forest edges with shrub vegetation or grassland
Common vole – Field vole Mediterranean pine vole Rabbit	Areas with abundant herbaceous or shrub vegetation
Tundra vole	Waterlogged soil, water edges
Southern water vole	Water edges with abundant herbaceous or shrub riparian vegetation

Fig. 2 Connection between micromammals and environmental interpretation in the late Magdalenian-epoch occupations at La Peña de Estebanvela (Segovia) ca. 13,300 and 12,610 BP (As per Cacho *et al.* 2013).

valley, also a tributary of the Ebro, with Magdalenian settlements at a time of extreme cold, according to pollen data.

The Magdalenian hunters at Peña de Estebanvela selected their prey by directing their efforts to catch animals from 4 to 6 years old, juveniles and infants, perhaps looking for the highest quality meat, and a certain guarantee of success in hunting, given that these are the individuals that are the least protected. The prey was accumulated during two times of the annual cycle: spring and early summer, and autumn, both coinciding with the calving season (greater vulnerability) and the rutting season (greater aggregation of individuals). Rabbits, goats and horses, and to a lesser extent red deer, chamois, roe deer and wild boar were consumed in the camp. The practical non-existence of burned bones seems to indicate that the meat, if cooked, was consumed once separated from the bones, which were probably abandoned without taking advantage of the fat they contain. The scarce presence of burned bones also suggests that fire was not used as an agent to dispose of these residues. The animals were transported whole from the place where they were shot by the hunting parties to the camp, suggesting a pattern of being captured in the nearby environment, no more than 10 kilometres away.

Downstream, on the western edge of the Meseta, in what is now Portuguese territory, the Côa River valley, a tributary of the left bank of the Douro, has provided additional information on the climatic changes that occurred during the Upper Palaeolithic period. The acid soils developed in this region do not favour the preservation of organic remains, such as pollens, charcoal and bones.

Fig. 3 Reconstruction of the biotypes around La Peña de Estebanvela (Cacho *et al.* 2013, drawing by Enrique Navarro Praderas)

Only under special conditions, the existence of carbonate layers in metamorphic rocks, as in the open-air site of Fariseu, allowed the preservation of certain remains. From these it was possible, as in the Estebanvela site referred to above, to apply the C-14 dating method to date human activity at the different layers of this site. It was also possible to use the luminescence dating method, which makes it possible to determine when certain materials were subjected to a heat source (hearth, bonfires, etc.) or sediments last exposed to sunlight. Thus, since 1998, a set of 34 dates from successive Upper Palaeolithic occupation levels have been obtained from several sites in the Lower Côa that attest to a continuous human presence, between 34,000 and 11,700. (see chap. 1).

At the Fariseu site, animal and fish remains have been dated to between 12,000 and 11,500 BP, corresponding to the end of the last glacial period. Rabbits,

Fig. 4 Species represented on the open-air panels and the portable art from Fariseu and bone remains from documented wildlife.

wild boar, red deer, chamois and squirrels, species still common in the region, have been identified among the preserved remains. The presence of fish remains documents the practice of fishing (as occurs in Estebanvela on the same dates) and remains of shad fish have been identified, a species that used to go up the Douro River to reproduce between March and June, which allows the occupation on this site on the banks of the Côa River during the spring to be established.

This ecological diversity, in a relatively small geographic area, suggested by the extension of the hydrographic network and the presence of frozen water masses in the granitic plateau, which supply water during thawing periods, may explain the high occupation and concentration of hunting groups during different phases of the Palaeolithic period in the Côa Valley.

Geological and micromorphological studies (on sediment samples collected, consolidated and studied in thin layers) of deposits with traces of Upper Palaeolithic occupation underlying the Fariseu engraved panel No. 1, on the banks of the Côa, at about 125 m altitude, revealed a rotation between phases of accumulation of schist fragments produced by the degradation of rocky outcrops under the effect of melt/freeze cycles, during colder times, and of sands and silts deposited at the limit of the river plain by floods, during warmer times. The dates these layers were formed attest to the existence of climatic fluctuations equivalent to those established in the Peña de Estebanvela rock shelter, at an altitude of more than 1,065 metres.

These climatic changes, witnessed in geographical contexts of very different altitudes, reveal a clear influence of the global climatic changes, detected in the marine record and in Greenland, after the Last Glacial Maximum, and the implications for the resources exploited by the hunter-gatherer groups that populated the interior of the Iberian Peninsula.

More difficult than determining the periodisation of the settlement and the evolution of its environmental context is to reconstruct the daily life of human groups in the Upper Palaeolithic. However, the analysis of the traces of use of stone and bone tools according to their wear and tear, the displacement of raw materials, the preservation of evidence of structures linked to the activities and the use of tools, allow us to advance some proposals on the lifestyles and mobility of these hunter-gatherers. More rarely, the preservation of features in excavated sites, such as stone groups with signs of heating (Olga Grande 4, Cardina-Salto do Boi) attest to the use of hearths. Two large structures discovered at the Cardina-Salto do Boi site, dating between 27,000 and 29,000 BP, can be interpreted as cobblestone floors at the base of the huts

The geological characterisation and the determination of the geographic origin of the raw material used for the manufacture of tools provide valuable information for the reconstitution of the exploitation territory, mobility and possible exchanges with other human groups. This type of study is particularly interesting in the Upper Palaeolithic sites of the Côa Valley, occupied between 34,000 and 11,700 BP, since there is no local flint in this area and they must have been supplied from other regions, identified between the northern Meseta, the southern Meseta and the Portuguese coast.

Located on the border between the Meseta and the central plateaus of Beiras, the Côa Valley can therefore be understood as a border area, and the high concentration of rock art found there is largely related to this matter. The already long trajectory of research in Portuguese Extremadura allows us to characterise the human occupation on the western side of this vast explored territory. However, to the east of the Côa Valley, the distribution of sites attributed to the Upper Palaeolithic period seems to correspond to an occupational "void", still incomprehensible given the recurrent use of its raw material sources throughout the period.

The lithic remains discovered at the La Dehesa site (El Tejado, Salamanca), located on the edge of the Northern Meseta, at 1,110 m above sea level, attributable to a recent phase of the Magdalenian, allow us to minimise this gap.

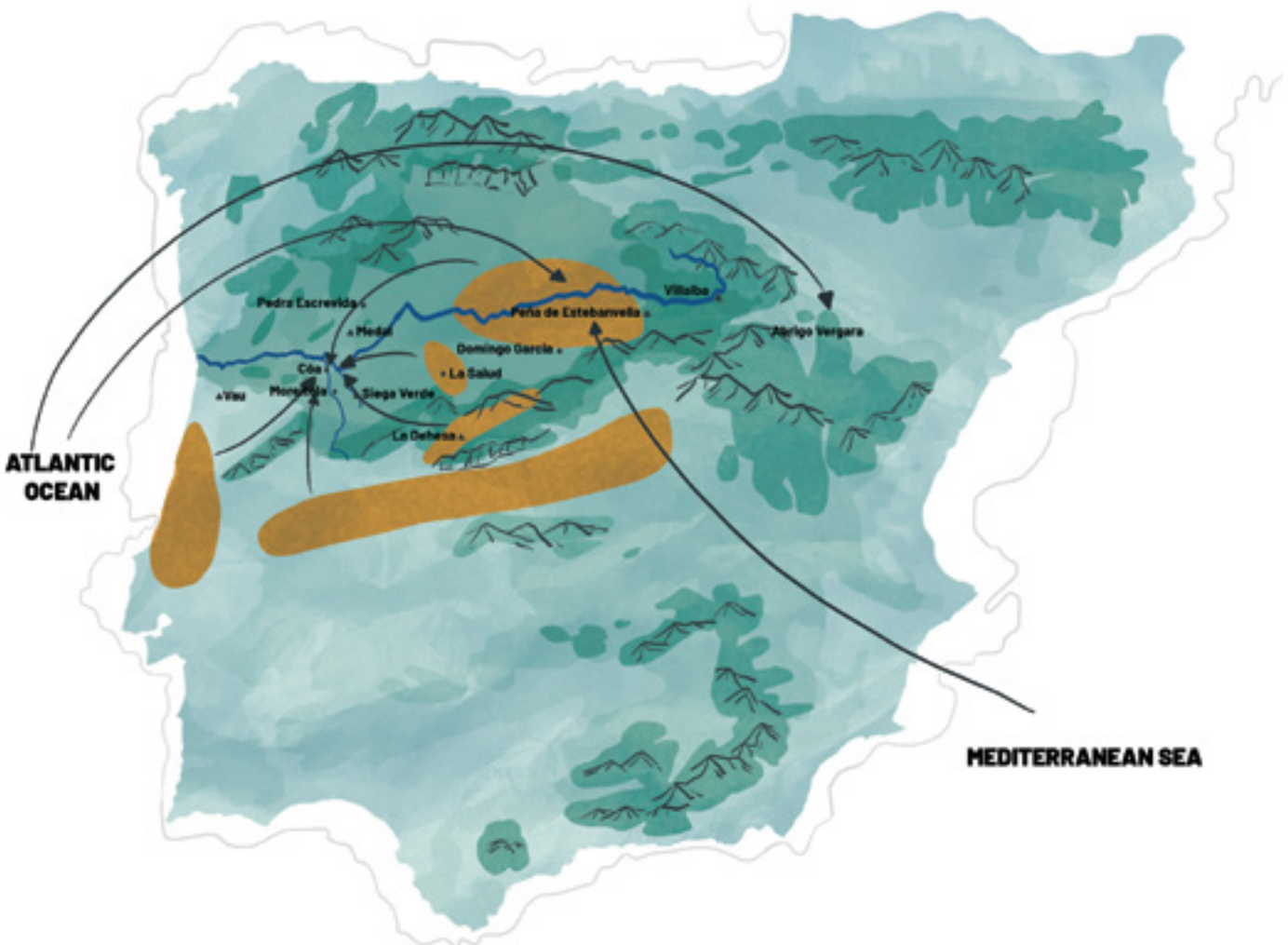

Fig. 5. Origin of the raw materials used at Palaeolithic sites to produce tools and adornments.

In this specific context, where there is no local flint, the study of the rocks used revealed the exploration and presence of flint both from the closest regions and from other more distant regions such as the Douro and Tagus Basin, or flint from Central Portugal, more than 300 kilometres away. These testimonies of mobility and exchanges between groups reveal the existence of a vast network between groups on both sides of the Central System and others.

At the eastern end of the Meseta, the Magdalenians of Peña de Estabanvela may have obtained flint for the manufacture of their tools from outcrops located in a radius no more than 20 km away from the site. Wider movements have been defined, based on the circulation of flint from the Central System, from the interior of the Peninsula towards the territories of the Western Douro. On the other hand, the different species of marine shells identified in the Vergara rock shelter or that of Peña de Estebanvela prove the existence, if not of movements, at least of contacts with both the Mediterranean and Cantabrian

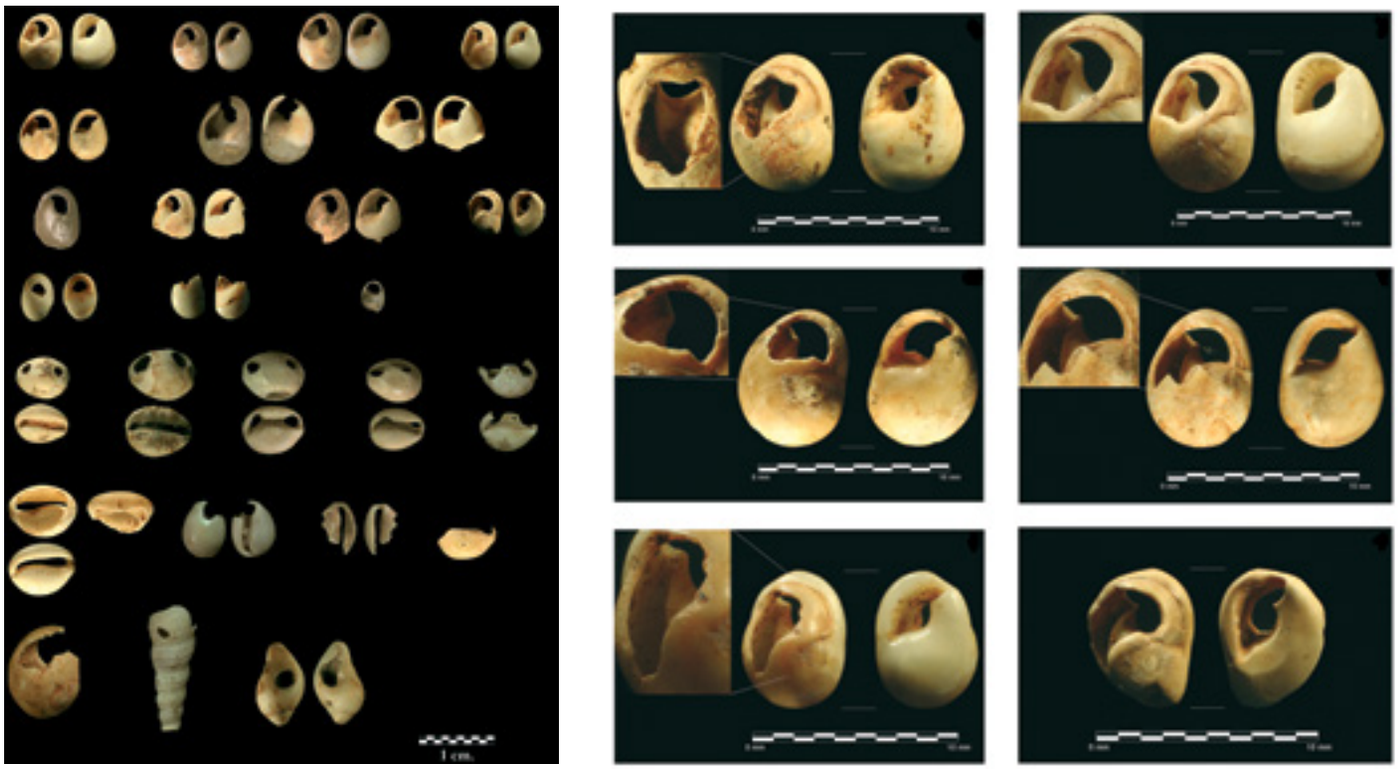

Fig. 6 a) Adornments/pendants from La Peña de Estebanvela. The presence of marine molluscs—the closest coast is over 200 kilometres away in a straight line—is testament to the mobility of the hunter-gatherer groups from the Upper/Late Magdalenian. They were made using seven marine species (*Cyclope neritea, Littorina obtusata, Trivia arctica, Trivia pulex, Nassarius reticulatus, Turritela comunis*), having been perforated prior to their arrival at the site, and one river nerite (*Theodoxus fluviatilis*) present in the stream that runs by the site. (Cacho *et al.* 2013. Photograph by Bárbara Avezuela).

Fig. 6 b) Perforated adornments/pendants on *Cyclope neritea*, a marine mollusc of Mediterranean origin, from the Upper/Late Magdalenian hunter-gatherer settlement at La Peña de Estebanvela. The value their bearers gave to them is evident in the high degree of wear that many of them have. (Cacho *et al.* 2013. Photograph by Bárbara Avezuela).

areas. In this sense, the decorative motifs present in the pieces of portable art from Peña de Estebanvela could support, based on parallelisms in the motifs represented, relations of these groups with others located beyond the Pyrenees.

The distribution of the sites and the activities documented in them can help to reconstitute the mobility of these groups throughout the year. What we can currently propose is based on ethnological data observed in present-day hunting groups and on the reconstitution of the location of resources during the Palaeolithic period. In fact, in hunter-gatherer societies there is a set of common behaviours that can probably be extrapolated to Palaeolithic societies. The traces of habitat found suggest a nomadic life, based on the exploitation of animal and vegetal resources from different ecological niches, with significant differences in the amount of water and variety of fauna depending on the altitude.

In the Vale do Côa region, two main types of ecological niches used by the Palaeolithic hunting communities can be differentiated, with remains that point to different activities. While in the camps at the bottom of the valley, located near the main watercourses, abandoned tools are more abundant and more varied and the traces they preserve reveal the practice of diversified activities, in the high altitude sites most of the findings correspond to carved stone points and bladelets, with breaks typical of their use as projectiles, linked to a hunting activity, suggesting, in this case, the undertaking of more specialised activities.

From the point of view of the origin of the lithic raw materials, the stone tools exhumed in both niches reveal the systematic presence, in small quantities, of flint from distant regions, more than 150 kilometres away, together with the existence of tools made with a variety of local vein quartz.

These data, especially the use of the same varieties of flint during the Aurignacian and Magdalenian period (between 34,000 and 12,000 BP) associated with a majority of local raw materials, lead us to believe that the Baixo Côa region was permanently inhabited during the different phases of the Upper Palaeolithic period. In fact, the available data point to an exploration of the plateaus that would correspond to hunting camps, contemporary to the residential use of the sites at the bottom of the valley (cf. Gravettian features at Cardina). At the same time, on a regional scale, an exploration of the resources of the different basins of the Douro tributaries was alternatively carried out, by the same group or fraction of the same group, which temporarily joined together at certain times of abundance of resources.

Within the Northern Meseta, the location of the sites we know about seems to indicate that the Magdalenian groups would have preferred to locate their camps in rock shelters. However, where there were no such formations, this group could have created open-air camps, although they are more difficult to trace archaeologically. In fact, there is no lack of references to the possible existence of these open-air settlements, as could be the case of the aforementioned La Dehesa, in the Upper Magdalenian period, or even more casual basis, as in the case of the site known as Valle de las Orquídeas, as a possible workshop linked to local flint and at an ancient time of the Upper Palaeolithic period, with dates close to 30,000 BP.

In Peña de Estebanvela there is an intensive, recurrent use of the riverside environment near the camp established in the rock shelter. For example, the charcoal identified indicate the use of wood from the riverside woodland, especially willow, as fuel for households. The existence of trout vertebrae proves the inclusion of fishing for their diet. Although there is no direct evidence in the remains recovered at the site, this intense use of the environment also leads us to think about the possible consumption of a wide variety of edible fruits that were present in the vicinity of the camp (cherries, sloes, hazelnuts and apples). It is also suggested from the trees identified in the anthracological study (botanical classification of charcoal and wood in archaeological contexts) the possible use of young branches of willow or hazel for basket weaving.

Little can be said about the spatial organisation of these camps in rock shelters or in the open air. In the Magdalenian rock shelter of Vergara, we have tried to identify basins, post holes and large slabs, perhaps to condition the ground. However, the Peña de Estebanvela site is again the only one that provides us with small windows into life in a Magdalenian camp at the eastern end of the Douro valley. The information obtained from the archaeological works allows us to observe a certain differentiated use of space within the camp. The dispersion of lithic remains topographed in a small space of barely one square metre with a semicircular geometry, in a layer of about 13,980 BP, repeats patterns identified in knapping actions in

Fig. 7 Recreation of everyday activities (fishing and gathering) at Estebanvela (Cacho *et al.* 2013, drawing by Luis Pascual)

both ethnoarchaeological and experimental studies, and therefore is identified with an area where intense knapping work was carried out in a single settlement. In the surroundings of this knapping space, a concentration of flint nodules of excellent quality was found, piled up in a small area of about 25 cm2, together with barely roughed cores and flakes of bark being stripped off, interpreted as a place of storage or reserve of raw materials for knapping. On this same level there seems to be another space dedicated to the skinning, fleshing and dismembering of hunted animals. In particular, the concentration of limbs (phalanges, sesamoids and distal epiphyses of metapods) of goats, red deer and horses is associated with the skinning of animals. At a somewhat later layer, between 13,720 and 13,100 BP, three combustion structures were excavated. Two of them have a diameter slightly greater than one metre and reach an ash thickness of about 10 to 15 cm. The virtual absence of lithic or fauna remains in their interiors leads us to rule out the possibility that domestic activities related to meat cooking or the manufacture of lithic tools were carried out around these hearths. On the other hand, the presence among the ashes of

a large number of quartzite, quartz and limestone pebbles with thermal fractures points to the heating of these pebbles and the use of the hearths as heat accumulators.

The lithic tools recovered at Peña de Estebanvela represent, in general terms, those possessed by Magdalenian groups in the central and eastern sector of the Douro Basin. This is characterised by the predominance of flint blades and bladelets on which the tools used to cover different needs related to their subsistence are made: retouched blades and backed bladelets for the preparation of hunting weaponry and tools for the clearing and treatment of prey, scrapers, possibly linked to the treatment of skins among other tasks, and burins. In Peña de Estebanvela, the bone tools, mainly made of bone and not antler, is scarce, although there are burins, needles and a few spears, probably because their functions were replaced by tools made of other materials such as wood, which we have not been able to find due to reasons of conservation. Singular elements in this site are the ornaments, a total of 53, almost all of them on shells, except for 3 on atrophied canine tooth of a red deer and a fourth on sepiolite. It is also worth mentioning an exceptional group of more than 40 plaquettes, almost all of them made of schist, engraved with geometric representations except for two that include depictions of horses.

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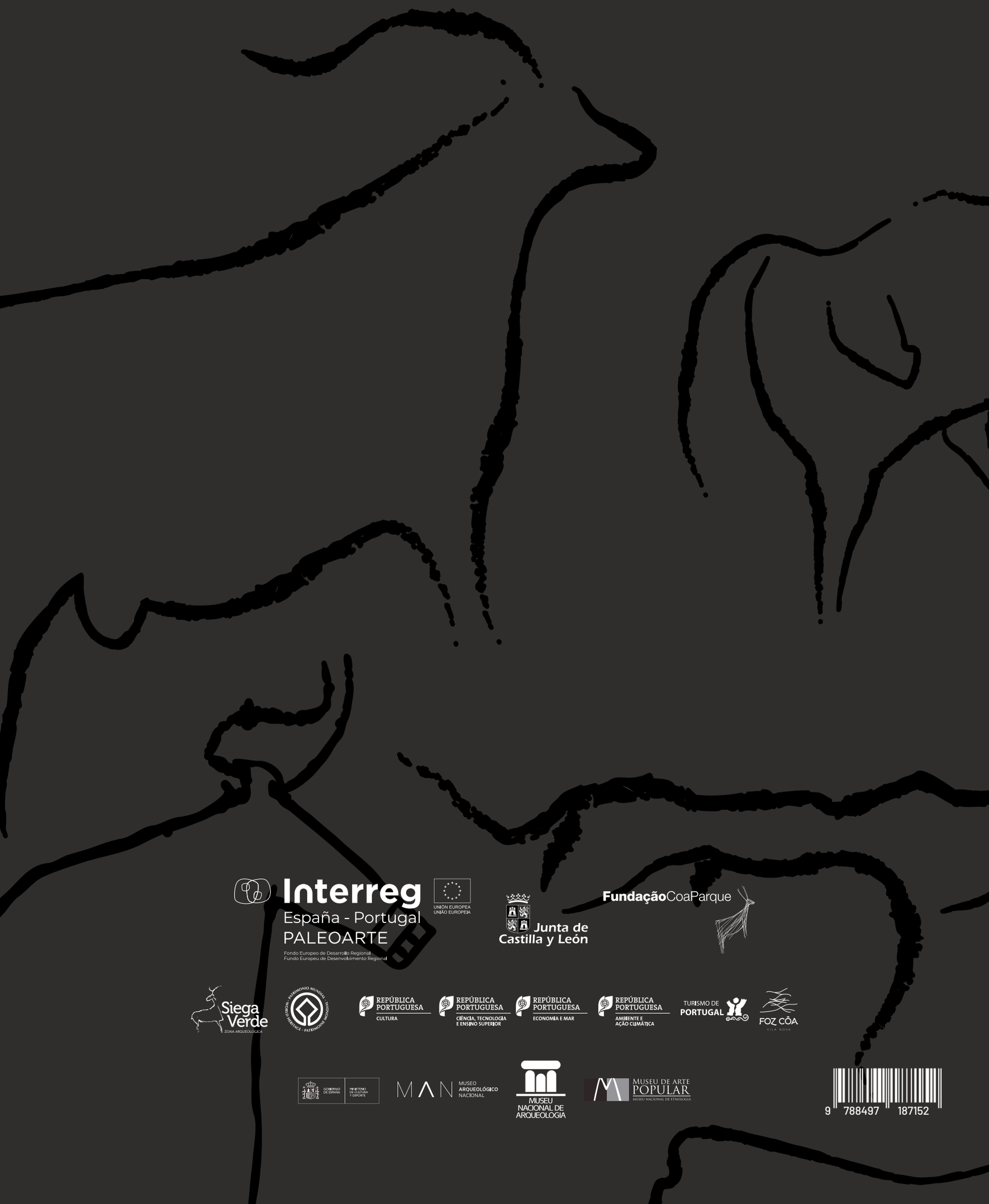

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