Funerary Practices in Western Europe from the Upper Palaeolithic to the Early Neolithic: A Multivariate Analysis

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Abstract

The aim of this thesis was to create databases of funerary remains dating from the Upper Palaeolithic to the Early Neolithic from an extensive area of Western Europe (Portugal, Spain, Andorra, France, Belgium, Switzerland, and Luxembourg) to identify geographical and chronological continuities and variations of several aspects of mortuary practices. These aspects include where the deceased were placed in the landscape if the funerary context was modified (or not), the material culture that was deposited with the deceased, the type of treatment given to the body, and if social categories such as gender and social age influenced how the dead were deposited. Through the study of these aspects of funerary practices an interpretation of how past societies understood death, their bodies, and their surroundings is made.

Monte Carlo plots are used to analyse change through time. Some of the analysed variables seem to have influenced other variables (*e.g.*, the sex of the deceased likely influenced the type of funerary offerings) and this was analysed using $\chi 2$ tests. The geographical distribution of cultural patterns was visualised using ArcGIS.

The key findings of this research show how around 7500-6000 cal BC several changes regarding funerary practices occurred in Western Europe. The main changes are: that the deceased started to be buried rather than left unburied; that individuals generally started to be deposited complete and in single deposits rather than disarticulated in multiple deposits; changes in the offerings deposited alongside the deceased; the appearance of cultural traditions regarding offerings in Téviec, Hoëdic and the Linear Pottery Culture area; and an increasing influence of gender and social age in funerary customs.

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This PDF is accompanied by three spreadsheets: the data table by site, the data table by individual, and the data table by funerary offerings. These were uploaded in a different format (CSV).

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An important quantity of the data analysed in this thesis was not published or was published but I could not access it. Thanks to the researchers and/or field workers that have either sent me copies of their published or unpublished works, including excavation reports, or that have replied to my queries and/or recommended sources. They are Alfonso Alday Ruiz, Bruno Aubry, Carolyn Barshay-Szmidt, Nuno Bicho, Geoff Bailey, Miguel Ángel de Blas Cortina, Àngel Bosch, Jean-Pierre Chadelle, Louis Chaix, Pierre Chalard-Biberson, François-Xavier Chauvière, Miguel Cortés, Felipe Criado, Eugénia Cunha, Marta Díaz-Zorita Bonilla, Henri Duday, Pablo García Borja, Achilles Gautier, Juan Francisco Gibaja Bao, Javier González, Javier González Muñoz, Lamys Hachem, Dominique Henry-Gambier, Almudena Hernando, Montserrat Hervella, Brigitte Holt, Mary Jackes, Paulette Lawrence-Dubovac, Walter Leclercq, Michel Mauvilly, Christopher Meiklejohn, Moritz Mennenga, José Manuel Morlote Expósito, Lourdes Montes Ramírez, Emilio Muñoz, Cécile Paresys, Rita Peyroteo Stjerna, Karine Raynaud, Manuel Rojo Guerra, Mirjana Roksandic, Isabel Rubio de Miguel, Isaac Rufi Casals, Jesús Sesma Sesma, Josep Tarrús, Cláudia Umbelino, Christian Verjux, Pierre Vermeersch, Bernhard Weninger, Aurélie Zemour and João Zilhão.

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Author's declaration

I declare that this thesis is a presentation of original work, and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as references. The bibliography was made with Zotero 5.0.96.2 reference management software, using a version of the 'Universidade Estadual do Oeste do Paraná - Programa Institucional de Bolsas de Iniciação Científica' modified by myself. The thesis was sent to a proofreading service before submission.

Chapter 1: Introduction

1.1. Background

This research continues a smaller-scale project which was started as a master's dissertation and which showed huge potential and a strong rationale for analysing funerary data across time and space. Firstly, across Western Europe, many sites from these periods have been excavated but there is no synthesis pulling together all the data. What syntheses exist only include some of the existing funerary remains and usually focus on small regions. Notable exceptions are Newell *et al.* (1979) and Gruenberg (2000), though neither now provides a comprehensive overview of the evidence. Secondly, many publications (*e.g.,* site reports, anthropological studies, small-scale syntheses) offer few interpretations of human life- or deathways, focusing instead on the exposition of data, such as summaries of burials, stratigraphic sequences, metric traits of skeletons, or descriptions of lithic materials. Thirdly, archaeologists tend to stick within their period interests, such that there is very little discussion of practices across these modern constructs.

This thesis attempts to fill these gaps and create a full compendium of funerary remains from the Upper Palaeolithic to the Early Neolithic, leading to a better understanding of the societies through the mortuary record.

1.2. Temporal and geographical focus

This study focuses on the Upper Palaeolithic, Mesolithic and Early Neolithic (48,000–4500 cal BC) in Western Europe, specifically in Portugal, Spain, France, Luxembourg, Belgium, Switzerland and Andorra (Figure 1).

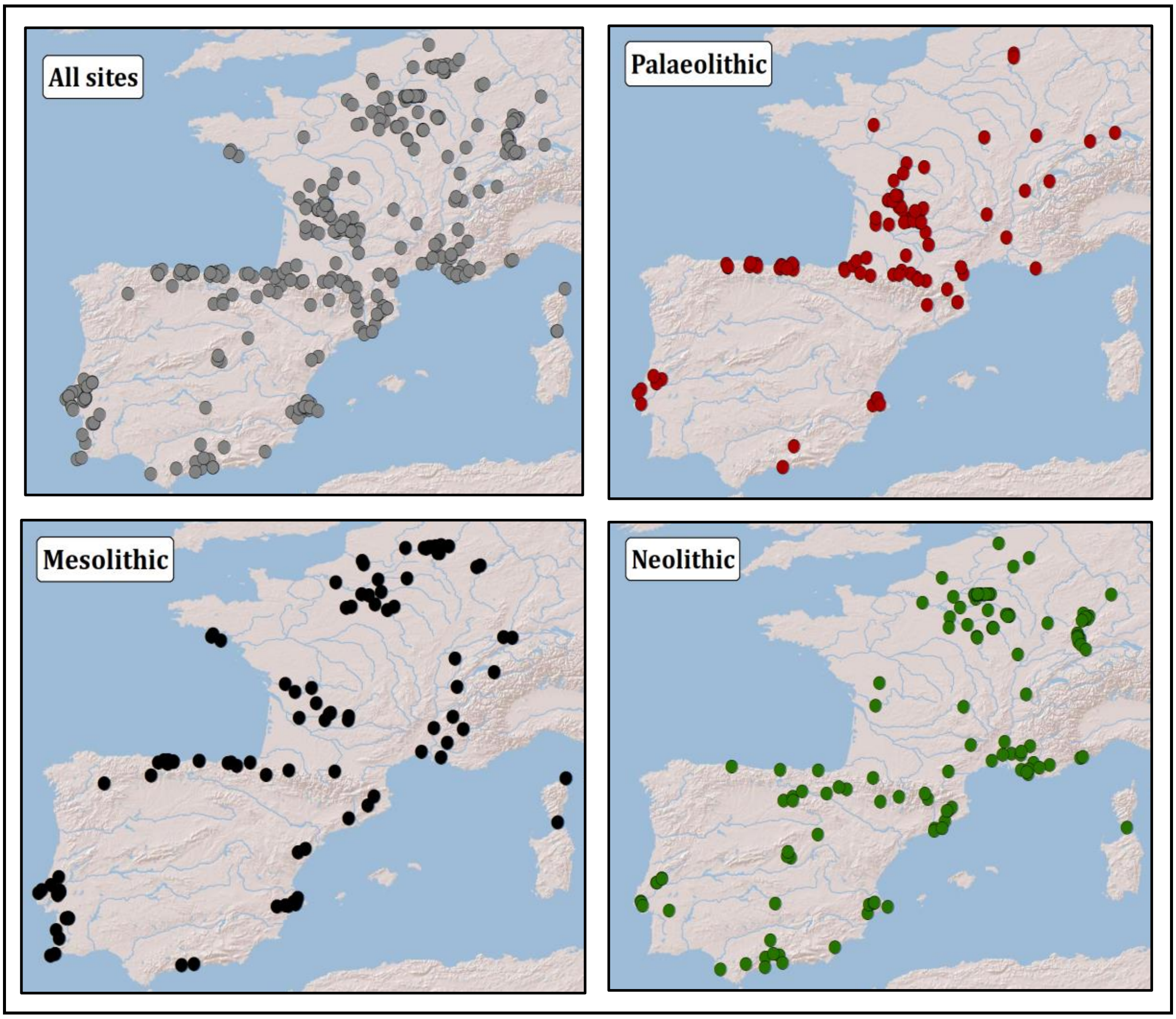


Figure 1: Geographical distribution of the sites analysed

1.3. Aims and Objectives

This thesis aims to:

1. Collate all published data on human remains from the Upper Palaeolithic, Mesolithic and Early Neolithic from Portugal, Spain, France, Luxembourg, Belgium, Switzerland and Andorra.

2. Analyse and assess variability in funerary practices chronologically and geographically within the study region.

3. Interpret the results to improve current knowledge on the life-, deathways and identity construction of the people and societies who lived and died during the Upper Palaeolithic, Mesolithic, and Early Neolithic in Western Europe.

Identity can be broadly defined as the way people conceive themselves and the world around them, including the land and their inhabitants. As identity is a vague and broad concept, the analysis focuses only on some of the facets of human identity construction. These facets of identity are analysed through different approaches to the way human remains were treated (*e.g.*, landscape, materiality, personhood, gender, and childhood studies). The analysed facets are:

- **The relation with death:** Whether it was hidden or exhibited.
- **Territoriality:** If they were territorial and whether the ancestors played a role in claiming the land.
- **Cultural traditions and group belonging:** If members of the same group were identified as such in death via specific material culture.
- **Understanding of the human body:** The different ideas these past societies might have had about the human body (*e.g.*, if they understood it as an indivisible or divisible entity).
- **Individual and relational identity and social personas:** If individuals in multiple rather than individual funerary deposits had a less developed social persona and/or a more developed relational identity (built through social links, actions, the body, and material culture).
- **Animal personhood**: If past societies or some of them perceived and treated animals like non-human persons.
- **Sex and Gender:** The different roles of men and women in their groups and the extent to which biological sex influenced the social category of gender. Third genders are not considered as that would require a site-by-site approach.
- **Social age:** If the role of people and the society's perception of them changed with age.
- **Care and treatment of people with life-altering pathologies:** If the group took care of people with disabilities or temporary life-altering pathologies (*e.g.* healed injuries).

Large-scale projects are fundamental for research as they provide new insights into a broad range of geographic and diachronic variations. The detailed data collated for this project will facilitate future research on mortuary practices either expanding the geographical scope to an even wider area or through site-by-site approaches. Unfortunately, any type of research has specific issues of its own. The problem with large-scale projects covering many different topics is that they do not allow the same type of nuanced in-depth analyses that site-by-site research or research focused on a single topic would. Any of the topics analysed in this thesis (*e.g.,* landscape, funerary offerings or the treatment of the body) and several of the sites included in the study (*e.g.,* Téviec, the Muge shell middens) would require a thesis on their own to be examined and interpreted in detail. That is not to say that the knowledge generated by a large-scale project such as this is not valid or relevant but rather that it is important to be aware that the information is discussed at a more superficial level than it would be in other types of research.

1.4. Thesis structure

The thesis is divided into nine chapters. In Chapter 2, I review the archaeological background of the study region. This is divided into two sections. The first summarises the evidence for regional and chronological variation within the Upper Palaeolithic to Neolithic, and how this relates to fluctuating environmental conditions and demography. The second reviews previous research on Upper Palaeolithic to Early Neolithic mortuary practices in Western Europe arranged by topic: the funerary context, the body (including biological information and mortuary treatment), grave goods, animals in graves and identity.

Chapter 3 explains the methods used to explore the research questions of the study, including how data were collated, the issues that arose during the collation process, and how data were analysed and interpreted.

The five chapters that follow present the results of the research and a general discussion (analysis and interpretation) of the findings. Chapter 4 examines those elements relating to the site context and features and their variation through time and space. This includes the environmental context of the site, the types of sites containing funerary remains (*e.g.*, cemeteries or settlements), the size of the funerary space, the intra-site spatial distribution of the funerary remains and whether the site was abandoned or continued to be used after the deposition of the deceased. The information is presented according to the relationship people had with death and territoriality.

Chapter 5 analyses the modifications of the funerary context and the changes in their prevalence through time and between geographical regions. The modifications considered are the use of a grave or other kinds of sepulchral structures, the presence of location markers and furnishings, the use of sealing methods, and the presence of fire and mineral colourant within the context. This chapter is an extension of the previous one and expands on the relationship with death.

Chapter 6 focuses on funerary offerings, sorted into four broad categories: tools and equipment, ornaments, and unmodified faunal remains, including shells and other offerings, including portable art, ochre nodules and plant materials –the material from which each type of offering was made is also analysed. This information is used to infer how material culture played a role in the identity construction of individuals and communities, particularly as adscription markers of groups, and if there were cultural traditions regarding what items were included in funerary contexts, noting variations through time and space.

Chapter 7 focuses on the treatment and understanding of the human body. First, it examines the deposition of complete bodies, disarticulation and cremation, as well as the body position of the complete individuals to get a better appreciation of whether death was understood as a discrete event or a process, and if people were understood as *dividuals* or individuals. Then, the use of ochre with respect to the body and its possible meanings is analysed. Finally, individual and multiple funerary deposits and their potential as evidence of whether individuals had their identity constructed more through individual or relational means and whether their social persona was or was not fully developed is evaluated. Variations in these practices through time and space are also considered.

Chapter 8 focuses on how individuals of different sexes and ages, those with life-altering pathologies and animals were treated to investigate if social categories such as sex and social age played a role in the social organization of the human groups analysed. Continuities and variations through time and space are also examined.

Chapter 9 provides a synthesis of the evidence and interpretations presented in the foregoing chapters and considers the extent to which the aims of the research were met as well as its significance.

Chapter 2: Archaeological background

2.1. Archaeology and Palaeoenvironments 42,000-4500 cal BC

Geography, fluctuating environmental conditions, and demography are three key factors influencing archaeological remains, including those related to mortuary practices. The location of water sources affects where domestic spaces are located. Terrain morphology can create barriers between human groups (*e.g.*, the Pyrenees) and foment the appearance of different cultural traditions (Kozłowski, 2009: 220-221). Environmental conditions affect different issues, from the availability of resources to coastlines. Sea levels have risen around 130m in the past 22.000 years (Figure 2). From the beginning (48th-millennium cal BC) to the end (5th-millennium cal BC) of the study period, the orography, water formations, and coastlines varied (Shackleton *et al*., 1984; Edmunds *et al*., 2001; Chiocci *et al*., 2017). This influences the distribution of the archaeological sites depending on their chronology. For example, a study by Mieklejohn *et al*. (2016) shows a correlation between the absolute age of Mesolithic sites with human remains, the duration of occupation, and their location relative to the coastline.

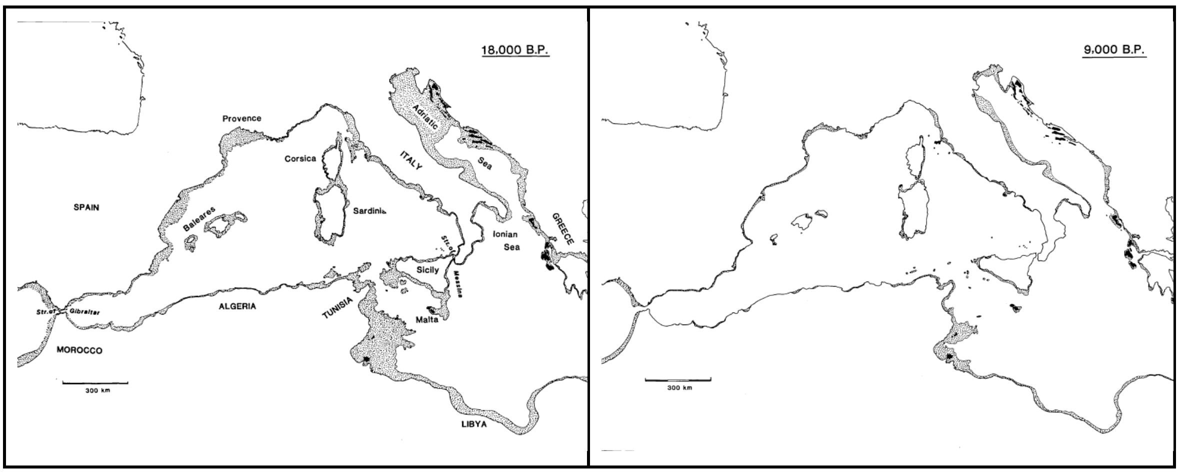


Figure 2: Mediterranean coastlines at 22.000 and 10.200 BP

Source: Shackleton *et al.*, 1984

Demography, on the other hand, might influence the number of sites with human remains found, as well as the Minimum Number of Individuals (MNI) deposited in a funerary space. In both cases, other factors such as preservation or coastlines also play a role, as sites with human bones from some periods might be less well preserved or below sea level. It is important to consider that population size or other external factors are not the only ones affecting the number of sites with human remains, nor the MNI. Burial selection practices may have played a role since the individuals found in funerary spaces usually do not follow the expected population distribution for hunter-gathering or horticultural societies (*e.g.*, there are too few children) (Chamberlain, 2000: 206). Regardless, it is likely that demographic changes such as the Neolithic Demographic Transition (NDT), that resulted in a significant increase in population (Jackes *et al*., 1997; Bocquet-Appel, 2011), did have an impact on the number of human remains we find.

Lastly, it is important to note that, for all periods, research biases have also shaped the distribution of sites. For example, most research on Iberia has been undertaken on the coasts (Kozłowski, 2009: 254-255), while French research has favoured the Paris area due to France being a centralised country (Schnapp, 1996: 65).

2.1.1. Upper Palaeolithic

The Upper Palaeolithic is the longest of the three archaeological periods analysed, spanning more than 30,000 years. This period is set during the Last Glaciation when large parts of Northern Europe were covered in ice. In the study region, glaciers developed at lower altitudes than today. This affected the direction and volume of water in rivers and coastlines, which, during the Last Glacial Maximum, were approximately 120m lower than modern sea levels (Djindjian *et al*., 1999: 27).

There were important climatic variations during the Last Glaciation. Those during the Upper Palaeolithic start with Greenland Interstadial 12 (c. 46,000 b2k) and end with the beginning of the Holocene (c. 11,700 b2k). This comprises 14 Greenland Stadials (GS) and Greenland Interstadials (GI), defined by shifts in the quantity of δ18O (reflecting surface air temperature) and [Ca2+] (Rasmussen *et al*., 2014: 2, 8-9). Stadials represented full glacial conditions, while interstadials had relatively mild climate (Rasmussen *et al*., 2014: 2). Between GI 12 and GI 3 (c. 46,860-27,780 b2k) temperature oscillations were more frequent, with rapid successions of stadials and interstadials (Rasmussen *et al*., 2014: 4, 9) (Figure 3). Relatively mild temperature conditions led to a landscape of mixed coniferous forests and meadows in the South and tundra in the North (Djindjian *et al.*, 1999: 59-67).

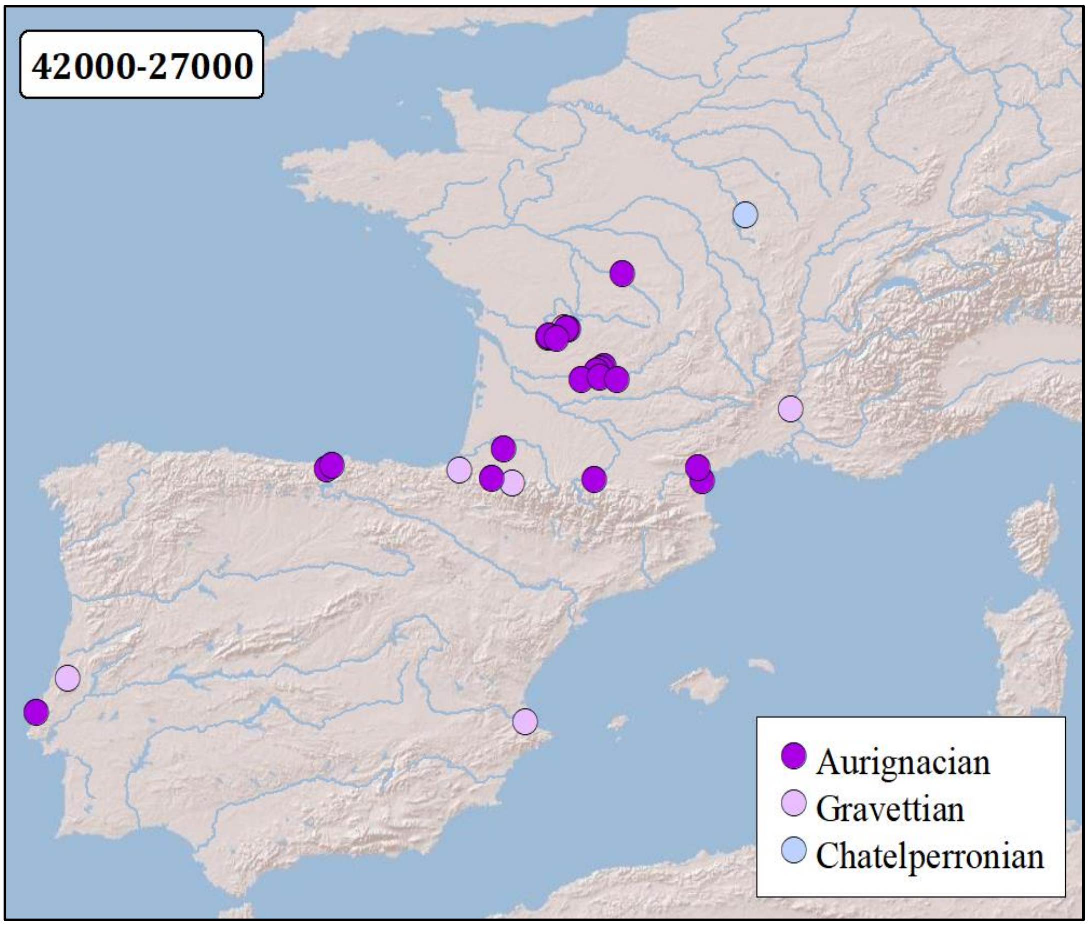


Figure 3: Distribution of Upper Palaeolithic funerary sites 42,000-27,000 cal BC

From GS 3 and until the end of GS 2 (c. 27,540-17,480 b2k), temperatures became colder and more stable (Figure 4) (Rasmussen *et al*., 2014: 4, 9). In the coldest stages, the landscape was characterized by boreal and Mediterranean forests in the southwest, with tundra in the mountains. In the northeast, the landscape was tundra, taiga, and steppe. Mixed and Mediterranean forests were inhabited by a variety of species including cervids, bears, wolfs, and lynxes. Among the large mammals found on the steppes were woolly rhinoceros, mammoths, horses, antelopes, bison, hyenas, and aurochs. The most important large, herbivorous mammal of the taiga and boreal forests was the reindeer, while on the tundra musk oxen, arctic foxes and mountain hares were common (Djindjian *et al*., 1999: 59-67).

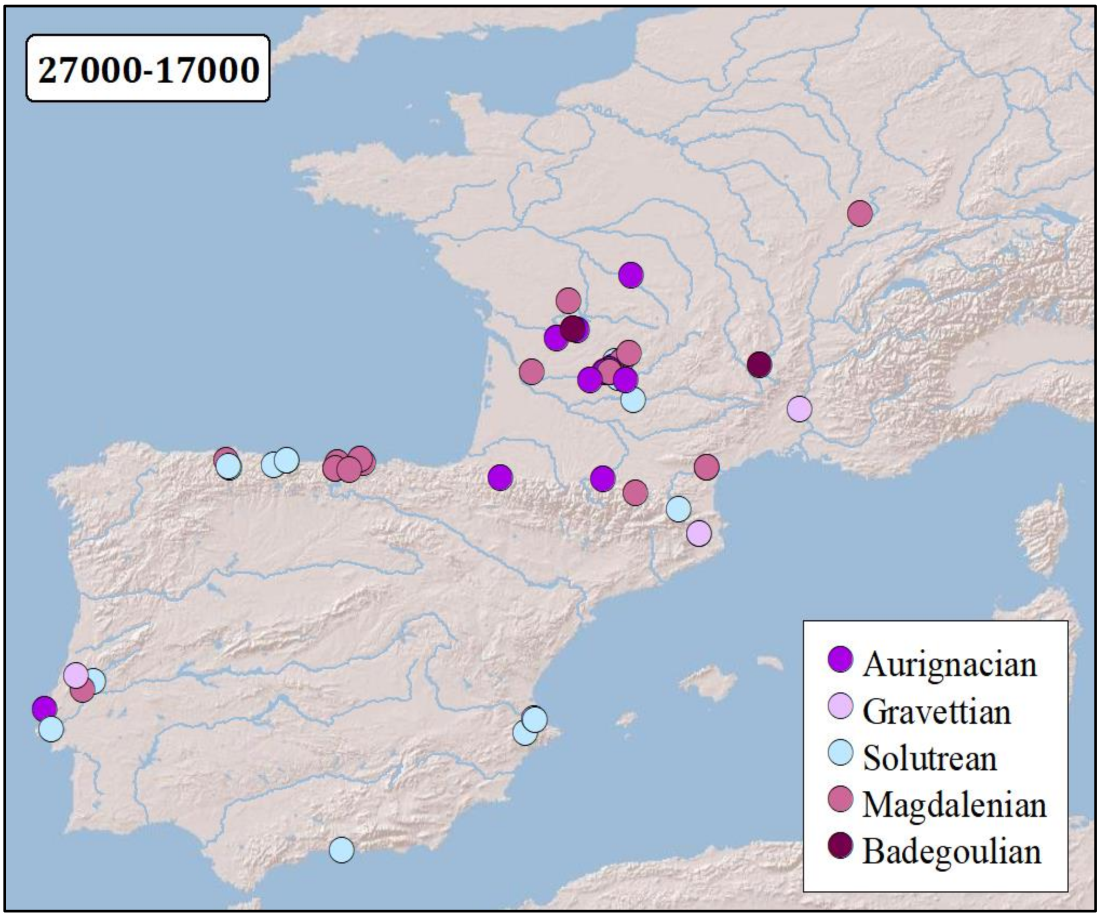


Figure 4: Geographical distribution of Upper Palaeolithic funerary sites in 27,000-17,000 cal BC

GI 1 (c. 14,692-13,099 b2k) was a warmer period that became progressively colder until the start of GS 1 (c. 12,896). From the end of GS 1 and the beginning of the Holocene (c. 11,703 b2k), the climate became progressively warmer, except for the 11.4ka, 9.3ka, and 8.2ka cold events (Figure 5) (Rasmussen *et al.*, 2014: 4, 8-9). Species adapted to colder temperatures (mainly megammammals), such as mammoths, became rare or extinct due to the warmer temperatures (Djindjian *et al.*, 1999: 59-67; Markov *et al.*, 2019: 115-121).

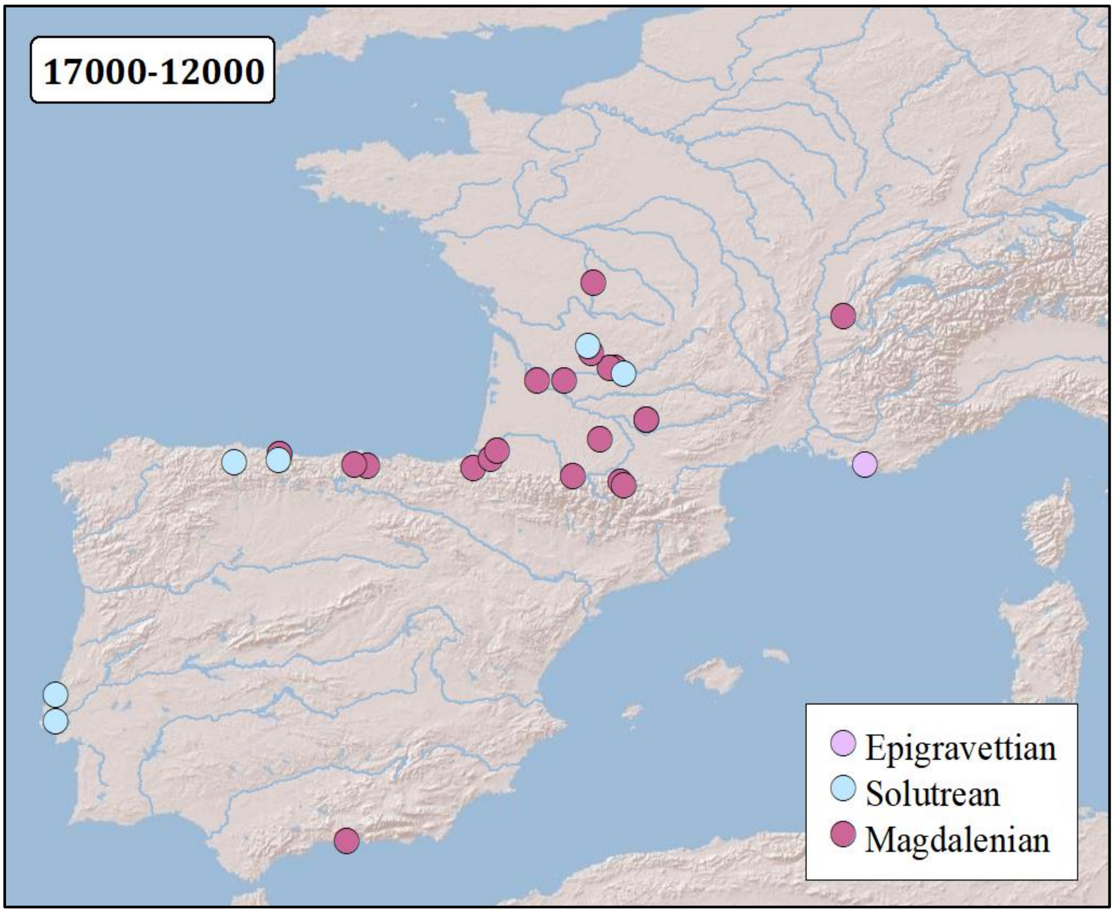


Figure 5: Distribution of Upper Palaeolithic funerary sites 17,000-12,000 cal BC

Population density is assumed to have been low. Hunter-gatherers of the Upper Palaeolithic are thought to have lived in small groups, based on cross-cultural studies of modern hunter-gatherers. These societies have an average of between 14.7 and 25 camp occupants and the camps are dispersed (Djindjian *et al.*, 1999: 22; Hill *et al.*, 2011; Hamilton *et al.*, 2018; Bird *et al*., 2019). Upper Palaeolithic populations are thought to have been highly mobile, although there are some authors, such as Susan Cachel (1997) or Clive Gamble (2004), who have suggested that some groups were less mobile than originally thought due to the existence of a few Upper Palaeolithic sites containing several deceased. Regardless, due to the scarcity of these types of sites, the population density for the period would still be low. However, the quantity of funerary remains from this period in Western Europe (323 individuals) is too low for it to be exclusively a result of the low population density. Preservation issues and burial selection practices probably also played a role.

Upper Palaeolithic populations were affected by the changing environmental conditions, which they had to adapt to. An apparent response to climate change by human populations took place during GS 3 and GS 2. Based on the distribution of archaeological sites from the Last Glacial Maximum (25,000-21,000 BC), there seem to have been migrations toward Southwestern and Europe during this period, as the most suitable habitats for humans during that time were the coasts of Iberia and Southwestern France (Djindjian *et al.*, 1999: 59; Rasmussen *et al*., 2014: 8-9; Lécuyer *et al.*, 2021: 2; Straus, 2015). After the Last Glacial Maximum, human populations spread out and this was reflected in the distribution of Magdalenian sites (Lécuyer *et al.,* 2021: 2). The changing climate also affected the altitudes at which humans could live (Figure 6). For example, locations higher than 500m were not habitable during the coldest stages. Due to the same reason, high mountains became natural barriers that contributed to the existence of more cultural regionalism during the Last Glacial Maximum (Figure 4). The changes in coastlines and the courses of rivers also had an impact on the geographical distribution of human populations and the regionalization of material culture (Djindjian *et al.*, 1999: 34-36).

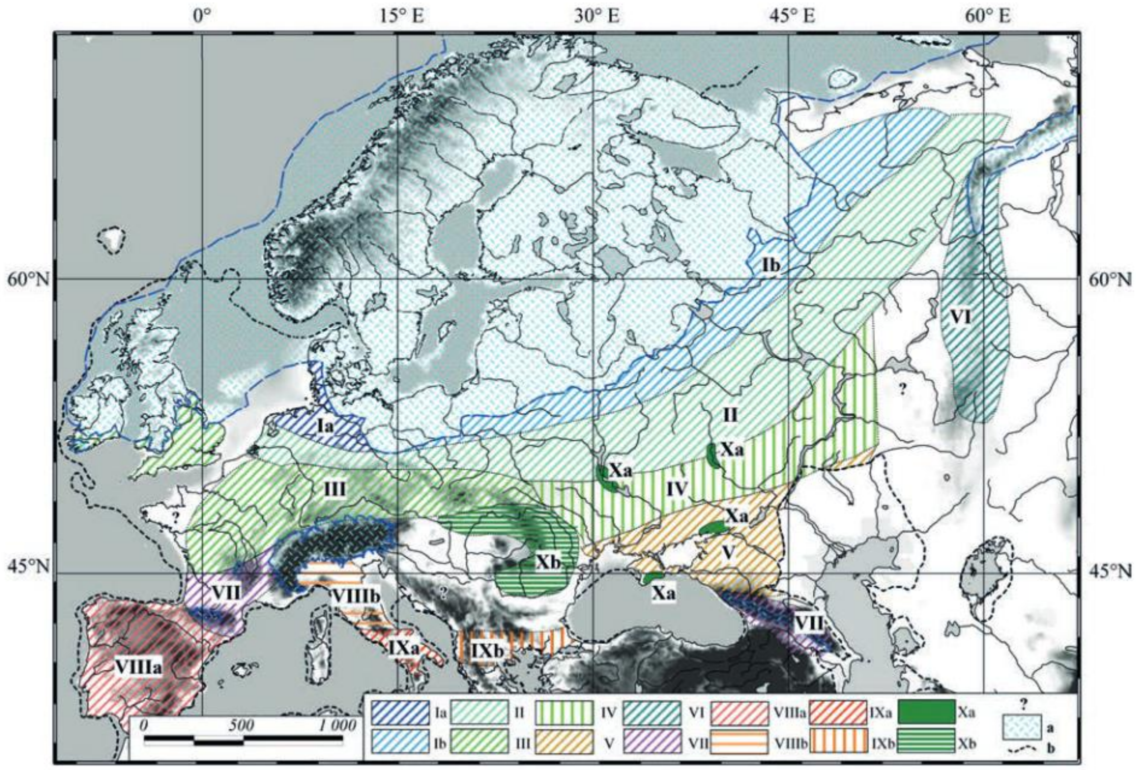


Figure 6: Approximate coastlines and ecosystem distribution during the Last Glacial Maximum in Europe. Ia – shrub tundra (western variant); Ib – shrub tundra (eastern variant); II – periglacial tundra-forest-steppe; III – periglacial forest-steppe (western variant); IV – periglacial forest-steppe (eastern variant); V – periglacial steppe; VI – the Ural mountains tundra-forest-steppe; VII – the mountain and plain periglacial forest-steppe; VIIIa – Mediterranean mountain and plain forest-steppe (Iberian variant); VIIIb – Mediterranean mountain and plain forest-steppe (Apennine variant); IXa – Mediterranean xerophytic forests (south Apennine and south Balkan variant); IXb – Mediterranean xerophytic forest (north Balkan variant); Xa – forest refugee; Xb – periglacial pine forests of the Carpathians; 1 – the regions without palaeontological data; 2 – ice sheets; 3 – coastline.

Source: Markova *et al.*, 2019: 227

2.1.2. Mesolithic

When analysing the Mesolithic in the study region it is important to note that there are differences in their theoretical backgrounds and that they have affected the way the Mesolithic is understood. These differences are a result of the influence of the Anglo-American and the French schools of thought. These two currents have had a great impact on the rest of the countries included in this study, especially in Spain and Portugal, likely due to the great influence of foreign research as a result of the stalemate of their research during the dictatorial regimes (Estévez & Vila, 2006: 300).

A consequence of the French and Anglo-American influences is the existence of two different terms to refer to the prehistoric period before the Neolithic, each with a different origin and different connotations. The term Mesolithic, developed in the British Isles in the 19th century, and Epipalaeolithic, first proposed by Stjerna (1910) but promoted most vigorously in France. The problem with these two terms is that, in the countries in which both of them are used, they acquire different meanings depending on the author. Sometimes they are used indistinctly, sometimes only one of them is used and, on other occasions, both of them are used with different meanings (Fullola i Pericot & Nadal Lorenzo, 2011: 20, 112–113; Gallego Lletjós, 2013: 78).

Currently, there are two main ways of understanding these terms. The first uses 'Mesolithic' to refer to the cultural features of the Holocene before the Neolithic and 'Epipalaeolithic' to refer to the Pleistocene after the Magdalenian. The second way of understanding these terms uses 'Mesolithic' to refer to the post-glacial communities that began the Neolithisation process and 'Epipalaeolithic' for those that had not started it and, thus, remained mobile hunter-gatherers. According to this definition, the main difference between Epipalaeolithic groups and Upper Palaeolithic communities is that the Epipalaeolithic ones date to the Holocene (Fullola i Pericot & Nadal Lorenzo, 2011: 20, 112–113; Gallego Lletjós, 2013: 78). However, for this study, only the term 'Mesolithic' is used, referring to hunter-gatherers after the Last Glacial Maximum.

The sustained climatic warming at the end of the Pleistocene resulted in a fast-rising of sea levels, that only slowed down after 7ka. On the Atlantic coast of France, sea level rose from -60 to -6m during the Mesolithic, resulting in significant land loss (see Figure 7) (Price, 1987: 238, 240-241; García-Artola *et al.*, 2018). This has probably caused many sites from this period to be transgressed. Temperatures also affected the available resources, with a gradual change in vegetation and fauna, from arctic and subarctic species to more temperate ones. Tundra and steppe were replaced by woodland, and large migratory ungulates were replaced with less mobile forest-adapted species, which were more dispersed across the landscape (Price, 1987: 238, 244-246; Markov *et al.*, 2019: 226-238). The new landscape and new distribution of resources might have affected the geographical distribution of Mesolithic sites.

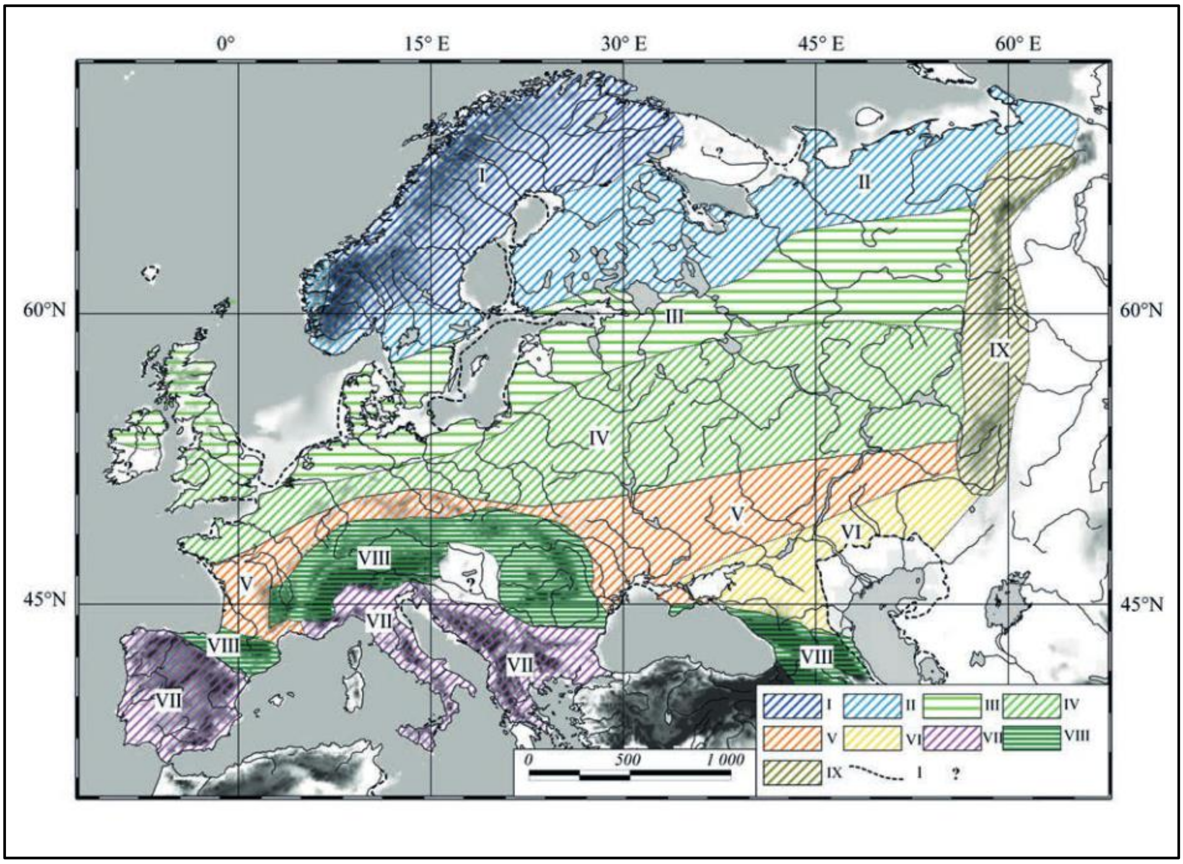


Figure 7: Approximate coastlines and ecosystem distribution at the beginning of the Holocene in Europe. I – shrub tundra with patches of forest-tundra; II – forest-tundra; III – light pine-birch forests with patches of tundra communities; IV – pine-birch and pine-spruce forest with broad-leaved elements and patches of forest-steppe communities; V – forest-steppe; VI – steppe; VII – Mediterranean xerophytic coniferous-broad-leaved forests with herbaceous communities; VIII – mountain coniferous-broad-leaved forests; IX – The Ural Mountains forest with patches of tundra-steppe communities; ? – absence of data;1 – coastline

Source: Markova *et al.*, 2019: 236

Population size is thought to have been slightly larger than in previous prehistoric periods and lower than in later ones and to have experienced high spatial and temporal fluctuations (Riede *et al*., 2007; Lundström *et al*., 2020; Jackes & Meiklejohn, 2008). However, in the burial record, the number of Mesolithic individuals is notably larger than Upper Palaeolithic ones (323 Palaeolithic; 863 Mesolithic). This is largely influenced by the large Mesolithic cemeteries, which are the exception and not the norm. Burial selection practices might have also played a role. Geographically, it is relevant for the study area that geographic features, such as the Pyrenees or the mountains of central Spain, fomented strong regionalisation in material culture (*e.g.*, the Asturian) (Kozłowski, 2009: 220-221). All these factors, as well as research biases, have influenced the distribution of Mesolithic funerary sites (Figure 8).

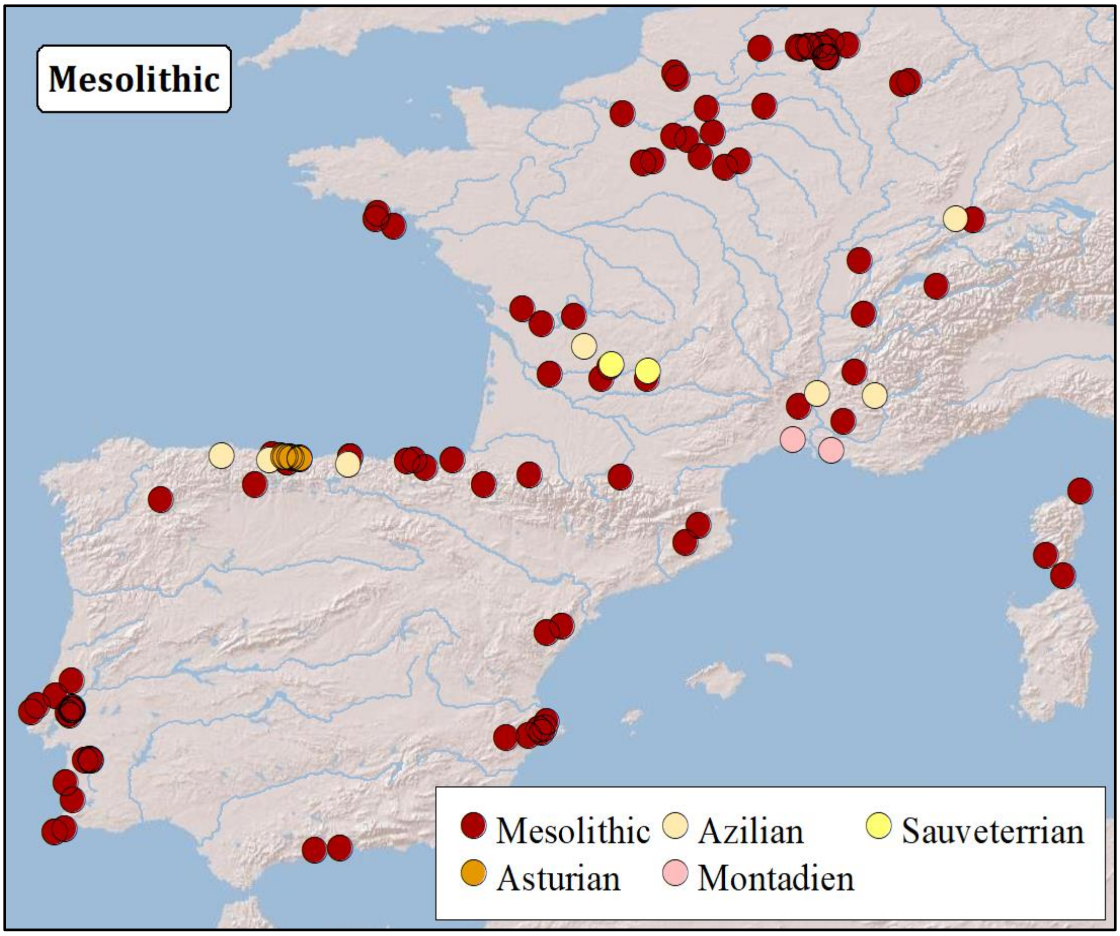


Figure 8: Geographical distribution of Mesolithic funerary sites

2.1.3. Early Neolithic

From the beginning of the Holocene until the end of the study period (4500 cal BC), there were smaller temperature variations, which caused sea levels to oscillate by a few metres until reaching modern levels (Price, 1987: 241; García-Artola *et al.*, 2018). The landscape was still composed largely of woodland inhabited by forest-adapted species (García Puchol *et al.*, 2009: 239). The most important factor affecting Early Neolithic sites was the increase in population brought by the Neolithic Demographic Transition (NDT), which caused an increase in birth rates and, as a result, a larger number of children and population growth (Jackes *et al.*, 1997; Bocquet-Appel, 2011). The NDT might have contributed to the territorial expansion of some Neolithic groups (Figure 9), such as the Linear Pottery Culture (Dubouloz, 2008).

NDT is not fully reflected in funerary sites, as there are only slightly more Early Neolithic than Mesolithic funerary sites (116 Mesolithic; 140 Neolithic) and there are more Mesolithic than Early Neolithic individuals (863 Mesolithic; 798 Neolithic). This is in part due to the influence of large Mesolithic cemeteries as, without them, the increase in population would have indeed been reflected in funerary remains. However, even taking the large Mesolithic cemeteries (those with more than one hundred individuals) out of the sample, the increase of individuals during the Neolithic is not much higher than the increase at the Palaeolithic-Mesolithic transition (323 Palaeolithic; 534 Mesolithic; 798 Neolithic). In addition, there are not as many children in graves as might be expected (Rubio de Miguel, 2009; Gibaja *et al*., 2010; Bickle & Fibiger, 2014). This points to burial selection practices, preservation issues, and/or research biases being important factors (Chamberlain, 2000: 206; Gibaja *et al*., 2010).

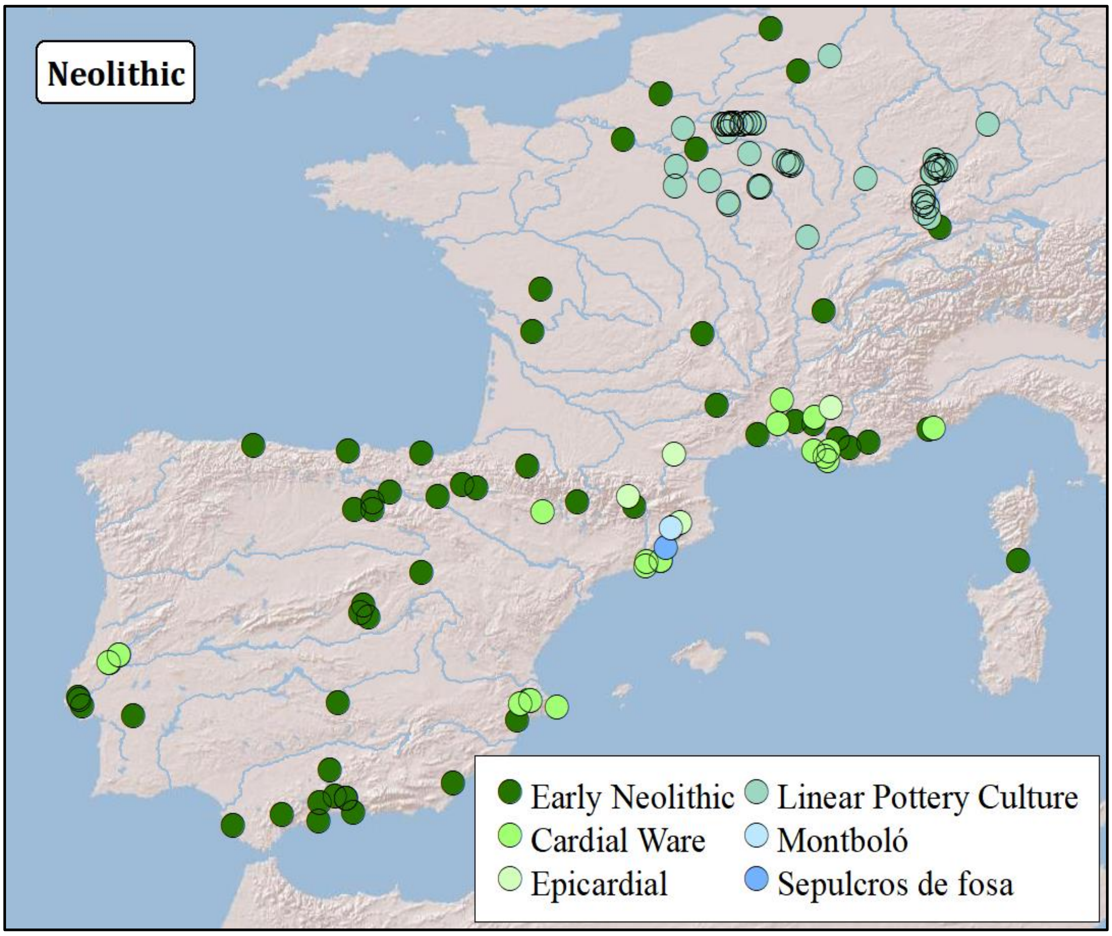


Figure 9: Geographical distribution of Early Neolithic funerary sites

2.2. Review of previous research on Upper Palaeolithic to Early Neolithic mortuary practices in Western Europe

Literature on Upper Palaeolithic to Early Neolithic human remains in Europe is abundant. However, most of it consists of papers focused on a single site, usually the publication of excavations and/or laboratory results. Publications studying the burials over wider regions are less frequent, and those comprising a whole country or more are rare. If this does occur it is often the result of the compilation of papers dealing with different areas in the proceedings of national or international conferences and symposia (*e.g.*, Cartailhac, 1903; Newell *et al*., 1979; Hurtado *et al*., 2007; Gibaja *et al*., 2012a; Gramsch *et al*., 2016). This problem is more evident in Neolithic studies, perhaps due to the larger quantity of burials compared to earlier periods and thus the possibility to better establish regional patterns that allow the creation of 'cultural areas'.

Most syntheses that focus on Western European Early Neolithic burials relate to the Linear Pottery Culture or the Cardial Ware tradition. The Linear Pottery Culture is found mainly in Central Europe but also in northeastern France, Belgium, Switzerland, and Luxembourg (*e.g.* Jeunesse, 1997; Beyneix, 1998; Lenneis, 2007). The Cardial Ware tradition (*e.g.*, Beyneix, 1997, 1998; García Borja *et al.*, 2016) is present on the Mediterranean coast (Figure 10). However, there are broad areas with other traditions that are only partially or not affected by either of them, although the number of syntheses focused on them is much lower (*e.g.*, Laporte & Gomez de Soto, 2001; Rojo-Guerra *et al.*, 2016). Perhaps this is due to it being more difficult to find general patterns in these areas since Early Neolithic burials are very scarce in some of them and several of them are poorly documented (Arias, 2012a: 11–12; Díaz-Zorita *et al.*, 2012: 51–53; García Puchol *et al.*, 2012: 41–43; Gibaja *et al.*, 2012c: 29).

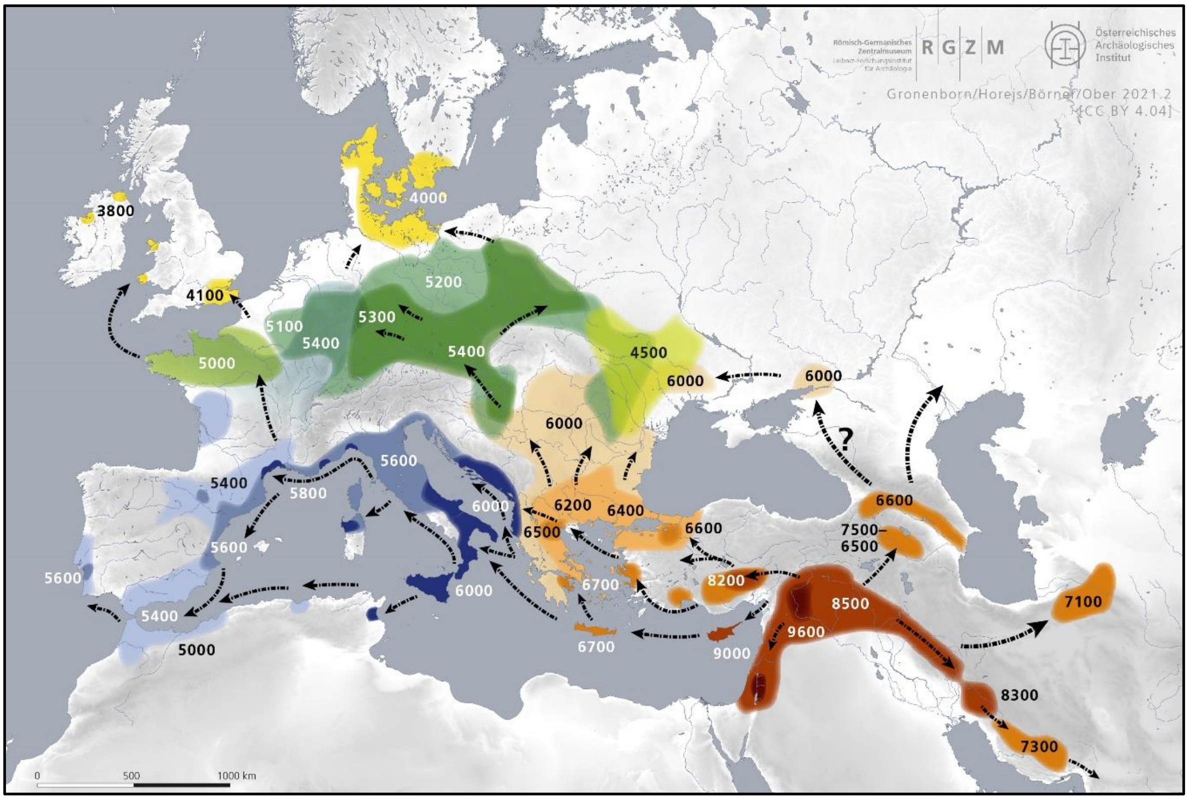


Figure 10: Map of Early Neolithic Europe. Arrows - expansion of farming; Green – Linear Pottery Culture; Blue – Cardial Ware

Source: Gronenborn & Horejs, 2021

For all periods, studies that are not limited to describing the burials and offer interpretations about society or changes between periods are even scarcer.

2.2.1. Funerary context

Funerary context can be defined as the chronological and the physical location of human remains, understood as the type of site (*e.g.*, open-air, cave, settlement) and the type of grave. The establishment of chrono-typological sequences has always been a major concern of archaeologists in Portugal, Spain, and France. However, many studies have been focused on small areas distinguished by a large number of subcultures (*e.g.*, Joffroy, 1968; Arias & Pérez Suárez, 1990). A wider and more general interest in periodization, that affected all of the countries of this study, arrived with the introduction of radiocarbon dating. As a result, publications that focused on dating burials started to appear (*e.g.*, Henry-Gambier *et al.*, 2000; García Borja *et al.*, 2016).

Meiklejohn (2009a, 2009b) and Meiklejohn *et al.* (2010, 2014) have compiled radiocarbon dates on burials for the Mesolithic in Spain, Portugal, Luxembourg, and Belgium that showed that some of the individuals previously thought to belong to that period were actually from other periods. For example, Beg-an-Dorchenn (France) and Grotte de la Martina (Belgium) were thought to be Mesolithic but they were Iron Age and Late Neolithic, respectively. Other authors have also made radiocarbon date syntheses, but they are not specifically aimed at burials (*e.g.,* Delibrias & Evin, 1980; Cardoso, 2009) or do not include many dates (*e.g.,* Jordá Pardo & Aura Tortosa, 2008). Most recent studies on burials systematically include radiocarbon dates on the skeletons (*e.g.,* Brou *et al.*, 2015).

Fewer publications deal with the physical location of burials for the Upper Palaeolithic to the Early Neolithic as exist for later periods (*e.g.*, from the final Neolithic with the megalithic phenomenon) where landscape is considered important for communication (Criado-Boado, 1999; Wright, 2013). In periods before megalithisim, when the geographic location of burials is studied, it has to do more with environmental reasons such as Meiklejohn *et al*.'s paper (2016) discussing the correlation between the absolute age of sites with burials, the duration of occupation, and their location relative to the coastline.

Nevertheless, publications have focused mainly on other topics, such as funerary rituals, and usually agree that the most frequent locations for burials during the Upper Palaeolithic were caves and rockshelters, which then changed to open-air cemeteries placed inside or near villages during the Mesolithic (Arias & Álvarez-Fernández, 2004; Verjux, 2004; Meiklejohn *et al.*, 2009; Aura Tortosa, 2010; Arias, 2014; Gibaja *et al.*, 2015). However, there is no agreement on whether this change happened closer to the end (*e.g.*, Arias & Álvarez-Fernández, 2004; Arias, 2014; Gibaja *et al.*, 2015) or the beginning of the Mesolithic (*e.g.*, Verjux, 2004; Aura Tortosa, 2010), perhaps even having Upper Palaeolithic roots (Meiklejohn *et al.*, 2009). On the other hand, in much of Western Europe, large Mesolithic cemeteries are a phenomenon mostly exclusive to shell middens along the Atlantic façade (Gibaja *et al.*, 2015; Orschiedt, 2018) although, during this period and the Early Neolithic, burials were still placed in caves (Arias, 2012a: 12; Beyneix, 2012a: 225; Díaz-Zorita *et al.*, 2012: 51; Gibaja *et al.*, 2012c: 31, 2012a; Acosta Martínez, 2013: 40; Gibaja *et al.*, 2015; Peyroteo Stjerna, 2016b: 637; Schulting, 2016; Orschiedt, 2018). The exception to this is the burials in the area of the Linear Pottery Culture, which are mainly placed in open-air locations (Beyneix, 1998).

During the Mesolithic, a large number of burials, and even whole cemeteries, are found in shell middens. Shell middens are massive accumulations of shells that can be found in some settlements and that first appeared during the Mesolithic, perhaps as an adaptive response to a cold event that took place around 6200 BC. It should be noted, however, that the consumption of molluscs began in the Middle Palaeolithic (Bicho *et al.*, 2010; Gutiérrez-Zugasti *et al.*, 2011; Hellewell & Milner, 2016).

Concerning cave or rockshelter sites, the relationship between the human remains with the living or activity areas is not usually mentioned in Spanish and Portuguese literature (Peyroteo Stjerna, 2016b: 634), and there are only a few studies and syntheses that contain this information (*e.g.*, Arias, 2014). Arias (2014) concluded that Iberian hunter-gatherers did not seem to distinguish between domestic and funerary spaces since most Upper Palaeolithic and Mesolithic burials were placed in settlements. However, the presence of burials in domestic areas does not imply that the place was used for both activities at the same time. In some cases, individuals were buried in domestic spaces that were no longer in use. Arias also points out a potential bias: the difficulty of locating non-monumental burials outside of settlement areas. This could mean that there might be more burials in non-domestic sites, but they have not been detected. French, Belgian, and Luxembourgian literature provide good descriptions of the context of burials (*e.g.*, Bresson, 2000; Aujoulat *et al.*, 2002) but few papers analyse general trends in these countries. Published reports show something similar to what happens in Iberia: individuals are usually found in domestic spaces (Cauwe, 1996; Pettitt, 2011: 242).

Information about the context of burials is systematically included in most Western European works about Mesolithic and Neolithic open-air cemeteries (*e.g.*, Peyroteo Stjerna, 2016a), where graves are placed inside settlements, mixed with (*e.g.*, El Collado) and/or delimited from the domestic areas (*e.g.*, Los Cascajos, Arapouco). Sometimes there is more than one delimited burial space (*e.g.*, in Moita do Sebastião there are two separate areas, one for adults and one for children) (Arias, 2014: 60). In the Neolithic, some of the cemeteries are near the settlements (*e.g.*, Ingenheim) (Beyneix, 1998; García Gazólaz & Sesma Sesma, 2007; Gibaja *et al.*, 2010, 2015; Lefranc *et al.*, 2014; Peyroteo Stjerna, 2016a).

Similarly, descriptions of the graves are not frequently mentioned or described for the Upper Palaeolithic and the Mesolithic. Maybe this is a result of the absence of a grave, at least in the case of the Upper Palaeolithic, since, according to Arias (2014: 70), inhumation during this period was likely a rare exception. However, the most plausible explanation is that there is a lack of sufficient information to demonstrate its existence (Peyroteo Stjerna, 2016b), although this lack of information is not usually stated either. For the Neolithic, descriptions are frequently available (*e.g.*, Rowley-Conwy, 1992; Montero Ruiz *et al.*, 1999) but studies finding general patterns or changes through time are not common before the arrival of megaliths.

Studies analysing general trends show that, during the Upper Palaeolithic and the Mesolithic, individuals were deposited directly on the ground or in simple pit graves, with or without filling, covering, and/or a position marker (Verjux, 2007: 22–24; Pettitt, 2011; Arias, 2014; Orschiedt, 2018). During the Mesolithic, more elaborate graves started to appear (*e.g.*, Téviec and Hoëdic), although they were still uncommon (Verjux, 2007: 22–23; *e.g.*, Boulestin, 2016). Later, during the Early Neolithic, the deposition of individuals in simple graves was still the most frequent burial custom (Beyneix, 1998; Verjux *et al.*, 1998: 62–63; Jiménez Brobeil, 2009: 128; Beyneix, 2012a; Díaz-Zorita *et al.*, 2012: 51; Rojo-Guerra & Garrido-Pena, 2012: 21–22; Acosta Martínez, 2013: 40; Rojo-Guerra *et al.*, 2016: 205), though more monumental megaliths started to appear (Beyneix, 1997; Jeunesse, 1997: 60; Gibaja *et al.*, 2012c: 31, 2012b). However, it must be kept in mind that, in some cases, the apparent absence of built funerary structures and/or pits may be due to the use of perishable materials and/or the difficulties of identifying such structures in certain kinds of sediments (Arias, 2014).

It has been argued that the appearance of cemeteries and marked graves, especially monumental ones, may be related to an increase in territorial behaviour. Cemeteries would be a way of legitimizing the use of a territory and its resources by a certain community through their ancestors, and the tomb markers would be landmarks used to communicate that (Parker Pearson, 2003: 132–133, 136–139; Gallego Lletjós, 2011). Finally, furnishings present similar problems for interpreting graves, since it is likely these were sometimes made of perishable materials. The preserved inorganic furnishings frequently consist of rocks used as headrests (*e.g.*, Drak & Garralda, 2009b). In the past few decades, partially thanks to archaeothanatology, some studies have revealed the use of perishable elements, such as wrappings or pillows, to keep the body in position (*e.g.*, Peyroteo Stjerna, 2016a), as well as wooden platforms to place the bodies on (*e.g.*, Arias, 2014) or lids to cover the pit while keeping a space unfilled (*e.g.*, Olària i Puyoles, 2003).

2.2.2. The body

Information about the deceased's body can be divided into two parts: 1) biological information from anthropological and genetic analyses and 2) mortuary treatment applied to the body (for instance primary burial, secondary burial, cremation, the position of the body, colourant applied to the body). These two types of data frequently appear together in syntheses (*e.g.*, Newell *et al.*, 1979; Pérez Iglesias, 2013).

2.2.2.1. Biological information

There are several works focused on biological analyses (*e.g.*, Ferembach, 1965, 1974; Vallois, 1972) as well as some databases that attempt to compile this information (*e.g.*, Akazawa, 2007). However, there are fewer large-scale projects that have tried to find patterns for either the Upper Palaeolithic, the Mesolithic, or Neolithic (*e.g.*, a higher incidence of one sex, or individuals of a certain age) or changes between periods (*e.g.*, an increase of males over females through time), except for the evolution of diet and pathologies and the demographic changes caused by the Neolithic Demographic Transition. This is likely due to the greater interest in most of the study area countries in research on processual topics due to the influence of the British school of thought (Scarre, 1999).

Marta Cintas-Peña has developed several studies focused on the evolution of gender and sex in Europe and, especially, Iberia. In her paper about sexual dysmetria in Europe during the Upper Palaeolithic (Cintas-Peña, 2014) it is shown that women are buried less frequently or in poorer preservational conditions than men. For Iberia, she shows there are more males than females in graves from the Mesolithic and Neolithic (Cintas-Peña, 2018: 541–542). The sex ratio suggests that this difference may be due to cultural selection rather than demography. However, there are not enough data to reach firm conclusions about the Upper Palaeolithic. In these studies, the 12% bias in favour of males when sexing through osteological methods, was taken into consideration (Weiss, 1972).

The few studies that focus on children in graves show that their number in burials is low for the West European Upper Palaeolithic (Gambier, 2000; Henry- Gambier, 2008; Olària i Puyoles, 2008). The number of children in graves rises during the Mesolithic (*e.g.*, Figure 11) and again during the Neolithic as a result of the Neolithic Demographic Transition (NDT), characterized by a significant increase in the birth rate (Jackes *et al.*, 1997; Bocquet-Appel, 2011). However, the number of subadults in graves is still much lower than the number of adults, and their representation increases with their age (Rubio de Miguel, 2009; Gibaja *et al.*, 2010; Bickle & Fibiger, 2014). Although cultural selection may have played a role in the representation of young individuals in graves, other important factors are the differential preservation of bones (children have less bone density and more cartilage) and excavation standards – for example, in northeast Iberia before 1980, excavators often did not collect small bones, or stored them with the faunal remains. (Gibaja *et al.*, 2010).

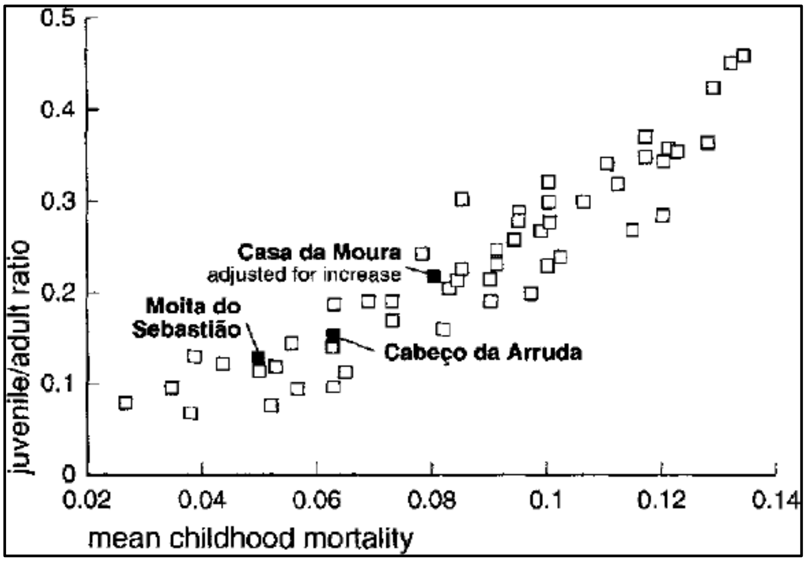


Figure 11: Demographic change, showing demographic estimators for Moita do Sebastião and Cabeço da Arruda, with Casa da Moura adjusted for non-stationary demographic status, plotted against 51 samples sufficiently large for a reliable statistical analysis

Source: Jackes *et al.*, 1997: 652

A topic that is generating great interest is genetic evidence of population replacement at the beginning of the Neolithic. DNA analyses of Early Neolithic individuals from various parts of Europe, including Iberia (Figure 12), show a replacement of the local hunter-gatherers by early farmers of Near Eastern ancestry. However, the impact of Near Eastern genes on the European gene pool is uneven, giving different results for Central Europe, Mediterranean Europe and the Cantabrian fringe (Deguilloux *et al.*, 2012; Hervella *et al.*, 2012; Hofmanová *et al.*, 2016; Olalde *et al.*, 2019).

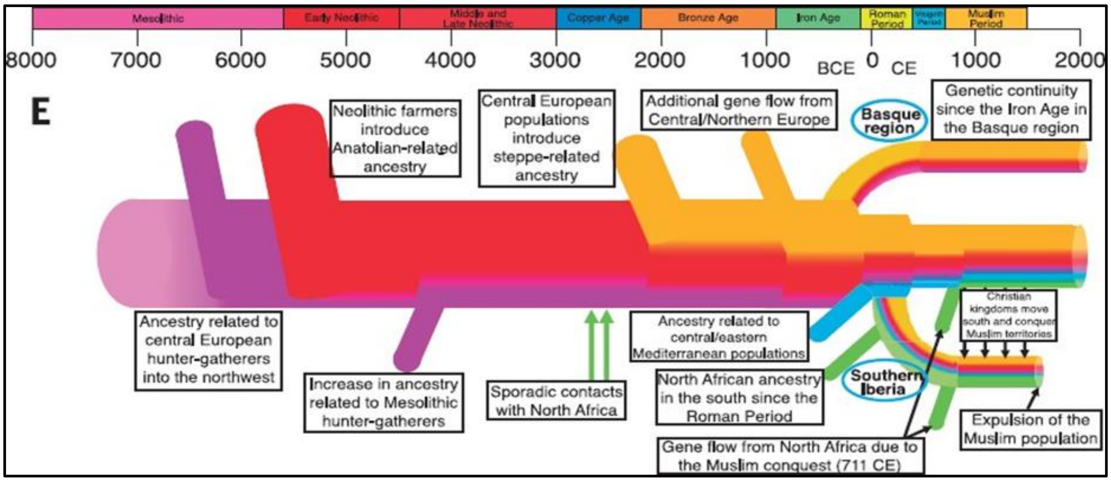


Figure 12: Iberian genetic time transect

Source: Olalde *et al.*, 2019

Another important aspect of the Neolithization process is the incidence and evolution of diseases and traumas. Several studies focusing on pathologies consider how people were affected by the introduction of agriculture during the Neolithic, as a result of the development of new tasks and the change in the diet (*e.g.*, Jackes *et al.*, 1997). Most of these works take a generalist approach to the topic, analysing the influence of agriculture on ancient populations from around the world and the differences between the pathologies present in modern hunter-gatherers and early agriculturalists (*e.g.*, Cockburn, 1971; Larsen, 1995; Meiklejohn & Zvelebil 1991).

These studies show how, despite the population increase, health worsened with the adoption of agriculture: malnutrition rates increased and sedentism caused a rise in infectious diseases due to the lack of hygienic conditions and living close to animals (Cockburn, 1971; Larsen, 1995; Richards, 2002; Wittwer-Backofen & Tomo, 2008). Malnutrition and diet-related pathologies can be observed in growth rate retardation and shorter stature (signs of malnutrition); the thin cortical tissue and high rates of remodelling (signs of malnutrition and/or high functional demand); the small size of teeth (a sign of malnutrition) (Larsen, 1995); the higher prevalence of Harris lines (a sign of arrested growth), porotic hyperostosis (a sign of iron deficiency), cribra orbitalia (sometimes linked to iron deficiency and parasitism), enamel hypoplasia (a sign of malnutrition, infection, fever or illness during the formation of the teeth), scurvy (a sign of vitamin C deficiency) and rickets (a sign of vitamin D deficiency) (Cook, 1979; Larsen, 1995; Wittwer-Backofen & Tomo, 2008).

According to Larsen (1995), the change in diet also brought with it an increase in a series of dental pathologies since the high consumption of carbohydrates promoted the appearance of caries and periodontal disease and subsequently an increase in tooth loss. On the other hand, consuming soft food (due to its preparation) led to a craniofacial gracilization due to maxillomandibular growth variations resulting from a change in the size and position of mastication muscles. This increased tooth crowding and malocclusion but a decrease in tooth microwear fractures and dental trauma.

The increase in infectious diseases can be observed in the prevalence of periostitis on the skeletons (Cockburn, 1971; Larsen, 1995). Furthermore, the decrease in mobility and overall physical demand led to a reduction in the size and robusticity of skeletal elements and cross-sectional geometry (Larsen, 1995).

Specific and non-specific stress markers also changed as a result of agriculture. Osteoarthritis, arthritis, osteophytosis, spondylosis, the incidence of Schmorl's nodes and joint disease, pathologies related to heavy mechanical demands but also with ageing and trauma, are slightly higher in hunter-gatherer populations (Larsen, 1995; Weiss, 2015: 76). However, specific stress markers observed in Natufian populations seem to indicate that agriculturalists developed more strenuous activities than hunter-gatherers (Hershkovitz & Gopher, 2008).

Nevertheless, a study on the specific incidence of these bone alterations in Western Europe by Jackes, Lubell, and Meiklejohn (1997), using a sample of 581 individuals from three Mesolithic and six Neolithic sites in Portugal, shows something very different. The main change that can be observed between the Mesolithic and Neolithic populations is jaw and tooth size reduction. However, this seems to be caused by something other than diet, since it is a continuation of a trend that started much earlier and did not coincide with a general reduction of the size of the body. The study also shows a decrease in dental pathology during the Neolithic; and a continuity in the prevalence of non-specific stress markers and the prevalence of infectious diseases. This was interpreted as a result of the degree of sedentism not varying much between the Portuguese Mesolithic and Neolithic.

Concerning specific stress markers, there seems to be a tendency toward the increase of bone robusticity in femora and an increase in the size of the proximal femoral shaft due to biomechanical factors, activity and terrain during the Neolithic. Something similar can be seen in the tibial shafts, which became rounder during this period. This is also evidence of a change in activity since flat bones have greater strength in torsion than rounded ones (Jackes *et al.*, 1997).

One study that focuses on Linear Pottery Culture (Wittwer-Backofen & Tomo, 2008) uses a sample of 266 Mesolithic individuals and 214 from the Early Neolithic from several European sites. In this case, the results are similar to the ones described by the generalistic studies analysing the impact of agriculture on human health. Signs of malnutrition (enamel hypoplasia, cribra orbitalia, Harris lines) and caries increased dramatically. However, there was not enough information to determine the evolution of degenerative joint disease. In addition, this study points out the different speeds in the adoption of agriculture and the climatic differences as potential reasons for the different impacts of the Neolithic transition on human health. Lastly, it must be noted that the burials used for the analysis are more eastern than the area studied in this thesis.

Finally, the evidence of trauma potentially caused by violence is low for the Western European Upper Palaeolithic to Early Neolithic, increasing during the Late Neolithic (Thorpe, 2003, 2005; Schulting & Fibiger, 2012). In Iberia, the anthropological evidence of violence for these periods seems to be reduced to a projectile wound in Moita do Sebastião, a broken arm and a cranial wound in Cabeço da Arruda, and some parry fractures (defensive wounds) in the Portuguese shell middens (Thorpe, 2003, 2005; Beyneix, 2012b). In France, several Mesolithic individuals from Hoëdic and Téviec show healed fractures of the clavicle, forearm, face, and jaw; and one presents two flint points in the spine (Thorpe, 2003, 2005). During the Neolithic, there are no known cases of violent trauma in southern France, and only two individuals from the Linear Pottery Culture, coming from the Hoenheim-Souffelwersheim and the Quatzenheim cemeteries, show evidence of violence in the form of arrow wounds (Beyneix, 2012b).

2.2.2.2. Mortuary treatment

In terms of the mortuary treatment of the body, there are fewer studies that focus on a single individual (they are still very frequent, but the information is usually given alongside biological information) (*e.g.*, Urtilla Miranda *et al.*, 2008) but more syntheses (*e.g.*, Newell *et al.*, 1979) and studies that attempt to find patterns and changes. The problem with these studies is that they are usually based on a limited number of burials (between 10 and 15 sites, usually with one inhumation per site) (*e.g.*, Beyneix, 1997; Rojo Guerra *et al*. 2016; Henry-Gambier 1990).

According to these studies, secondary burials were more frequent during the Upper Palaeolithic (Henry-Gambier, 1990: 20; Aura Tortosa, 2010: 40; Arias, 2014). The first evidence of dated modern human primary inhumations is from c. 30,000 cal BC, after which the number of funerary sites kept on increasing (Arias, 2014: 70). As a result, the number of primary burials was larger for the Mesolithic and Neolithic (Jeunesse, 1997; Verjux, 2004; Aura Tortosa, 2010: 40). However, during the Mesolithic, the number of secondary burials was still high and some primary burials presented missing bones as a result of secondary removal, *e.g.*, one individual in Vale de Romeiras or one individual in Le Petit Marais (Verjux, 2004: 110, 113; Gallego Lletjós, 2011: 546; *e.g.*, Ducrocq & Ketterer, 1995; Peyroteo Stjerna, 2016a). During the Early Neolithic, these practices were still common in some areas (*e.g*., southern France) (Beyneix, 2008), while in others (*e.g.*, the Linear Pottery Culture area) secondary manipulation of the deceased became rare (Jeunesse, 1997: 67).

Isolated bones, often found in Upper Palaeolithic, Mesolithic and Neolithic sites, have usually been interpreted as secondary burials. However, the presence of isolated bones is not always proof of secondary burial, since their isolation could be a result of taphonomic processes, that would have moved one or a few bones from the original position or destroyed the rest of the skeleton (Gambier, 2000: 6; Arias, 2014: 53). Isolated teeth are especially likely to be the result of these processes since they survive better (Wilczyński *et al.*, 2016: 158–159). Post-depositional taphonomic processes are especially important for the Upper Palaeolithic as the poor preservation of human remains from that period is caused by them (Gambier, 2000: 6; Arias, 2014: 53).

However, some of these bones can be shown to have undergone secondary treatment since they display evidence of manipulation, such as cut-marks and/or breakage patterns from defleshing (*e.g.*, Cova dels Trocs I) (Rojo Guerra *et al.*, 2013). In addition, the evidence of defleshing and breakage patterns has led to some cannibalistic interpretations, *e.g.*, for the cranial remains at Le Placard (Saladié & Rodríguez-Hidalgo, 2017; *e.g.*, Boulestin, 2012).

Skull burials are a distinctive type of secondary burial during these periods (Pettitt, 2011: 220– 223; Henry-Gambier & Faucheux, 2012; Orschiedt, 2013, 2016; Pérez Iglesias, 2013; Schulting, 2015), although their prevalence is not as high in Western Europe as in other areas such as the Middle East (Bonogofsky, 2011a; Schulting, 2015). On the other hand, jewellery (Figure 13) and other objects, such as skull cups, made out of human bones, *e.g.*, the possible skull cups and the perforated teeth at Le Placard (Pettitt, 2011: 223–225; Boulestin, 2012; Orschiedt, 2013) are a rare example of manipulated bones. These objects have been interpreted as the result of a relationship between the wearer and the deceased (Orschiedt, 2013) or as an extension of the subject in the social sphere (Gallego Lletjós, 2011).

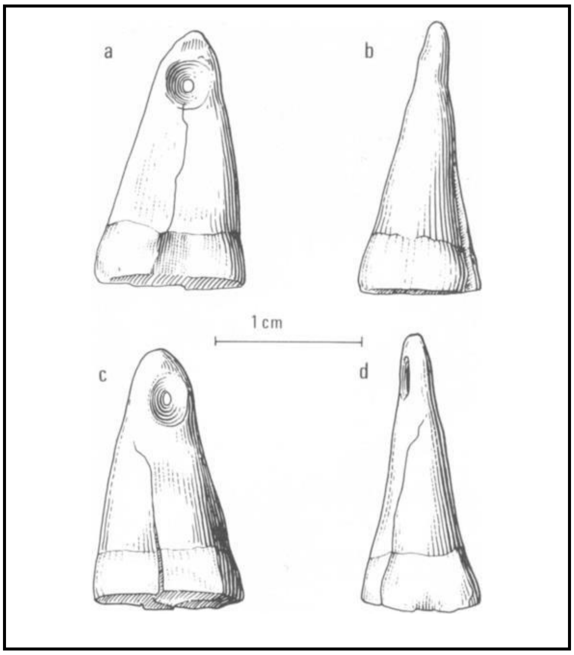


Figure 13: Modified human teeth from the Upper Palaeolithic site of Saint-Germain-la-Rivière

Source: Le Mort, 1985

Concerning primary burials, the original position in which the deceased was laid out and whether perishable elements, such as wrappings, were used to keep them in position are topics that have been generating growing interest thanks to developments in archaeothanatology. Since archaeothanatology originated in France, it has been more frequently applied to French sites (*e.g.*, Buthiers-Boulancourt, La Balance-Ilot P) (Samzun *et al.*, 2006; Zemour *et al.*, 2017) or by French authors (*e.g.*, Aurélie Zemour). However, in the past decade, such studies have become more frequent in other countries (*e.g.*, Peyroteo Stjerna's (2016b) analysis of burials in the Muge shell middens). These works have shown homogeneity in the positions of burials in some cemeteries (*e.g.*, Moita do Sebastião, Ensisheim (Les Octrois)) (Jeunesse, 1997: 129–130; Peyroteo Stjerna, 2016a) and heterogeneity in others (*e.g.*, Paternanbidea, Los Cascajos, Téviec) (García Gazólaz, 2007; García Gazólaz & Sesma Sesma, 2007; Boulestin, 2016).

Works analysing general patterns for periods or differences between them show that, during the Upper Palaeolithic and Mesolithic in Western Europe, most individuals were buried in supine or lateral decubitus (left and right), flexed or extended, and, in some cases, other positions, such as seated (Henry-Gambier, 1990: 22; Verjux, 2004: 109, 113, 2007: 16–17; Arias, 2014: 67; Orschiedt, 2018: 13). The cardinal orientation of the deceased's head is a feature that is not usually recorded. However, it seems to have been highly variable, especially in cave and rock-shelter burials, but there seems to be more intra-site homogeneity at open-air sites (Olària i Puyoles, 2003: 96). Not only the inter- but also the intra-site variability of positions and orientations for these periods was high, with some exceptions such as the positions of the inhumed in the Muge shell middens, where supine decubitus was the most frequent position, and the Sado shell middens, where most individuals were in the flexed lateral decubitus position (Verjux, 2004: 109–113; Gallego Lletjós, 2011: 543; Orschiedt, 2018: 13).

During the Neolithic, there was still high inter-site variability, but in some areas positions and orientations became more homogeneous within sites. In interior Iberia, individuals were usually placed in the right lateral decubitus position, although sometimes they appear in left lateral decubitus, with the head to the southeast, southwest, or northwest (Rojo-Guerra *et al.*, 2016: 206). Cardial burials tend to be in flexed lateral decubitus positions and oriented to the south or the west (Beyneix, 1997: 196, 1998: 551, 2008: 649–651). For the Linear Pottery Culture, Beyneix (1998) distinguished two traditions: Tradition I (Paris Basin and Upper Alsace), in which individuals tend to be buried in flexed lateral decubitus, frequently on the left side and less commonly on the right side, with the head to the east; and Tradition II (Lower Alsace), where they are more frequently found in supine decubitus. In this case, head orientation is less homogeneous, the most frequent being toward the northwest (Jeunesse, 1997: 62– 63; Beyneix, 1998: 549; Lenneis, 2007: 130). However, in these areas, there are also other burial positions such as ventral decubitus or seated and with other orientations (Jeunesse, 1997: 65).

In Western Europe cremations are found mainly during the Mesolithic and the Linear Pottery Culture Neolithic (Jeunesse, 1997: 57–60; Beyneix, 1998; Olària i Puyoles, 2003: 100; Verjux, 2004: 110, 113, 2007: 17–18; Lenneis, 2007: 131). However, they also appear occasionally in other areas, such as the inner part of Iberia or Andalucia, during the Neolithic (Jiménez Brobeil, 2009; Acosta Martínez, 2013: 40; Rojo-Guerra *et al.*, 2016). Once thought to be an extremely rare practice, subsequent research has shown that it was frequently practised along with inhumation (Jeunesse, 1997: 57–60; Verjux, 2004: 110,113). In the case of the Mesolithic and the Iberian Neolithic, sometimes only a particular part of the body was burnt, *e.g.*, the head as in the case of Cova Fosca (Olària i Puyoles, 2003: 100). During the Neolithic, cremations can be found in graveyards, sometimes overlying primary burials and sometimes deposited alongside them (Jeunesse, 1997: 57–60; Beyneix, 1998; Lenneis, 2007: 131).

There were also other uses of fire in the burial context aside from cremation. It was also used as part of certain burial rites, where a ritual hearth was made below (*e.g.*, Rochereil, Morín), on top of (*e.g.*, Téviec and Hoëdic, Cueva de Chaves), or nearby (*e.g.*, Brismatten-Basisgrotte, Moita do Sebastião) inhumations (Verjux, 2004: 110, 113–114, 2007: 24; Pettitt, 2011: 264–265; Arias, 2014: 68; Rojo-Guerra *et al.*, 2016). The practice appeared for the first time during the Upper Palaeolithic (Pettitt, 2011: 264–265), but no studies have analysed the difference in its prevalence between Upper Palaeolithic, Mesolithic and Neolithic.

Another important ritual element in burials is the use of mineral colourants, especially ochre. Despite being strongly associated with Palaeolithic and Mesolithic mortuary practices, the prevalence of this element varies regionally and between/with sites (Verjux, 2004: 110, 114, 2007: 25; Riel-Salvatore & Gravel-Miguel, 2013: 330). In Iberia and western and southern France ochre is rare, only registered at a few sites (*e.g.*, Morin, Lagar Velho, La Vergne) (Arias, 2014: 68, 2016: 702). However, it is more frequently found further east, usually on the bones and not in the grave filling (Verjux, 2004: 110, 114; Orschiedt, 2018: 13–14).

During the Neolithic, ochre is found only occasionally outside the Linear Pottery Culture area (Beyneix, 1997: 196, 1998: 551, 2008: 651; Verjux *et al.*, 1998: 62–63; Acosta Martínez, 2013; Rojo-Guerra *et al.*, 2016). However, ochre and other colourants, such as graphite[1], frequently occur in Linear Pottery Culture burials (Jeunesse, 1997: 80). In Tradition I, ochre is dusted especially around the head area, and in Tradition II ochre was deposited in fragments (Beyneix, 1998: 549; Lenneis, 2007: 129). In her work on the influence of Mesolithic burial practices on Neolithic megalithism, Olària i Puyoles (2003: 99) noted a reduction in the use of ochre between the Upper Palaeolithic and the Neolithic.

Whether the burials were individual or collective is usually recorded, and those studies that analyse general patterns and changes through time seem to show that during the Upper Palaeolithic most burials were individual, although multiple burials exist, especially for secondary inhumations (*e.g.*, Belgian secondary burials contain from four to ten individuals) (Henry-Gambier, 1990; Aura Tortosa, 2010: 41; Riel-Salvatore & Gravel-Miguel, 2013: 329; Orschiedt, 2018: 13–14).

During the Mesolithic, this trend continued in Iberia, where both individual and multiple graves exist (Olària i Puyoles, 2003: 96; Aura Tortosa, 2010: 41; Gallego Lletjós, 2011: 543), but individual inhumations are the most common type of burial (Arias *et al.*, 2009: 654; Arias, 2014: 67). However, in France and Belgium the pattern changes, and multiple graves, especially double and triple, are very frequent. In this area, double burials usually contain an adult and a child (Olària i Puyoles, 2003: 96; Verjux, 2004: 111, 114, 2007: 19–21). In all cases, several of the multiple burials display evidence of being reopened and had more individuals added over time (Olària i Puyoles, 2003: 96; Verjux, 2004: 111, 114). During the Neolithic multiple graves almost disappeared in most areas (Beyneix, 1997: 195, 1998: 549–550, 2008: 647; Jeunesse, 1997: 62; Rojo-Guerra *et al.*, 2016). Empty graves were interpreted by Jeunesse (1997: 62) as symbolic burials.

Differences over time in the way the human body was treated after death, from the presence or absence of manipulations to the placing of individuals in individual or collective graves, may be related to a shift in the perception of identity as proposed by Gallego Lletjós (2011) and will be further discussed in section 2.2.5. below.

[1] Graphite appears mainly in Central Europe, not Western Europe

2.2.3. Funerary offerings

Funerary offerings have traditionally been studied from a typological perspective. Funerary contexts were preferred by historicists to help them create typological sequences that would show the gradual technological improvement experienced by society (Chapa Brunet & Ruíz Zapatero, 1990: 357). As a result, several studies on grave goods, at least in the study area, are descriptions of the materials, features, and/or dimensions (*e.g.*, Auxiette, 1989).

However, it is difficult to distinguish between intentional funerary offerings and objects that were included accidentally when backfilling the grave. This can result from the poor preservation of the burials or the fact that the excavations were carried out in the 19th or early 20th century, when methodological and recording standards were low compared to the present day, resulting in poor spatial records. This makes it impossible to reconstruct the original position of the potential funerary offerings using modern techniques such as archaeothanatology (Arias *et al.*, 2009: 655; Duday *et al.*, 2014; Appleby, 2016; Arias, 2016: 694–696; Zemour *et al.*, 2017). Arias (2016: 696) proposed a series of criteria to identify items near a skeleton as grave goods when the original context of the objects is not clear:

- they have some kind of particularity, such as their distant origin or their raw material;
- they have an unusual size (bigger or smaller than most items of the same type);
- they are unused and thus present no use-wear;
- or they represent a statistical anomaly in the archaeological record (*e.g.*, a higher than normal concentration of snail shells in the Los Canes graves).

Typological patterns within and changes between periods have been tracked by some authors. These studies show that, during the Upper Palaeolithic and Mesolithic of the study area, grave goods are rare (Olària i Puyoles, 2003; Verjux, 2004; Aura Tortosa, 2010; Gibaja *et al.*, 2012b; Rojo-Guerra & Garrido-Pena, 2012; Pérez Iglesias, 2013; Figueiredo, 2014; Arias, 2016: 701–702). In the few sites where funerary offerings are present, it seems that individuals were frequently deposited with faunal remains, used or unused everyday objects (bone and lithic tools, etc., that were common in non-funerary contexts), and perforated shells (mainly marine, but occasionally terrestrial) and other kinds of beads, such as those made of animal teeth. These were likely worn by the deceased directly (as necklaces, bracelets, hair ornaments, and so forth) or sewn onto clothing as appliqués, or perhaps a shroud (Henry-Gambier, 1990: 22; Lenneis, 2007: 135; Arias *et al.*, 2009: 655; Aura Tortosa, 2010: 41; Gallego Lletjós, 2011: 543; Riel-Salvatore & Gravel-Miguel, 2013: 330–334; Arias, 2014: 68, 2016: 701–702; Orschiedt, 2018: 13). Other types of funerary offerings are less common, such as *bâtons de commandement* or portable art; and some individuals were deposited without grave goods (Aura Tortosa, 2010: 41–42; Riel-Salvatore & Gravel-Miguel, 2013: 334).

During the Neolithic, a similar pattern can be observed: faunal remains and everyday objects, represented by flint arrows and pottery and ornaments are still the main types of funerary offerings (Beyneix, 1997: 196, 1998, 2008: 652; Jeunesse, 1997: 70–75; Verjux *et al.*, 1998: 62–63; Laporte & Gomez de Soto, 2001: 21; Alday Ruiz, 2009: 165; Acosta Martínez, 2013: 40; Rojo-Guerra *et al.*, 2016: 206). Most of the ornaments from the entire study region are also made from perforated marine shells (mainly *Spondylus* in the Linear Pottery Culture and *Cardium* pendants in the Cardial area) and, in smaller numbers, snail shells. More elaborate (modified beyond perforation) shell beads are also very common in the Linear Pottery Culture area (tubular shape), and central and western France (discoid shape), and limestone and marble bracelets in the Cardial area (Beyneix, 1997: 196, 1998, 2008: 652; Laporte & Gomez de Soto, 2001: 21; Lenneis, 2007: 133–134). Other types of ornaments can be found but in a lesser number (perforated animal teeth and lithic beads), as well as foods such as cereals (Jeunesse, 1997: 75–77). However, the quantity of funerary offerings varies hugely between burials, and burials with offerings are still scarce (Jiménez Brobeil, 2009; Rojo-Guerra *et al.*, 2016: 206).

Interpretations of the meaning of funerary offerings from these periods vary from food provisions for the afterlife (*viatica*) or remnants of funerary meals (faunal remains and cereals) (*e.g.*, Arias *et al.*, 2009: 655), to objects specifically crafted as status symbols, gender and/or age markers or other elements that were included in the grave with a similar purpose (ornaments, tools, faunal remains, portable art, clothing) (*e.g.*, Verjux, 2004; Hachem, 2018); personal mementoes (*e.g.*, flowers or an object owned by the mourners) (Arias, 2016: 693–694); and objects that belonged to the deceased (tools, ornaments, clothing) (*e.g.*, Gallego Lletjós, 2011: 543; Arias, 2014: 68). This last interpretation is the one that can be found most often in the literature. In some cases, the deceased's belongings can be deposited with them as a mark of veneration, as a means of placation, or due to the deceased's belongings being considered impure (Parker Pearson, 2003: 7; Arias, 2016: 694).

Regardless of the reason for burying individuals with offerings and whether they belonged to the deceased or not, the offerings can usually provide information about the social role (status, gender, age) of the deceased. In a paper about the bone pins from Téviec, David (2016) proposed that the pins (Figure 14) were buried with individuals as a way of identifying them as members of the same community.

Figure 14: Engraved bone pins from Téviec

Source: David, 2021

Use-wear analyses have opened a new path of research (Gibaja, 2007). Some analyses have demonstrated that certain funerary offerings were used before being added to the grave (*e.g.*, a blade used to cut plants from the Neolithic site of Ca l'estrada, or the discoid beads from Lamérac that were worn as part of a necklace) (Laporte & Gomez de Soto, 2001; Subirà *et al.*, 2015), while others were commissioned for the grave (*e.g.*, the two unused flint blades from the Mesolithic site of Les Pièces de Monsieur Jarnac) (Henry-Gambier *et al.*, 2011). These studies have opened the door to new interpretations of funerary offerings and reinforced old ones. The idea of funerary offerings being specifically crafted as funerary items and belongings of the deceased has been reinforced. Some use-wear analyses from outside the research area show that some of the tools included in burials were ritually blunted before deposition and after being used as part of the funerary rites (Little *et al.*, 2017: 233–235). However, there are too few use-wear studies to allow general patterns and changes to be tracked.

2.2.4. Animals in graves

Studies of animal remains in graves, aside from those considered funerary offerings, are very scarce in the study area. Animals considered to be grave goods are usually represented by one or a few bones buried alongside human remains in a primary position (*e.g.*, the deer tibia in Molino de Gasparín or the bovine rib in one of the Can Sadurní burials) (Drak & Garralda, 2009b; Edo *et al.*, 2017). However, animals could be considered as buried individuals rather than offerings when they receive similar funerary treatment to the humans they were buried with, although this is not always the case (*e.g.*, Bosch i Lloret & Tarrús i Galter, 1990; Hachem, 2018). The most common unmodified faunal remains, including complete animals, interpreted as funerary offerings in Western Europe are deer and wild goats (Olària i Puyoles, 2003: 100), which are frequently represented by horns or horned skulls (Arias, 2016: 702). Interpretations of the meaning of animal funerary offerings are similar to those given to other types of funerary offerings. They are often seen as markers of gender and/or status (*e.g.*, Hachem [2018] considers that wild boar is a marker of masculine status in the Linear Pottery Culture), but also as food (Munt & Meiklejohn, 2007) or a sign of a belief that the deceased will reincarnate into one of those animals (Olària i Puyoles, 2003: 100).

In those cases where animals have been interpreted as individuals that received funerary treatment, they are not studied from a funerary perspective but from an adaptational one (Detry & Cardoso, 2010; Boudadi-Maligne *et al.*, 2012; Pires *et al.*, 2019). This means that no information about the position of the animal or the presence or absence of funerary elements such as ochre is offered. Instead, the studies are focused on the skeleton morphology to understand the process of domestication. These types of domestication studies are mainly aimed at dogs, since they were the first animals to undergo this process (Detry & Cardoso, 2010; Boudadi-Maligne *et al.*, 2012; Pires *et al.*, 2019).

The few studies that analyse fauna from a funerary perspective show that animal burials were extremely infrequent in Western Europe (Grünberg, 2013; Morey, 2014). As a consequence, those offering interpretations about the meaning of animal burials come from sites outside the area of this study. Owing to their special relationship with humans, these interpretations are largely focused on dogs. Some of the explanations offered are that dogs were buried in human-like customs as they were considered people, hunting partners, valuable companions, and/or a part of the household, or as symbolic protection or foundation offerings (Munt & Meiklejohn, 2007; Hill, 2013; Perri, 2017).

2.2.5. Identity

Identity can be defined as people's perception of themselves and their surroundings (Hernando, 2002: 16). This wide definition involves several topics, such as gender, social age, kinship, or the idea of personhood. Thanks to feminist archaeology, gender and childhood studies have become more popular over the last two decades and they are frequently considered within the context of burials (Lombo Montañés *et al*., 2013; Sofaer & Sørensen, 2013). In addition, studies tracking general patterns within periods and changes between them are also starting to include some information about these topics (*e.g*., Olària i Puyoles, 2003; Arias, 2014).

For Western Europe, Cintas-Peña's work on gender in prehistory stands out. Her thesis on gender inequality in Iberia from the Upper Palaeolithic to the Chalcolithic (2018), as well as her papers focusing on the European Upper Palaeolithic and Iberian Neolithic (2014; 2019), show that during the Upper Palaeolithic and the Mesolithic the differences between male and female burials (presence of ochre and grave goods) are not significant. However, in some Late Neolithic Iberian sites, there are differences in the associated grave goods (men are more frequently associated with weapons and women with pottery) and something similar occurs in the Linear Pottery Culture, where men are more frequently associated with polished axes and women with pottery (Cintas-Peña, 2018; Robb & Harris, 2018; Bickle, 2019; Cintas-Peña & García Sanjuán, 2019). Furthermore, other studies of funerary practices that are not specifically focused on gender show similar results: an absence of significant differences between the treatment of men and women in the Upper Palaeolithic and Mesolithic and an emerging differentiation in the Neolithic (Henry-Gambier, 1990: 26; Jeunesse, 1997: 95–98; Arias, 2014: 69).

According to Cintas-Peña (2018), from the Upper Palaeolithic to the Mesolithic there are no clear differences between men and women in the incidence of traumas, diseases, and body modifications, and they did not have a significantly different diet. However, they seem to have carried out different activities. Villote and Knüsel's (2014) work on the differential prevalence of epicondylosis in men and women from the European Upper Palaeolithic to Neolithic shows that men had a greater tendency to carry out activities that involved throwing motions. During the Neolithic, the prevalence of traumas by sex seems to change. Men present a higher prevalence of traumas and projectile injuries across Europe (Cintas-

Peña, 2018; Cintas-Peña & García Sanjuán, 2019), although Robb and Harris (2018) point out that there are significant regional variations. This, along with the differential association of men and women with funerary offerings led Cintas-Peña (2018; 2019) to see a stronger association of men with violent activities from the 6th millennium BC onwards. On the other hand, Robb and Harris (2018) consider European Neolithic gender a contextual feature with high regional variation. They point out that burials present little gender distinction and, when they do, there is no clear binary divide for male and female categories, but a gradation influenced by other factors such as localness and age.

The few studies analysing children from West European Upper Palaeolithic, Mesolithic and Neolithic burials show there are no significant differences, aside from them being lower in number, in their treatment relative to adult burials (Henry-Gambier, 1990; Jeunesse, 1997: 98–99; Olària i Puyoles, 2008; Gibaja *et al.*, 2010; Lombo Montañés *et al.*, 2013: 47–50; Arias, 2014: 69; Cintas-Peña & García Sanjuán, 2019). Lombo Montañés *et al*. (2013: 48–50) note how the similarities between individual burials of children and adults with funerary offerings suggest children participated in community life from birth. Another interpretation of children buried with grave goods is the inheritance of status (Jeunesse, 1997: 116–117). However, other authors (Ucko, 1969; Hernando, 2008; Aura Tortosa, 2010: 41) have pointed out that this seems less likely since hunter-gatherer and early agricultural societies are typically highly egalitarian and status does not necessarily have a direct representation in the richness of the grave. As Cintas-Peña notes (2018: 536), it is important to keep in mind the difference between biological and social age since individuals that are classified as subadults biologically could be considered adults by the society to which they belonged.

Another topic relating to the social perception of individuals is that of individuals with pathologies who would need help to survive. This is rarely acknowledged in the literature on Western European Upper Palaeolithic to Early Neolithic burials. In her paper about Mesolithic burials and their influence on megalithism, Olària i Puyoles (2003: 98) briefly mentions this when discussing individuals with life-limiting pathologies who are well represented in Mesolithic graves and points out that they are treated in a similar way to other individuals.

Kinship is also an emerging topic of research and, as a result, there are only a few studies. An example is Cingle del Mas Nou, where non-metric traits were used to conclude that the man and woman were biologically related to the children buried with them (Olària i Puyoles, 2010). In the Linear Pottery Culture, aDNA and stable isotope studies have been used to suggest that it was a patrilineal and patrilocal society, and this information has allowed an interpretation of the adzes associated with male graves as related to land inheritance (Bickle, 2019). From a different perspective, the study of the Lagar Velho child's grave goods has allowed to interpret that the ornamentation was crafted by more than one individual, leading to interpretations involving a possible multiple kinship system (Pettitt, 2011: 169). At the site of Téviec, it has been suggested that people buried in the same grave belonged to the same kin group even if they did not have blood ties (David, 2016: 612).

Lastly, an important topic in the study of identity is the idea of personhood: what is a person, what elements constitute a person, and if a person is a divisible or an indivisible entity (Fowler, 2004, 2010, 2013, 2016). Personhood is an extremely broad topic, and most of its dimensions are not covered in this thesis. The two key areas of study that potentially provide information about this topic and that are analysed in this thesis are animal burials and the post-mortem treatment of the body. As Ivana Živaljević (2015) has suggested, animals in graves could be a result of their being considered non-human persons. Following this argument, the requirement for being considered a person would not be to look like a human, but rather a state of consciousness and a particular perception of the world achieved through the eyes, the ears, etc.

The idea of the person as a divisible entity is explored by authors, such as Gallego Lletjós (2011) or Gray-Jones (2011), who propose an interpretation for the loose human bone or "LHB phenomenon" (isolated bones in non-funerary contexts). It is suggested that LHB are the result of a diachronic funerary practice in which death is understood as a process and the subject as a divisible entity. A part of the person would die with their biological death, but a part would remain, and 'loose bones' would be an extension of the deceased in the social sphere.

2.2.6. Overview

The above review of funerary practices in Western Europe points to a tradition whereby Upper Palaeolithic and the Mesolithic funerary deposits were mostly placed in domestic areas inside caves, with some exceptions such as the Portuguese shell midden cemeteries.

Individuals appear to have been primarily deposited in the ground or buried in individual or collective pits. Research has revealed both primary and secondary burials, and, in the Mesolithic, cremation was often practised alongside primary burials. During the Upper Palaeolithic and Mesolithic, the way of laying out the bodies in primary burials appears to vary significantly from site to site and within the same sites with some exceptions, such as the Portuguese shell middens.

From the review, ochre and funerary offerings appear infrequently. The funerary offerings recorded were usually faunal remains, everyday objects, and ornaments, mainly made from perforated shells (mainly marine, but also from snails) and other types of beads (*e.g.*, from animal teeth). Furnishings were likely common but have not survived due to being made out of perishable materials. The individuals represented in the graves are both male and female and, in a lesser proportion, children. Perhaps surprisingly, all of the individuals recorded presented similar burial customs and pathologies, with notable exceptions including age-related pathologies and enthesopathies related to throwing motions that were mainly present in men. The review revealed a small number of dog burials.

During the Early Neolithic, research has shown that burials were still placed mostly in caves, except for in the Linear Pottery Culture area where they appear to mostly occur at open-air cemeteries inside or near villages. Despite the existence of some megalithic structures, bodies were still mainly deposited in simple pit graves. Secondary burials still existed in some areas but are not found in the Linear Pottery Culture area. This is the only area in which cremation was still common. Collective burials became very rare in most of Western Europe and individuals started to be buried in a more standardised way in some areas (*e.g.*, in right lateral decubitus with the head to the southeast, southwest, or northwest in the inner part of Iberia).

Like the Upper Palaeolithic and Mesolithic, studies show that ochre remains infrequent during the Early Neolithic, except in the Linear Pottery Culture area. Furnishings were likely common and made from perishable materials, the number of burials with funerary offerings remained low and the main types of offerings changed little: predominantly faunal remains, daily-use objects, and ornaments made of perforated shells. However, in some graves, cereals have been identified, and pottery appears as a new addition to the daily-use objects category.

Based on available published resources, the proportion of children in graves appears to increase as a result of the Neolithic Demographic Transition (NDT), although it is still much lower than the proportion of adults, and the adoption of agriculture can be seen as a contributing factor in the general worsening of health, except for the Portuguese shell middens. In this period, studies point to men displaying a significantly higher prevalence of traumas. From the evidence, it might be argued that this is connected to violence-related activities with differences between men and women evident from the 6th millennium onwards.

Chapter 3:
Materials and Methods

The project collected data on human remains from the beginning of the Upper Palaeolithic (excluding Neanderthal remains) to the appearance of the megalithic and other Middle Neolithic cultures, around 4500/4300 cal BC. Human remains for which the earliest date range's limit is later than 4500 or 4300 cal BC (depending on the area) have not been collated. For example, an individual or site dated between 4310-3900 cal BC would not be considered. However, in the case of sites with a continuous sequence of human remains that contain several individuals from before 4500/4300 cal BC, those individuals dated after 4500/4300 cal BC were included to avoid cutting the sequence short. Nonetheless, the exclusion of large sites that only have a few individuals dated before 4500–4300 cal BC might have affected the density of data for that date range. This is why the data were only analysed up to 4500 cal BC.

Funerary data were collated in three Excel sheets: one for the sites, one for the individuals and one for the funerary offerings (see appendices Appendix I, Appendix II and Appendix III). These tables are organized by site, individual and funerary offerings, respectively. Information was extracted from a large number of published and unpublished sources, as well as directly from the following researchers: Alfonso Alday Ruiz, Bruno Aubry, Carolyn Barshay-Szmidt, Nuno Bicho, Miguel Ángel de Blas Cortina, Àngel Bosch, Jean-Pierre Chadelle, Louis Chaix, Pierre Chalard-Biberson, François-Xavier Chauvière, Miguel Cortés, Eugénia Cunha, Marta Díaz-Zorita Bonilla, Henri Duday, Pablo García Borja, Achilles Gautier, Juan Francisco Gibaja Bao, Javier González, Javier González Muñoz, Lamys Hachem, Dominique Henry-Gambier, Montserrat Hervella, Brigitte Holt, Mary Jackes, Paulette Lawrence-Dubovac, Michel Mauvilly, Christopher Meiklejohn, José Manuel Morlote Expósito, Lourdes Montes Ramírez, Emilio Muñoz, Cécile Paresys, Rita Peyroteo Stjerna, Karine Raynaud, Manuel Rojo Guerra, Mirjana Roksandic, Isabel Rubio de Miguel, Isaac Rufi Casals, Jesús Sesma Sesma, Josep Tarrús, Cláudia Umbelino, Christian Verjux, Pierre Vermeersch, Bernhard Weninger, Aurélie Zemour and João Zilhão. In addition, Geoff Bailey, Felipe Criado, Almudena Hernando, Walter Leclercq and Moritz Mennenga provided information and recommended sources not directly related to the data tables.

The data were collated up until February 2019, when analyses started to be carried out. At that time, studies on the human remains from some sites, such as L'Avellaner or Cova dels Trocs, were still ongoing and thus, could not be considered here.

3.1. Data gathering

The data collated was first recorded in an Excel sheet organized by individual. However, since some of the analysis and the maps required organising by site, a second table with site-level data was created using the information from the original one. This was done for three reasons: 1) To avoid information for different individuals from the same site overlapping on the maps; 2) Because some analyses work better at a site level (*e.g.*, those related to site features) and others on an individual level (*e.g.*, those related to body treatment); and 3) To create some new categories of information. Most of the categories are the same in the two tables, but some are different. For example, MNI is a field that can only exist in the data table by site. Lastly, an extra data table focused on funerary offerings was created so as to have a row for each funerary offering and, thus, individualized information about each of the diverse types of objects and materials placed in graves that, otherwise, could not be spatially or chronologically analysed.

3.1.1. Assigning dates

The first category of information is the **site** name; for each site, a row is provided in the spreadsheet for each individual; this is followed by a header titled **period**. Entries are divided into Upper Palaeolithic, Mesolithic or Early Neolithic based on the information provided in the site reports and/or syntheses.

Some of the human remains and/or sites have been radiocarbon dated. Some dates were obtained directly from human bone. However, when this was not possible, dates from materials found in stratigraphic relationship with the deceased were used. These dates are entered as radiocarbon dates; calibrated dates have been used and, if they were not available, they were calibrated with OxCal online 4.3, using the IntCal 13 calibration curve (Reimer *et al.*, 2013). Only the terrestrial curve was used, as given the characteristics of this study, the extra resolution provided by using a marine curve on individuals that could potentially have had a marine diet was not needed. The materials dated and the number of dates were also recorded.

From the calibrated radiocarbon dates, an assignment to millennium BC is given.. Equally, when only information about the millennium is given, it is converted to years and added to the **Date cal BC (from)** and **Date cal BC (to)** columns. Where direct dates or dated materials in stratigraphic relationship to human remains, including other human remains, are not provided, dates given to the site in general are used. This is potentially problematic as it could result in individuals from different occupation events sharing the same broad date range. However, this is better than not having these individuals dated at all. Lastly, if no dates are available for the site, an approximate date range is assigned based on a criterion of authority: if authors that are experts on a certain period, such as Paul Pettitt (Upper Palaeolithic); Christopher Meiklejohn (Mesolithic), or prehistoric French sites (Dominique Henry-Gambier), consider it to be likely that a certain site or individual belongs to a certain period due to, for example, material culture, then the site is added to the table with a date range extrapolated from other dated sites or individuals from the same period (*e.g.*, Aurignacian, Azilian). To do so, the dates of all the dated sites collated for this project were considered, as well as dates from the analysed area collated in the CalPal database project (Weninger & Jöris, 2017) and the Radiocarbon Palaeolithic Europe Database v28 (Vermeersch, 2021). The ranges used for some periods (*e.g.,* for the Azilian or the Mesolithic) are wider than the ones generally used. This is not the result of a few sites presenting aberrant dates or very wide date ranges, but rather of several sites from those periods being dated to later dates than the typically used. The date ranges used are listed in Table 1:

Period	Date range cal BC
Aurignacian	41000-26000
Gravettian	29000-27000
Epi-Gravettian	18000-9300
Solutrean	25500-12500
Magdalenian	19000-9500
Azilian	12000-7100
Mesolithic	10000-4200
Sauveterrian	10000-7700
Montadien	8000-7200
Early Neolithic	8600-4200
Cardial Ware culture	5500-4000
Epicardial	5100-4000
Linear Pottery Culture	5500–4100

Table 1: Date ranges for non-dated sites

There are 107 non-dated sites (30%) and 390 non-dated individuals (20%) that got these date ranges. Most of them are from the Linear Pottery Culture (46 sites, 240 individuals) Thus, not every individual has a direct date, but this should not adversely affect the research objectives due to the large scale of the project. This information is specified in the **dated material** column as ‘extrapolated’ where dates for other individuals were used, ‘level date’ if the date came from the same level as non-buried deceased or, in the case of burials, the level in stratigraphic relation to it, ‘site date’ if general dates for the site were used, or ‘no radiocarbon’ if no radiocarbon dates were available (Figure 15).

	Site	Period	Millennium Cal. BC (from)	Millennium Cal. BC (to)	Radiocarb on date	±	Date cal. BC (from)	Date cal. BC (to)	Dated material	Number of dates
Agut	Abric Agut	Mesolithic	11	9	10085 9185	60 60	10026 8556	9405 8286	Charcoal	2
Bocas	Abrigo Grande das Bocas	Mesolithic	6	6	7130	120	5840	5400	Shell	1
Aizpea	Aizpea	Mesolithic	6	6	6600	50	5610	5500	Human bone	1
Alkerdi	Cueva de Alkerdi	Palaeolithic	30	28	26470	40	29398	27599	Animal bone	1
Amoreiras I	Amoreiras	Mesolithic	7	6	-	-	6200	5316	Extrapolated	1
Amoreiras II	Amoreiras	Mesolithic	7	6	-	-	6200	5316	Extrapolated	1
Amoreiras III	Amoreiras	Mesolithic	7	6	-	-	6200	5316	Extrapolated	1

Figure 15: Extract from data table by individual showing data on radiocarbon dates

3.1.2. Site details

The first category of information recorded is the physical location of the site, *i.e.*, whether it is a cave, rockshelter or open-air site. If the site is a shell midden, it is recorded in a separate column. From this, the site type based on function is assigned (*e.g.*, funerary cave, settlement, activity area, cemetery); however, this is far from straightforward. These categories are interpretations and often problematic. For instance, from the osteological reports, it is often difficult to gauge the site type. Reports and other data have therefore been consulted to assess what the site was used for at the time of the deposition of the deceased.

A funerary cave is a straightforward category because it is defined by the absence of archaeological material from that period, aside from the human remains (*e.g.*, Schulting, 2016). However, if human remains are found on a settlement site, it is sometimes difficult to determine whether those activities were contemporaneous. Based on the data from the site an interpretation is made. In some cases, the author writing the site report has categorised the site as a temporary or permanent residence (*e.g.*, Zilhão, 1992). There are other sites where no evidence of habitation in the form of post-holes, stake-holes or hearths were found but there is evidence of some form of industry, such as lithic manufacture. These have been termed activity areas (*e.g.*, Bouville *et al.*, 1983).

In addition, if the human remains were not found within a settlement or activity area but authors consider they are related to a nearby settlement or activity area, it is placed in the category ‘settlement-related burial’ or ‘activity area-related burial’ (*e.g*., Lefranc *et al.*, 2014; Raynaud & Paresys, 2016).

Finally, some cemetery sites can be characterised as settlement cemeteries (when the cemetery is inside the settlement or at its entrance) (*e.g*., Boulestin, 2016; Peyroteo Stjerna, 2016a), settlement-related cemeteries (when it is clearly related to a nearby settlement) (Lefranc *et al.*, 2014) or isolated cemeteries (when no evidence of a settlement has been identified nearby) (*e.g*., Jeunesse, 1997). When the category ‘cemetery’ is used without any other qualification, it means there is not enough information about the site, but it can be classified as a cemetery due to the MNI.

Cemeteries are defined by the Oxford English Dictionary as ‘A large burial ground, especially one not in a churchyard’. However, it is necessary to define what is ‘large’ and if other requirements are needed to consider a burial ground as a cemetery, especially for prehistoric sites. Authors do not always define what they mean by ‘cemetery’. Where they do, there is no consensus on what constitutes a cemetery. Some authors require a MNI of two individuals; others a minimum of ten, and yet others a MNI of 50 (for discussion, see Meiklejohn *et al.* 2009: 640–641).

Very often, authors provide only a vague definition of ‘large’. For example, Pardoe (1988) and Olària i Puyoles (2003) merely state that a ‘significant’ number of individuals is needed to consider a collection of graves as a cemetery, but they do not specify what number would be ‘significant’. Other requirements might need to be fulfilled for authors to consider a group of graves a cemetery. These requirements might include the continuity of use of the burial ground for a certain amount of time, that the graves are arranged contiguously, the bounded character of the compound, its exclusive funerary use, etc. (*e.g*., Pardoe, 1988; Verjux, 2007: 26; Pettitt, 2011: 10). The only conclusion that can be extracted from the large variety of definitions of cemetery is that there is no clear definition of what a cemetery is.

In this thesis, cemeteries are defined as funerary places exhibiting continuity of use. They must contain at least 10 non-buried or buried individuals that were not deposited simultaneously. This number has been chosen based on cross-cultural demographic studies that take into consideration up to 478 hunting-gathering, foraging and horticulturalist populations worldwide (Marlowe, 2005; Gurven & Kaplan, 2007; Hill *et al.*, 2011; Hamilton *et al.*, 2018; Bird *et al.*, 2019). The studies show that these societies have a small number of camp occupants with a minimum of two individuals per camp and an average of between 14.7 and 25 per camp (Hill *et al.*, 2011; Hamilton *et al.*, 2018; Bird *et al.*, 2019). In these groups, it is rare for 10 individuals to die at the same time (Marlowe, 2005; Gurven & Kaplan, 2007). However, since these small communities of camp occupants can be integrated into larger ones of up to 150 individuals, allowing fluctuations in the number of co-residents (Hill *et al.*, 2011; Hamilton *et al.*, 2018; Bird *et al.*, 2019), sites with all individuals in a multiple grave or a shared space (if they are not buried) that do not have separated dates for each individual or other means to show they were deposited at different points in time (*e.g.*, archaeothanatological studies) are not considered cemeteries.

The site data table has a column showing the **MNI** (Minimum Number of Individuals) and, to facilitate some analyses, a column with **MNI categories**. The MNI categories are sorted into six groups: 1 individual, 2-3 individuals, 4-9 individuals, 10-20 individuals, 21-30 individuals and more than 30 individuals. Since determining the number of individuals can be difficult for various reasons, such as sites not being fully excavated, the sites that contain less than 10 individuals, but have more than one individual buried, have been registered in another category. These are recorded as **collective funerary spaces** in a column of their own, to acknowledge collectiveness. The problem of partially excavated sites is worse when it comes to individual depositions, since several come from salvage excavations and, thus, there could be more human remains that remain un-excavated.

Other site characteristics include whether the funerary space was **delimited**, or if there is continuity in the use of the site after the human remains were deposited. The information on the delimitation is subdivided into three categories:

- <u>Mixed</u>: human remains are located within domestic spaces;
- <u>Delimited</u>: human remains are located in a delimited space – different from the one used for daily life activities;
- <u>Both</u>: the site has both a mixed and a delimited funerary area. This category is only present in the data table by site.

In some cases, the relationship between the human remains and the domestic space is established by the authors who wrote the reports and/or papers consulted. However, there are several works, especially in Spain, that do not offer this information. In these cases, the information on the delimitation of the funerary space was obtained by comparing the information available about the context of the human remains (dates, layer, quadrant) with the information available about the material culture and living structures dated to the same period. When radiocarbon dates were not available, the stratigraphic relationship between the funerary remains and the living structures was used to establish contemporaneity.

In terms of the continuity of use of the site, data were collected on whether the site was **abandoned** or not after the first funerary deposition took place. Information was obtained from stratigraphy: if the layer with human remains is the last or was followed by sterile layers, the site was considered to be abandoned. Thus, this is a category mainly used for sites with isolated burials since cemeteries were not abandoned after the first deposition.

These two categories are the most complicated ones in terms of obtaining data; they are also the least reliable. In most cases, it is difficult to be sure whether the human remains and residential spaces were contemporaneous and if the remains were displaced from their original position. However, based on data within the published reports, I have a relatively high level of confidence in these categories (Figure 16).

Location	Site type	Delimited / Mixed	Abandoned / Non-abandoned	Collective funerary space	Shell midden	MNI	MNI categories
Open air	Settlement cemetery	Both	Non-abandoned	Yes	No	41	>30
Cave	Activity area	Mixed	Non-abandoned	Yes	No	6	4-9
Open air	Settlement	Delimited	Non-abandoned	Yes	No	13	10-20
Cave	Funerary cave	-	-	No	No	1	1
Open air	Settlement cemetery	Delimited	Non-abandoned	Yes	No	11	10-20

Figure 16: Extract from data table by site showing data on site details

3.1.3. Completeness of the remains

This information has been recorded in two ways: it specifies 1) the completeness of the individual when they were found and 2) the completeness of the individual when originally deposited. **'Preservation state'** describes the state of preservation of the remains. **'Body treatment at deposition'** assesses the state of the body when it was originally deposited. This is expressed in five fixed categories: 'Complete', 'Disarticulated bones', 'Skull', 'Isolated bone', 'Ornament' and 'Cremation'. The column **'Preservation state'** exists in the data table by individual and by funerary offering, not in the one by site. On the other hand, in the data table by site, the column '**Body treatment at deposition'** has the extra category 'Inconsistent', used when more than one type of treatment given to human remains is found at the same site. Lastly, an extra 'yes' or 'no' category in both tables shows if there was evidence of **post-decomposition bone removal**. It must be noted that a 'no' in this category does not mean that no bones were intentionally removed after the deceased decomposed, but rather that there is no evidence of it (Figure 17).

Preservation state	Body treatment at deposition	Post-decomposition bone removal
Mostly complete	Complete	Yes
Cremation	Cremation	No
Cremation	Cremation	No
Cremation	Cremation	No
Scattered cranial remains	Skull?	No
Isolated bone	-	No
626 bone fragments	Disarticulated bones	No

Figure 17: Extract from data table by individual showing data on the completeness of the remains

While this information is mainly based on the interpretation of the authors who wrote the reports, the individuals represented only by cranial fragments and/or mandibles are registered as ‘skull?’, unless otherwise specified. This decision of marking cranial fragments as possible skull deposits is based on the fact that crania, mandibles and long bones have similar preservation rates. Thus it is unusual for postcranial remains to be absent when the cranial remains are preserved (Bello & Andrews, 2006).

Teeth found in graves are registered as such in the ‘Preservation state’ column. However, they were not included in any of the ‘Body treatment at deposition’ categories (their rows are left empty) since it is impossible to know whether they were part of a burial or discarded loose teeth. When several teeth are found in funerary caves and are associated with ritual elements (*e.g.*, funerary offerings) it is more likely that isolated teeth are the only surviving remains of a burial. This may be due to taphonomic processes, *e.g.*, cave floods, which have dissolved the mineral content of the bone. However, when only a tooth is found in an area of human activity and it is not associated with any funerary element, the reason for its presence may not always be clear (Wilczyński *et al.*, 2016: 155, 158–159). As a result, even if the ‘Body treatment at deposition’ column is left empty in the case of all teeth, teeth are considered to be the remains of funerary deposits when they are found in funerary areas.

3.1.4. Biological information of the individual

The first header regarding biological information of the individual is species. This is needed because, in some sites, other animals, such as dogs, have been found in graves. These non-human animal species are also recorded in the data table because information about how they were treated relative to humans offers important information linked to concepts of personhood (Bird-David, 1999; Willerslev, 2007; Živaljević, 2015). In the data table by site, this column does not exist; instead, there is a yes/no column registering the presence or absence of animals receiving funerary treatment.

The **sex** column registers individuals as biologically male or female. This column only contains data that was obtained through osteological, DNA or amelogenin analyses. It is important to note that none of the information regarding the sex of the individuals comes from studies that assess the sex of the individuals through the funerary offerings deposited with them. Nonetheless, it cannot be discounted that, in some instances, the type of grave goods influenced the osteological sexing of bodies. It must be noted, however, that only 164 out of the 501 sexed individuals had offerings, as grave goods are not frequent in the study area during the Upper Palaeolithic, Mesolithic or Early Neolithic. Most of the sexed individuals with funerary offerings were well preserved, which facilitates the sexing. They were sexed relatively recently (*e.g.*, Ferembach, 1974a; García Sánchez, 1982; Sedlmeier & Kaufmann, 1996; Ferembach, 1974c), several of them after AD 2000 (*e.g.*, Aymard *et al*., 2007; Yáñez *et al*., 2002; Brou *et al*., 2015; Moreno Márquez, 2017; Zemour *et al.*, 2017), and some of them via DNA (*e.g.*, Peyroteo Stjerna, 2016a). As a result, the impact of funerary offerings in the sexing of individuals should be negligible.

The information related to the age of individuals is divided into **age range** (given in site report) and **age group**. Age group was assessed as in Table 2:

Age group	Age range
Foetus	Up to 40 weeks in utero
Neonate	Around the time of birth
Infant	Following birth to one year
Juvenile	1–12 years old
Adolescent	13–17 years old
Young adult	18–25 years old
Young middle adult	26–35 years old
Old middle adult	36–45 years old
Mature adult	>46 years old
Subadult	Age could not be determined more precisely, but is under 18
Adult	Age could not be determined more precisely, but is over 18

Table 2: Age groups and age ranges

Source: Scheuer & Black, 2004: 6; Lewis & Falys, 2011

In the data table by site, age is only recorded in a column registering the presence of adults, subadults or both at a site. Finally, animals are only classified in foetus, adult and non-adult categories and only in the data table by individual.

Information about **activity markers** (dental wear, degenerative joint changes, functional morphological changes, stress fractures, changes in the bone architecture, ossifications and calcifications and enthesopathies) (Galtés *et al.*, 2007) and **pathologies,** including **life-altering pathologies.** Pathologies that are considered to be life-altering are, for example, a broken leg. These alterations can be temporary if the injury had healed, or permanent if the individual ended up losing the leg or developed a limp as a result of a poorly healed fracture (Casas Flores, 1997; Campillo & Subirà, 2004). The temporary character of some of these life-altering pathologies has been registered in the data tables by individual and by funerary offering, but not in the one by site.

Lastly, information that could indicate if the individuals were genetically related (DNA and non-metric traits) is recorded in the notes section (Figure 18).

Species	Sex	Adult / Subadult	Age group	Age range (min)	Age range (max)	Activity markers	Pathologies	Life altering pathologies
Human	Female	Adult	Young adult	20	25	-	-	-
Human	Male	Adult	Young middle adult	25	30	-	Shoulder joint arthropathy	No?
Human	Female	Adult	Young middle adult	25	30	-	-	-
Human	-	Subadult	Juvenile	1	12	-	-	-
Human	Female	Adult	Old middle adult	35	50	-	Osteoarthritis in the hands, wrists and maxilla	Yes?
Human	Male	Adult	Old middle adult	35	45	-	Osteoarthritis in the spine	Yes?
Human	Male	Adult	Mature adult	50	-	Strenuous activity performed with both arms that affected the right elbow especially	Osteoarthritis in the shoulders, hips, spine	Yes?

Figure 18: Extract from data table showing biological information of the individuals

3.1.5. Type of deposition

Information regarding the type of deposition records whether it is an **individual or a multiple deposition** and if it was in a **primary or secondary position** (Figure 19). In the case of the data table by site, the column also considers the presence of both forms of deposition at a site. Categories are based on information extrapolated from site reports and other primary literature. Given the often poor preservation of many of the human remains, it is frequently difficult to determine if they were in a primary or secondary position. Individuals represented by crania, cranial fragments and/or mandibles were considered as potentially secondary ('secondary position?') based on the study of preservation rates by Bello & Andrews (2006): this shows that crania, mandibles and long bones have similar preservation rates, making it unusual not to find any postcranial remains when cranial remains or mandibles are preserved.

Individual / Multiple deposition	Primary / Secondary position
Multiple?	Secondary position?
Multiple?	Secondary position?
Multiple?	Secondary position?
Individual	Primary position
Individual	Primary position

Figure 19: Extract from the data table by individual showing information on the type of deposition

3.1.6. Position of the body

Information about the position of the body is only present in the data table by individual and is divided into four categories (Figure 21):

- **Position:** Supine decubitus, lateral decubitus, prone position and other less common positions like sitting and kneeling positions.

- **Lateralization:** When the individual is in lateral decubitus, it is laying on its right or its left side.
- **Flexed degree:** The degree of flexure has been divided into five categories: extended, semiflexed, flexed, hyperflexed and foetal. The position of the legs was used to categorise these data since this is what most influences the general position of the body. Hence, semiflexion implies that the legs were slightly flexed, and hyperflexion implies that the knees were at the height of the head. Positions in between have been marked as flexed. The foetal position is the only one that takes into consideration the position of the arms (Figure 20).
- **Head orientation:** The cardinal direction in which the head lies.

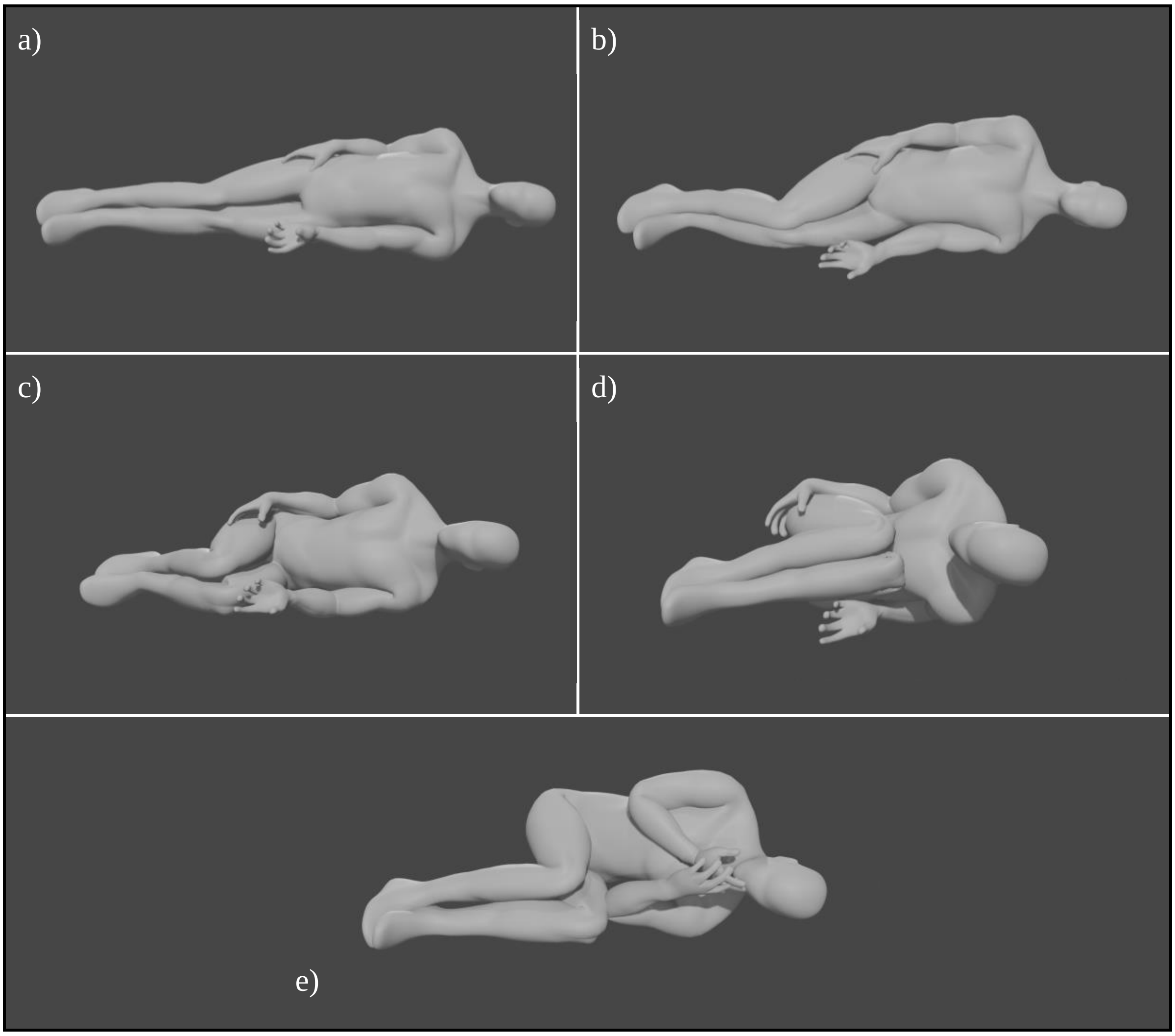


Figure 20: Different flexed positions: a) extended b) semiflexed c) flexed d) hyperflexed and e) foetal

Source: Figures created by the author in Blender using a free rigged model from CGTrader uploaded by the user aaravjohan77

Most of this information is reported by the researchers, but in some cases, it was extracted from illustrations. In the data table by site, when the position of individuals from the same site is not uniform (*e.g.*, some individuals are in lateral decubitus and others in supine decubitus), the categories ‘both’ (for the lateralization) and ‘inconsistent’ (for the remaining columns) have been used.

Position	Lateralization	Flexed degree	Head orientation
Lateral decubitus	Left	Foetal	SE
Supine decubitus	-	Hyperflexed	NE
Supine decubitus	-	Flexed	NE
Supine decubitus	-	Flexed	NE
Supine decubitus	-	Flexed	NE
Supine decubitus	-	Flexed	W
Supine decubitus	-	Hyperflexed	SW

Figure 21: Extract from data table by individual showing information on the position of the body

3.1.7. Ritual features

This section presents data related to the grave and the funerary ritual. This information relates to the different elements used to modify the funerary context or the body of the deceased. The first is the presence/absence of a **grave** or sepulchral structure, such as a circle of stones or any other type of structure in which the deceased was deposited, as it proves that the body was not just left on the ground. The second recorded feature is if the funerary context was **sealed** by placing anything on top of the grave or the individual. The third is if a **location marker** was used to mark the position of the funerary remains. The fourth is if

furnishings were used. Furnishings are objects intentionally placed in the funerary context that cannot be considered funerary offerings (*e.g.*, pillows, beds or wrappings), as their use aims at modifying the funerary context or keeping the bodies in position rather than being *viatica* (food or drinks for the journey to the afterlife), belongings of the deceased or the mourners or objects specially crafted for the deceased (Arias, 2016: 693–694). Lastly, traces of **fire** and/or **mineral colourants** are recorded.

The presence of fire is recorded in three different columns and the use of mineral colourants in four. The first column of each records the presence of ochre and fire respectively, regardless of them being in the funerary context, including on associated objects or human remains. The second column records their **presence in the funerary context**: there are many sites in which ochre and fire are found at the bottom, top or near the grave but not on the remains themselves. In these cases, contemporaneity has been established based on radiocarbon dates or the stratigraphic relationship of the fire or colourant traces and the deceased. The third of the mineral colourant and fire columns registers the presence of traces of these elements **on the human remains.** Lastly, the fourth column for mineral colourant records the presence of **ochre nodules and/or fragments** in the funerary context.

Although these divisions of the data may obscure some patterns, fire and mineral colourants within the context were registered separately from fire and mineral colourant applied to human remains to ensure a better fit of these elements within the thesis structure. The presence of fire and mineral colourants in the funerary context is considered a modification of the funerary space and analysed in chapter 5, which focuses on the modifications of the funerary context. Mineral colourant and fire applied to human remains are considered types of body treatment and, thus, are discussed in chapter 7. Lastly, ochre nodules are treated as funerary offerings and therefore analysed in chapter 6.

All these features are described in the column '**Funerary context description**'. This last column does not, however, exist in the data table by site. In this table, all the remaining columns have the extra category 'both' for sites in which some individuals present evidence of, for example, mineral colourant or fire but others do not (Figure 22).

Grave	Location marker	Sealed	Fire	Fire within context	Fire affected body	Mineral colorant	Mineral colorant within context	Mineral colorant on body	Ochre nodules	Furnishings
Yes	No	Yes	Yes	No?	Yes	No	No	No	No	No?
Yes	No	Yes	Yes	No?	Yes	No	No	No	No	No?
Yes	No	Yes	Yes	No?	Yes	No	No	No	No	No?
Yes	No	Yes	Yes	No?	Yes	No	No	No	No	No?
Yes	No	Yes	Yes	No?	Yes	No	No	No	No	No?
Yes	No	Yes	Yes	No?	Yes	No	No	No	No	No?

Figure 22: Extract from data table by individual showing information on the features

3.1.8. Funerary offerings

In terms of funerary offerings, their presence or absence and quantity were recorded in the data tables by site, by individual and by funerary offering. The data tables by individual and by site contain broad categorisations of types of funerary offerings which include: tools and equipment, ornaments, unmodified faunal remains (including bones and shells), plants and derivatives and portable art. In addition, there is a category named ‘various’ for those cases where individuals were deposited with more than one type of funerary offering and an ‘absent’ category when there are no funerary offerings. A detailed free text description of the funerary offerings has been provided under ‘Funerary offerings description’. Within the individual data table, the use of tools and personal ornaments according to traceological analyses has also been recorded. However, this information is rarely available (Figure 23).

Presence of funerary offerings	Type of funerary offerings	Quantity of funerary offerings	Presence of tools	Quantity of tools	Presence of ornaments	Quantity of ornaments	Presence of faunal remains / shells	Quantity of faunal remains / shells	Presence of plants and derivatives	Quantity of plants and derivatives	Presence of portable art	Quantity of portable art	Funerary offerings description	Use of tools	Use of ornaments
Yes	Ornaments	1	No	0	Yes	1	No	0	No	0	No	0	Necklace composed by a minimum of three bone rings that were found around the deceased's	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	It is not sure if the materials found mixed with the sediment used to close the pit can be	-	-
Yes	Varied	2	Yes	1	Yes	1	No	0	No	0	No	0	A schist or slate bracelet and a pottery vessel	-	-
No	Absent	0	No	0	No	0	No	0	No	0	No	0	-	Some of the flint bladelets found mixed with the sediment were used to cut cereal	-
No	Absent	0	No	0	No	0	No	0	No	0	No	0	-	-	-
Yes	Tools and equipment	>3	Yes	>3	No	0	No	0	No	0	No	0	Some grinders and a ofita adze	Some of the flint bladelets found mixed with the sediment were used to cut cereal	-
Yes	Tools and equipment	42	Yes	42	No	0	No	0	No	0	No	0	A bone awl, some needles and 41 geometric lithics	At least 25 of the microliths were used as projectiles, 8 more were probably used for the	-

Figure 23: Extract from data table by individual showing information on the funerary offerings

Funerary gifts are recorded in more detail in a separate data table that is organised by item so that each funerary offering has its own row. Information exclusive to the data table by funerary offering is the object **ID** number, the **general object type** (*e.g.*, pin, blade, shell, tibia, pot, nodule), the **specific object type** (*e.g.*, unmodified shell, truncated blade, lithic nodule), the **material category** (*e.g.*, bone, teeth, antler, lithic, pottery, shell), the **ornament composition** (*e.g.*, perforated tooth, perforated shell, discoid bead, tubular bead), the **animal body part** (*e.g.*, tibia, cranium, canine, rib), the **species/geology type** (*e.g.*, periwinkle, wild boar, deer, flint, limestone) if the object was **embellished** (*e.g.*, painted or engraved), is **complete or fragmented**, if there are **single or multiple objects** of the same type and the **number** of items of the same type. Lastly, the table also includes the **number of individuals each offering is associated with** as well as all available information about those individuals (Figure 24).

ID	General object type	Specific object type	Material category	Ornament composition	Animal body part	Species/ Geology type	Embellishment	Complete/ Fragmented	Type of funerary offering	Single/ Multiple	Quantity	Presence of funerary offering	Funerary offerings description	Use-wear	Quantity of individuals with offerings
257	Shell	Unmodified shell	Shell	-	-	*Cancilla scrobiculata*	No	Complete	Unmodified faunal remains / shells	Multiple	-	Yes	12 perforated red deer canines and a compound of *Cyclope neritea, Homalopoma*	-	1
258	Shell	Unmodified shell	Shell	-	-	*Nucella lapillus*	No	Complete	Unmodified faunal remains / shells	Multiple	-	Yes	12 perforated red deer canines and a compound of *Cyclope neritea, Homalopoma*	-	1
259	Ornament	-	Teeth	Perforated tooth	Canine	Red deer	No	Complete	Ornaments	Multiple	12	Yes	12 perforated red deer canines and a compound of *Cyclope neritea, Homalopoma*	-	1
260	Ornament	-	Teeth	Perforated tooth	Canine	Lynx	No	Complete	Ornaments	Multiple	11	Yes	11 lynx perforated canines, 5 fox perforated canines, 6 red deer perforated canines, 4	-	1
261	Ornament	-	Teeth	Perforated tooth	Canine	Fox	No	Complete	Ornaments	Multiple	5	Yes	11 lynx perforated canines, 5 fox perforated canines, 6 red deer perforated canines, 4	-	1
262	Ornament	-	Teeth	Perforated tooth	Canine	Red deer	No	Complete	Ornaments	Multiple	6	Yes	11 lynx perforated canines, 5 fox perforated canines, 6 red deer perforated canines, 4	-	1
263	Ornament?	-	Bone	Perforated femur head	Femur head	-	No	Complete	Ornaments	Multiple	4	Yes	11 lynx perforated canines, 5 fox perforated canines, 6 red deer perforated canines, 4	-	1

Figure 24: Extract from data table by funerary offering

The presence of two or more items sharing all their traits (type, material, species, etc) is recorded only once. This was done for two reasons. First, in many articles and books, specific numbers of some funerary offerings are not given. Instead, authors refer to ‘groups’ of shells or to the presence of ‘some’ lithic items. Consequently, adding some items found in large groups individually while registering others together would result in an inconsistency that would affect the analyses. The second reason is also related to the analyses. Having the same type of item registered several times might make it seem like a particular age group or sex is more frequently associated with that item, when the result is caused by one individual being deposited with a large proportion of the same object type. It must also be acknowledged that items made of more than one material (*e.g.*, necklaces made of different types of shells) have been duplicated so that all of their components could be properly added to the table.

3.1.9. Geographic information

To understand the spatial relation between sites, the **longitude**, **latitude** (in WGS 1984 system) and **altitude** (in metres above sea level) were recorded. Some coordinates are not precise since, in many papers, the locations of sites were only reported as those of the nearest settlement (*e.g.*, village or town).

3.1.10. Notes

Finally, there is a notes section for information that may be relevant but does not fit into any of the other categories. This ranges from genetic information for individuals to the stratigraphy and state of preservation of the site. A ‘notes’ column does not exist in the data table by site.

3.2. Limitations of the data

When it came to collating the data, the first issue encountered was that information given in some papers contradicted that in others. This was particularly evident in the case of the funerary offerings but was also frequent in the sex and age assessment. In those cases, the explanation based on a larger quantity of data was the one taken. When no explanation was given, the information used was the one extracted from the more recent paper.

In terms of the sex and age data, the poor preservation of human remains at many sites often made assessment impossible. In addition, since most papers are heavily focused on the anthropological study of the remains, important data has not been published for many sites, such as the presence or absence of ochre, fire, the presence of a grave or any structure that shows that the body was not just deposited on the ground, or the orientation of the bodies. This is even more of an issue in the case of the non-human remains. They appear to be published separately and the studies of them are mainly focused on how domestication can be observed from the bones (Detry & Cardoso, 2010).

Information concerning the context of human remains in Iberian Upper Palaeolithic and Mesolithic sites is less frequent and not as reliable as that from French sites. This is because stratigraphy, the human remains, radiocarbon dates and other archaeological materials are studied and published separately and/or presented in different sections or even published in different papers (*e.g.*, Dubouloz *et al.*, 1986; Bosch i Lloret & Tarrús i Galter, 1990; Antunes *et al.*, 2009; Carvalho & Cardoso, 2011). Consequently, to know what was associated with the deceased and what happened after the deposition of the human remains, it is necessary to know the layer and quadrant, information that belongs to the stratigraphic report, and then look for materials in a different section. Problematically, the quadrant is not usually specified, making it impossible to know the exact context of the human remains. When the quadrant is mentioned, the taphonomic processes that may have affected the location of the materials have rarely been studied. This problem is not as common in Neolithic literature, but it still exists.

Secondary burials have less reliable information than primary ones since in many cases it is difficult to know which bones came from disturbed primary burials as a result of taphonomic processes (Wilczyński *et al.*, 2016). Nevertheless, primary burials also have data problems of their own. Primary burials with complete skeletons have a larger number of features that need to be recorded and studied, such as the position of the body (lateral decubitus, supine decubitus, etc.), the flexion level, the lateralization and the orientation of the head. However, the preservation state of the skeleton sometimes means that such observations cannot be made. Knowing the original position of the skeleton requires the use of archaeothanatology, a relatively recent practice that is not frequently applied (Duday *et al.*, 1990).

One problem relates to the documentation of the Sado shell middens in Portugal: the sites of Arapouco, Cabeço das Amoreiras, Cabeço do Pez, Poças de São Bento, Vale de Romeiras and Várzea da Mó. Manuel Heleno, who excavated the sites, passed away without publishing his work. This led to researchers having to use materials such as sketches and photographs of the excavations to try and understand the grave features and the funerary ritual (Umbelino & Cunha, 2012: 92–93). In this respect, Rita Peyroteo Stjerna's PhD thesis, in which archaeothanatology was applied to the human remains to understand the characteristics of the graves in which they were buried, is very useful (Peyroteo Stjerna, 2016a).

A similar situation affects the Muge shell middens, in which the records and remains coming from the first excavations are few. However, there are several papers published by Roche and Ferreira, who continued the excavations of Moita do Sebastião, Cabeço de Amoreira and Cabeço de Arruda during the 1960s (Gallego Lletjós, 2013: 393). In addition, there have been recent excavation campaigns at some of these sites, some of which are still active (*e.g.*, Roksandic, 2006; Roksandic & Rolão, 2007; Ferreira *et al.*, 2015). In these cases, information about the human remains found is more accessible. All of these excavations were undertaken by different people during short periods and with little work undertaken, often separated by several years, which makes understanding the records a complicated task.

An example is the site of Cabeço da Amoreira, in which the labelling of skeletons is difficult to follow since it appears to be referred to differently in different articles. For example, the skeletons from the 1930s were originally referred to by a date code (*e.g.*, 13-14/viii/1931) and a skeleton number (*e.g.*, skeleton 4) and sometimes a trench code (*e.g.*, H1). However, it seems that not all human remains were assigned a skeleton number. This is the case with Skeleton 1, which was originally labelled as 2-VIll-930 (Cardoso & Rolão, 1999). When Jackes *et al.* (unpublished) refer to this individual, using what is supposed to be the original label, they use 30/ix/1930, which shows that at some point there was a mislabelling problem. On the other hand, in their 2001 paper, Cunha & Cardoso refer to one skeleton, supposedly from the 1930s, as Skeleton C (Cunha & Cardoso, 2001). This skeleton is not from the 1930s series, but from a short intervention during 1958, usually being considered the first skeleton found in the 1960s campaign (Cardoso & Rolão, 1999: 208; Roksandić & Jackes, 2014: 116–117).

Similarly, skeletons coming from the 1960s excavations are frequently referred to by the box number (*e.g.*, 80.221), but some of them were given a name (*e.g.*, Santos Junior), and sometimes they are referred to by numbers from 1 to 17, although some do not have a skeleton number since bones that were not mentioned on the field journal appeared alongside other individuals in the boxes (Roksandić & Jackes, 2014). This is why in the data tables for this thesis they are referred to by the name given to the individual when possible, but otherwise by the site name plus the skeleton number followed by the year in which they were found. This was the case for Moita do Sebastião, where associating the skeleton number given in the anthropological report by Ferembach (1974) with the original names given by the excavators in the 1950s campaigns (Cardoso & Rolão, 1999: 184) was not possible.

Returning to the Amoreira case, individuals excavated in the 21st century are referred to differently depending on the paper. While Roksandić (2006) and Rolão & Roksandić (2007) refer to the young woman found in 2001 as CAM-01-01 and the foetus as CAM-01-02, Ferreira *et al.* (2015), refer to the foetus as CAM-01-01. The woman is labelled as CAM-01-03 but her sex is not mentioned (in the introduction to Amoreira it says a young adult female was recovered, but the sex of the only individual mentioned of that age and with a similar set of bones recovered is not mentioned). The same applies to the adult male found in 2001, which is only labelled in the proceedings of the Muge 150th Conference, while the subadult represented only by fragments of the scapula and radius is not mentioned (Arias *et al.*, 2015; Ferreira *et al.*, 2015; Jackes *et al.*, 2015a).

This mislabelling of skeletons has also led to a disagreement about the MNI at each site. Returning to the Amoreira example, Cunha & Cardoso (2001), established it as 21 individuals; Sarasketa-Gartzia (2015) as 34 and Figueiredo (2014: 165) as 47. However, when reading the various publications that present up to date data (Roksandić, 2006; Roksandić & Rolão, 2007; Roksandić & Jackes, 2014; Ferreira *et al.*, 2015; Jackes *et al.*, unpublished) and the published excavation journals (Cardoso & Rolão, 1999), I was able to count a total of 41 individuals based on the MNI given by the authors and the excavators for each campaign: 10 were found during the 1930s, 17 during the 1960s and six in the most recent studies. Eight additional individuals appeared in the storage boxes from the 1960s excavations, although they were not mentioned in the field journals nor shown on the sketches, plans and images.

A similar case is Cabeço da Arruda, which was first excavated in 1863. Information about this site is confusing since not all the individuals exhumed were detailed in the excavation record, frequently shared with other sites (*e.g.*, the same field journal for Cabeço da Amoreira and Cabeço da Arruda in 1963), or in publications. This is why some researchers (*e.g.*, Jackes & Meiklejohn, 2008) have tried to re-examine all the existing documentation to establish a minimum number of exhumed individuals. The most recent attempt was made by Jackes *et al.* (2015), counting a MNI of 124. However, while I was examining the field journals and the information offered in that paper, as well as Olívia Figueiredo's (2014) master's dissertation, and adding all the individuals reported by each author for the different archaeological campaigns, I counted a minimum of 185 individuals, some represented just by isolated bones or teeth (*e.g.*, there are five juveniles represented by mandibles).

Lastly, it should be noted that the overall quantity and quality of data is influenced by external factors. For example, the research techniques that were or were not available when the papers were published (*e.g.*, DNA and Amelogenin analysis for sex assessment) have a direct impact on the quality of data (Stewart *et al.*, 2017). The dictatorships in Spain (1939-1975) and Portugal (1926-1974) are also relevant influential factors. After the taking of power by the dictators, the researchers, organizations and publications that were not close to their ideologies were replaced or suppressed (García Alonso, 2009: 107–210). Therefore, the dictatorships heavily impacted the quantity and topics of the research produced in those countries before the mid-1970s (Fernández-Götz & García Fernández, 2011; Lillios, 1995; Fabião, 1996). The laws and regulations regarding archaeological excavations also have an important impact on the quantity of data. For example, in Luxembourg, archaeology was not professionalised and was barely regulated until 1972 (Bis-Worch, 2007; Meyer, 2009) and, in France, more than 90% of the archaeological information has been produced since 1977 because, until then, there was no law that made mandatory to carry out excavations before construction works (Coudart, 2001: 523; Inrap, 2019).

3.3. Data analysis

The data analysis was divided into three parts: the visualisations in graphs, the statistical analyses and the generation of maps. The graphs and statistical analyses are based on the data table by individual, the data table by site or the data table by funerary offering depending on which one is the best option to look at each specific feature. For example, the analyses and graphs related to site features (*e.g.*, location, site type, MNI) are based on the data table by site; the ones related to features specific to each grave and individual (*e.g.*, position of the deceased, presence of funerary offerings) are based on the data table by individual; and those related to funerary offerings (*e.g.*, type of funerary offering, material category) are based on the data table by funerary offering. In addition, in those cases where tests based on two tables can provide complementary information, both have been performed. For example, the most frequent type of burial might be individual or multiple, and this would be reflected in the data table by individual; but often, at a single site, there are both individual and multiple burials, and this is shown in the data table by site. In addition, unreliable data have been excluded from the analyses unless stated otherwise.

A similar situation exists for the maps. Most are based on the data table by site. This prevents overlapping of data (all the individuals at the same site share the same coordinates) and allows a better display of the information from sites in which individuals present different features thanks to the category 'both' (*e.g.*, the sex column has three categories in the data table by site: 'male', 'female', and 'both'). However, maps based on the data table by individual have been used to display the distribution of a single feature (*e.g.*, individuals represented by isolated bones) or the combination of two features (*e.g.*, male individuals represented by isolated bones).

All the Excel tables were converted to CSV files and slightly modified before using them in any program (SPSS, R and ArcGIS). For example, column names had to be changed for them not to contain any spaces so the programs had no problems reading them. The name of the columns 'Date cal BC (from)' and 'Date cal BC (to)' was changed to 'Start' and 'End'. More importantly, some cells in the 'Date cal BC (from)' and 'Date cal BC (to)' contain multiple values as there were multiple dates available for the same individual, site and/or offering. In the CSV files, when one site, individual or offering has more than one date, only the older date available for the 'Start' column and the earlier date for the 'End' column were preserved, as each cell can only contain a single value for it to be read as numeric. Lastly, there is an extra variable in the CSV tables called ‘Weight’, whose value is always 1. This was needed for the Monte Carlo simulations.

Analyses are performed on the whole data sets and/or by millennium blocks, rather than discriminating by period, archaeological cultures (*e.g.*, Solutrean, Magdalenian) or cultural areas. The option of analysing the sample by period was discarded for two reasons. First, amalgamating sites from the 42nd millennium cal BC and the 10th millennium BC would combine human groups that did not coexist. Second, variation in the use of the different ritual elements is sometimes higher within than between periods. The option of performing analyses by archaeological culture also presented issues. One is that the sample for some of them is very small (*e.g.*, there is only one Epigravettian individual) and the sites are separated. Another is that these cultures are established based on material culture, which does not necessarily relate to funerary practices.

Using established cultural areas, such as the Cantabrian region or the Plateau region in Iberia, did not seem a good option either. First, they are strongly influenced by present-day territorial boundaries, such as the autonomous communities in the case of Spain. Second, they are defined by typology and complexity (*e.g.*, lithic production style, pottery decoration, etc.). These are not good methods for defining past cultures or studying past behaviours that are not directly linked to tool production, such as the deposition of human remains.

It was also considered performing the analyses based on funerary customs areas. These areas would be established based on the similarity of the funerary customs (presence of ochre, gravestones, funerary offerings, use of primary or secondary depositions, etc.) found in sites placed in close geographical locations. However, this would not imply the same culture for a group sharing a funerary customs area, since the use of the same ritual elements can have different and even opposite meanings for different cultures. This idea is derived from anthropological cultural areas, used to classify and group different cultures through the sharing of several features such as types and decorations of material culture, residential patterns and kinship (Herskovits, 1952: 204–222). These areas are a tool to facilitate the study of different human groups and must never be mistaken for real cultural boundaries (Herskovits, 1952: 219).

The purpose of using funerary customs areas was to make sure that the inferences made on the data could be generalized for a certain territory and to obtain more accurate results when making analyses based on frequencies, so they would not be distorted by the fact that only in some regions did human groups use a certain type of ritual feature. For example, a hypothetical case in which the frequency of ochre use was common in the south of Iberia but non-existent in the north. However, when the data on the use of funerary ritual elements were plotted on a map, no funerary customs areas could be observed, except, perhaps, for a small group of sites in Belgium and the cemeteries in the Portuguese shell middens. This would not change if the results were plotted altogether or by millennium. In addition, when plotting them by millennium, an additional problem appeared: before 10th millennium cal BC, there are barely 10 funerary sites per millennium, and they are widely separated.

Taking all this into consideration, the best option for the analysis of this set of data is to analyse it altogether and/or by millennium blocks, given that, in most cases, each site analysed belonged to a different culture and the same ritual elements likely had a different meaning for the people inhabiting those sites.

3.3.1. Graphs

Two types of graphs are used to illustrate data –visualisations of Monte Carlo simulations that relate a certain feature of the funerary deposition with the time scale and pie charts.

Monte Carlo graphs have been included for every variable with a large enough sample size. These graphs have been generated in R using personalized code created with the help of David Orton (see Appendix VII). This code helps generate a set of Monte Carlo simulations, each representing one of the many possible temporal distributions within the age range provided by the radiocarbon dates or the chronocultural attribution of a certain variable (*e.g.*, funerary feature). Each graph is composed of 3000 different runs of a Monte Carlo simulation. The advantage of using Monte Carlo simulations to represent changes through time instead of other methods, such as midpoints or aoristic sums, is that it acknowledges that these date ranges do not represent a fixed point in time, but they do not represent duration either. Instead, Monte Carlo simulations allow the inclusion of uncertainty in the analysis and graphic representations of data (Crema, 2012; Orton *et al.*, 2017; Crema & Kobayashi, 2020).

The code works on the assumption of a uniform probability distribution between the start and end dates of each individual, site or offering date range, to randomise dates in each simulation run. The uniform probability distribution was chosen over an uneven one as it facilitates the required mathematical calculations, without supposing a significant loss of accuracy (Crema, 2012). A kernel density estimate was used to smooth and present the results. To prevent it from making excessive assumptions, the smoothing kernel was set as rectangular instead of using the default setting (gaussian), which provides smoother results. Since Monte Carlo simulations show random possible temporal distributions, plots may vary slightly each time they are plotted. However, the large number of repetitions used in each graph (3000), should make these differences negligible.

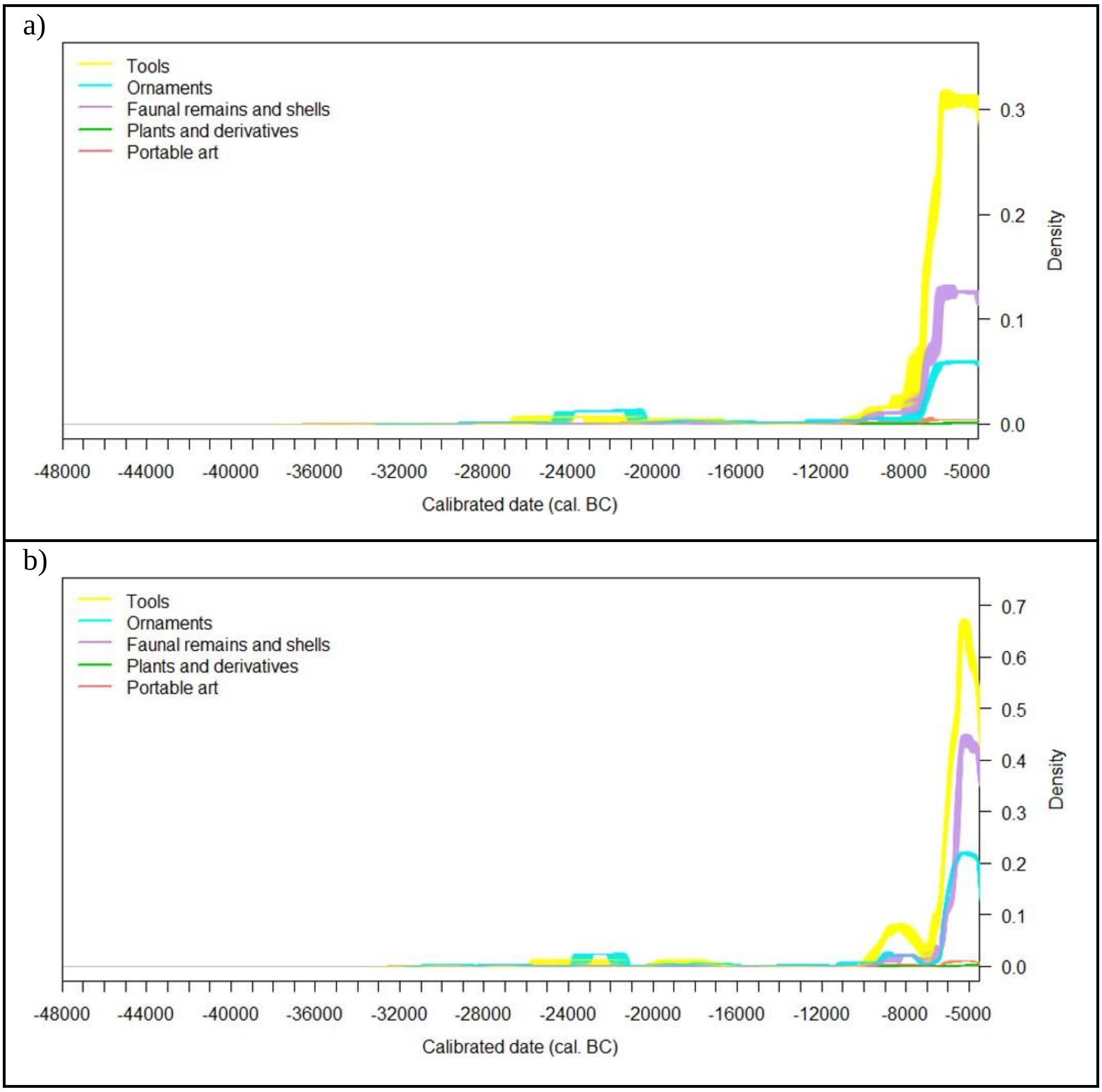
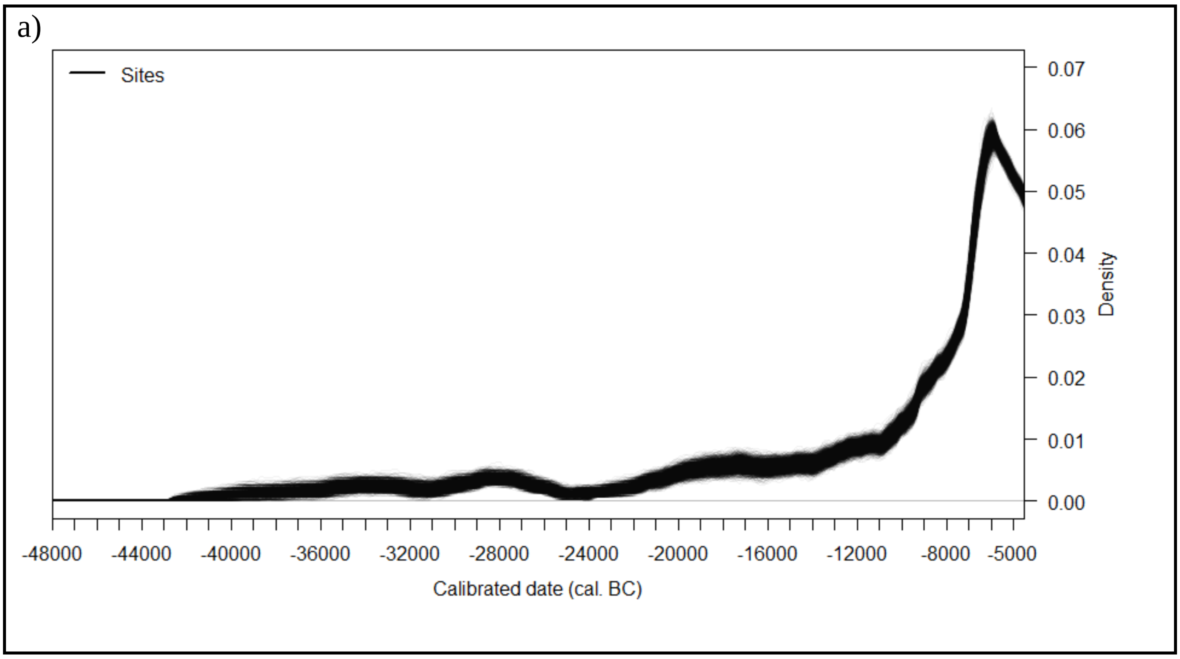


Figure 25: Hypothetical examples of Monte Carlo simulations by site (a) and individual (b)

Monte Carlo simulations are plotted both by site (Figure 25a) and by individual (Figure 25b). Plotting them by site offers information about the general behaviour of groups while plotting them by individual is more precise in showing the general variety of practices without considering which group developed them. In addition, plotting by site and individual varies the assumption of whether the data ranges mostly represent uncertainty or duration. A site-level simulation assumes that the individuals were quite close together in time, but it is uncertain exactly when. An individual level simulation assumes that individuals were spread across much of the reported date range and, thus, represent the duration of the use of the site. The categories of information inherent to funerary offerings (*e.g.*, type of funerary offering, material category or species/geology type) are plotted by funerary offering. All graphs go from 48000 to 4500 cal BC and each unit of data (sites, individuals and funerary offering) is weighted to one. In the plots by individual and by offering, the bandwidth of the kernel is set to 500, while for plots by site it is set to 1000. These bandwidths offer a better degree of smoothness to the results.



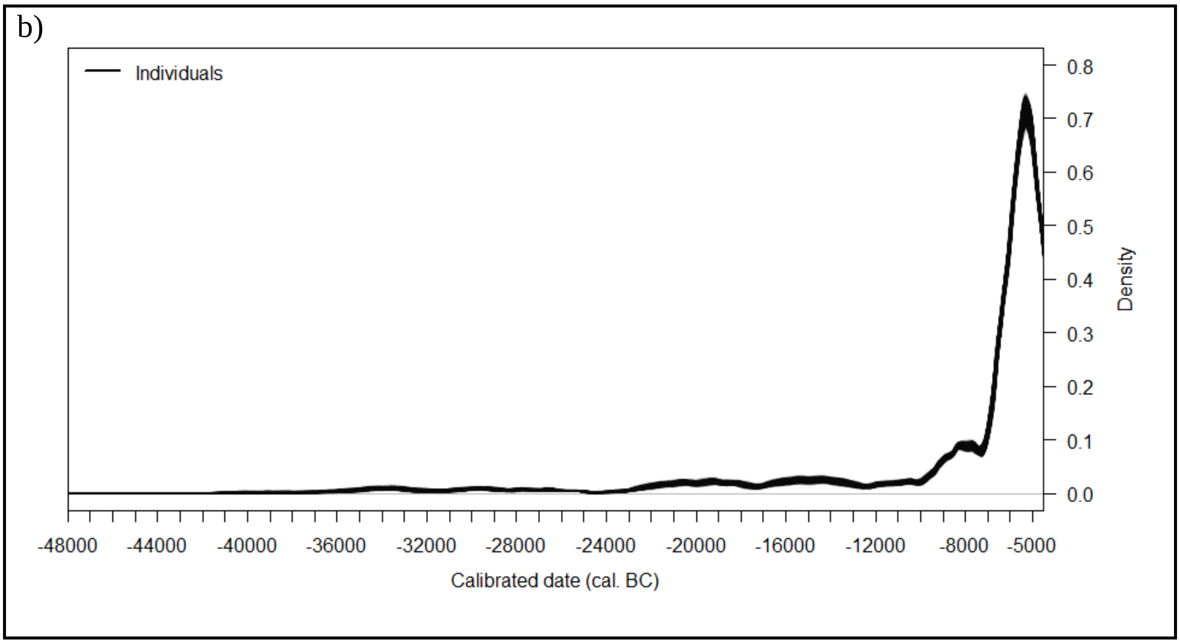


Figure 26: Density of funerary sites (a) and individuals (b) dated from 48000 cal BC to 4500 cal BC

The density of individuals may be slightly reduced when the limit of the period of study (4500 cal BC) is approached (Figure 26). This is partly caused by the way the limit was made. Individuals for which the earliest date range's limit was earlier than 4300 or 4500 cal BC (depending on the area) were only collated in some cases: if the individuals belonging to later phases were at sites with a continuous sequence of depositions that included several individuals within these dates, the earlier depositions were also added to avoid breaking the sequence (*e.g.*, the sequence from the site of Los Cascajos ranges from 5311 to 3775 cal BC and all the individuals were included). In addition, individuals for which the lower date limit was just a bit later than 4300 or 4500 cal BC were also included (*e.g.*, the individual from Cueva de los Murciélagos was included and was dated from 6459 to 4047 cal BC). However, the exclusion of large funerary sites with only a few individuals within the 4300 and 4500 cal BC limits may have affected the density of data around that time.

Nevertheless, this decrease is likely not true to reality. There are 112 Upper Palaeolithic sites, 113 Mesolithic sites and 140 Neolithic sites. When looked at by year, there are 22 sites in c. 7500–6500 cal BC, 92 in c. 6500–5500 cal BC and 125 in c. 5500–4500 cal BC. In the case of individuals, a decrease can be observed, but it is not as abrupt. By period there are 323 Upper Palaeolithic individuals, 863 Mesolithic individuals and 798 Neolithic individuals and by year, there are 92 individuals in c. 7500–6500 cal BC, 912 in c. 6500–5500 cal BC and 734 in c. 5500–4500 cal BC.

The second type of graph is a regular pie chart to show the number and percentage of a certain feature in a concrete moment of time (*e.g.*, the total number of each type of funerary offering). These graphs have been made for the whole period, but also by period or blocks of millennia shown in the Monte Carlo simulations. For example, if in the Monte Carlo simulation there seems to be a change in the 15th millennium cal BC and another in the 8th millennium cal BC, three different blocks would be created (from the 48th to the 16th, from the 15th to 7th and from the 8th to the 5th), and a graph would be made for each one of them. There are only a few pie charts in the whole thesis because including charts for each relevant piece of data would cause there to be an excessive quantity of figures and, thus, charts would lack impact.

3.3.2. Statistical analyses

The $\chi 2$ and Kruskal-Wallis tests have been used to check the correlations between variables. $\chi 2$ has been used for the qualitative variables (*e.g*., the relation between the sex and the presence of funerary offerings) and Kruskal-Wallis for the quantitative ones (*e.g*., the relation between the MNI and the number of funerary offerings). The Kruskal-Wallis test requires that the analysed variables follow a non-parametric distribution and this was checked with the Shapiro-Wilks normality test. Both the $\chi 2$ and the Kruskal-Wallis tests were performed for the sample as a whole, but also by the time blocks observed in the Monte Carlo simulations. These were performed at a level of significance of 0.05, which means that there is a 5% risk of concluding that a relation between variables exists when there is no actual relation. The null hypothesis of both the $\chi 2$ and the Kruskal-Wallis test is that the variables are not correlated. This means when the p-value is lower than 0.05, the null hypothesis is rejected and the variables are correlated. The p-values from the tests are included in Appendix V and the contingency tables of the tests offering relevant results are included in Appendix VI. Sample sizes of each variable can be found in Appendix IV.

The correlations have only been explained in-text when they are offering relevant information. For example, results like the correlation between the MNI and if the site is a collective funerary space have not been explained as they are truisms. These sorts of truisms are recurrent in the analyses by site as a result of the variable ‘both’, since for more than one feature to be present at the same site, at least two individuals are needed. The larger the site is, the more probability there is for finding more than one feature. Lastly, correlations that are based on the absence of two rare features (*e.g.*, a correlation caused by the absence of fire and the absence of ochre) have not been explained either. Appendix VI contains the contingency tables for the χ^2 tests, as there were too many to include them in the main text. However, the tables for correlations that are not mentioned in-text are not included there either.

All the statistical analyses were performed in IBM SPSS Statistics 27 using the data set by individual, by site or by offering, depending on if the feature examined is a site (*e.g.*, location, type of site, delimitation), an individual (*e.g.* use of a grave, sex and age of the individuals) or an offering feature (*e.g.*, type of offering or material). The data analysed by statistical tests were filtered to exclude the most unclear cases (those marked with an interrogation mark). Lastly, when analyses related to the 'Site type' variable are performed, only the categories 'Funerary cave', 'Isolated burial', 'Activity area', 'Settlement' and 'Settlement cemetery' have been considered, since the rest of them have only a few cases, or are the result of lacking information (*e.g.*, most cemeteries are classified as that because the only information available about them was the MNI, and they were likely placed in or near settlements).

It is important to note that analyses by millennium blocks were made using a query on SPSS to select specific data. Said query was structured as follows: ((Start <= 48000 AND Start >= 4500) OR (End <= 48000 AND End >= 4500)). This is the query that allows better results. Nevertheless, in some cases, it can leave data out of the selection. What happens in the cases where both the starting and the ending year are outside of the query. For example, if a period that starts at 15,000 cal BC and ends at 9000 cal BC is selected, sites whose date ranges from 18,000 cal BC to 8000 cal BC would be left out. Sometimes this issue is presented with sites at the end of the sequence. Examples of this are the sites from the Linear Pottery Culture dated between 5500-4100 cal BC or the Cardial Ware sites dated between 5500-4000 cal BC which would be left out if the selected date range is, for example, 5000-4500 cal BC. In these cases, the date range selection has been expanded to 5000-4100 cal BC to include the Linear Pottery sites. This has been done as it is preferable to include in the analysis a couple of sites that are posterior to the aimed period than exclude almost all the sites from the Linear Pottery Culture. However, there are only a few Cardial Ware sites ranging between 5500 and 4000 cal BC, so it is preferable to leave those out of the sample.

3.3.3. Maps

Maps that allowed visualization of the data have been made with ArcGIS and they display the available information on a certain funerary deposition or site feature, based on the sites or individuals. These maps have been made for the whole dataset (see Figure 27), but also by the blocks of millennia shown in the Monte Carlo simulations. As with the statistical analyses, the maps by millennium blocks have been made using a query on ArcGIS to select specific timeframes. Said query was structured as follows: ("Start" <=48000 AND "Start">=4500) OR ("End" <=48000 AND "End" >=4500). Again, despite this being the best option, in some cases, it can leave data out of the selection and, thus, the maps.

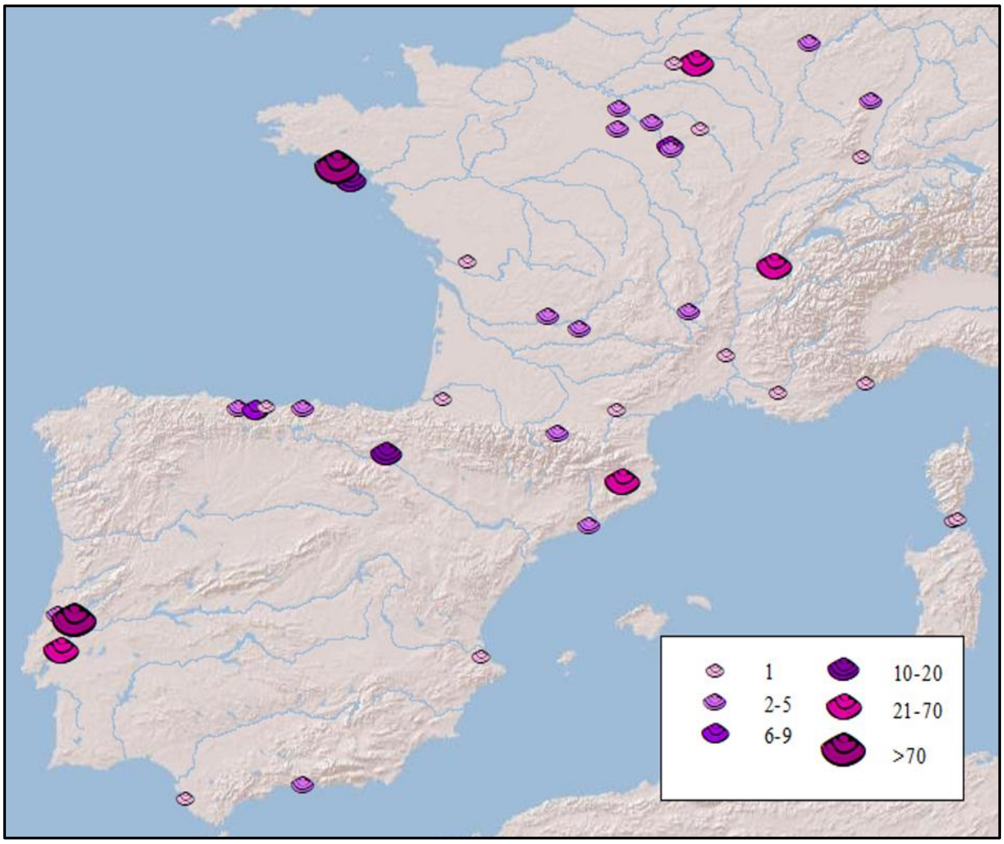


Figure 27: Map showing a hypothetical example of the distribution of shells

Aside from the data collated in the data tables, all the maps display information about the watercourses and orography of Europe, so it can be appreciated which sites are placed near mountains and/or water formations. However, it must be noted that this information, as well as the location of coastlines, correspond to present-day Europe, and it has highly varied from prehistoric times.

3.4. Data interpretation and ethnographic analogies

Ethnographic analogies are the use of ethnographic data generated by anthropology to inform interpretations about past societies (Currie, 2016: 84). In this thesis, ethnography has been used in two different ways. The first and most important is to widen the range of possible interpretations applicable to some of the data resulting from the analyses. In archaeology there are two main valid uses of ethnographic analogies: the use of the ethnography of a living human group directly linked to the archaeological record or a transcultural approach to the interpretation of material culture (Wylie, 1985; Martelle Hayter, 1994; Mora, 2007; González Urquijo *et al*., 2015; Currie, 2016). The latter is the one that has been used in this work and it must be noted that its purpose is to offer a wide array of possible interpretations about the uses and meanings of material remains, but never a unique and definitive answer (Ucko, 1969: 262–264; González Urquijo *et al*., 2015).

The second way in which ethnographic analogies have been used is to support or disprove some of the hypotheses with quantitative data based on cross-cultural studies. This has only been done in two cases. In the first one cross-cultural demographic studies of modern hunter-gatherer, foraging and horticulturalist populations (*e.g.*, Marlowe, 2005; Gurven & Kaplan, 2007; Hill *et al.*, 2011) were used to get an idea of the size these groups can have and whether the population distribution observed in prehistoric funerary contexts could be true to reality or a result of burial selection practices. It is important to note that the sizes and population distribution of past and present hunter-gatherer and horticulturalist societies are not necessarily the same but that this is the best option to approach the issue (French, 2016).

In the second case, ethnographic atlases (Murdock, 1981; Gray, 1999) that contain quantitative information of up to 1291 societies from around the globe have been used to obtain generalised information about the usual labour division in hunter-gatherer and horticulturalist societies. The information from these atlases is not nuanced but I still consider it useful given the fact that the sample of societies it considers is much wider than what could be achieved through the reading of several more nuanced studies, each one of them focused on a single society.

Despite considering the use of ethnographic analogies as the best way to interpret the results, the author is well aware of the potential issues derived from their use. Ethnographic analogies derived from cultural comparison, a subdiscipline of anthropology that was born along with ethnology in 18th century Germany. In the same way as ethnology itself, created as the study of primitive, cultural comparisons was born associated with 19th-century racial theories. Originally, cultural comparison was made from an evolutionist point of view and was used to prove that all cultures evolved in the same way and, thus, that some of them were more ‘primitive’ than others. To achieve this aim, not only coetaneous societies were compared between them, but also living hunter-gatherers and early agriculturalists were compared with past populations. As a result, for years, any kind of cultural comparison was considered an obsolete method (Radcliffe-Brown, 1958a, 1958b; Fernández Moreno, 2012: 16).

This criticism caused the revision of the method and created an awareness of the problems cultural comparison has (Fernández Moreno, 2012). The first one is how to know what different human groups have in common and how to explain variations (the combination between unity and diversity). This debate is usually focused on biology vs culture and might lead to ethnic-racist interpretations (Geertz, 1966; Menéndez, 2002). The second one relates to the analytical units and classification schemes (what type of analytical categories and cultural equivalences can be compared), since the comparison of non-comparable cultural categories creates xenophobic interpretations (Bandrés & Llavona, 2010). The last problem is the interpretation of cultural categories (how to compare cultural categories and who has created them, the researcher or the subjects of study) (Geertz, 2008; *e.g.*, Bohannan, 1966). This criticism made possible the appearance of new approaches to the comparison of cultures, such as the inductive and structuralist methods and transcultural studies. The application of one of these depends on the case of study since all of them are nowadays considered valid methods to achieve generalizations about cultural facts (Fernández Moreno, 2012: 16–17).

These generalizations of cultural facts are what is useful to archaeology. However, in this case, the purpose of the use of these comparative techniques is not the same as what the anthropological research looks for (the production of ethnographies), since the subject of research is long gone. Instead, the aim is to get a better understanding of those long-gone populations by using analogies between their material remains and those of the living populations (Currie, 2016: 84). Due to the same reason, the problems faced are not the same either, although they are similar. In archaeology, it is potentially problematic to make inferences about what living human groups might have in common with past populations, comparing elements that cannot be compared, as well as assuming that the cultural categories in past populations are the same as in modern societies, whether they come from the researcher's culture or ethnographies (Wylie, 1985; Martelle Hayter, 1994; Mora, 2007: 170–172).

The result of these potentially problematic interpretations also differs slightly from the ones affecting anthropology. In archaeology, it is not comparing modern societies with different socioeconomic systems in an unfair way that might lead to xenophobic interpretations, but to assume that present hunter-gatherer and early agricultural societies, and prehistoric populations are the same (Martelle Hayter, 1994; Ravn, 2011; Currie, 2016). This assumption generates two research issues and a social issue. The research issues are taking the interpretations as true and absolute; as well as comparing the specific meaning of material culture and cultural categories. For example, interpreting a specific type of pottery decoration as an expression of femininity because that is the case in certain modern hunter-gatherer societies, instead of only suggesting that those decorations could be acting as identity markers; or applying a specific modern kinship system to the individuals of a prehistoric cemetery. The social issue is the creation of an idea in society that modern hunter-gatherers are 'primitive' since they have not 'evolved' since prehistory and, thus, justifying their annihilation through their 'need for modernization' (Wylie, 1985; Hernando, 2012b).

These problems, many of which exist by design, and the fact that a culture can only be fully understood in its own terms should not be taken as a justification to fall into extreme relativism. If an attempt to obtain certain generalizations and interpretations is not made, archaeology and any discipline aiming to study cultures and societies would lack purpose (Ucko, 1969: 262–264; Kaplan & Manners, 1979: 25–34). Furthermore, not using ethnography would not mean that comparisons would not be made. It would result in the use of implicit rather than explicit and likely subconscious comparisons of the study cultures with our own (Chang, 1967; Yellen, 1976; Martelle Hayter, 1994; Ravn, 2011).

Chapter 4: Death and the use of landscape

The physical location of prehistoric human remains within the landscape is a topic that has been frequently analysed in the literature, especially concerning trends and changes in mortuary practices (*e.g.*, Beyneix, 1998; Olària i Puyoles, 2003; Verjux, 2004; Aura Tortosa, 2010; Arias, 2014). The existing data concerning the location of human remains show that, during the Upper Palaeolithic, the Mesolithic and even during the Early Neolithic the deceased were mainly deposited in domestic spaces and placed in caves and rockshelters. Though, through time, gradually more human remains were placed in open-air locations (Cauwe, 1996; Arias & Álvarez-Fernández, 2004; Verjux, 2004; Meiklejohn *et al*., 2009; Aura Tortosa, 2010; Pettitt, 2011: 242; Arias, 2012a: 12, 2014; Beyneix, 2012a: 225; Díaz-Zorita *et al*., 2012: 51; Gibaja *et al*., 2012c: 31, 2015; Acosta Martínez, 2013: 40; Peyroteo Stjerna, 2016b: 637; Schulting, 2016; Orschiedt, 2018). The two main exceptions to this are the large Mesolithic open-air cemeteries from the Atlantic façade (Arias & Álvarez-Fernández, 2004; Verjux, 2004; Meiklejohn *et al*., 2009; Aura Tortosa, 2010; Arias, 2014; Gibaja *et al*., 2015; Orschiedt, 2018) and the Early Neolithic funerary depositions in the area of the Linear Pottery Culture, which are mainly placed in open-air locations (Beyneix, 1998).

Unlike the megalithic and post-megalithic periods (*e.g.*, Criado-Boado, 1988, 1991: 89, 2015; Wright, 2013: 406–407), the economic, social and ideological reasons for the placement of the dead in certain locations and the broader implications of those decisions, are not commonly explored, since studies are usually focused on environmental reasons. An example is Mieklejohn *et al*. (2016) discussing the correlation between the absolute age of sites with human remains, the duration of occupation and their location relative to the coastline. Another example is Arias and Ontañón (2012) who discuss the change in use of La Garma karst system's caves, which were used for settlement during the Palaeolithic and the Mesolithic (the deep areas first, and then those near the exterior) before becoming funerary spaces during the Neolithic. This has been explained as the result of the climatic change, the partial collapse of the roof of some of the caves and the adoption of farming. The potential symbolic meaning of caves is mentioned but never fully explored. An exception is Schulting (2016) who not only considers the functional aspects of the use of caves as funerary spaces, but also ideological reasons —that the caves (and particularly the entrances) were regarded as liminal places.

This chapter will attempt to fill the gap by looking more closely at the physical location of human remains, making an in-depth analysis about the landscape contexts funerary sites were placed in, their features and their internal distribution, and the possible meanings behind them. With this purpose, the visibility of the archaeological record will be taken into account. Felipe Criado (2012: 277–279) defined four different types of strategies used by societies to hide or exhibit in the landscape the material culture resulting from social action: *strategies of inhibition*, or the lack of interest in hiding or exhibiting the social action; *strategies of hiding*, or the intentional hiding of the results of the social action; *strategies of exhibition*, or the intentional exhibition of the results of the social action; and *strategies of monumentality*, a kind of exhibition strategy that attempts to exhibit the results of the social action both in space and time.

Each of these strategies could be reflecting different ways in which humans related to space and time. Strategies of hiding could be showing an absence of land division and nature/culture division, as artificial demarcation of the landscape was intentionally avoided. Intentionally hiding the results of social action also effectively hides the evidence of the passage of time. This has led some authors (Criado-Boado, 2012: 285–286; Hernando, 2002) to consider the fear of the passage of time as another potential reason behind the use of strategies of hiding in those societies that perceived change as a risk to the continuity of the group. On the other hand, the intentional exhibition of the material results of social actions would show the presence of a nature/culture division, reflected in the demarcation and social appropriation of the land. In the case of monumentality, time would now be used to legitimize the group. This is especially evident when applied to the funerary record. Hiding death is a very efficient way of hiding the passage of time, while exhibiting it in the shape of cemeteries or megaliths is a way of using the ancestors to legitimize a group's existence and ownership of the land (Criado-Boado, 1991: 93–96, 105, 1993: 51, 1995).

Along with taphonomy, hiding death is a possible reason for the absence or scarcity of funerary remains during the Upper Palaeolithic, Mesolithic and Early Neolithic. Some of the funerary practices that could destroy the evidence of death are the abandonment of dead individuals in places to which the group will never return, or the deposition of bodies in trees to ensure their disappearance by natural processes, or anthropophagy. Other strategies of hiding that do not completely eliminate the body of the deceased are the burial of individuals under dwelling structures or depositing them with rubbish. This last-mentioned behaviour can be observed for some funerary remains found in shell middens (Criado-Boado, 1991: 94; Arias, 2014: 70). The appearance of new types of funerary sites, such as cemeteries, will be evaluated in terms of constituting or not constituting the beginning of the change of the relationship humans had with their environment, as well as a change from strategies for hiding death towards exhibition strategies and ancestral land claims.

4.1. Landscape and environmental context

4.1.1. Caves, rockshelters and open-air sites

From the Upper Palaeolithic to the Early Neolithic, open-air funerary sites were located on plains, usually near rivers. Caves and rockshelters containing human remains were, as might be expected, located in mountainous places (Figure 28). Since most human remains from these periods were placed in domestic spaces (Beyneix, 1998; Arias, 2012a, 2014; Díaz-Zorita *et al*., 2012; García Puchol *et al*., 2012; Rojo-Guerra *et al*., 2016), this distribution of human remains is likely a reflection of the environments people were living in. Most rockshelters are located in a small region of France. However, the concentration of sites in small areas, especially those in caves or rockshelters or near rivers, may reflect a bias whereby nearby locations were explored after the caves/rockshelters were discovered.

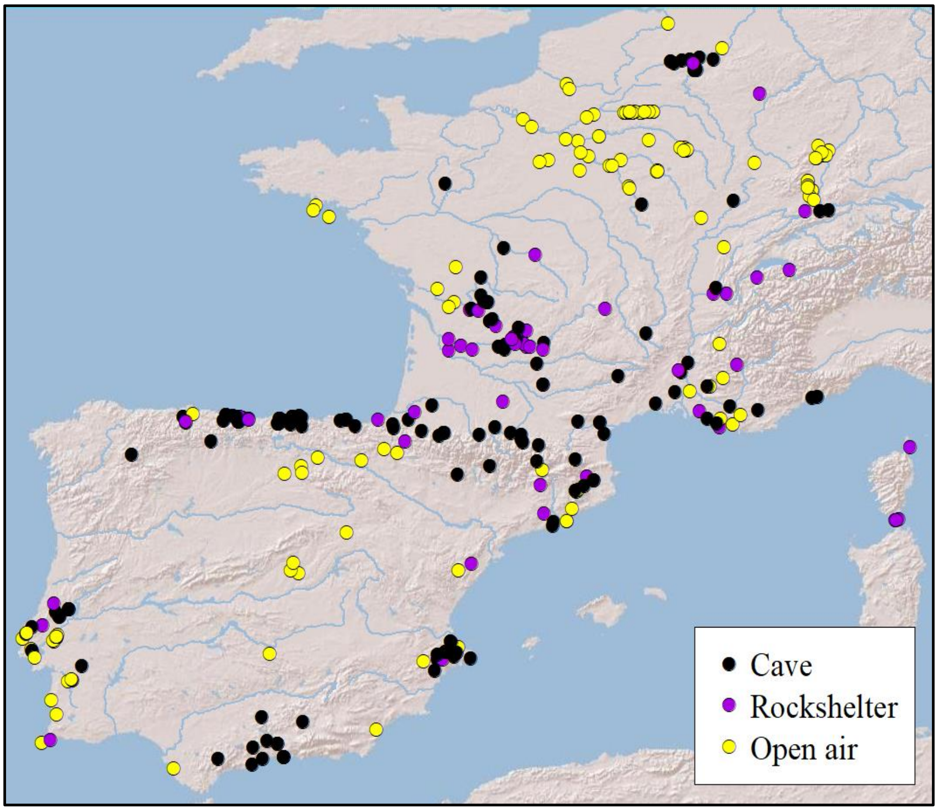


Figure 28: Geographical distribution of sites by location

Before c. 14000 cal BC, all known funerary sites were located in caves and, less commonly, rockshelters. Subsequently, some funerary sites started to be placed in open-air locations. During the Mesolithic (c. 7000 cal BC), open-air funerary sites outnumbered rockshelters and caves (Figure 29a). Furthermore, open-air sites started to contain a larger number of individuals than those located in caves or rockshelters (Figure 29b). A possible reason for the rapid increase of human remains in open-air sites is that remains from more recent periods have been exposed to taphonomic processes for less time and, thus, are better preserved (Surovell & Brantingham, 2007: 1871). In addition, the dramatic climate changes of the Late Glacial Maximum-Bølling, the Allerød-Younger Dryas and the Pleistocene–Holocene transitions likely had an important effect on the remains (Collins *et al.*, 2002; Hedges, 2002). However, bones deposited in places with more constant temperature and humidity would have had better chances of survival.

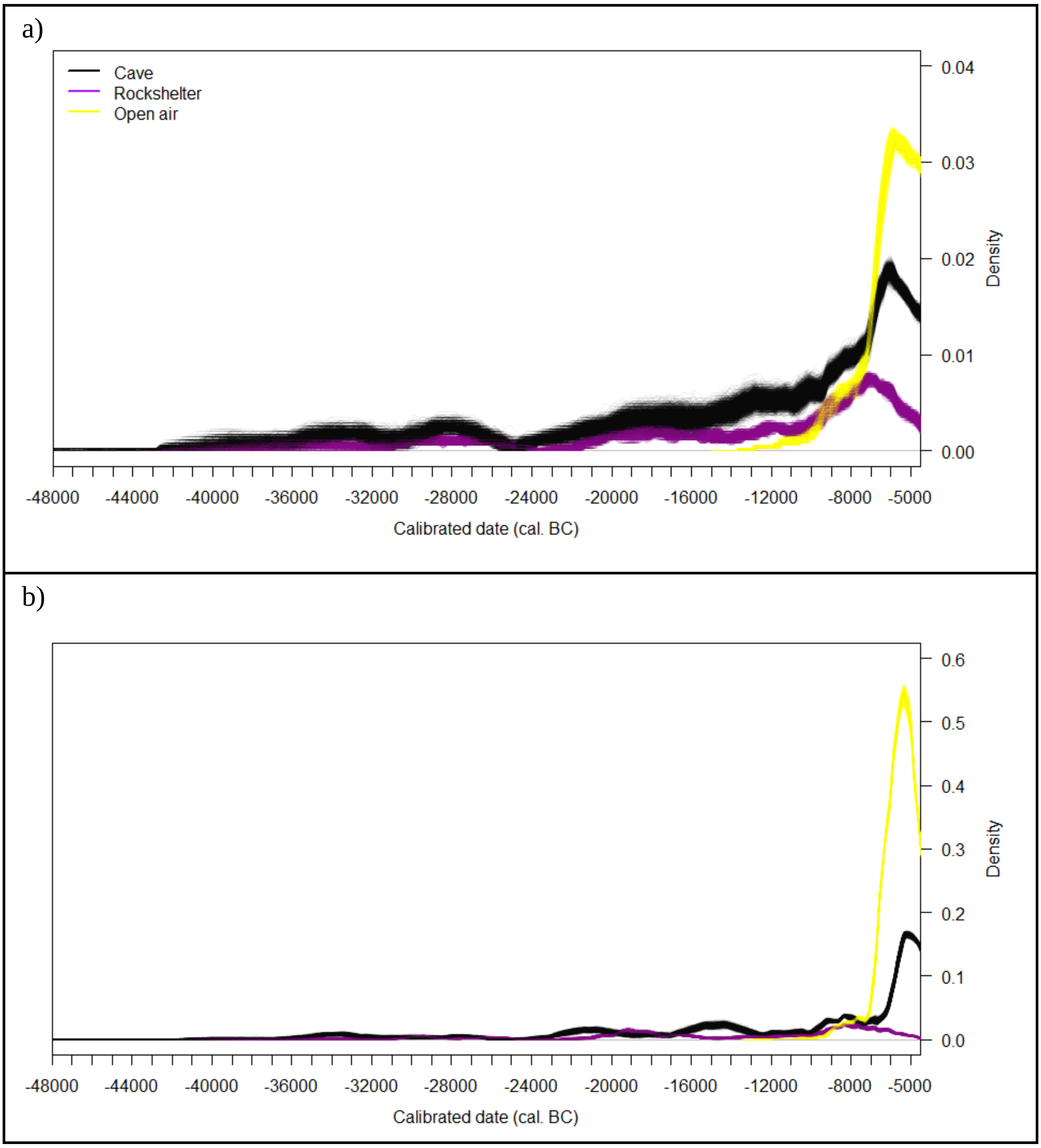


Figure 29: Monte Carlo graphs showing changes by year in the preferential location (cave, rockshelter, open-air) of sites (a) and individuals (b)

Caves and deep burials are some of the places that offer such conditions (Hedges, 2002: 322), although, in the case of deep burials, other factors might affect the preservation of the bone, such as the soil pH (Hedges, 2002: 325). However, deep burial is arguably more relevant in bone preservation than long-term soil conditions (Smith *et al.*, 2007) since it offers protection against scavengers. Thus, bone has a higher chance of surviving in open air locations if it was buried deeply than if it was left on the surface. As a result, another factor influencing the gradual increase of funerary remains found in open-air sites might be a general increase in the incidence of deep burials. It has been suggested that the low number of human remains from the Upper Palaeolithic and Mesolithic (large cemeteries are the exception, not the rule) (Gibaja *et al.*, 2015; Orschiedt, 2018) might be partly due to burial being an unusual funerary practice (Arias, 2014: 70). Some ethnographies show that the abandonment of the deceased in unritualised customs or in ways that ensure that the body will disappear is not unusual in hunter-gatherer societies and some horticultural groups (Clastres, 1981; Woodburn, 1982; Criado-Boado, 1991; Gallego Lletjós, 2011; Weiss-Krejci, 2013). A complementary reason for this increase of human remains in open-air might be that the climate change at the beginning of the Holocene influenced the location of human remains, since they are usually linked to domestic spaces and these moved from the deep parts of the caves to the entrances, and then to valleys due to the requirements of agriculture (Arias & Ontañón, 2012).

From c. 7000 cal BC, the number of individuals deposited in caves also increased, while the number of individuals in rockshelters started to decrease. This shows how, despite the rise of open-air funerary sites, the deposition of individuals in caves always remained important. This might be because caves were still occasionally used as domestic spaces, but also to their symbolic significance as liminal places (Schulting, 2016: 557).

Geographical patterns not intrinsically linked to terrain features (*e.g.*, finding open-air sites on large plains and in caves in mountainous areas) can be observed after 7000 cal BC (Figure 30). Thereafter, most sites, both Neolithic and Mesolithic, were placed in the open air except for the Neolithic sites in the area of the Mediterranean Coast and the Pyrenees, which were mainly in caves. This may be because Mesolithic cultural traditions survived longer in that area since it is known that similar funerary customs to those of previous periods were maintained there (Beyneix, 1997; Garcia Borja *et al.*, 2011; García Borja *et al.*, 2016). Alternatively, since most Mesolithic sites were located in the open air, the differences found in that area might be the result of the influence of immigrant Anatolian farmers and population replacement, at least in the case of Iberia, where the work by Olalde *et al.* (2019) shows there was a high influence of Near Eastern genes on the Iberian gene pool after 5500 cal BC.

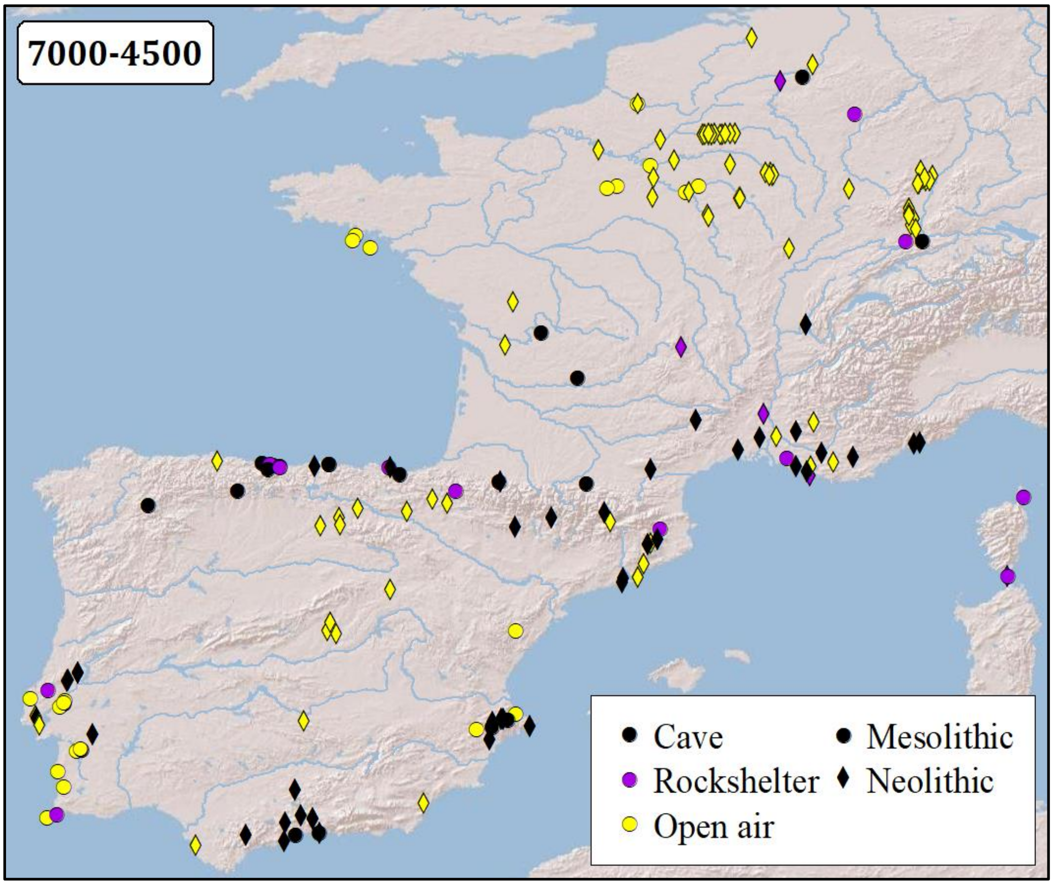


Figure 30: Geographical distribution of sites by location after 7000 cal BC

4.2.2. Shell middens

Shell middens are mounds of shells that can be found in association with settlements and funerary spaces. According to the available data, shell midden sites seem to be a Mesolithic phenomenon. However, it is likely that the consumption of molluscs already started in the Middle Palaeolithic (Bicho *et al*., 2010; Gutiérrez-Zugasti *et al*., 2011; Hellewell & Milner, 2016) and that the absence of Palaeolithic shell middens in the record might be caused by sea-level changes (Shackleton *et al*., 1984; Edmunds *et al*., 2001; Chiocci *et al*., 2017).

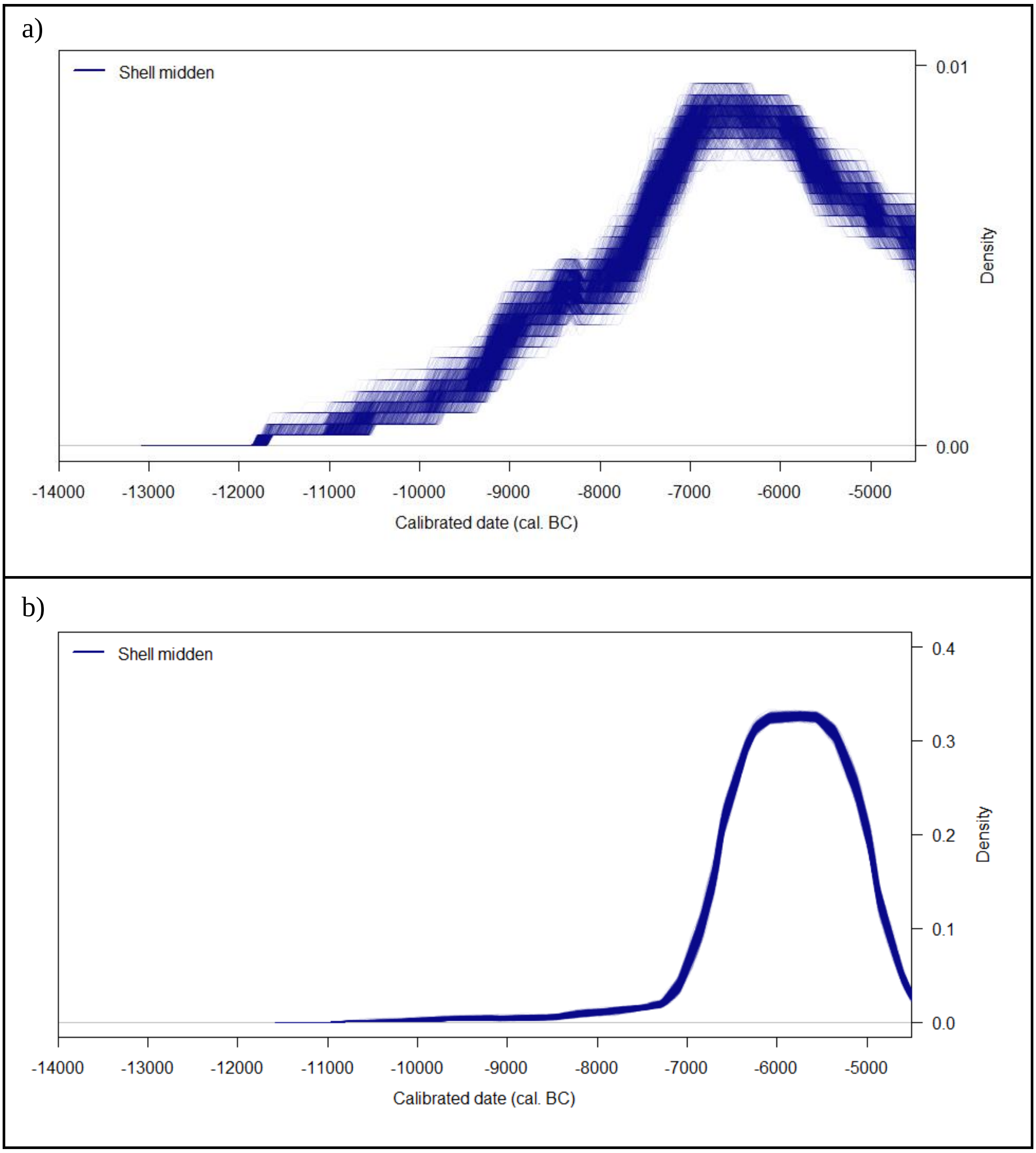


Figure 31: Monte Carlo graphs showing changes by year in the number of funerary sites (a) and individuals (b) placed in shell middens

In the study area, shell middens first appeared and started increasing c. 12000 cal BC. Numbers stabilised c. 7000 cal BC and started decreasing after c. 6000 cal BC (Figure 31a). Half of the human remains from shell midden sites are from the large cemeteries in the Sado and Muge valleys in Portugal. As a result, the plot by individual (Figure 31b) shows a higher peak that rises and decreases more rapidly than in the plot by sites.

The large number of individuals placed in shell middens after c. 6500 cal BC might be caused by human groups starting to display a higher ritualization and visibility of death. Shell midden cemeteries contain more than half of the individuals placed in these types of sites. However, they are the exception, not the norm, and a late phenomenon. The first shell midden cemetery recorded in the area is the Spanish site of El Collado (7590– 6648 cal BC) (Aparicio Pérez, 2015; Gibaja *et al.*, 2015) and the last recorded shell midden cemetery is Cabeço do Pez, Portugal (5744–4246 cal BC) (Cunha & Umbelino, 2001; Meiklejohn, 2009a, 2009a; Meiklejohn *et al.*, 2010; Peyroteo Stjerna, 2016a).

Almost half of individuals in shell middens (268/616, 43%), especially from shell middens dated before 6500 cal BC, are represented by isolated bones of uncertain origin or intentionally disarticulated remains. This is in line with Schulting's observation that shell middens are rubbish heaps or habitation sites, and having human remains there does not automatically turn them into ritual places (Schulting, 1996a: 347). There are various reasons why the deceased were placed in rubbish heaps. One is that it was a way to hide death (Criado-Boado, 1991: 93–96, 1993: 51, 1995). Another option is that loose bones might have been a continuation of the deceased in the social sphere and, thus, ended up in domestic spaces (Gallego Lletjós, 2011: 547). These two hypotheses are not incompatible, since the reasons behind a shared material record might be different depending on the group. In any case, the cessation of these behaviours might point to a change in the perception of death.

Geographically, most shell middens occur in Iberia, especially in the Portuguese Sado and Muge valleys and the Cantabrian region, except for the three French shell middens at Téviec (5490–5220 cal BC), Hoëdic (6040–4440 cal BC) and Beg-er-Vil (6415–4722 cal BC) (Figure 32). This distribution of shell middens might be partly because almost half of the individuals in shell middens (268/616, 43%) are represented by isolated bones of uncertain origin (252/616, 41%) or intentionally disarticulated remains (16/616, 2%). This suggests that other shell middens with less rigorous excavation methods might also contain human remains but have not been identified. This seems likely in the case of France, where most of the excavations are salvage ones (Coudart, 2001: 523). In addition, the grouping of shell middens with human remains in particular regions points to other excavation projects being undertaken near the sites where human remains were previously found.

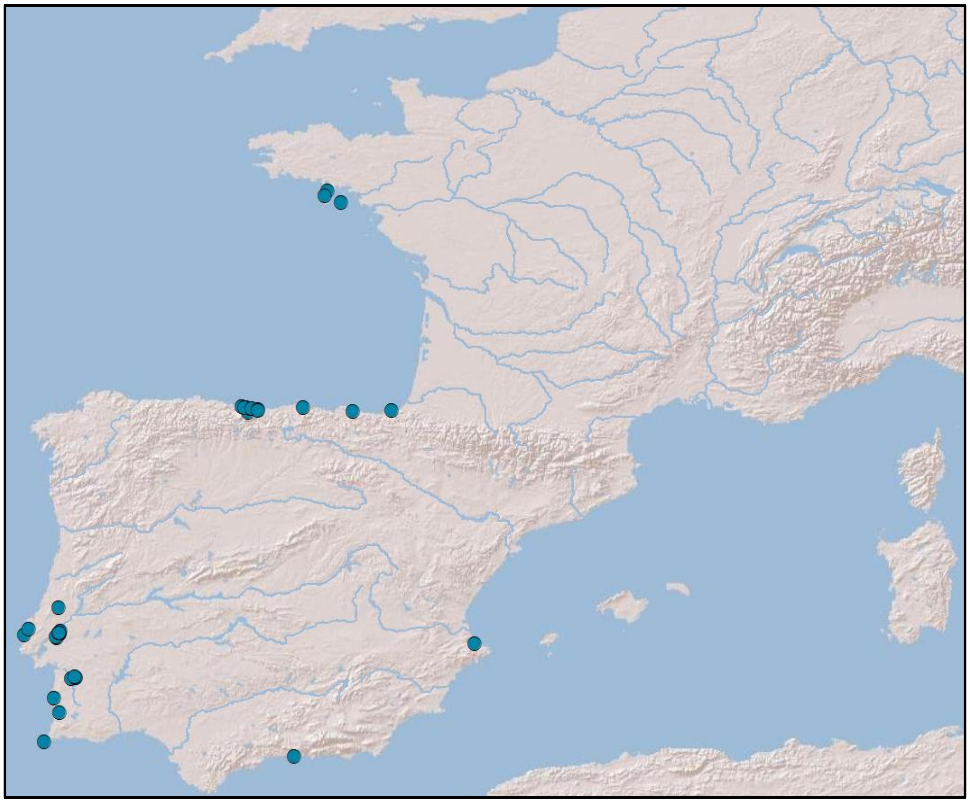


Figure 32: Geographical distribution of shell middens

4.2. Types of sites containing funerary remains

Most funerary remains from the Upper Palaeolithic to the Early Neolithic are related to domestic areas. The deceased were usually placed inside or at the entrance of settlements or activity areas (sites with traces of human activity that do not have evidence of hearths or postholes). Placing the deceased inside or at the entrance of the inhabited area has frequently been interpreted as a legitimising strategy to create and communicate a feeling of belonging via the group's ancestors (Criado-Boado, 1991: 95; Gallego Lletjós, 2011: 545). This is especially the case with cemeteries that have been highlighted as ways of demarcating the territory (Pardoe, 1988). Depositing the deceased in domestic spaces can also be used as a method of hiding the bodies when they are placed under living structures (Criado-Boado, 1991: 94). Alternatively, some of the remains that appear in domestic spaces might have been the result of people keeping bones of their loved ones near them (Lévy-Bruhl, 2003: 367–368; Gallego Lletjós, 2011).

Not all the funerary remains associated with domestic areas are inside those domestic areas. Some burials or cemeteries are near settlements. They might be the result of trying to differentiate the space of the living from the space of the dead (Jacobs, 1995: 393). This desire might be based on different beliefs. For example, Saami ethnography, which provided interpretations for the Russian site of Olenii Ostrov, shows that people had a desire to keep the dead and their spirits away, since they believe that the deceased want to take their belongings and families with them (Jacobs, 1995: 393). However, settlement-related remains, especially cemeteries, might also be the result of the use of the dead to mark the group's ownership of a resource near the settlement (Hodder, 1984: 52).

Lastly, some human remains are not associated with domestic structures: isolated remains and megaliths. The isolation of human remains can reflect several possible intentions, such as depositing the body in a place to which the group would never return in order to hide death (Criado-Boado, 1991: 94), the intentional isolation of certain social individuals (*e.g.*, children, witches, sorcerers, etc.) (Ucko, 1969: 271), or some sort of selection of individuals who got to be buried (Chamberlain, 2000: 206).

Megaliths are a type of sepulchral structure that became common in the 4th millennium cal BC, although in the study area there are a few early examples from c. 7000 cal BC (Scarre *et al.*, 2003; Arias, 2012a; Sánchez-Quinto *et al.*, 2019). These monumental mass graves, usually containing disarticulated remains, have been interpreted as a mark of ownership over the land and of legitimization of the group via the ancestors and the visualization of death (Criado-Boado, 1991: 105). These interpretations regard the disarticulation of the deceased as a way of taking away their identities and make them join the ancestors' group (Criado-Boado, 1991: 105; Midgley, 2008: 116).

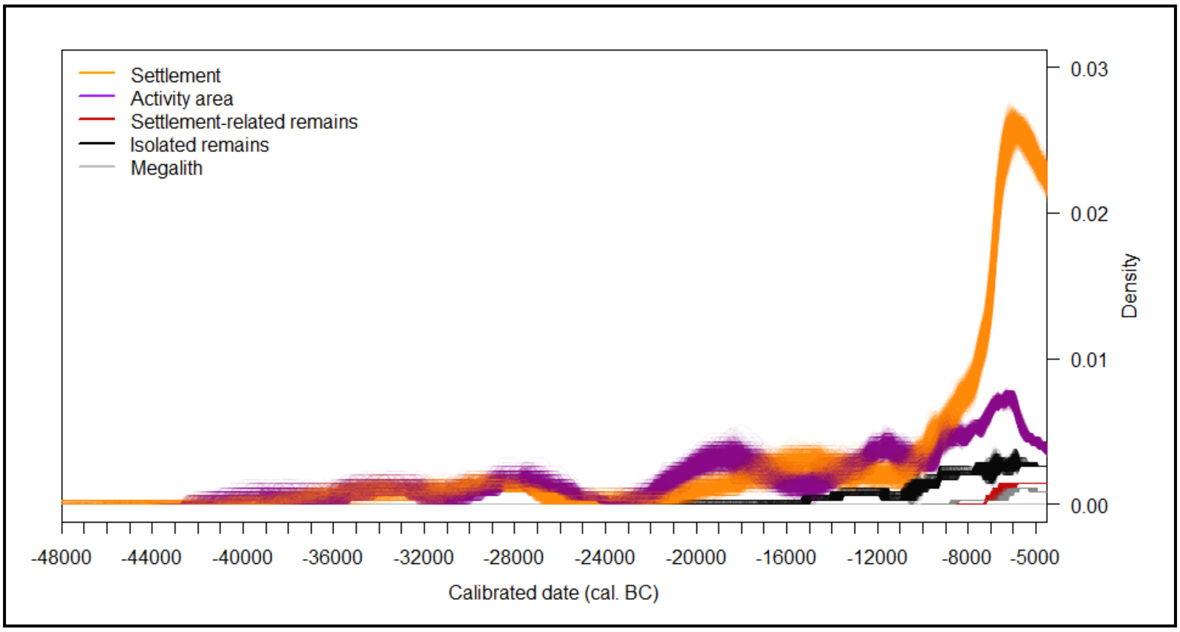


Figure 33: Monte Carlo graph showing changes by year in the number of each site type

Settlements and activity areas containing funerary remains were approximately equally numerous until c. 29000 cal BC. Then they alternated in frequency until c. 10000 cal BC when settlements clearly outnumbered activity areas (Figure 33). This might be due to bias since activity areas are those that show traces of human activity have no evidence of hearths or postholes; these kinds of structures may be better preserved and easier to recognize in more recent periods due to shorter exposure to taphonomic processes (Surovell & Brantingham, 2007: 1871).

Isolated remains are present from c. 22000 cal BC but are uncommon. Most isolated burials come from French salvage excavations (Coudart, 2001: 523), so there might be more human remains or a domestic space nearby that was never excavated. Furthermore, some of the bones found isolated in caves might be removed from their original contexts due to taphonomic processes (Wilczyński *et al.*, 2016).

Burials and cemeteries near settlements that researchers have been able to link together (settlement-related remains) are a late phenomenon (after c. 5500 cal BC) and extremely uncommon (Figure 33a), likely partly due to the difficulty of establishing such links. There were only four settlement-related burials in the study area: Plaça Vila de Madrid, Spain (5535–5460 cal BC) (Pou Calvet *et al.*, 2010), Algar Picoto, Portugal (5300–4540 cal BC) (Alday Ruiz, 2009), Saint-Léger-près-Troyes (Le château de la Planche), France (5231–4932 cal BC) (Raynaud & Paresys, 2016) and Villamayor de Calatrava, Spain (4932–4725 cal

BC) (Rojas Rodríguez-Malo & Villa González, 2000). In addition, there was a Neolithic settlement-related cemetery: Ingenheim (Bannenberg), France (5500–4500 cal BC) (Lefranc *et al.*, 2014).

Lastly, there were only three cases of megaliths from before 4500 cal BC: Tremedal, Spain (7049–6687 cal BC) (Ruiz-Gálvez Priego, 2000; Díaz-Zorita *et al.*, 2012), El Padró II, Spain (4986–4451 cal BC) (Molist & Clop, 2010; Gibaja *et al.*, 2012c) and Monte Areo VI, Spain (4999–4000 cal BC) (Blas Cortina, 1995), Bougon, France (5296–4234 cal BC) (Weninger & Jöris, 2017).

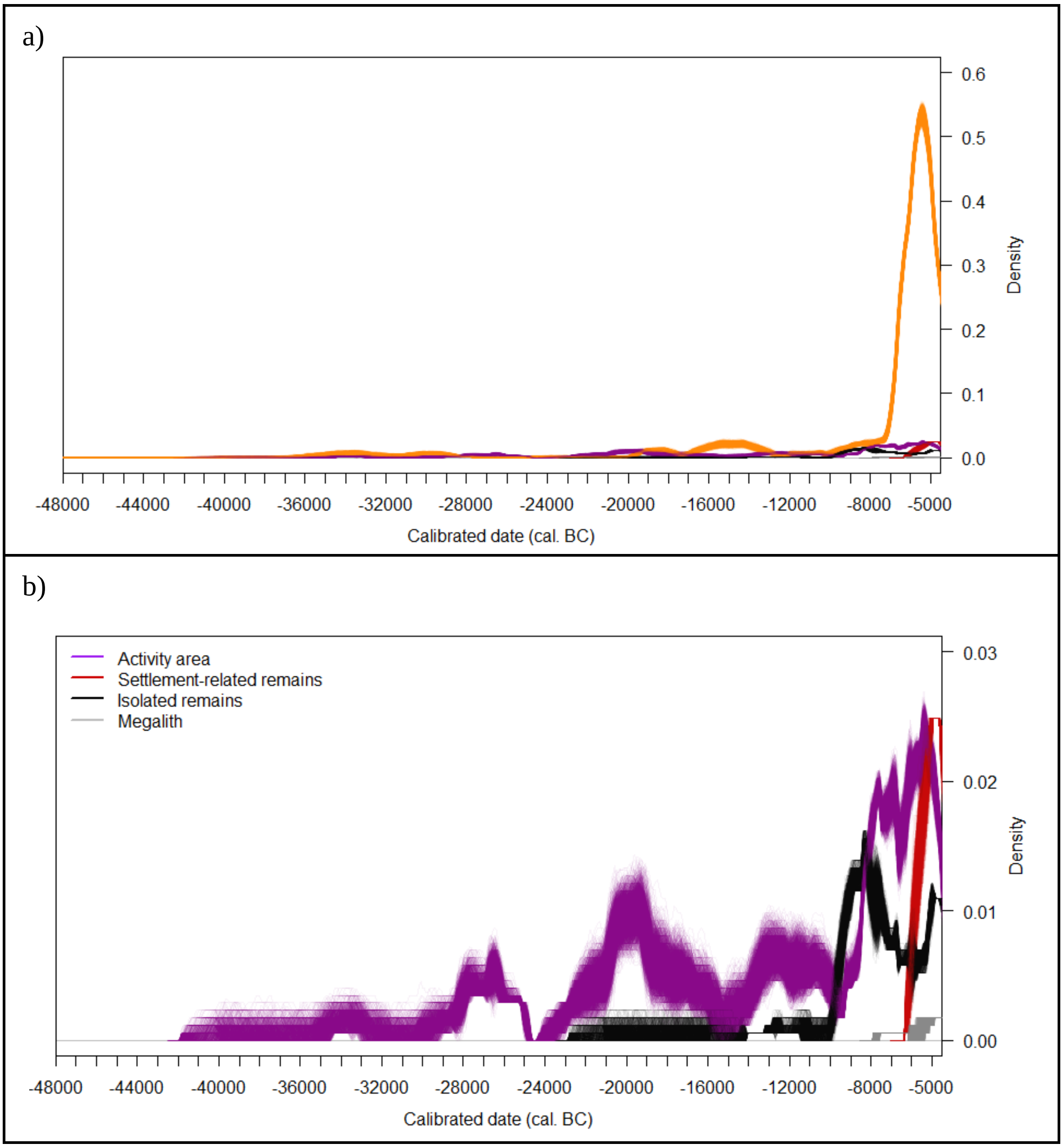


Figure 34: Monte Carlo graphs showing changes by year in the number of individuals deposited in each site type including settlements (a) and excluding settlements (b)

Regarding the number of individuals buried in each of the site types analysed (Figure 34), most individuals were in settlements, especially after c. 6000 cal BC. This rapid and pronounced increase in the number of individuals in settlements was hugely influenced by the large numbers of individuals (up to 186) in some of the Mesolithic cemeteries from the Portuguese shell middens, as they were in settlements (Cardoso & Rolão, 1999; Cunha & Umbelino, 2001; Bicho *et al.*, 2010; Figueiredo, 2014; Peyroteo Stjerna, 2016a). The number of individuals deposited in the other site types was always very low, with activity areas having larger numbers[2].

Regarding the geographical distribution of site types, settlements and activity areas did not follow a specific pattern – they were present everywhere, and there were too few settlement-related remains and megaliths for any pattern to be discerned. On the other hand, between 10000–6500 cal BC, isolated remains in caves were all Mesolithic and seem to have been extraordinarily frequent in Belgium, but it is not clear if this was a cultural feature or bias caused by the caves not being fully excavated. In addition, the contexts of some of the human remains from Belgian caves is unclear (Toussaint, 2010a: 186). Something similar can be observed with Mesolithic and Neolithic isolated remains in open-air sites. They occur mainly in the Paris Basin as a result of salvage excavations (Coudart, 2001: 523). Thus, these types of sites are likely the result of a bias, since more archaeological remains might occur near the 'isolated burials' but remain unexcavated (Figure 35).

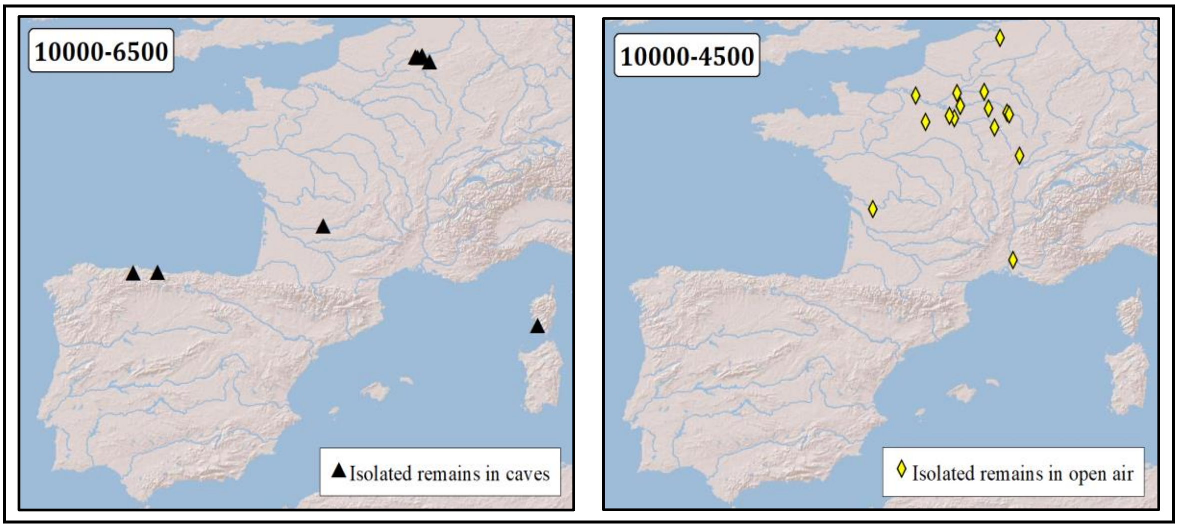


Figure 35: Geographical distribution of isolated remains in caves (left) and open-air sites (right)

[2] Given the scarcity of megaliths, the large number of individuals buried in them and the general absence of individualized information about the deceased, each megalith has been added as a single individual.

To summarise, despite the diversification of site types with funerary remains that can be seen from c. 7000 cal BC, the most common and widespread ones are always those inside domestic areas, especially settlements, where most of the individuals are.

4.3. Number of individuals

The funerary remains that have survived can offer a variety of information. The first is related to preservation. However, the scarcity of remains might be a sign of intentional destruction. Conversely, better preservation might be partly a result of human groups protecting the bodies and preserving their integrity (Clastres, 1981: 75–76; Criado-Boado, 1991, 1993, 2012; Fowler, 2004: 8; Beltrán Pedreira, 2015; García Acevedo, 2015). In this respect, it is also relevant how the remains were distributed: whether they were deposited alone or in collective funerary spaces, the size of those funerary spaces and if they were cemeteries.

4.3.1. Minimum Number of Individuals

In the study area, the number of individuals was low until c. 10000 cal BC, when it started increasing. On the other hand, the number of sites in which these individuals were deposited seems to have increased gradually from c. 24000 cal BC, accelerating after c. 10000 cal BC. The scarcity of remains before 10000 cal BC may result from taphonomic bias: more recent remains were exposed to taphonomic processes for less time and, thus, had better chances at surviving (Surovell & Brantingham, 2007: 1871). Human remains dating from the Holocene may not have suffered the effects of the dramatic climate changes that characterized the end of the Pleistocene (Collins *et al*., 2002; Hedges, 2002). However, the scarcity of remains before 10000 cal BC might could be a sign of intentional destruction or abandonment of funerary remains, a practice that is not rare among modern hunter-gatherers according to cross-cultural studies of African and Amazonian societies, such as the Hadza of Tanzania, the Mbuti Pygmies of Zaire, the Guayaki of Paraguay or the Bororo of Brazil (Clastres, 1981; Woodburn, 1982; Criado-Boado, 1991; Gallego Lletjós, 2011).

The presence of funerary remains accelerated after c. 7000 cal BC, reaching a peak c. 5300 cal BC, likely due to the large Mesolithic cemeteries. The increase of sites, which also accelerated from c. 7000 cal BC was not as abrupt as a result of a few sites containing large quantities of individuals. After the peak, the quantity of both individuals and sites decreased, although the decrease of individual burials was, again, more abrupt (Figure 36).

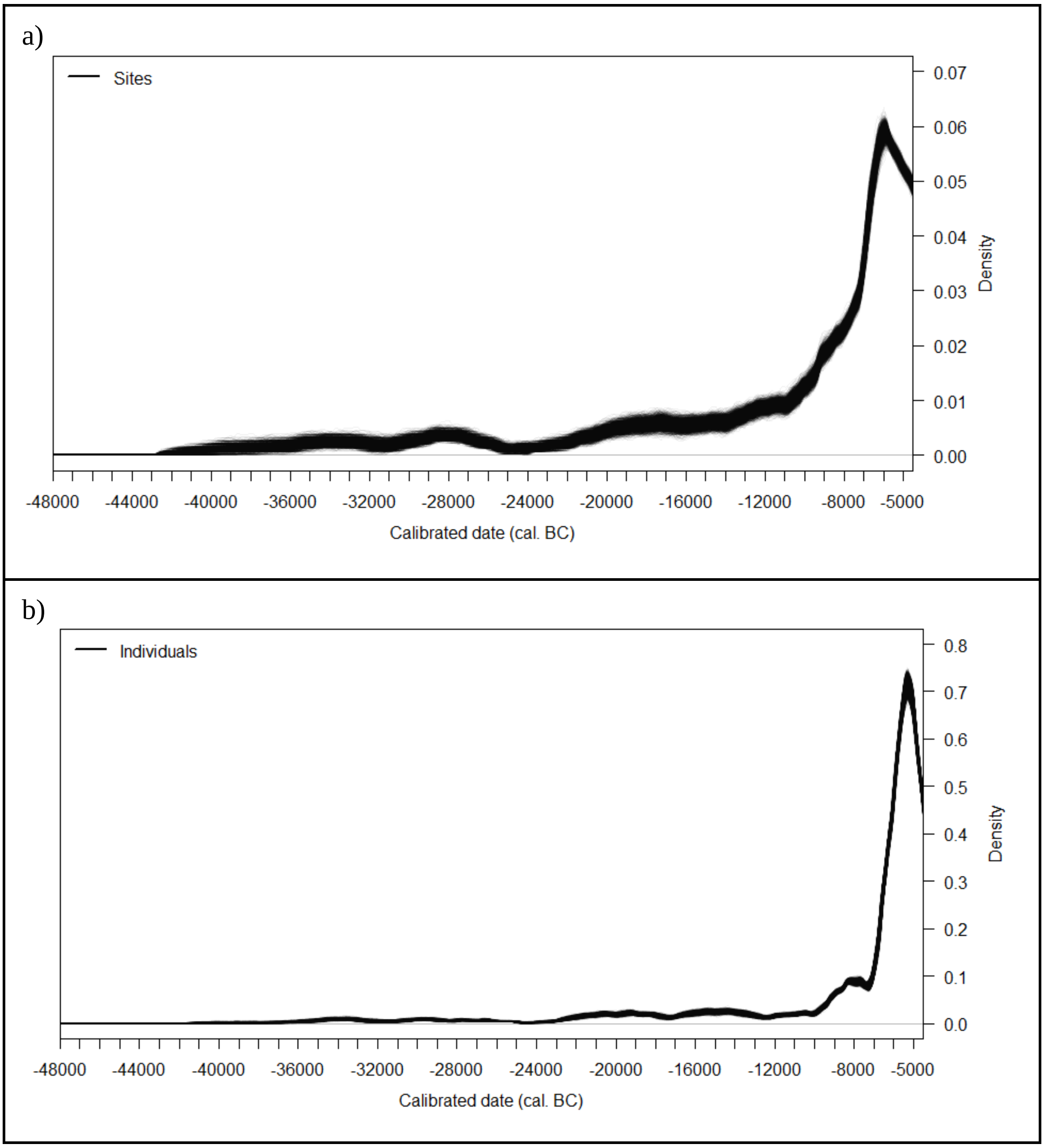


Figure 36: Monte Carlo graphs showing the MNI buried per year for by individual (a) and by site (b)

These results are not completely true to reality, as the graphs present edge effects caused by a decrease in data near the edges of the studied period (see section 3.3.1.). After c. 5500 cal BC, the number of sites continues to increase. There are 112 Upper Palaeolithic sites, 113

Mesolithic sites and 140 Neolithic sites. Looked at chronologically, there are 22 sites in 7500–6500 cal BC, 92 in 6500–5500 cal BC and 125 in 5500–4500. In terms of individuals, a drop can be observed, but it is not as abrupt as that presented in the Monte Carlo simulations. By period there are 323 Upper Palaeolithic individuals, 863 Mesolithic individuals and 798 Neolithic individuals and by year, there are 92 individuals in 7500– 6500 cal BC, 912 in 6500–5500 cal BC and 734 in 5500–4500 cal BC.

The slight decrease in the number of individuals after c. 5500 cal BC is likely caused by two factors. The first is the end of Mesolithic large cemeteries. The second is that some areas, such as the Cantabrian region, barely have any funerary sites documented for the first half of the 5th millennium cal BC (Arias, 2012a: 11), which might have affected the overall picture. Despite all this, the number of individuals from the Neolithic was still high, probably, at least in part, due to the Neolithic Demographic Transition (NDT), characterized by a significant increase in the birth rate and, as a result, of the population (Jackes *et al.*, 1997; Bocquet-Appel, 2011).

4.3.2. Single and collective funerary spaces

Individual and collective funerary spaces can be reflective of different ideas society had about death and territory. Human remains that are the only funerary evidence at a site can be the result of biases caused by salvage excavations resulting in incompletely excavated sites on the one hand and by taphonomic processes on the other (Coudart, 2001: 523; Bosset & Valentin, 2011). However, they can also reflect cultural factors. In this case, human remains in isolation might be the result of intentional abandonment of the remains in places to which the group would not return. This abandonment seems to be a way of hiding the evidence of death due to fear of the passage of time and death itself. Some ethnographic records show that the abandonment and destruction of corpses is not an unusual practice in hunter-gatherer societies and that there are groups that abandon and even burn their villages when someone dies there (Clastres, 1981; Woodburn, 1982; Criado-Boado, 1991; Gallego Lletjós, 2011). It cannot, however, be discounted that individual funerary spaces might be the result of burial selection (Chamberlain, 2000: 206).

The deposition of several individuals in the same place (collective funerary places), where they were not deposited at the same time, indicates continuity of use of the funerary place.

This continuity supposes a revisiting of the funerary spaces that implies larger visibility of death that might point to the deceased being used to legitimize the group's existence (Criado-Boado, 1991: 94, 1993, 1995, 2012: 265–292) or to the beginnings of territorial behaviour, if, as Gallego Lletjós (2011: 545) suggests, the deposition of several individuals in the same place is understood as territorial demarcation, even if the MNI is not enough for the site to be considered a cemetery.

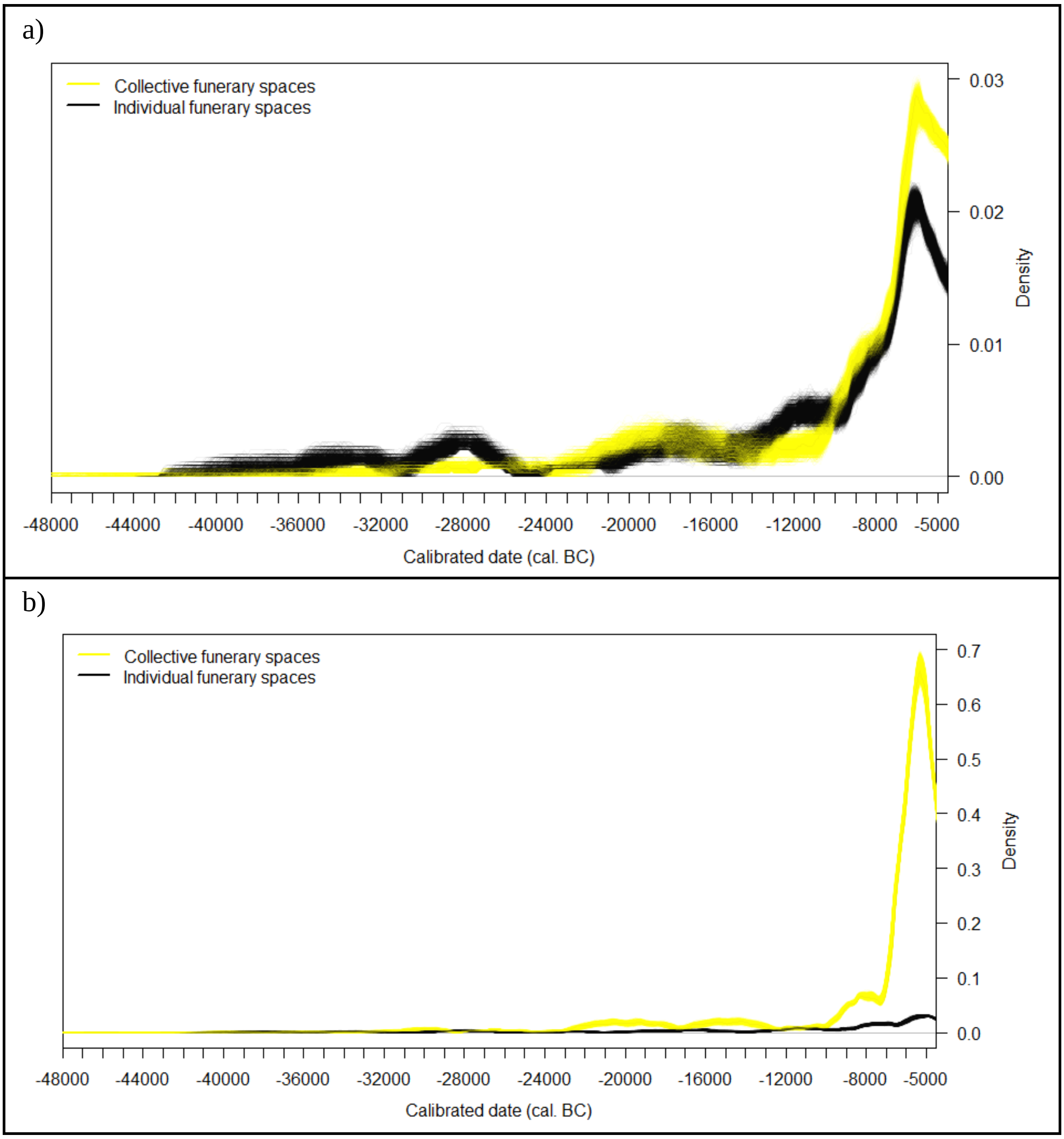


Figure 37: Monte Carlo graphs showing changes by year in the number of collective and individual funerary sites (a) and the number of individuals deposited in collective and individual funerary spaces (b)

Individual funerary spaces were more common than collective ones before c. 10000 cal BC, with brief exceptions between c. 22000 and c. 19500 cal BC (Figure 37a). Moreover, the number of individuals in collective funerary spaces started to increase from c. 10000 until c. 8000 cal BC when it stabilised. However, the number of individuals in collective funerary spaces started to rapidly increase again c. 6000 cal BC (Figure 37b).

This pattern appears to be showing a change from a scenario before c. 10000 cal BC in which most societies attempted to hide death to a scenario after 10000 cal BC in which, at least some human groups, attempted to visualize death. This was perhaps done, especially after 6000 cal BC, as a means of territorial demarcation. No geographical patterns in the distribution of individual and collective funerary spaces could be detected, indicating that the generalization of collective funerary spaces reflects general tendencies affecting the whole study area.

4.3.3. Size of funerary spaces

For analytical purposes, sites containing funerary remains have been divided into six categories depending on the number of individuals they contain. The ranges used to create these categories were chosen based on which ones allowed better visualization of the data: 1 individual, 2–3 individuals, 4–9 individuals, 10–20 individuals, 21–30 individuals and over 30 individuals.

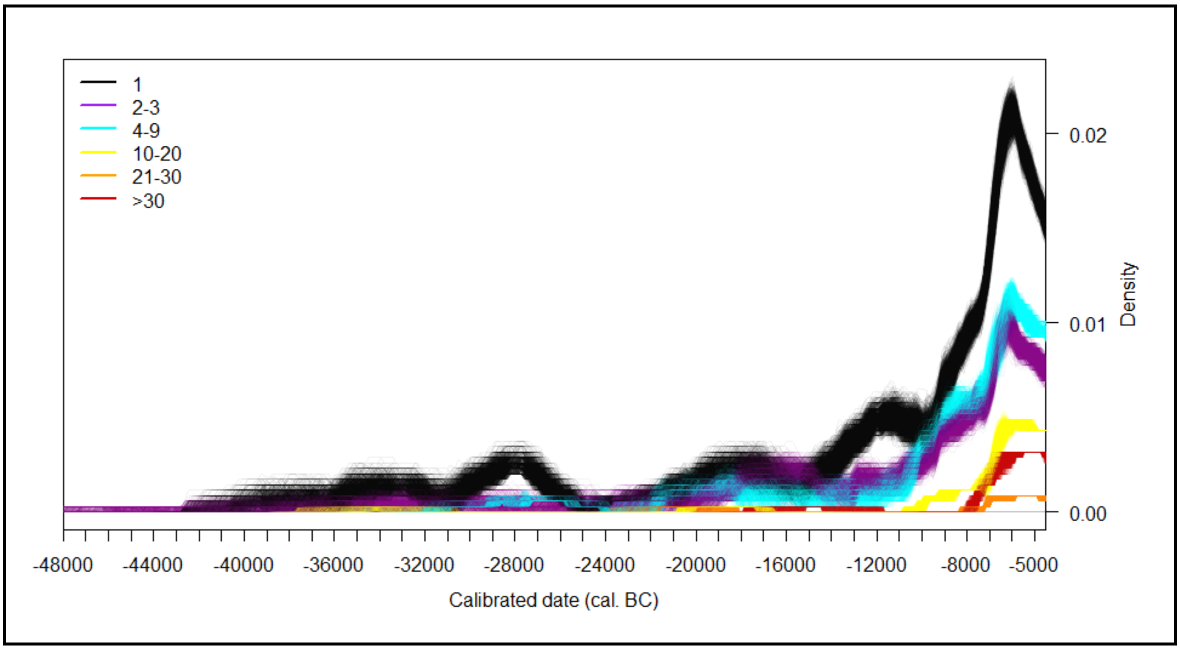


Figure 38: Monte Carlo graph showing changes by year in the number of sites depending on the MNI they contain

From the Upper Palaeolithic to the Early Neolithic the number of individuals in one site was most frequently one (Figure 38). These sites were followed in frequency by those containing 2–3 and 4–9 individuals. These were equally frequent until c. 11000 cal BC, when sites containing 2–3 individuals were outnumbered by those containing 4–9. The sites containing less than ten individuals were widespread across the whole study area, with no geographical clusters or gaps. The high frequency and widespread distribution of sites with only a small number of individuals might be partly due to the bias generated by incomplete and salvage excavations, as these need to be done fast and are not as extensive as other types of projects, and to some sort of population selection of the individuals who were buried. These are concerns that demographic studies of past populations usually take into account (Chamberlain, 2000: 206).

Most of these funerary depositions were performed by hunter-gatherers who were mobile societies, so deceased members of a group might be deposited across different locations. This interpretation has been offered for the Muge and Tagus shell middens, which were more sedentary societies. In Cabeço das Amoreiras and Vale de Romeiras, there is a more scattered distribution and a lower frequency of human remains. One of the explanations offered for this pattern is that both cemeteries were used by the same group (Peyroteo Stjerna, 2016a: 471).

Sites containing more than 10 individuals are a late phenomenon and were never common (Figure 38). Most of them fall after c. 7000 cal BC, with only a few exceptions from earlier periods –Bassempouy, France (35962–32279 cal BC) with 16 individuals (Gambier, 2000; Pettitt, 2011); Grotte du Placard, France (22198–19814 cal BC) with 25 individuals (Le Mort & Gambier, 1991); Saint-Germain-la-Rivière, France (19087–18271 cal BC) with 15 individuals (Henry-Gambier, 1990; Henry-Gambier *et al.*, 2000); Isturitz, France (16171–13403 cal BC) with 43 individuals (Henry-Gambier *et al.*, 2013); Abri des Autours, Belgium (9120–7990 cal BC) with 14 individuals (Polet & Cauwe, 2002); and El Collado, Spain (7590–6648 cal BC) (Aparicio Pérez, 2015; Gibaja *et al.*, 2015). Of these sites, the only one that is considered a cemetery is El Collado, Spain (7590– 6648 cal BC).

In this thesis, cemeteries are defined by the continuity of use of the funerary space and, in most cases, a MNI of 10. According to cross-cultural demographic studies that take into consideration up to 478 hunter-gatherer, foraging and horticulturalist populations worldwide, the number of camp occupants is usually small (Marlowe, 2005; Gurven &

Kaplan, 2007; Hill *et al.*, 2011; Hamilton *et al.*, 2018; Bird *et al.*, 2019). The minimum is two individuals per camp and the average is between 14.7 and 25 per camp (Hill *et al.*, 2011; Hamilton *et al.*, 2018; Bird *et al.*, 2019). Thus, it would be infrequent that ten individuals died at the same time (Marlowe, 2005; Gurven & Kaplan, 2007). However, these small communities of camp occupants could be integrated into larger ones of up to 150 individuals, allowing fluctuations in the number of co-residents (Hill *et al.*, 2011; Hamilton *et al.*, 2018; Bird *et al.*, 2019). Therefore, sites with all individuals in a multiple grave or a shared space (if they were not buried) that cannot be shown to have been deposited at different times (*e.g.*, dates for several individuals or archaeothanatological studies) are not classed as cemeteries.

Most sites containing more than 10 individuals do not follow specific geographical patterns. The only exception is cemeteries after 7000 cal BC, especially those with more than 20 individuals. Most Mesolithic examples are located in the Portuguese shell middens, while the Neolithic examples are in the Linear Pottery Culture area (Figure 39). The other three cemeteries with more than 20 individuals are Téviec, France (5490–5220 cal BC) with 23 individuals (Boulestin, 2016) and Los Cascajos, Spain (5311–3775 cal BC) (García Gazólaz & Sesma Sesma, 2007).

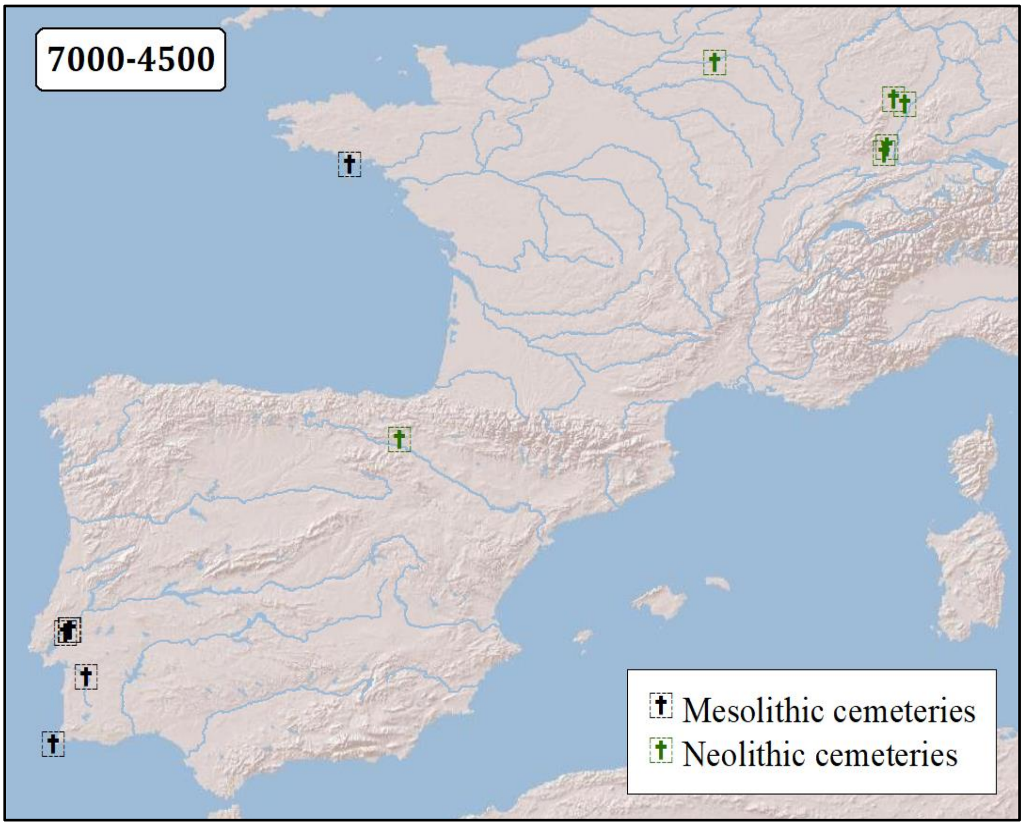


Figure 39: Geographical distribution of cemeteries after 7000 cal BC containing more than 20 individuals

The deposition of several individuals of the group in the same place, especially in cemeteries, might indicate some sort of territorial behaviour since they would be used to demarcate the land (Renfrew, 1976; Pardoe, 1988; Charles, 1992; Gallego Lletjós, 2011). In this respect, it is of interest that almost all cemeteries (17/23, 73%) were in settlements, either inside them or at the entrance. The cemetery of Ingenheim (Bannenberg), France (5500–4500 cal BC) (Lefranc *et al.*, 2014) was not inside the settlement, but in a nearby location. Cemeteries in apparent isolation or nearby settlements might have been used to claim the exclusive use of a certain resource (Hodder, 1984: 52). Alternatively, it could simply be a way of keeping the deceased and their spirits away (Holmberg, 1964; Ucko, 1969; Jacobs, 1995: 393). The relationship of the remaining cemeteries with domestic areas is not known as it was not specified (Jeunesse, 1997).

4.4. Intra-site spatial distribution of the remains

Human remains in settlements and activity areas can be mixed with the domestic structures, as at Cova dels Trocs I, Spain (5305–4840 cal BC) (Rojo Guerra *et al*., 2013) and Les fieux, France (9251–7662 cal BC) (Champagne *et al*., 1990); or placed in a delimited area within the site, as at Hoëdic, France (6040–4440 cal BC) (Boulestin, 2016) or Arapouco, Portugal (5970–5730 cal BC) (Peyroteo Stjerna, 2016a). There are also a few sites that have both funerary delimitations among dwelling structures, and in a separate delimited space. Examples are known from Cova de la Sarsa, (5512–5300 cal BC) (García Borja *et al*., 2011) and Los Cascajos in Spain (5311–3775 cal BC) (García Gazólaz & Sesma Sesma, 2007).

Mixed funerary spaces can be explained in different ways. Taphonomic processes might have displaced some bones from their original positions (Wilczyński *et al.*, 2016; Aspöck *et al.*, 2020). However, this is not always the case and there are some documented cultural reasons for the phenomenon. In some historical periods (*e.g.*, the Roman Empire), burials under the floors of houses, especially children's burials, have been associated with founding ceremonies and the protection of the household (Pérez Almoguera, 1998). In the case of hunter-gatherer and early agricultural societies, human remains under or among houses and domestic structures have been interpreted in two ways. The first understands burials under domestic structures as strategies used to hide death resulting from fear of death or denial (Criado-Boado, 1991: 94) or, in the case of superposed burials, as a process towards forgetting (Borić, 2010: 63–64). The second interprets human remains in domestic spaces as a way of keeping the deceased with the living, especially in the case of unburied bones found in domestic areas (Lévy-Bruhl, 2003; Stefanović & Borić, 2004; Gallego Lletjós, 2011). These might be the result of a living person carrying them as a way to integrate the deceased in the social sphere (Lévy-Bruhl, 2003: 367–368; Gallego Lletjós, 2011: 547). These unburied bones can be unmodified or made into ornaments. The latter are relatively frequent in Upper Palaeolithic France (*e.g.*, MacCurdy, 1914; Chertier, 1986; Champagne *et al.*, 1990; Stahl Gretsch, 2005).

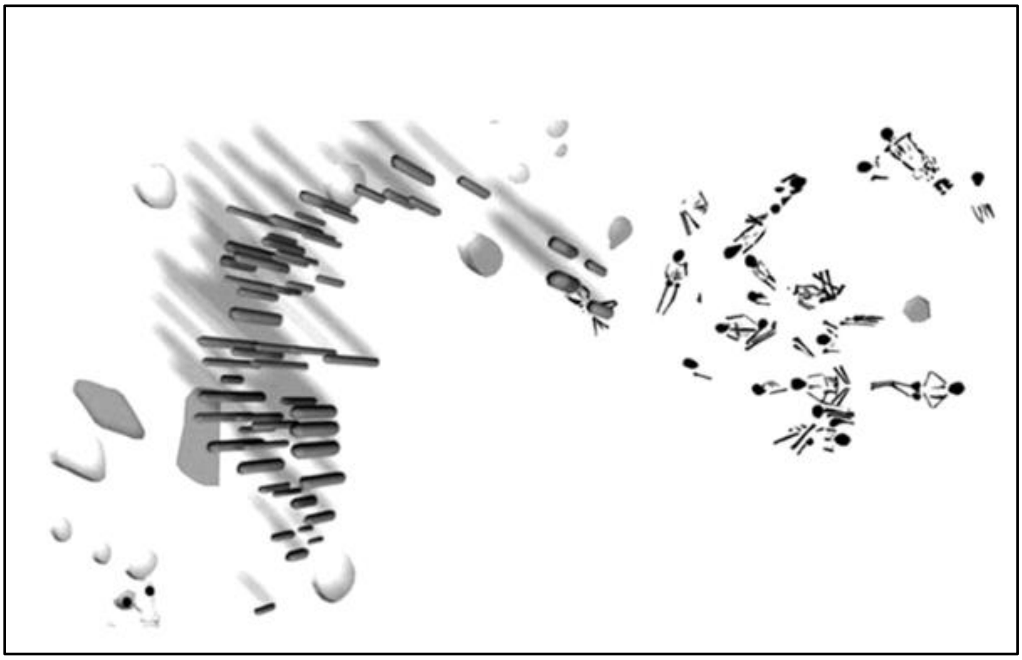


Figure 40: Reconstruction of the timber structures from Moita do Sebastião based on a reinterpretation of the postholes as demarcating the funerary area rather than as related to residential structures

Source: Peyroteo Stjerna, 2016a: 473

Delimiting a funerary space inside the domestic area makes it more visible (Criado-Boado, 1991, 1993, 1995, 2012). It is possible that, at least in some cases, spaces were marked with some sort of landmark. This is the case of Cabeço da Amoreira and Moita do Sebastião, which seemed to be delimited with some sort of timber structure (Peyroteo Stjerna, 2016a: 472) (Figure 40). Death visibility has been associated with the use of the ancestors to legitimize the group's existence and use of a certain land area and, thus, with land property and demarcation (Criado-Boado, 1991: 105).

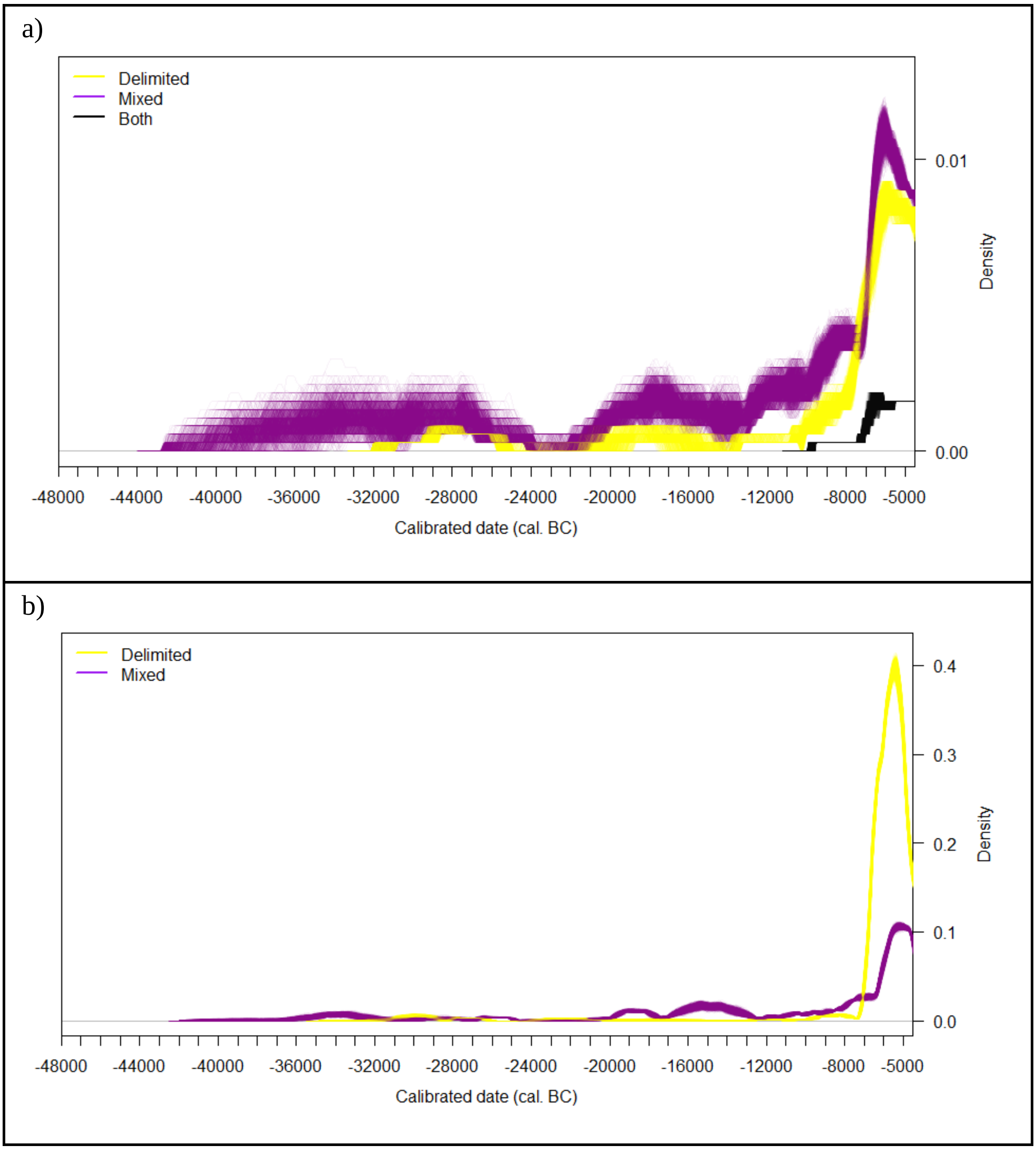


Figure 41: Monte Carlo graphs showing changes by year in the number of sites with (a) and individuals in (b) delimited and mixed funerary spaces

Mixed funerary spaces were always more frequent than delimited spaces except for a brief period around 7000 cal BC when they might have been equally frequent. Conversely, after c. 7000 cal BC, the number of individuals in delimited funerary spaces was larger than the number of individuals in mixed funerary spaces, reaching a peak c. 6000 cal BC due to the influence of cemeteries (Figure 41). The χ^2 test revealed a correlation between the delimitation of the funerary space and the site type after 6000 cal BC (p=0.007). The correlation is caused by most cemeteries in settlements (13/15, 86.6%) being delimited. Sites containing both delimited and mixed funerary areas were never common and are a late phenomenon, perhaps due to there being better information about the stratigraphic sequences of sites from later millennia

Geographically, there is no clear distribution pattern for delimited and mixed funerary spaces in general. However, when narrowed down to delimited and mixed funerary spaces in settlements (Figure 42), it can be seen that most delimited cemeteries in settlements are Portuguese Mesolithic shell middens, while most settlements containing smaller delimited funerary areas are Neolithic sites in the Mediterranean Coast and the Pyrenees. The Linear Pottery Culture area contained both delimited cemeteries and smaller delimited funerary spaces.

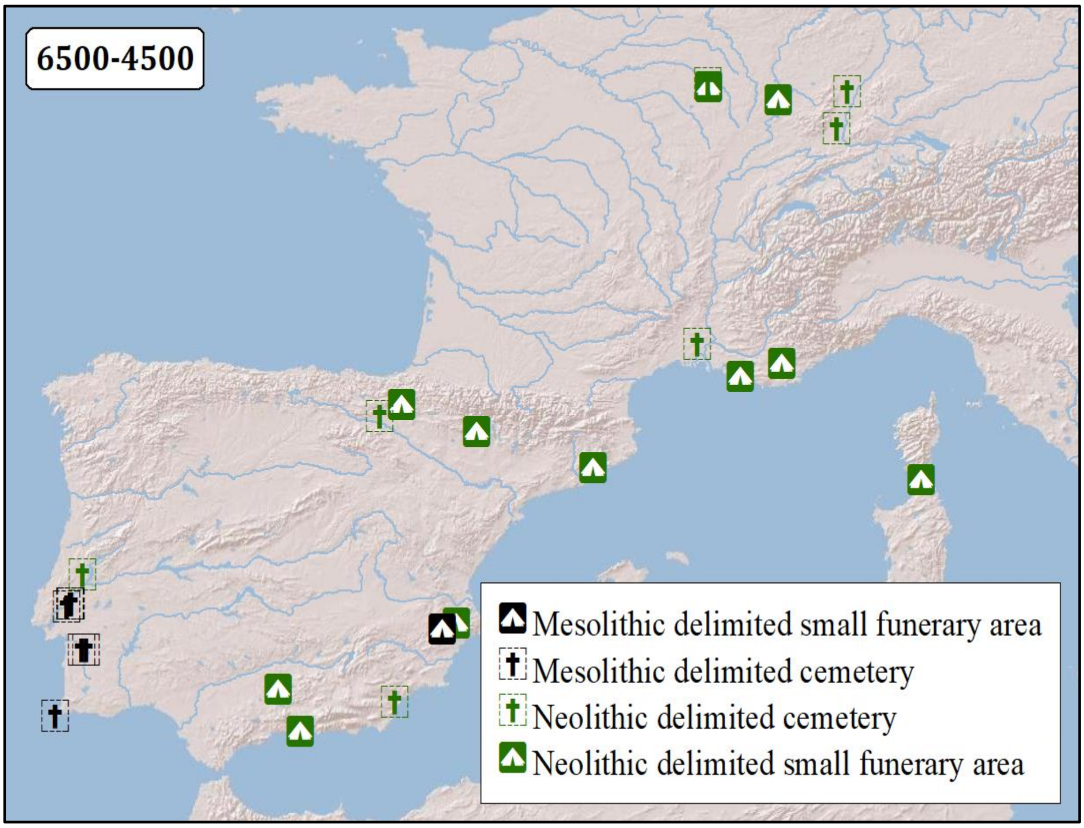


Figure 42: Maps showing the geographical distribution of Mesolithic and Neolithic sites after 6500 cal BC containing delimited cemeteries and delimited small funerary areas

The fact that mixed funerary spaces are always more frequent than delimited ones might indicate that, even during the Neolithic, strategies for hiding death were still used by most groups and that territorial behaviours existed, but were not the rule (Criado-Boado, 1991: 94, 105). Furthermore, groups more likely to be displaying territorial behaviours are those connected to the Mesolithic Portuguese shell middens, as this is one of the few places in which large, delimited cemeteries occur. This shows that large cemeteries are not specific to a period nor linked to an increase in 'complexity' over time. They are a phenomenon linked to certain cultural features that may be present only in small regions and can disappear over time. Nevertheless, some of the Neolithic groups from the Mediterranean Coast, the Pyrenees and the Linear Pottery Culture areas also started to delimit funerary spaces, although these contained less than 10 individuals. This shows that delimited funerary spaces, and perhaps territoriality, are phenomena that chronologically and geographically were more widespread than cemeteries.

4.5. Abandonment and continuity of use

Continuity in the use of a place used for depositing the deceased and its abandonment suggest differences in how individuals and societies dealt with death. The abandonment of a funerary space may suggest a relationship with death based on fear and/or denial. Woodburn (1982) made a compilation of African societies that shows how usually they buried the bodies of the deceased and then moved to a new location. For example, the Mbuti Pygmies of Zaire bury the deceased and immediately move to a new camp (Woodburn, 1982: 197). If a person dies outside the living area, the body can be left there and the location avoided thereafter (Clastres, 1981; Criado-Boado, 1991: 94).

The decision to not abandon places where human remains are deposited implies a different relationship with death. If the area where dead individuals are deposited is not delimited, the relationship might still be of fear and denial, since the burial of individuals under houses can also be considered a strategy for hiding death (Criado- Boado, 1991: 94), and the presence of unburied loose bones might signify the continuation of the deceased in the social sphere (Gallego Lletjós, 2011: 547). However, if death is confined to a delimited space, particularly at the entrance of the site, it might signify the use of the ancestors as a way to legitimize the group and to claim the land as property (Renfrew, 1976; Clark & Neeley, 1987; Pardoe, 1988; Criado-Boado, 1991: 105; Gallego Lletjós, 2011; Pettitt, 2011: 269).

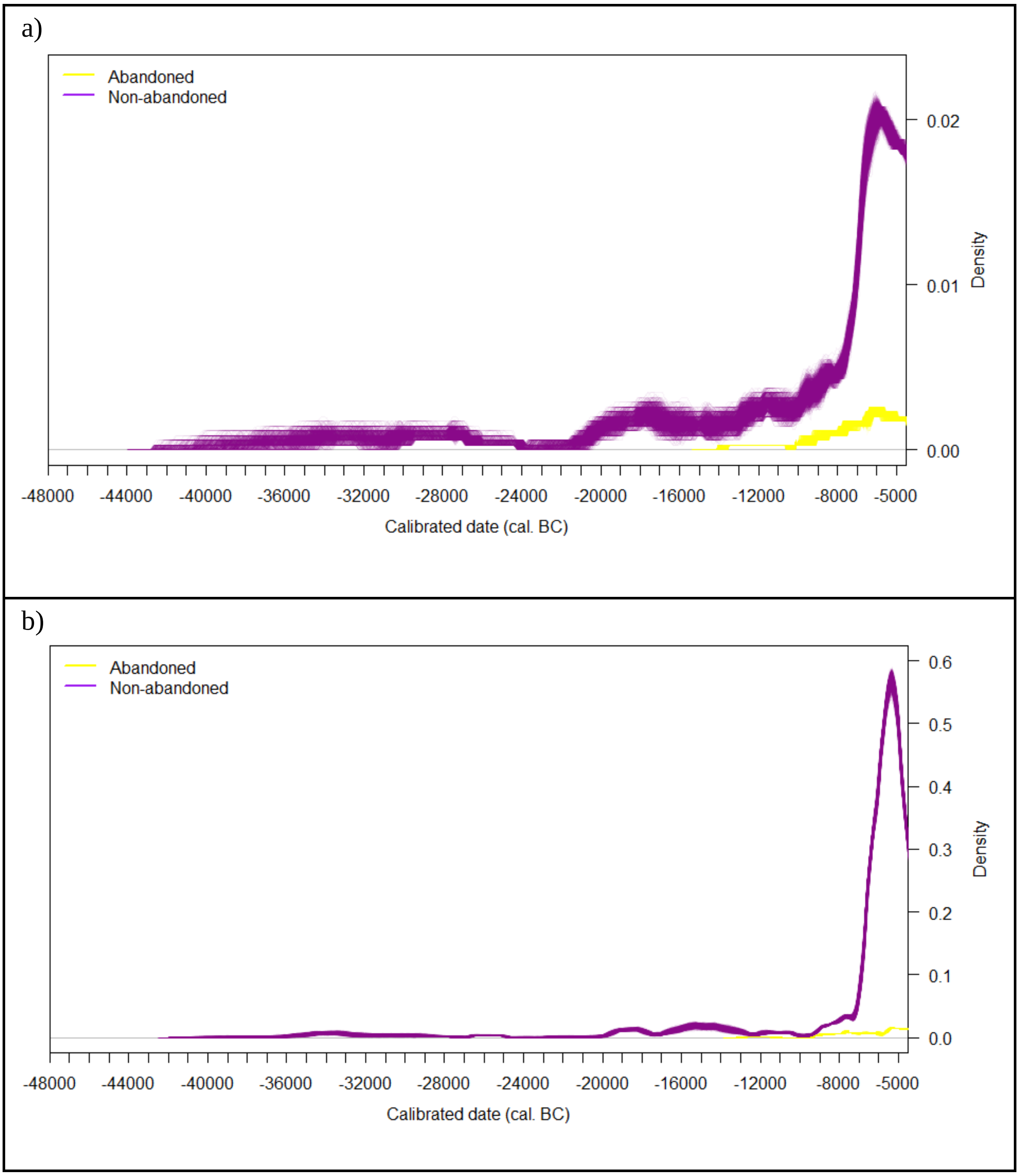


Figure 43: Monte Carlo graphs showing changes by year in the number of abandoned sites (a) and individuals (b)

Few changes can be observed in the continuity of use or abandonment of funerary sites (Figure 43). For the entire period, there were only 18 (13%) sites that were likely abandoned after the deposition of human remains. However, in many cases, this may be due to a lack of stratigraphic information that can be used to determine if a site was or was not abandoned. These sites existed from c. 32000 cal BC but are mainly from after c. 10000 cal BC, likely due to the better quality of the available stratigraphic information from more recent periods.

According to the available information, the abandonment of sites was a rare phenomenon and the deceased were deposited in spaces that continued to be used after the burials took place. There is no geographical patterning to the distribution of abandoned and non-abandoned funerary spaces.

4.6. Overview

4.6.1. Death and use of landscape before c. 7500–6000 cal BC

Before c. 7500–6000 cal BC (Mesolithic–Early Neolithic), funerary spaces mostly contained only one or a small number of individuals (less than 10), and these were found within living area contexts, along with domestic structures. The remains appear to have been deposited during occupation of the sites, which were not abandoned after the deposition of human remains. There is no evidence of any human remains from open-air sites before 14,000 cal BC; most human remains have been found inside caves and rockshelters. The absence of human remains from open-air sites is mainly the result of two (inter-related) biases:

1) Research bias: caves have received more attention due to better preservation of archaeological remains (Schulting, 2016: 556).

2) Taphonomic bias: recent remains often have more chance of surviving since they have been exposed to taphonomic processes over a shorter period (Surovell & Brantingham, 2007: 1871) and, in particular, remains dating to the Holocene likely suffered less dramatic changes (Collins *et al.*, 2002; Hedges, 2002). Caves and rockshelters tend to regulate temperature and humidity conditions, which are needed for bone survival (Hedges, 2002).

Taphonomic bias cannot account for all the observed patterns. There are some Upper Palaeolithic open-air sites where bone is preserved, *e.g.*, sites in the Manzanares river fluvial terrace (Spain) such as Puente de los Tres Ojos (c. 18347–12966 cal BC) (Tapias *et al.*, 2012), and La Fontanilla in Cádiz, which has animal teeth associated with a Solutrean lithic industry (Ramos Muñoz *et al.*, 1995). At other open-air sites, deep burials offer fairly stable environmental conditions as well as protection against scavengers (Hedges, 2002: 325; Smith *et al.*, 2007).

For much of the Upper Palaeolithic and Mesolithic, it is unclear if the human remains in primary positions were buried or unburied. This might be caused, at least in some cases, by a lack of information to demonstrate the existence of a grave (Peyroteo Stjerna, 2016b). Arias (2014: 70) and Pettitt (2011: 262) have pointed out that the low number of burials found during the Upper Palaeolithic might be partly due to inhumation being an unusual funerary practice. This points to strategies employed to 'hide' death being another potential factor behind the absence of human remains at open-air sites before 14,000 cal BC. This could also partly explain why most individuals are found in domestic sites, mixed with domestic structures.

The hiding of death can be observed in several hunter-gatherer and early agricultural societies and has been explained as a response to a fear of the passing of time and the discontinuities generated by it since change would be perceived as a risk for the continuity of the group. This explanation for the hiding of death stems from the fact that several groups whose funerary behaviours generate the destruction of the evidence of death also make special efforts to forget their past, generating an illusion of everlasting present (Clastres, 1981: 74–78; Criado-Boado, 1991: 93–96, 1993: 51, 1995, 2012: 285–286; Hernando, 2002).

Common ways of hiding death are burying the bodies under houses, depositing the bodies in trees to ensure their disappearance by natural causes, or the abandonment of the deceased in places to which the group will never return (Criado-Boado, 1991: 94; Weiss- Krejci, 2013). An example of the latter is how in some African societies the deceased are left *in situ* and, if the person dies in the village, the group moves to a new place (Woodburn, 1982).

Another explanation for the small number of human remains is that the funerary rituals which have taken place have removed the bodies. These might be cremation, defleshing, or even endocannibalism (Lyons, 1921; Bonogofsky, 2011b), which usually aim at ending the former status of the person and creating a nexus with the new one as a result of veneration, or destroying it out of fear. In addition, in some cases, it could be a combination of both, since there are societies that believe that a ritual to end the status of the deceased as a living person needs to be carried out so that they do not become a ghost that wanders around the village, causing sickness and death. Thus, the deceased are feared before the funerary rituals take place, but they are venerated afterwards, once they have joined the ancestors (Grimble, 1921: 46; Leenhardt, 1971: 54–54, 61; Clastres, 1981: 75; Hertz, 1990: 28–29). An example of these sorts of rituals that result in the disappearance of the body is that observed among the Bororo. Here funerary rituals culminate in the deposition of the deceased's bones in an urn that is thrown into the nearest river (Clastres, 1981: 76).

The explanations referring to the fear of the passing of time and ceremonies aimed at the change of the status of the deceased are not necessarily mutually exclusive, as they could play out subconsciously and consciously. There are other possible explanations for the presence of human remains mixed with the domestic structures. Gallego Lletjós (2011: 547) argues that loose bones and bones found in domestic spaces that underwent secondary treatment might have been an extension of the deceased in the social sphere. An example, from the Admiralty Islands, is the making of teeth pendants that are worn by the deceased's family to keep their loved ones with them (Lévy-Bruhl, 2003: 637).

Shell middens containing human remains are a phenomenon that only existed (or at least we only have evidence for), from c. 10080 to 4246 cal BC, with the sites of Santimamiñe and Cabeço do Pez marking their beginning and end, respectively (Gallego Lletjós, 2013; Peyroteo Stjerna, 2016a). Human remains in shell middens, or at least in the shell middens that were not large cemeteries, could also be explained as strategies for hiding death or the continuation of the deceased in the social sphere since, as Schulting (1996a: 347) points out, they are rubbish heaps or habitation sites and having human remains there does not automatically turn them into ritual places.

Perhaps the key point to emerge from these observations is that the modes of depositing human bones in this period appear to imply that people were hiding evidence of death, which in turn suggests the dead were not being used as a way to demarcate the land. It has been argued that the absence of land demarcation might imply the absence of nature/culture dualism, since the reason why the land was not demarcated is that it was perceived as a subject with agency, on whom the groups' survival depended, and not as something that could be controlled or owned (Hernando, 2012a: 66–67). These ideas of nature as a sacralised subject with its own agency can be observed in several hunter-gatherer and traditional agricultural groups, as it is the base for totemist and animist religions, which most of them practice (Lévi-Strauss, 1966; Ingold, 2000). For example, the Q'eqchí' of Guatemala and Belize venerate a mountain god. However, this god does not live in the mountains; he is the mountains themselves (Hernando, 2002: 152).

4.6.2. Death and the use of landscape after c. 7500–6000 cal BC

Around c. 7500–6000 cal BC funerary practices changed as the culmination of a series of transformation processes that occurred between c. 14,000 and 10,000 cal BC, depending on the variable analysed (*e.g.*, location, MNI, delimitation, etc). Human remains were still mainly placed in domestic spaces. However, these domestic spaces moved from caves and rockshelters to open-air locations: first in the Linear Pottery Culture area and, around 5500 cal BC, in the rest of the study area. MNI was still frequently under 10 individuals, but we see some cemeteries with more than 10 individuals and even some very large ones with hundreds of burials. However, these cemeteries were few: of the 177 sites dated after 7500 cal BC only 38 sites contained 10 or more individuals, 13 sites 30 or more individuals, and 2 more than 100 individuals. These sites were mostly concentrated in two geographical areas: the Linear Pottery province and the Portuguese shell middens.

After c. 7500–6000 cal BC, funerary spaces continued to be only rarely abandoned after human remains were deposited. During the same period, there was an increased frequency of delimited cemeteries and delimited funerary spaces in general, but these never came to outnumber individual and small funerary places mixed with domestic structures. Although most of these cemeteries were still inside settlements, some of them moved to locations nearby (*e.g.*, Ingenheim) (Lefranc *et al.*, 2014).

Several factors could explain the increasing frequency of delimited cemeteries in some areas and the occurrence of human remains at open-air locations. Arias and Ontañón (2012) have suggested that climate change at the beginning of the Holocene and agriculture likely influenced the location of human remains. Due to better weather, domestic spaces moved from the deeper parts of caves to the entrances and then to valleys, owing to the need for arable land. Since funerary spaces were linked to domestic ones, human remains moved with settlements. Another factor could be the generalisation of inhumation as funerary practice. Buried remains are better preserved than non-buried remains due to greater protection from taphonomic processes (Hedges, 2002; Smith *et al.*, 2007). As a result, if burial became a frequent practice, a larger number of remains would be preserved, especially in open-air sites.

Another key finding is the placing of inhumations in delimited cemeteries, which seems to show that, even if the norm was still the use of strategies for hiding death, some groups might have started using death exhibition strategies. Death visibility can be linked to territorial behaviour and the demarcation of territories. However, what is considered to be visible is not objective. Thus, the origin of, and reasons for the demarcation of territories is explained differently according to the author. Some authors (Renfrew, 1976; Clark & Neeley, 1987; Pardoe, 1988; Charles, 1992; Pettitt, 2011: 269) consider the beginning of land division and private property to coincide with the appearance of formal cemeteries, used as territorial markers and link this practice to early agriculture, sedentism and/or demographic pressures. Others (Criado-Boado, 1991; Hernando, 2002: 154– 155; Criado-Boado *et al.*, 2005: 862) consider that the change towards land division had to do with other factors, such as the complexity of socio-economic systems and control over the elements related to food acquisition, whether by hunter-gatherer or agricultural groups. This control would contribute to the perception of the land as an object that could be owned instead of a subject, initiating the path towards nature/culture dualism (Hernando, 2002: 155, 2012a: 66, 85).

In her paper on identity and the funerary record of Mesolithic Iberia, Gallego Lletjós (2011: 545) places the beginning of the appearance of territorial behaviour earlier in the Mesolithic, linking it to the reiterative deposition of individuals in the same place even if the MNI is not enough to consider it a cemetery. The results shown in this chapter seem to indicate that a degree of territorial behaviour might have existed in some groups from early periods and manifested in the manner of reiterative depositions of human remains in delimited spaces inside settlements. These funerary spaces were likely meaningful places to be remembered and seen, both by the group inhabiting the land as a way to legitimize their existence and use of the land through their ancestors and by other groups to transmit this same message (Criado-Boado, 1991: 95; Gallego Lletjós, 2011: 545; Peyroteo Stjerna, 2016a: 471). However, at least before megalithism, these types of enduring places, as well as territoriality, were always the exception and never the norm.

Cemeteries in apparent isolation or near settlements have also been traditionally interpreted in terms of territoriality since they might have been used to claim the exclusive use of a certain resource (Hodder, 1984: 52). However, this hypothesis has flaws since these kinds of cemeteries are not always near resources. An alternative explanation for cemeteries that are distant from domestic areas is that some human groups fear that the dead might come back. An example is the Saami, who believe that the deceased want to take their belongings and families with them; consequently, they wish to keep the dead and their spirits away (Holmberg, 1964; Jacobs, 1995: 393).

Lastly, Anatolian farmer migrations, which had a large impact on the Iberian gene pool during the Early Neolithic (Olalde *et al.*, 2019), and regional cultural factors need to be considered as influencing changes in funerary customs. For example, during 5500–4500 cal BC, most of the remains found in caves are in the Mediterranean Coast and the Pyrenees, which maintained funerary customs like those in previous periods (Beyneix, 1997; Garcia Borja *et al.*, 2011; García Borja *et al.*, 2016) although people started to delimit their funerary spaces. The first area to show human remains at open-air sites is the Linear Pottery Culture province. However, it must be kept in mind that large cemeteries, and especially the delimited ones, are Mesolithic and concentrated in a few very small areas, such as the Muge and Sado shell middens.

Chapter 5: Modifications of the funerary context

Through an analysis of modifications of the funerary context, it is hoped to gain a better understanding of how Upper Palaeolithic to Early Neolithic societies interacted with their dead and with death itself, that is, whether they attempted to hide death (strategies of hiding) or exhibit it (strategies of exhibition) and, in the second case, if this was made through the deposition of individuals in recognised but unmodified places in the landscape, or if the place of deposition was modified, for example, through the use of grave markers (Criado-Boado, 1991: 94, 105, 1995, 2012: 277–279; Pettitt, 2011: 266–267).

The modifications considered here are the use of a grave, sealing method, fire, ochre and other colourants, position markers and furnishings. The presence and absence of most of these modifications of the funerary context have been rarely studied. This is presumably a result of a general scarcity of evidence for most of these modifications likely caused by preservation issues. The features of graves cannot always be recorded, especially when it comes to analysing the presence of position markers or furnishings, frequently made out of perishable materials which rarely preserves (*e.g.*, Olària I Puyoles, 2003; Arias, 2014; Peyroteo Stjerna, 2016a). The problem with furnishings can be addressed using archaeothanatology. However, this approach is relatively recent and not frequently applied, partly because it relies on good preservation and documentation of the remains (Duday *et al.*, 1990; Appleby, 2016; Knüsel & Maureille, 2018). Consequently, there are no detailed studies of the prevalence and changes in the use of graves, sealing methods, position markers or furnishings for the study region.

Ochre and fire are more frequently found and studied than other modifications. Such studies usually focus on the fire-affected bodies and the ochre applied to the deceased. However, both are rare, especially fire, for which there is no literature analysing variations in its prevalence between periods and geographical areas. By comparison, ochre prevalence has been frequently assessed, and its presence varies depending on the period and geographical location. During the Upper Palaeolithic and Mesolithic ochre is rare in Iberia and western and southern France but is more frequent further east (Verjux, 2004: 110, 114, 2007: 25; Riel-Salvatore & Gravel-Miguel, 2013: 330; Arias, 2014: 68, 2016: 702; Orschiedt, 2018: 13–14). During the Neolithic, ochre is found frequently in graves in the Linear Pottery Culture area but is extremely rare outside it (Beyneix, 1997: 196, 1998: 551, 2008: 651; Jeunesse, 1997: 80; Verjux *et al*., 1998: 62–63; Acosta Martínez, 2013; Rojo-Guerra *et al*., 2016).

5.1. Graves

Regardless of the body treatment given to the deceased (*e.g*., cremation, disarticulation, no alteration), the remains could be scattered around the site, deposited on the ground, buried or deposited in some other type of sepulchral structure. An example of a sepulchral structure different from a grave would be that found in Beneito, Spain (19423–17022 cal BC), where cranial remains from two individuals were deposited between two rocks, one placed next to the cave wall and the other closing the burial (Iturbe *et al.*, 1993). Burying or not burying the deceased can reflect a wide array of sometimes opposing ideas about death. The absence of a grave or other types of funerary structure may reflect intentional hiding of death in the form of the simple abandonment of the deceased's body or as a result of a funerary practice that does not involve the burial of the individual, such as secondary treatment of the body (Criado-Boado, 1991: 94; Pettitt, 2011: 267; Weiss-Krejci, 2013).

However, the absence of a grave does not necessarily imply a desire to hide death. According to Pettitt (2011: 267), there are interactions with death that consist of the deposition of the deceased in a recognised place of the landscape that is associated with death. In this case, the place is not modified: the bodies are simply deposited there. Another reason for the presence of unburied remains is their curation out of a desire to extend the presence of the deceased within the social sphere of the living (Gallego Lletjós, 2011: 547). Not burying the deceased can also be a way of denying a proper funerary ritual to certain members of society, such as those who had a 'bad' death (Weiss-Krejci, 2013: 285).

On the other hand, burial often implies an intentionality that is reflected in the investment of time in modifying the place of disposal (Pettitt, 2011: 267). However, some burials, such as those in shell middens or under houses, and those that do not present any other ritual feature (*e.g.*, ochre, fire,funerary offerings) might also result from the intention of hiding the bodies (Clastres, 1981: 75; Criado-Boado, 1991: 94; Pettitt, 2011: 267).

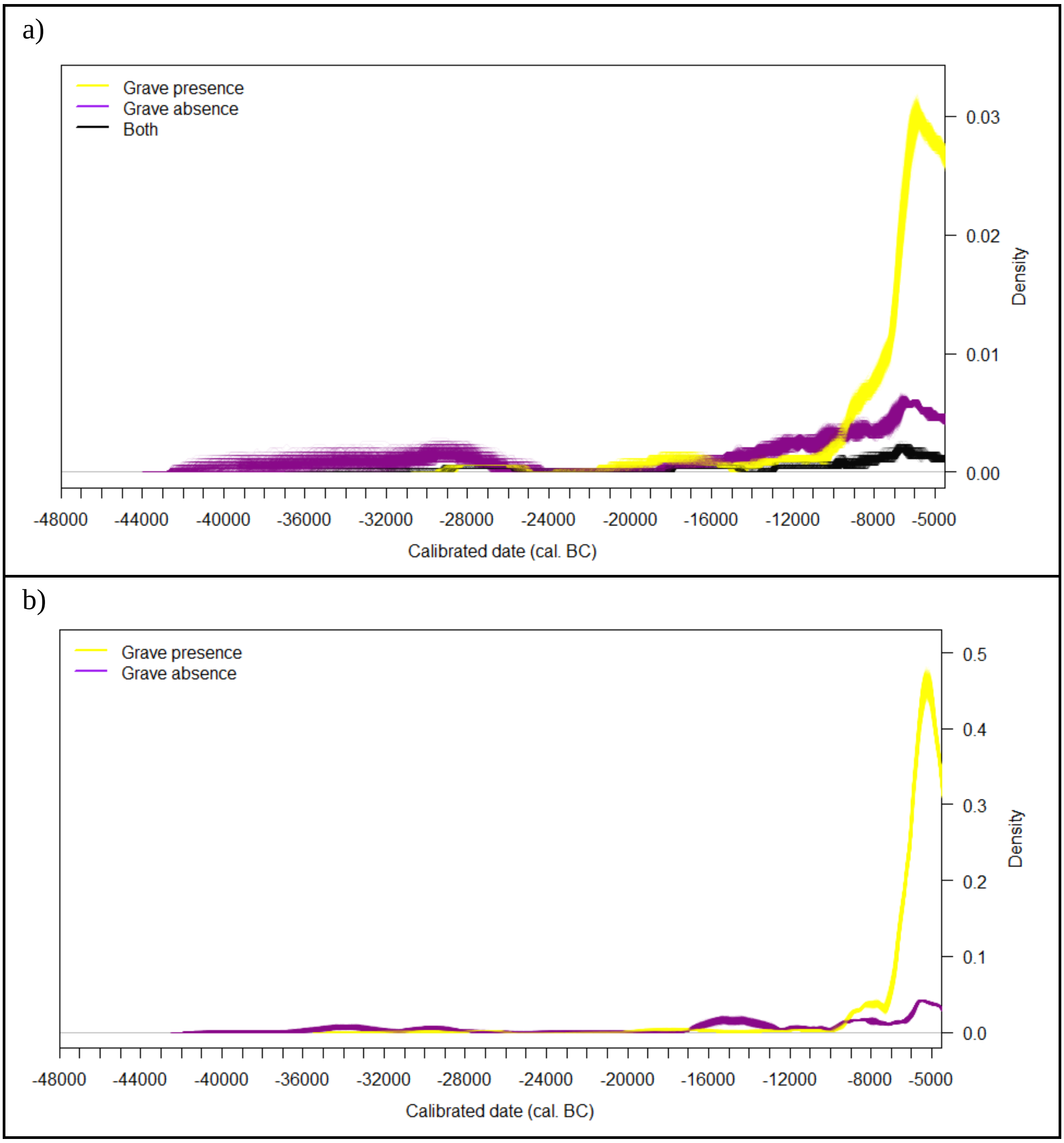


Figure 44: Monte Carlo graphs of changes over time in the number of sites with individuals in and out of graves (a) and individuals in and out of graves (b)

Sites containing unburied individuals were more common than sites containing buried individuals until c. 9500 cal BC, except for a brief period from c. 21500 cal BC to c. 18000 cal BC (Figure 44a). From 18000 cal BC, sites with unburied individuals started to increase slowly and sites with both buried and unburied individuals appeared. However, sites with both buried and unburied individuals always remained unusual. In c. 10000 cal BC, the number of sites with buried individuals started to increase rapidly and by c. 9500 cal BC outnumbered those with unburied individuals. Furthermore, from c. 7000 cal BC, the total number of buried individuals is vastly larger than that of unburied ones (Figure 44b). This is likely due to the high concentration of buried individuals in large cemeteries. No geographical pattern of sites containing buried and unburied individuals can be seen: before 10000 cal BC, sites with unburied individuals were widespread and, after 10000 cal BC, sites with buried individuals were the ones widespread.

It is worth noting that at least some of the individuals classed as unburied might have been deposited in graves that went undetected (Peyroteo Stjerna, 2016b). Notwithstanding, what the data seem to show is that for populations before c. 10000 cal BC burial was an uncommon practice. Furthermore, the scarcity of human remains preserved from these periods and their absence from open-air sites before c. 14000 cal BC might be a direct result of not burying the deceased (Pettitt, 2011: 262; Arias, 2014: 70), as unprotected remains, especially those in open-air locations, would be more affected by taphonomic processes (Hedges, 2002; Smith *et al.*, 2007). A χ^2 test showed a strong correlation (p=0.000) between the use of graves and the location of sites. This correlation is caused by the large majority of human remains in open-air sites being buried (795/819, 97.1%), while in caves and rockshelters the proportions of buried and unburied individuals were more or less equal. This is the case in the entire study area and shows how unburied individuals had a better chance of surviving in caves and rockshelters due to the stable conditions of humidity and temperature (Hedges, 2002: 325; Smith *et al.*, 2007).

These funerary practices that do not include the burial of the deceased might be showing the predominance of strategies for hiding death (Criado-Boado, 1991: 94; Pettitt, 2011: 267). However, the absence of graves during that time is also compatible with the deposition of the deceased in recognised places in the landscape (Pettitt, 2011: 267), and with the continuation of the deceased in the social sphere (Gallego Lletjós, 2011: 547).

On the other hand, from c. 10000 cal BC, the pattern changed rapidly, with individuals not being buried becoming an unusual practice. This change shows a higher investment of time in the modification of the funerary space and, likely, more interest in preserving and making the deceased visible (Clastres, 1981: 75; Criado-Boado, 1991: 94; Pettitt, 2011: 267). This hypothesis is supported by a χ^2 test that shows a strong correlation between the delimitation of the funerary space and the use of graves (p=0.000). This correlation is caused by human remains in delimited spaces, unlike those in mixed spaces, being extremely likely to be buried (510/549, 92.9%). Delimiting the funerary space instead of depositing the deceased among living structures is a way of making them visible by placing them in a recognisable location (Pettitt, 2011: 267). The fact that almost half of the individuals in mixed spaces were unburied does not mean that some societies left cadavers to rot in domestic spaces that were in use. Unburied remains in non-abandoned mixed funerary spaces are usually bones in a secondary position and the few remains in a primary position are cremations. This pattern is not linked to specific areas or sites; it characterises the whole study area.

5.2. Location markers

The use of location markers reflects a time investment in the modification of the funerary space. In addition, this modification allows easy recognition of the place in which the deceased was deposited and, thus, likely indicates a desire to exhibit death. On the other hand, the absence of a location marker might represent a desire to hide death, or simply a lack of time investment in the modification of the funerary space (Criado-Boado, 1991: 94, 105, 1995, 2012: 277–279; Pettitt, 2011: 267).

Elements used to mark the position of the grave, which mainly occur or are mainly preserved in Spain, consisted of megaliths, a small tumulus as at the Spanish site of Morín (34999–8000 BC) (Freeman & González Echegaray, 1970), stone slabs or rocks as at Aizpea, Spain (5610–5500 cal BC) and Téviec, France (5490–5220 cal BC) (Cava Almuzara *et al.*, 2002; Barandiarán Maestu & Cava Almuzara, 2007b; Boulestin, 2016), and wooden roofed structures such as that found on Cerro Virtud, Spain (5197–4464 cal BC) (Montero Ruiz *et al.*, 1999). Antlers might have been also used as grave markers in some cases, such as the ones positioned over one of the burials of El Collado, Spain (7590–6648 cal BC) (Aparicio Pérez, 2008). It is also possible that whole burial areas might have been marked instead of individual graves. This is one of the interpretations placed on a series of postholes found near the burial area at Cabeço da Amoreira, Portugal (6362– 5370 cal BC) and Moita do Sebastião, Portugal (6426–5390 cal BC) shell middens (see Figure 40) (Peyroteo Stjerna, 2016a: 472).

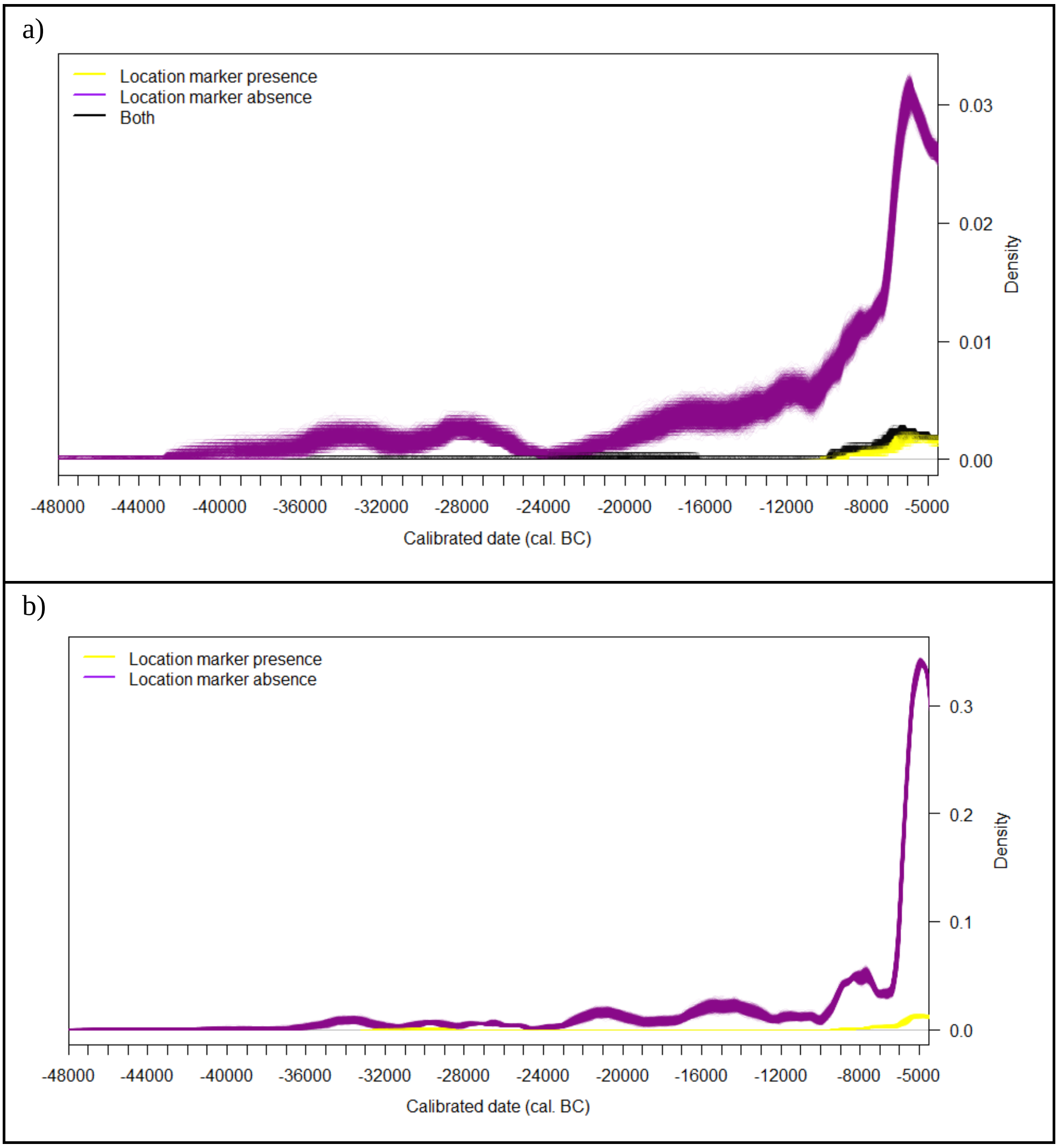


Figure 45: Monte Carlo graphs showing changes over time in the number of sites with graves with and without location markers (a) and individuals in graves with and without location markers (b)

Few changes over time are observable in the presence of a gravestone or grave location marker. Marked human remains first appeared around 35000 cal BC. However, unmarked human remains are always more frequent than marked ones (Figure 45). This may be due to factors of preservation since they could be made out of perishable materials. Due to their small number, no geographical pattern can be seen in the distribution of sites containing individuals with location markers. Furthermore, the slight gradual increase in the use of location markers from c. 10000 cal BC is inconsequential as the number of individuals without location markers also increased. This increase could be partly due to bias. Several location markers are found in open-air sites where organic matter is not well preserved (Collins *et al.*, 2002; Hedges, 2002). Thus, the differential preservation of evidence due to older sites suffering longer exposure to taphonomic effects needs to be considered (Surovell & Brantingham, 2007: 1871).

On the other hand, the few location markers that were preserved, including a few early megaliths, might reflect the adoption of death exhibition strategies that included the modification of the funerary context by a small number of human groups that lived before 4500 cal BC (Criado-Boado, 1991: 94, 105, 1995, 2012: 277–279; Pettitt, 2011: 267). This is further supported by χ^2 tests showing strong correlations between the incidence of location markers and graves (p=0.018) and between location markers and whether the funerary space was delimited or mixed (p=0.000). The first is caused by almost all individuals with location markers being buried (26/28, 92.8%). The only two unburied individuals deposited with a location marker come from the same context in Nerja Cave. They were placed in a natural niche, possible evidence of intentionality, and were separated by funerary offerings and a tumulus (González-Tablas Sastre, 1990). Sites containing buried marked individuals do not follow any recognizable geographical pattern.

The second correlation is caused by most individuals with location markers being in delimited funerary spaces (20/23, 86.9%). Sites containing individuals with location markers in delimited funerary spaces do not follow specific geographical patterns. Graves can be used as a way of protecting the bodies, while delimited funerary spaces facilitate the recognition of the place where the deceased was deposited. Thus, it is expected that individuals whose place of deposition was intentionally marked were buried and placed in delimited funerary spaces (Criado-Boado, 1991: 94, 105, 1995, 2012: 277–279).

5.3. Sealing methods

Sealing methods are ways to ensure closing of the funerary context. These methods vary from rocks closing the burial space, as at Cova Beneito, Spain (19423– 17022 cal BC) (Iturbe *et al.*, 1993), to complicated burial structures, as at Cova Fosca, Spain (12362–11791 cal BC) (Olària i Puyoles, 2003) where the burial was placed in the space created after a fall of rocks from the cave roof. The open side of the sepulchral structure was closed by a dry-stone wall. Rocks were also placed on top of both walls (natural and built) to close the grave. Then, a goat horn was placed over the rocks, and the entire grave was covered with soil (Olària i Puyoles, 2003).

However, the description of this feature is more subjective than others because the presence of rocks and other elements on top of graves could be explained in different ways, such as closing the grave so it could not be opened or, where elements on top of graves are visible, marking the position of the deceased. Thus, certain elements on top of graves, such as stones, can be interpreted as position markers, sealing methods or both. Moreover, sealing methods can have opposite meanings depending on the underlying intention.

One reason behind the closing of the grave could be a desire to protect the body from scavengers. Another possible interpretation is thanatophobia. Some modern hunter-gatherers and traditional agricultural societies, such as the Korowai of Papua, are afraid that the deceased might come back as malign spirits (Grimble, 1921: 46; Leenhardt, 1971: 54–54, 61; Clastres, 1981: 75; Hertz, 1990: 28–29). Funerary rituals among these groups are frequently methods used to prevent this from happening. In addition, some funerary disposals include the use of elements to immobilize the body, such as the placing of heavy rocks on top of the deceased or low walls around funerary spaces (Tsaliki, 2008; Roberts Kyle, 2012: 44–45).

There are prehistoric examples of individuals deposited with rocks on the chest. For example, at the Mesolithic site of El Collado (Spain), an individual dated to 7590– 6648 cal BC was placed in a pit protected with stones. A limestone rock was found on her chest (Aparicio Pérez, 2008, 2015; Gibaja *et al.*, 2015). Lastly, not all the deceased members of a group are necessarily feared, as sometimes only deviants, such as sorcerers, are. In these cases, special mortuary treatment may be required to prevent their return (Lyons, 1921; Shay, 1985). For example, at El Collado, only one individual received this type of treatment (Aparicio Pérez, 2008, 2015; Gibaja *et al.*, 2015).

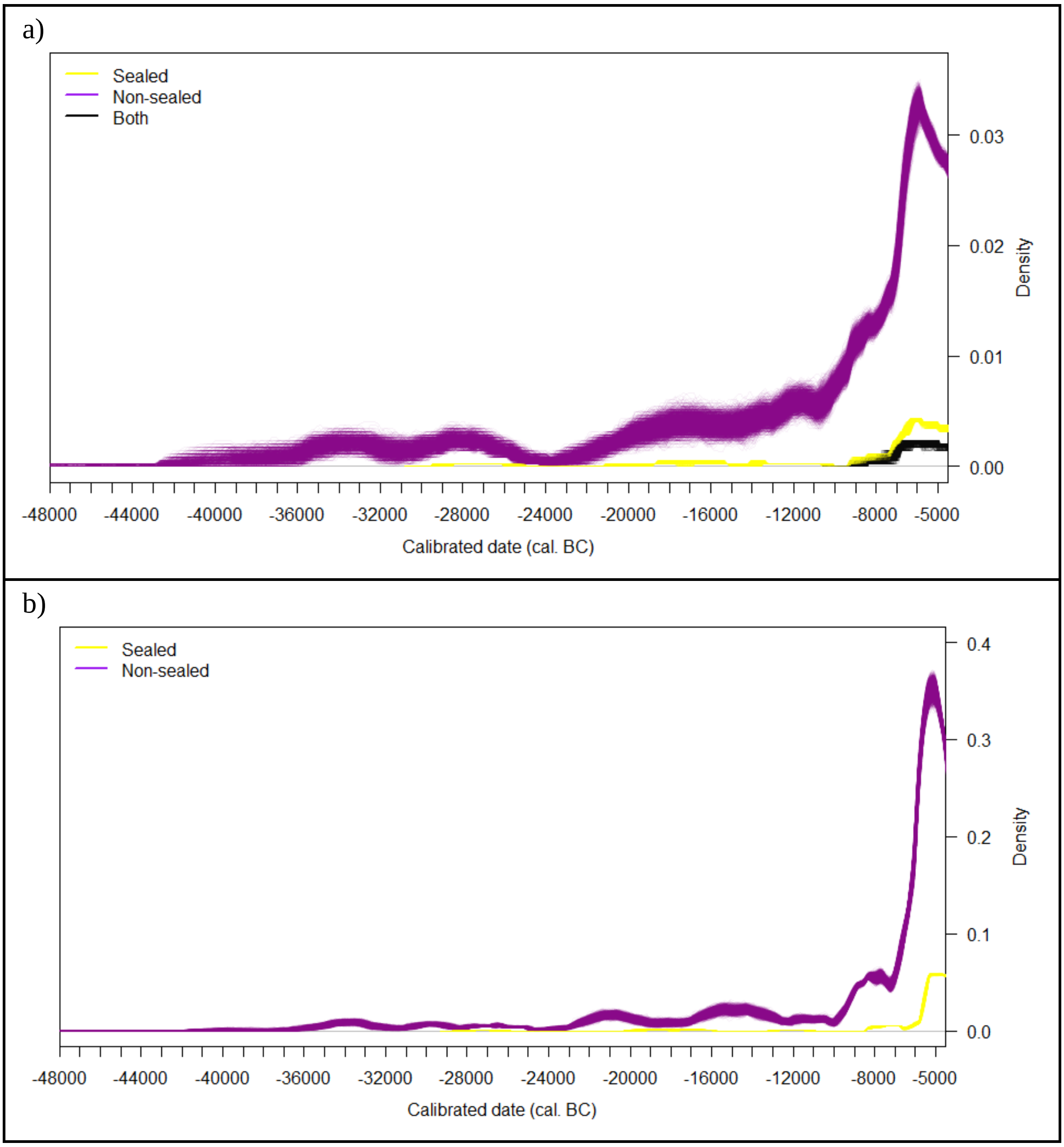


Figure 46: Monte Carlo graphs showing changes over time in the number of sites with sealed and non-sealed graves (a) and individuals in sealed and non-sealed graves (b)

Sealed graves are rare throughout the period of study. They first appeared around 30000 cal BC and increased slightly from c. 6000 to 5000 cal BC, when they stabilised. However, the number of individuals in non-sealed contexts also increased; thus, the proportion of individuals in sealed spaces barely changed or even decreased (Figure 46). During the Early Neolithic, most sites containing sealed graves were on the Mediterranean coast and the Pyrenees, although only a few of them were Cardial Ware (Figure 47).

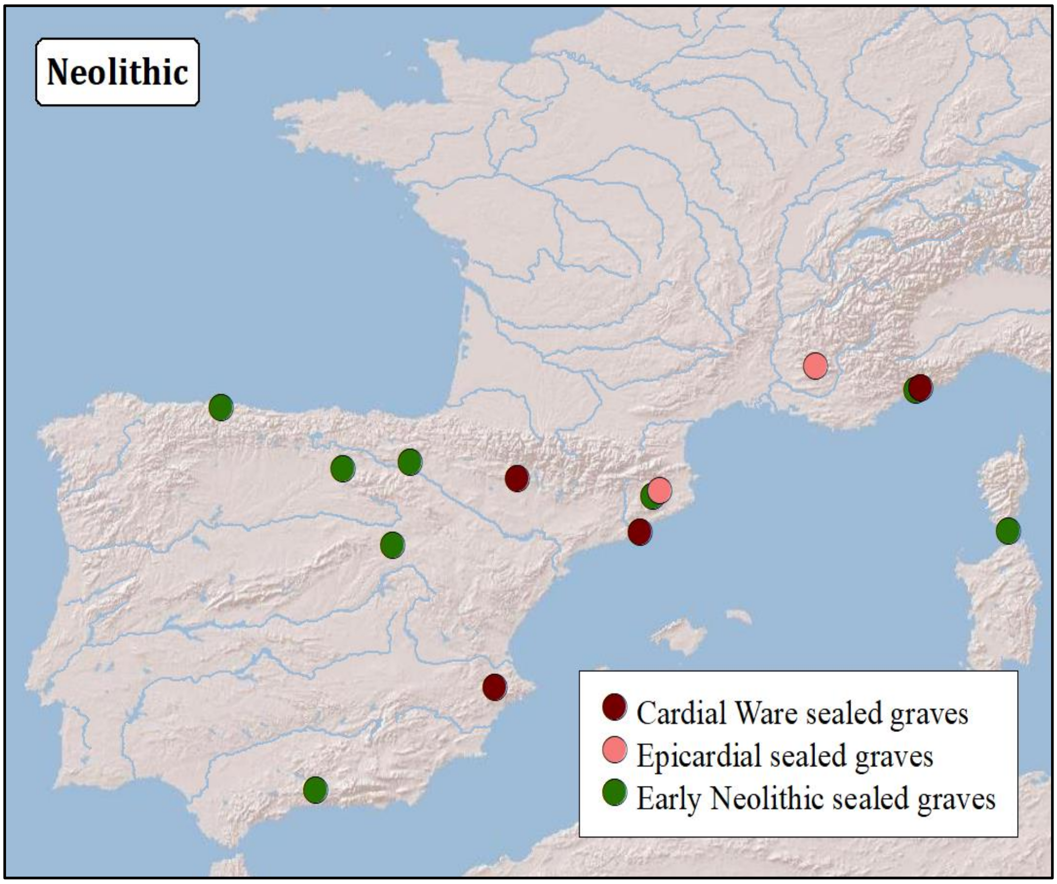


Figure 47: Geographical distribution of Early Neolithic sites containing sealed individuals

These results seem to show that the number of groups actively attempting to seal the deceased, either as a way of protecting the body or as a result of thanatophobia, was always very low but slightly more frequent on the Mediterranean coast and the Pyrenees. A χ^2 test showed a correlation between graves and sealing methods (p=0.000), as most sealed individuals are buried (109/112, 97.3%). In addition, Neolithic sites containing individuals in sealed graves follow the same geographical distribution as Neolithic sealed contexts in general. This is likely the result of both practices being used as methods of protecting the body in that area.

5.4. Furnishings

There were three main types of furnishings in the study area: 1) rocks used as headrests, as at the Spanish site of Molino de Gasparín (8000–5000 cal BC) (Carballo, 1960); 2) wrappings (Figure 48) or pillows of perishable materials, such as those used in the Mesolithic Portuguese shell middens (Peyroteo Stjerna, 2016a); and 3) wooden platforms for the bodies or lids to cover the pit while keeping an unfilled space, as at El Truchiro, Spain (5550–5310 cal BC) (Arias, 2014) and Cingle del Mas Nou, Spain (5842–5567 cal BC) (Olària i Puyoles, 2003).

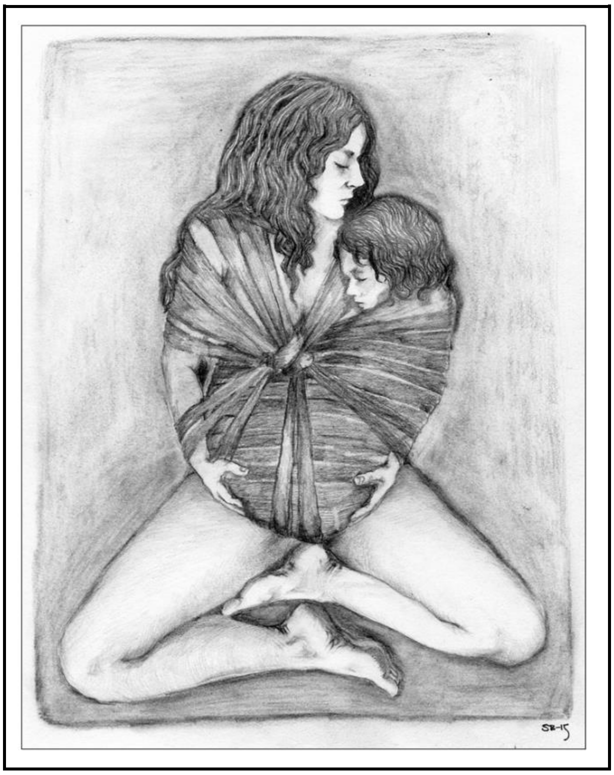


Figure 48: Reconstruction hypothesis of the initial position of individuals 11 and 12 of the Portuguese site of Arapouco (5970–5730 cal BC) and of the wrappings used to keep the individuals in place

Source: Peyroteo Stjerna, 2016a: 262

The inclusion of any type of furnishings in the funerary context implies an investment of time (Pettitt, 2011: 267). This can either be done as an act of love and care for the deceased or as bribery or placation due to fear the deceased might come back and haunt the living, as sometimes happens in the case of funerary offerings (Parker Pearson, 2003: 7; Roberts Kyle, 2012: 44). However, they fulfil different purposes, such as keeping the body in position, covering the ground or allowing subsequent openings of the grave (Carballo, 1960; Olària i Puyoles, 2003; Arias, 2014; Peyroteo Stjerna, 2016b).

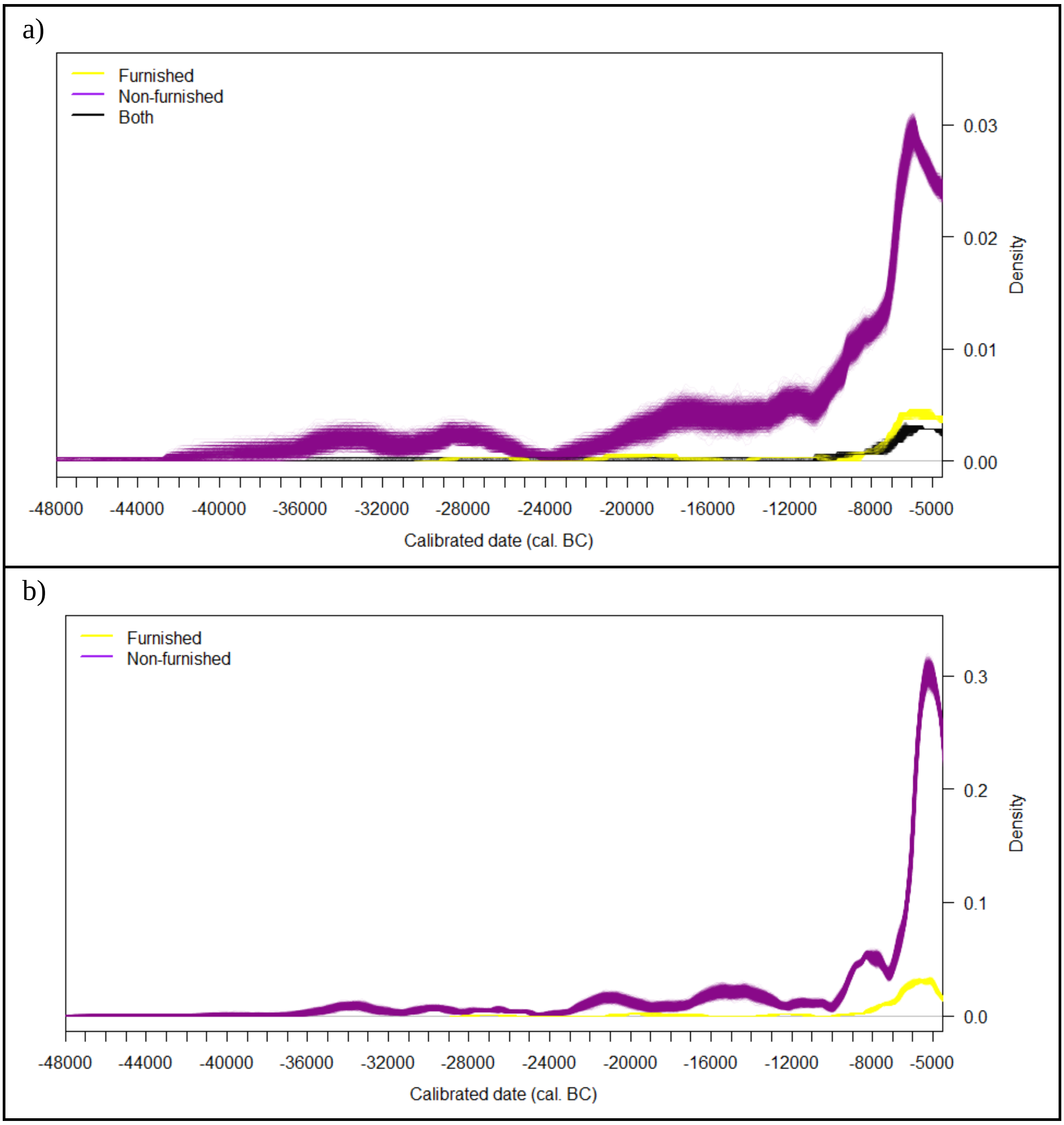


Figure 49: Monte Carlo graphs showing changes over time in the number of sites with graves with and without furnishings (a) and individuals in graves with and without furnishings (b)

Furnishings were absent from funerary contexts before c. 29000 cal BC, except for the Spanish site of Morín (34999–8000 cal BC). The use of furnishings slowly increased after c. 8000 cal BC (Figure 49a). Nevertheless, since individuals in non-furnished funerary spaces also increased, the proportion of furnished contexts may have remained unchanged or even decreased (Figure 49b). Furnished funerary contexts did not follow a specific geographical pattern in any period. These results suggest few human groups before c. 4500 cal BC were concerned with the embellishment of the funerary space or keeping the bodies in position, either as a way of caring for the dead or to placate them (Parker Pearson, 2003: 7; Roberts Kyle, 2012: 44).

The temporal distribution of furnishings is likely biased by taphonomic processes and time of exposure (Surovell & Brantingham, 2007: 1871). This hypothesis is supported by a χ^2 analysis. Furnishings are correlated with graves (p=0.000), as all individuals with furnishings are buried or placed in some type of sepulchral structure. This is, at least in part, caused by a taphonomic bias, as most furnishings are made of perishable materials and organic matter is better preserved in deep burials compared to those on the surface (Hedges, 2002; Smith *et al.*, 2007). This even applies to headrests, the only type of furnishing that is sometimes made of stone (Carballo, 1960; Drak & Garralda, 2009b; Arias, 2014). The fact that archaeothanatological studies, which are still unusual (Duday *et al.*, 1990; Appleby, 2016; Knüsel & Maureille, 2018), have allowed the detection of headrests made of perishable materials (*e.g.*, Peyroteo Stjerna, 2016a), likely means that examples made of such materials have gone undetected.

5.5. Fire within context

Fire can be lit in different parts of the funerary context. It can be lit at the bottom of the grave, as at the Spanish sites of El Truchiro (5550–5310 cal BC) (Arias, 2014) and the French site of L'étang David (4728-4174 cal BC) (Pellet, 1978) . It can be lit on top of the grave, as in the Spanish site of Cueva del Agua (5301–5060 cal BC) (García Sánchez & Jiménez Brobeil, 1985) and the French site of Téviec (5490–5220 cal BC) (Boulestin, 2016). Fires can be lit near to the grave, as in the Spanish site of Morín (34000–8000 cal BC), where one of the graves was physically connected to a smaller pit containing burnt bone and ochre (Freeman & González Echegaray, 1970). Finally, there are cases in which remnants of a fire were found in the filling of the grave, such as Casa Corona where charcoal and burnt land snails were found in the pit fill (Fernández-López de Pablo *et al.*, 2013).

Fire found on top of graves can be the result of burning structures built over the graves. For example, at Skateholm (Sweden) the grave of an old woman was covered by a wooden structure that was burnt down before refilling the grave (Larsson, 1993; 47). Fire traces at the bottom might result from fires lit before adding the deceased to the grave but might also be the result of burning the deceased for a reduced time and/or at a low temperature, so the bones are not visibly affected (Rebay-Salisbury, 2015: 26). Fire found in the filling of the graves can be the result of ceremonies conducted during the filling process, which might include feasting, the throwing away of leftovers, tools and ornaments, and/or the use of fire

(Rebay-Salisbury, 2015: 27). Lastly, hearths found near to the grave might be the result of a meal prepared for the participants of the funeral. This behaviour is present in some modern hunter-gatherer and horticultural groups, such as the Evenks of Siberia (Grøn *et al.*, 2008: 67). Moreover, in some sites, such as the Neolithic site of Los Cascajos, Spain (5311–3775 cal BC), large numbers of faunal remains that were simultaneously consumed have been found in funerary contexts supporting the idea of funeral meals (García Gazólaz & Sesma Sesma, 2007: 55).

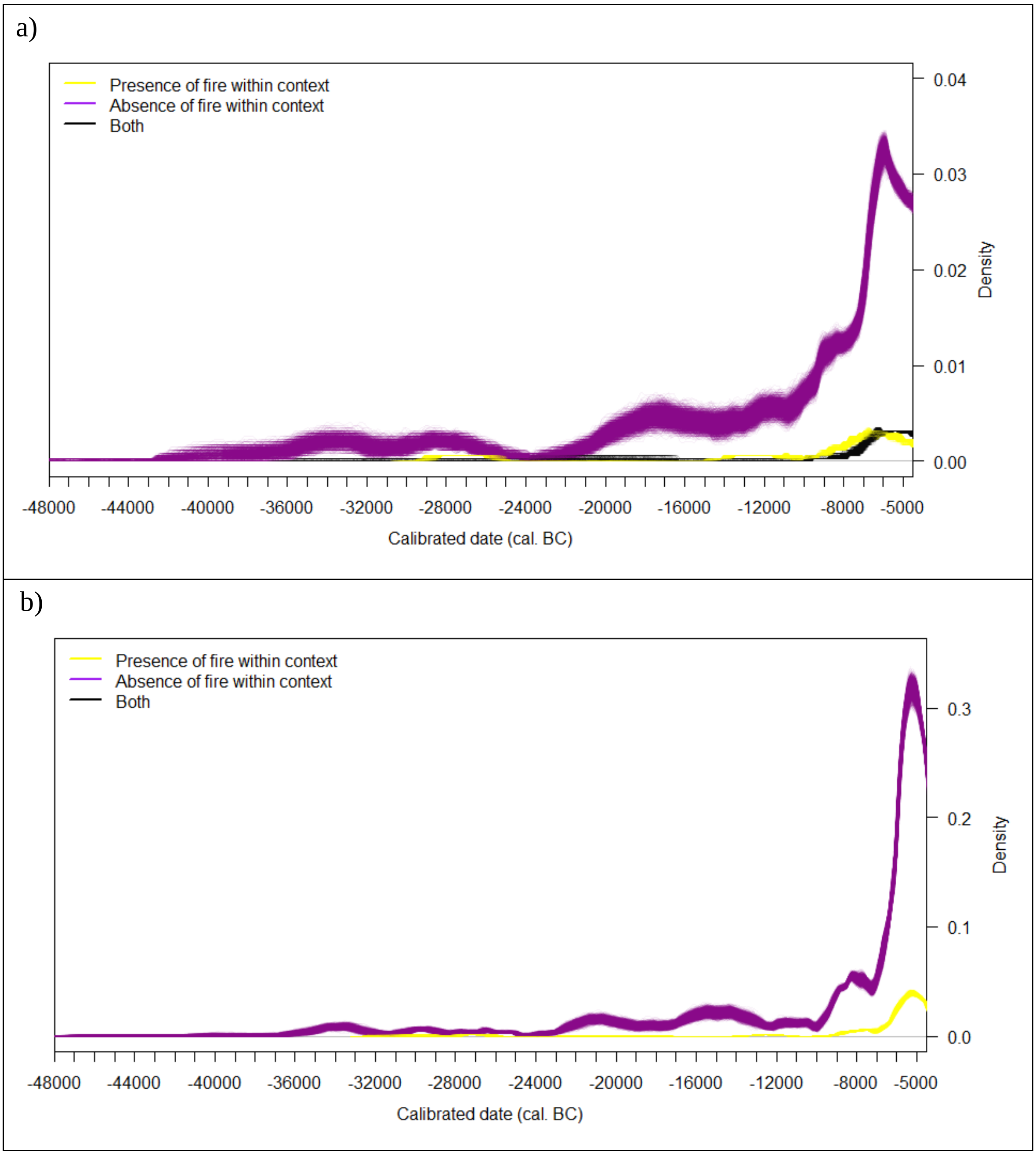


Figure 50: Monte Carlo graphs showing changes over time in the number of sites with graves with and without traces of fire (a) and individuals in graves with and without traces of fire (b)

Evidence of fire in funerary contexts within the study area was absent until c. 33000 cal BC (Figure 50a). The frequency of fire use was extremely low until 10000 cal BC, when the frequency of individuals and sites displaying evidence of fire use started to rise. However, their frequency was never high. On the contrary, given the general increase of individuals from 10000 cal BC (Figure 50b), the percentage of funerary contexts with evidence of fire was maintained or even decreased. No geographical patterns concerning the presence of fire within the funerary context were detected. These results show that only a few human groups from the Upper Palaeolithic to the Early Neolithic developed funerary practices that involved the lighting of fires within the context.

Lastly, the only relevant correlations shown by the χ^2 tests are those between evidence of fire within the context and the presence of graves (p=0.000), and the use of contextual fire and location markers (p=0.000). Most evidence of fire within the context is found in association with buried individuals (87/90, 96.7%). Furthermore, a large proportion of individuals in contexts with evidence of fire have location markers (17/45, 37.8%). Perhaps the reason why ritual elements tend to appear together, aside from preservation issues, is that they fulfil the same purpose of modifying and making more visible the place of deposition and/or the body (Pettitt, 2011: 267).

5.6. Mineral colourant within the context

Mineral colourant usually appears in the form of ochre as powder. Ochre powder could be applied to the funerary offerings, as at Molino de Arriba in Spain (5293–5057 cal BC) (Palomino Lázaro *et al.*, 2011). It can occur at the bottom or top of the grave, as at Sous Balme (8270–7310 cal BC) (Vilain, 1961, 1966) and Araguina-Sennola (7579–5062 cal BC) (De Lanfranchi *et al.*, 1972) in France; or in the fill, as at the French sites of La Montagne des Glaises (5209–4953 cal BC) (Sarel *et al.*, 2010) and Carrière d'Ecriennes (5500–4500 BC) (Bonnabel *et al.*, 2003).

However, while ochre was the most frequent colourant used in funerary contexts during the Upper Palaeolithic to Early Neolithic, it was not the only one. Manganese was also used in some cases, as at Abri Pataud in France (Nespoulet *et al.*, 2006). Both ochre and manganese powder might have had symbolic meanings as they suggest an effort to modify the place of disposal (Pettitt, 2011: 266–267). It has been argued that specific colours might have been associated with moments of transition and rites of passage or with specific concepts (Hovers *et al.*, 2003; Zagorska, 2008: 122–123). For example, the Khanty of northern Siberia associate black with hunger, illness and death, and red with regeneration and rebirth (Zagorska, 2008: 122–123). The colour red is recurrently cross-culturally associated with blood, danger and fire (Wreschner *et al.*, 1980; Zagorska, 2008: 122–123).

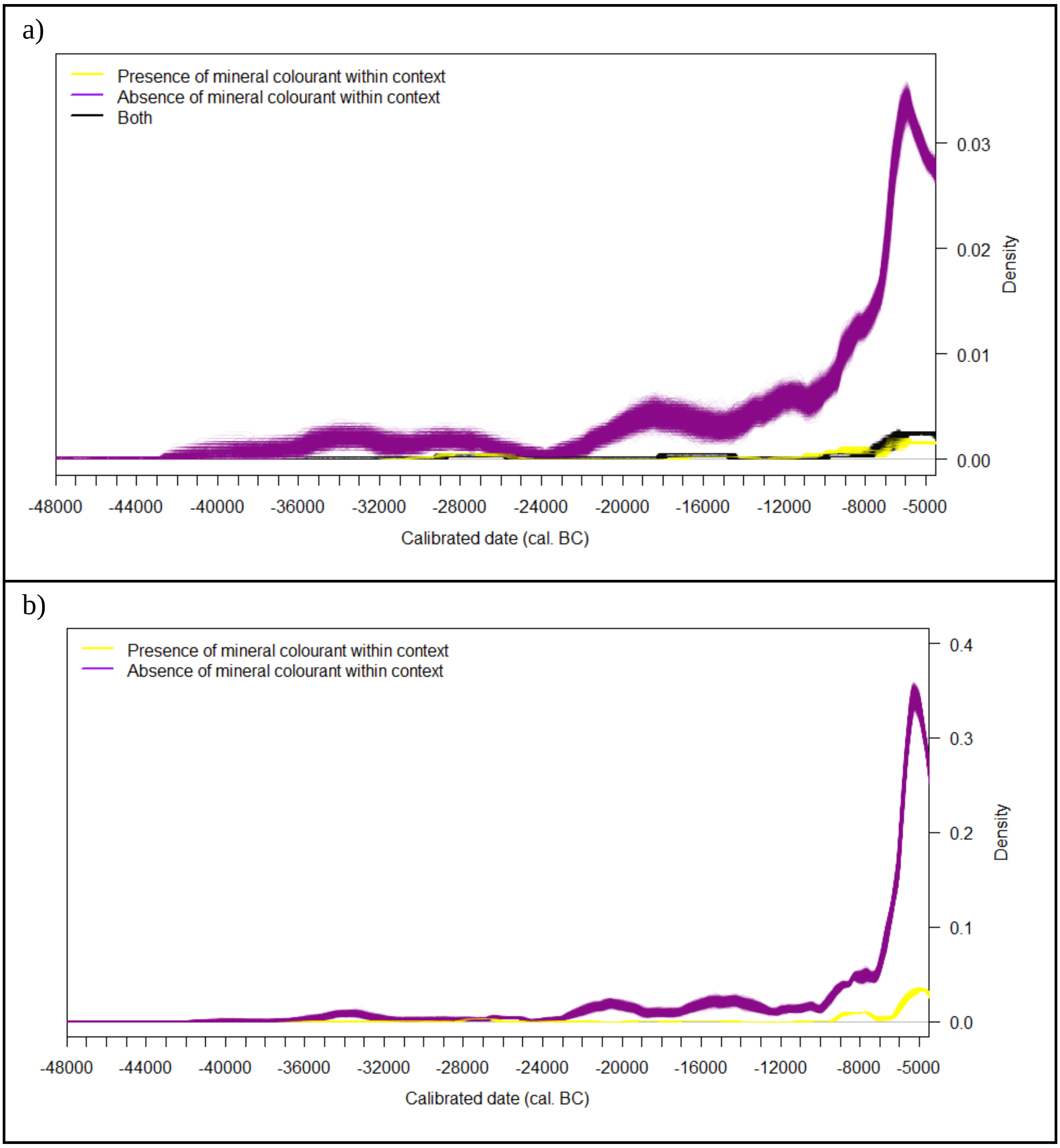


Figure 51: Monte Carlo graphs showing changes over time in the number of sites with graves with and without ochre (a) and individuals in graves with and without ochre (b)

In the study area and period, the use of contextual ochre was never common. There was no evidence of it in funerary contexts until c. 37000 cal BC and, thereafter, cases were extremely rare, even after c. 9500 cal BC, when its presence slightly rises in frequency (Figure 51). In her work on the influence of Mesolithic burial practices in Neolithic megalithism, Olària i Puyoles (2003: 99) pointed out a reduction in the use of ochre between the Upper Palaeolithic and the Neolithic. However, at least in the case of contextual ochre, this decrease only lasted until 6500 cal BC, when it started to rise again. On the other hand, given the rise in skeletal remains from 11000 cal BC (Figure 51b), the percentage of individuals in contexts with ochre was indeed reduced.

The only relevant geographical pattern occurs during the Early Neolithic when most contexts with ochre are found in the Linear Pottery Culture area (Figure 52). This is likely the reason for the relevant correlations regarding mineral colourant within the context. Mineral colourant within the context is correlated with the location of the site (p=0.000), whether the individuals were buried (p=0.000) and whether the funerary space was delimited or mixed with domestic structures (p=0.007). Most contextual ochre was found in open-air sites (72/92 cases, 78.3%), associated with buried individuals (85/87 cases, 97.7%) and in delimited funerary spaces (46/66 cases, 69.7%).

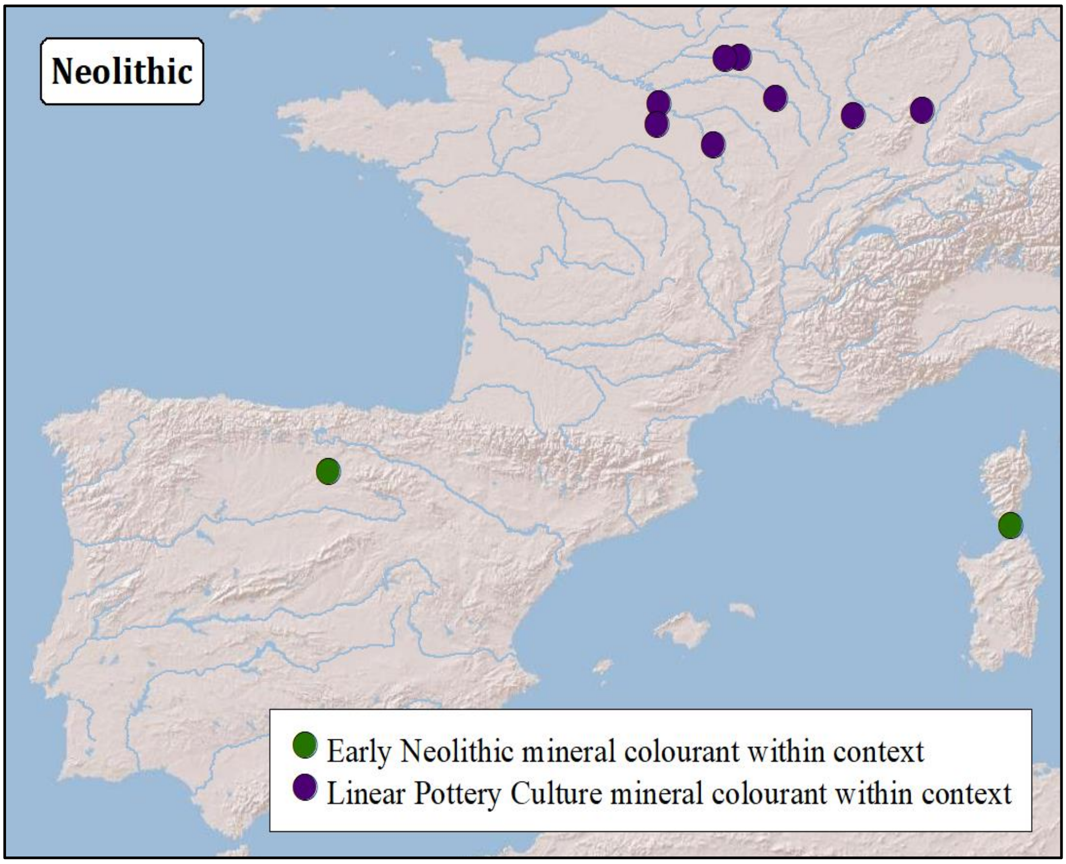


Figure 52: Geographical distribution of mineral colourant within the context during the Early Neolithic

5.7. Overview

From the Upper Palaeolithic to the Early Neolithic (48000–4500 cal BC) there was a continuity in the prevalence of the use of location markers, sealing methods, furnishings, and contextual fire and ochre. All these features were always extremely rare. Notwithstanding, it cannot be known if the results are reflecting reality or are a result of taphonomic biases, given the likelihood that many furnishings were made of perishable materials which rarely preserve.

Regardless, what the available evidence seems to indicate is that most human groups from the Upper Palaeolithic to the Early Neolithic did not invest time in modifying funerary contexts. This, in some cases, might be the result of a desire to hide corpses away. However, this is not necessarily the case –the mechanisms used by some groups might have simply been depositing the deceased in a recognised natural place associated with death (Criado-Boado, 1991: 94, 105, 1995, 2012: 277–279; Pettitt, 2011: 267). Some of these groups might have only modified the funerary context for certain members of society for reasons such as status or deviancy (Shay, 1985), thus their scarcity. For example, some societies give special treatments to individuals who died in traumatic circumstances (Strassburg, 2000; Weiss-Krejci, 2013).

There is, however, one change associated with the modification of the funerary context: the prevalence of the use of graves. Buried individuals, which were extremely rare before c. 21500 cal BC, outnumbered unburied individuals by c. 9500 cal BC, and increased even more during 7000 cal BC. The use of graves did not necessarily imply the abandonment of strategies for hiding death (Criado-Boado, 1991: 94, 105, 1995, 2012: 277–279), as burying bodies could be a response to the desire to hide them away (Pettitt, 2011: 267). Nonetheless, the correlation between graves, location markers and delimited funerary spaces does seem to indicate that the increase in the use of graves relates to a change towards death exhibition strategies, at least in part (Criado-Boado, 1991: 94, 105, 1995, 2012: 277–279).

Chapter 6:
Funerary offerings

Funerary offerings are items intentionally included in the funerary context, such as tools and equipment or ornaments, which are not part of the furnishing of the grave. It is sometimes difficult to distinguish funerary offerings from objects that ended up in the grave as part of the fill or due to taphonomic processes. In recent years, this problem has been partly solved by archaeothanatology, but these sorts of studies are infrequent. Regardless of the issues, funerary offerings have been intensively studied in archaeology; tools found in graves were used to create typo-chronologies that would demonstrate the technological improvement of society. Interest in funerary offerings has not decreased with time; their study has evolved from purely descriptive analyses to more social interpretations, some of which are based on use-wear analyses (*e.g.*, Laporte & Gomez de Soto, 2001; Henry-Gambier *et al.*, 2011; Subirà *et al.*, 2015; Little *et al.*, 2017).

The importance of objects in the construction of human identity (*e.g.*, in gender, ethnicity or personhood) is increasingly taken into account. Making and using things or simply living with them is fundamental in the shaping of people (Fowler, 2010: 360–361). Material culture can be used to transmit information about the identity of the individual, but it also plays a role in the formation of identity through a process of negotiation (Sinclair, 2000: 196; Cobb, 2014: 1208). An example of this is how arrows crafted by the Awá-Guajá (Amazonas) have part of the identity of the maker, since the arrow size depends on the height of the maker and each maker uses different decoration styles. At the same time, the process of making arrows is vital for the construction of male identity (González-Ruibal *et al.*, 2011: 5). Something similar can be observed in the relationship Gumuz and Dats'in women from Ethiopia have with necklace beads. The beads are a sign of group belonging and are worn from birth to after death, since removing them from the deceased would mean that they could not enter the afterlife (Hernando, 2017: 451– 452).

Not only are crafted items culturally important and related to identity, but the materials used and their properties, are relevant (Conneller, 2012). Ethnography also shows how different properties are associated with different ideas. For example, for the Merina and the Zafimaniry (Madagascar), new things and young people are associated with softness and fluidity, but they harden and dry with age (Bloch, 1998: 27). Other societies associate luminous materials with vitality. Thus, it is possible that the selection of materials used to craft items is not only based on practicality but also on these kinds of cultural associations (Jones, 2002; Fowler, 2010: 377).

Funerary offerings did not necessarily belong to the deceased, as the dead did not bury themselves (Parker Pearson, 2003: 3). In these cases, offerings might symbolise tasks or ideas associated with social roles and reflect how society perceived the deceased. The presence of offerings in the funerary context may not have been the decision of the dead but it was someone's decision, perhaps the decision of all of society (Parker Pearson, 2003; Babić, 2005: 73; Fowler, 2013; Arias, 2016).

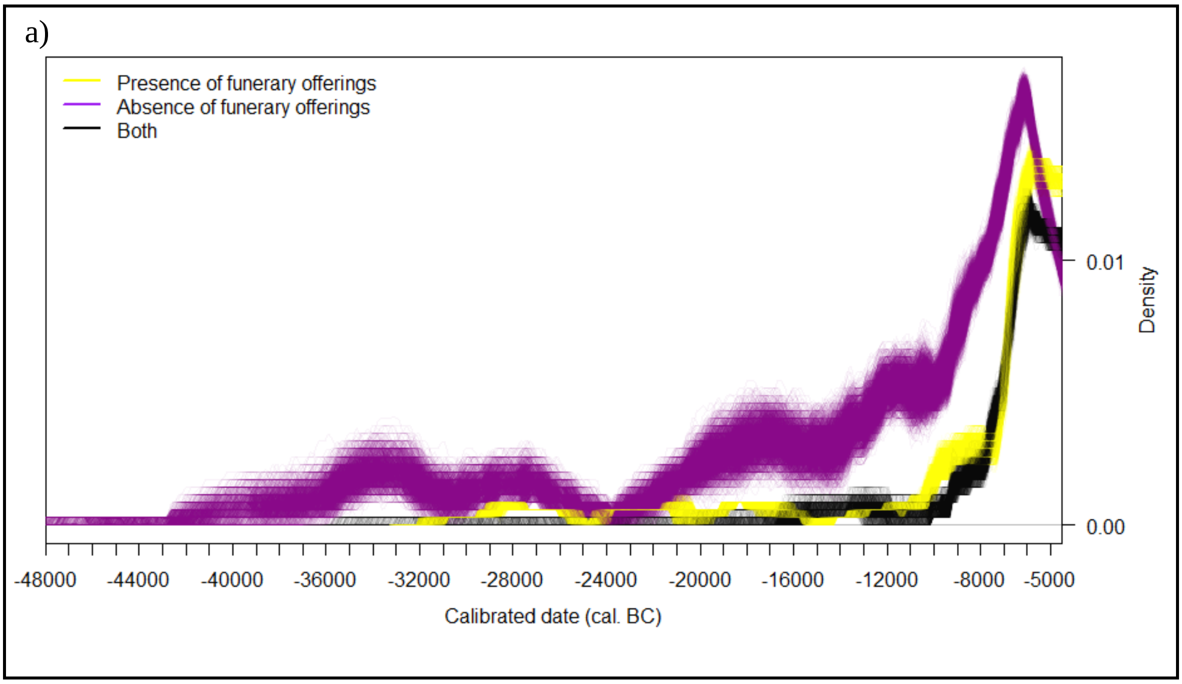
This chapter analyses the funerary offerings and their various interpretations, focusing on the changes in their presence, type and materials from the Upper Palaeolithic to the Early Neolithic in the study area. Given the vast amount of information on this topic, as well as the high variability of items, not all the information available will be discussed in depth.

6.1. Presence of funerary offerings

There are many possible reasons for depositing individuals with and without funerary offerings. The most obvious is that they are a sign of veneration or love. However, there are also cases in which funerary offerings are deposited with the deceased as bribery or placation out of fear that the dead might come back and haunt the living (Parker Pearson, 2003: 7; Roberts Kyle, 2012: 44). In both cases, the presence of funerary offerings points to a symbolic interaction with death (Pettitt, 2011: 267).

The existence of several sites containing some individuals deposited with funerary offerings and some without suggests not all members of those societies received the same funerary treatment. One possible reason for this is their social role (occupation, status, gender and/or age, deviancy, etc.) (Shay, 1985; Díaz-Andreu, 2005; Lucy, 2005a; Chapman & Gaydarska, 2011). However, this might not always be a case of different treatment in death. For example, in Bororo society in Brazil female ornaments were transmitted from mother to daughter; thus, no woman was buried with those ornaments (Lévi-Strauss, 1970: 243). Another possible explanation for the occurrence of items with only some of the deceased are beliefs such as those observed among the Nankanse of Ghana. They do not deposit funerary offerings to accompany the dead. The Nankanse believe that the soul of a living person can sometimes get trapped in the grave along with the deceased. In those cases, the inclusion of the favourite objects of the living person whose soul has been trapped will prevent them from dying (Ucko, 1969: 265).

Lastly, a non-symbolic interaction with death may be a reason for the absence of funerary offerings (Pettitt, 2011: 267). However, other cultural reasons might lead to the absence of funerary offerings. For example, the LoDagaa of Ghana only give nominal funerary offerings to the deceased: they state the number of offerings the deceased has during the funeral, but no physical offering is deposited (Goody, 1962: 73). Similarly, among the Lober of Ghana, the deceased is thought to be able to take their weapons with them by the symbolic action of placing the weapons by their side before burial, but those weapons are not buried (Rattray 1932: 446). In neither case are the actual funerary offerings placed in the grave.



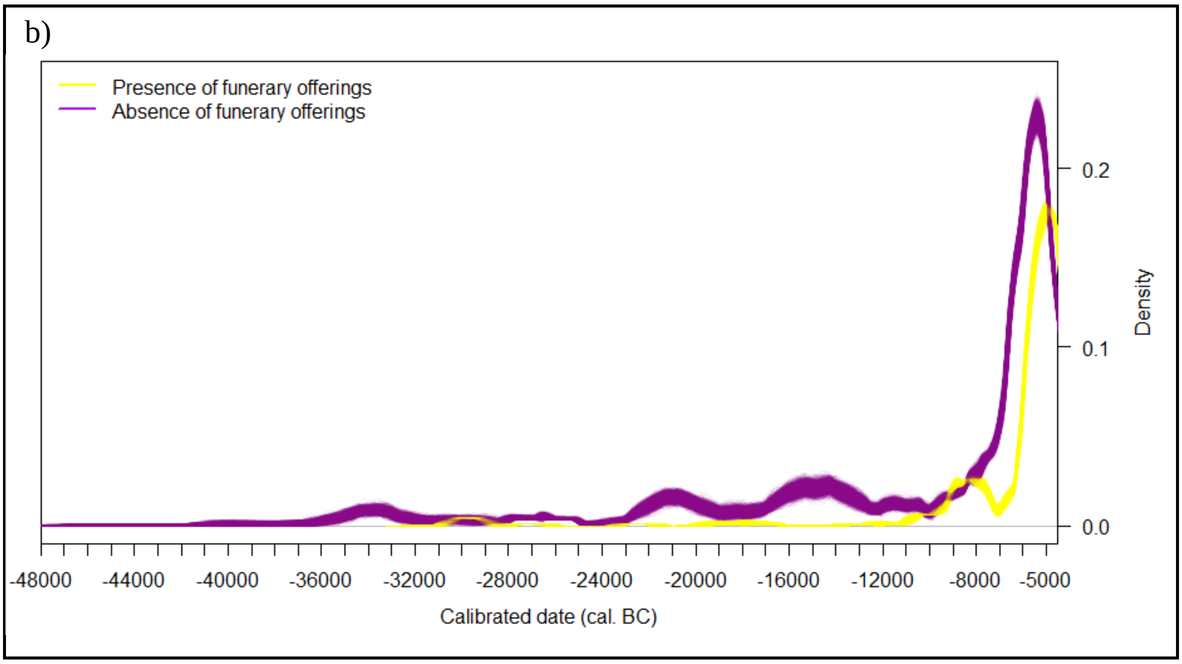


Figure 53: Monte Carlo graphs showing changes over time in the number of sites with and without funerary offerings (a) and individuals with and without funerary offerings (b)

The first instances of funerary offerings are from c. 34000 cal BC. Their presence was extremely rare until 11000 cal BC when the number of individuals with funerary offerings starts to increase. Between 8000 cal BC and 7000 cal BC, their frequency decreases before it starts rising again. However, this decrease can only be observed at an individual level (Figure 53a), as sites containing individuals with funerary offerings continued rising until c. 6000 cal BC (Figure 53b). Lastly, the number of sites and individuals with funerary offerings surpassed the number of sites and individuals without them at around 5000 cal BC.

These results might be biased by various factors. Some funerary offerings may have been made of organic materials and, thus, they might have disappeared due to taphonomic processes (Hedges, 2002). The ethnographic record shows that insect body parts and plant materials, such as seeds, nuts or leaves can be used to make ornaments (Iliopoulos, 2016: 261). As well as taphonomic biases, there might also be a research one; it is difficult to distinguish funerary offerings from objects that ended up in funerary contexts due to unintentional inclusion in grave fill or to taphonomic processes (Arias *et al.*, 2009: 655; Arias, 2016: 694–696).

That taphonomic processes and research methods create a bias is supported by a χ^2 test showing a strong correlation between the presence of funerary offerings and graves (p=0.000) caused by most individuals with funerary offerings being people buried in graves

(339/376, 90.2%). This result could be partly caused by societies that did not bury their dead having a non-symbolic relationship with death, and thus, not making any modification of the funerary context nor depositing the deceased with offerings (Pettitt, 2011: 267). It also points to buried items being less affected by taphonomic processes due to the more constant conditions of temperature and humidity and the protection against scavengers that graves offer. As a result, buried offerings had better chances of being preserved and being less displaced from their original position, facilitating their identification (Collins *et al.*, 2002; Hedges, 2002). The χ^2 test also showed a correlation between the presence of funerary offerings and site type (p=0.000), which is partly caused by the few individuals with funerary offerings in activity areas (12/132, 9.1%). Activity areas are contexts with traces of human activity that do not have evidence of hearths or postholes, maybe as a result of the general conditions of preservation being poorer.

These biases apart, what the data show is that there were no changes in the frequency of funerary offerings until the Early Neolithic, except for a relatively brief period during the Mesolithic (c. 10000–8000 cal BC), when the numbers of individuals with and without funerary offerings were almost equal. However, although the proportion of individuals with and without funerary offerings remained stable, χ^2 tests pointed to some changes in the type of context in which individuals with funerary offerings were deposited, with the presence of funerary offerings correlated with whether funerary spaces are collective or not, the site location, type, and if the funerary area was delimited or mixed.

In terms of whether the funerary space was collective or not, the causes of the correlation change through time. Between 8000 cal BC and 7000 cal BC rarely does any individual deposited in an individual funerary space have funerary offerings, but thereafter there was a large proportion of individuals with funerary offerings in individual funerary spaces, notably after 5000 cal BC. From 8000–7000 cal BC (p=0.006), 1 out of the 18 (5.5%) individuals in individual funerary spaces had funerary offerings. From 7000–5000 cal BC (p=0.003), the proportion was 27 out of 45 (60.9%). Lastly, from 5000–4500 cal BC (p=0.000), 25 out of the 28 (88.8%) individuals in individual funerary spaces had funerary offerings. This is a general tendency, not linked to geographical areas or sites. Nevertheless, most individuals with funerary offerings are always in collective funerary spaces for obvious reasons –they contain more individuals. The key is the difference in the proportion of individuals with and without funerary offerings, which, in open-air sites, changes less and the change is never abrupt.

A possible explanation for the changes observed in the case of individual funerary spaces is a shift in their meaning over time. Before 7000 cal BC, most skeletal remains in individual funerary spaces might result from an attempt to hide corpses (Criado-Boado, 1991, 1993, 1995, 2012). However, after that time and, especially after 5000 cal BC, the deposition of the deceased on their own and with funerary offerings might reflect a special social role, making them among the few individuals to receive funerary treatment (Pettitt, 2011: 267).

The correlations between the presence of funerary offerings and the site type (p=0.003) and whether the funerary site was delimited or not (p=0.000) show that, after 5000 cal BC, most individuals with funerary offerings were in delimited funerary spaces. Usually, these were in cemeteries or smaller burial grounds inside settlements. This is related to the only recognisable geographical pattern in the distribution of sites containing individuals with and without funerary offerings. It occurs during the Early Neolithic, when most sites containing individuals with funerary offerings and, particularly, sites containing both individuals with and without funerary offerings belong to the Linear Pottery Culture or are placed in the Mediterranean Coast and the Pyrenees. Some of these are Cardial Ware or Epicardial, and others belong to other Early Neolithic archaeological cultures (Figure 54).

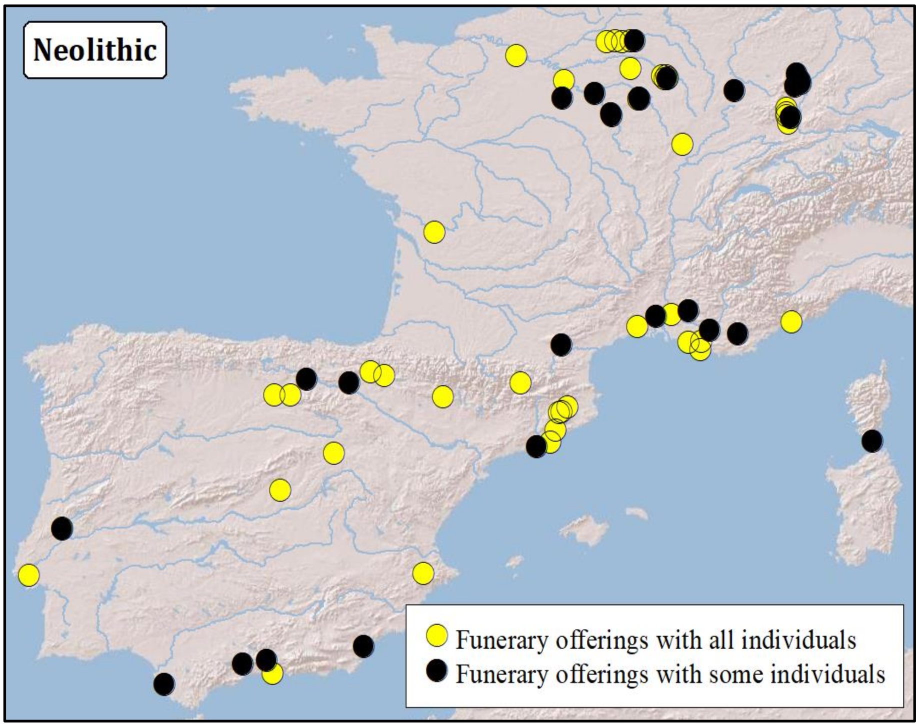


Figure 54: Geographical distribution of Early Neolithic sites where all or only some individuals have funerary offerings

The large number of sites containing both individuals with and without offerings in the Linear Pottery Culture area might be indicative of greater social differentiation in that area during the Early Neolithic or, at least, a broader array of funerary treatments, compared to other areas (*e.g.*, some individuals might receive physical offerings and others only nominal ones) (Ucko, 1969; Babić, 2005;).

Lastly, χ^2 tests show correlations between the presence of funerary offerings and location markers (p=0.000), sealing methods (p=0.000), furnishings (p=0.000), evidence of fire within the context (p=0.000) and mineral colourant within the context (p=0.000), as funerary offerings frequently occur in association with these elements. The only one of these associations that follows a specific geographical pattern is that of the presence of offerings and mineral colourant within the context during the Early Neolithic, as most examples are in the Linear Pottery Culture area. However, this has to do with almost all cases of mineral colourant within the context being in that area, regardless of whether the individuals had funerary offerings or not.

These results are likely caused by societies that deposited their deceased with funerary offerings having a more intricate symbolic relationship with death. Symbolism is also related to funerals and similar elaborate ceremonies that might involve integrating elements of fire, mineral colourant and other modifications to the place of deposition (Ucko, 1969; Pettitt, 2011: 267).

6.2. Types of funerary offering

Funerary offerings from the Upper Palaeolithic to Early Neolithic usually consisted of unmodified faunal remains, artefacts (*e.g.*, bone and lithic tools and pottery), and ornaments (*e.g.*, perforated shells and animal teeth). Other types of funerary offerings were not as common, such as portable art and plants and derivatives such as processed or unprocessed cereals.

Interpretations of these different types of funerary offerings are highly diverse. Broadly, they are interpreted as three main things: *viatica* (food or drinks for the journey to the afterlife), objects that were crafted specifically to be deposited with the deceased, and objects that were not (Roberts Kyle, 2012: 44; Arias, 2016: 693–694). Thanks to use-wear analysis, it is sometimes possible to know if offerings were crafted –or specially commissioned– to be deposited with the dead individuals. Specially commissioned items might be intended to reflect one or more of the many facets of the social role of the deceased, such as occupation, status, gender and/or age (Babić, 2005; Díaz-Andreu, 2005; Lucy, 2005a; Chapman & Gaydarska, 2011; Roberts Kyle, 2012: 44) or their belonging to the community (David, 2016). The interpretation of status is complicated. As Ucko (1969: 267) points out, a person can have prestige without power or wealth, and wealth without any of the former, or have all of them and be accorded a simple burial without grave goods.

If the offerings were not specifically commissioned for being deposited with the deceased, it is impossible to know whether they belonged to the deceased or not. As a result, both scenarios must always be explored. Where funerary offerings did belong to the deceased, their inclusion in the grave might be for diverse reasons, such as them being an important part of the person's identity, an extension of the self (Ucko, 1969: 265; González-Ruibal *et al.*, 2011) or the belongings of a dead person considered to be impure (Arias, 2016: 694). Regardless of the reason for the inclusion of the deceased's belongings in the funerary context, important information relating to the social role of the owner can be extracted from the offerings, especially in the case of items related to the individual's occupation, thanks to use-wear analysis (Gibaja, 2007; Cuenca Solana *et al.*, 2014). Where the offerings did not belong to the deceased nor specially commissioned for being deposited with them, they could have belonged to the mourners (Roberts Kyle, 2012: 44; Arias, 2016: 693–694) or be used to craft part of the tomb, such as a location marker (Little *et al.*, 2017: 233–235).

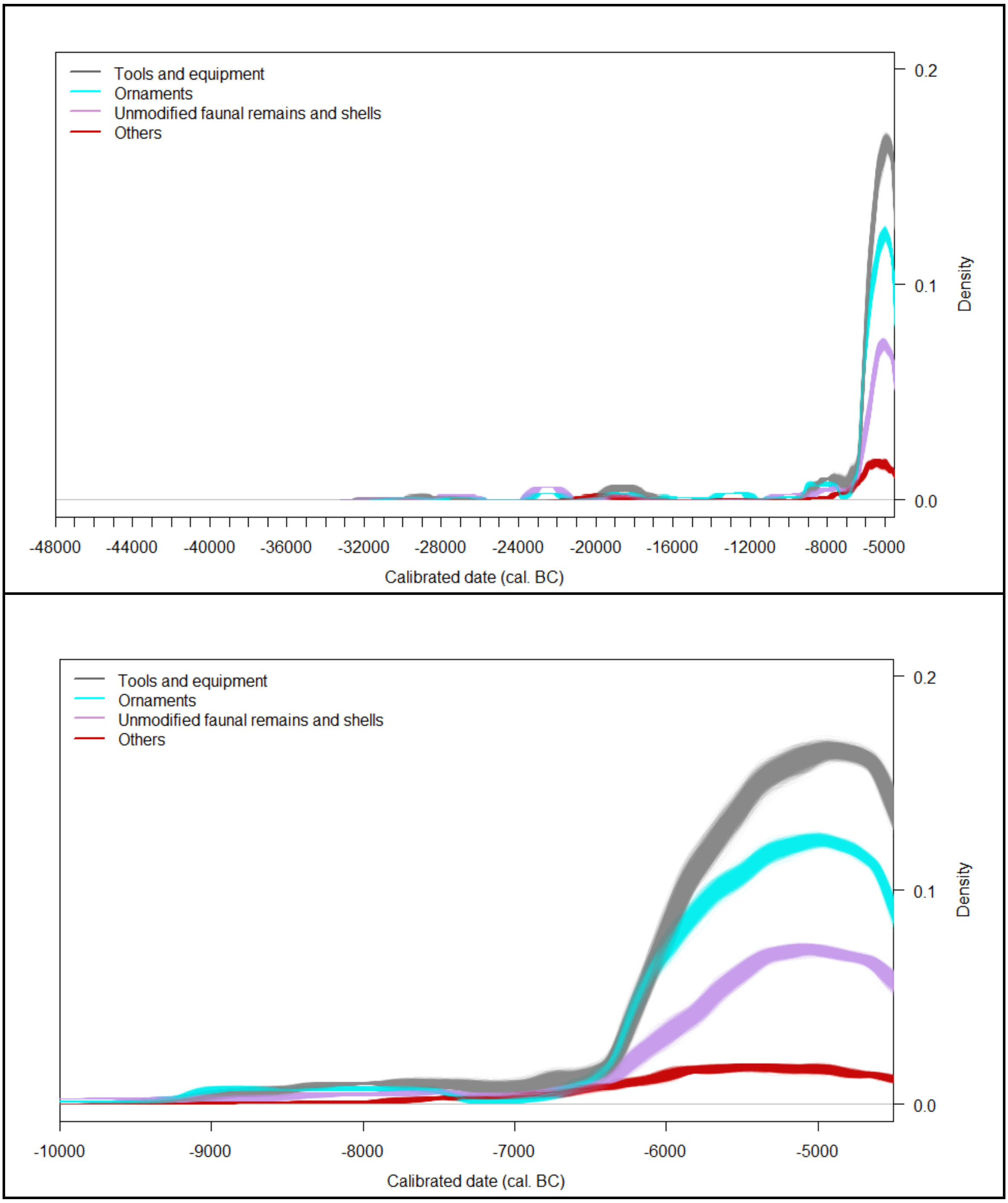


Figure 55: Monte Carlo graphs showing changes over time in the number of each type of funerary offering

No funerary offerings are recorded before c. 33000 cal BC and very few before c. 10000 cal BC, when their frequency started to increase (Figure 55). In addition, before c. 6500 cal BC they were not usual, and all of the different types of offerings were more-or-less equally frequent. After c. 6500 cal BC, tools and equipment became the most frequent type of funerary offering, followed by ornaments and unmodified faunal remains and/or shells. Other types of funerary offerings remained scarce.

Usually, sets of funerary offerings included more than one type of offering, although many individuals were deposited with tools and/or equipment exclusively. On the other hand, ornaments and unmodified faunal remains and/or shells were rarely the only offerings deposited with the deceased. The remaining types of funerary offering, such as plants and plant derivatives, and portable art, were never the only types deposited along with the deceased. This could represent reality, but also be the result of a taphonomic bias, as tools are usually lithic and equipment is usually made of pottery. Consequently, they are better preserved than items made of organic materials, especially plant materials (Collins *et al.*, 2002; Hedges, 2002).

Lastly, concerning biases, it is relevant that there is no correlation between the types of offerings and the delimitation of the funerary space. It would be expected that mixed funerary spaces would contain more of the types of items that can be found in domestic spaces, such as tools or faunal remains, as a result of unintentional inclusions and taphonomy. This likely shows that the items that have been registered as funerary offerings in the analysed sites are, in most cases, intentional inclusions.

Taphonomic issues apart, the data suggest there were barely any changes in the types of offerings most frequently deposited with the deceased, the only one being c. 6500 cal BC and related to the increase of the sample size. Nor were there any regional patterns until the Neolithic, when most unmodified faunal remains and shells occur in the Linear Pottery Culture area (Figure 56). This pattern can be explained as faunal remains playing an important role as identity markers in that area. For example, based on the distribution of animal remains in graves, Hachem (2018) proposed that members of different clans might be associated with cattle, sheep or pig, depending on which species each clan bred; males might be associated with wild boar and pig and females with red deer, while children might be associated with sheep.

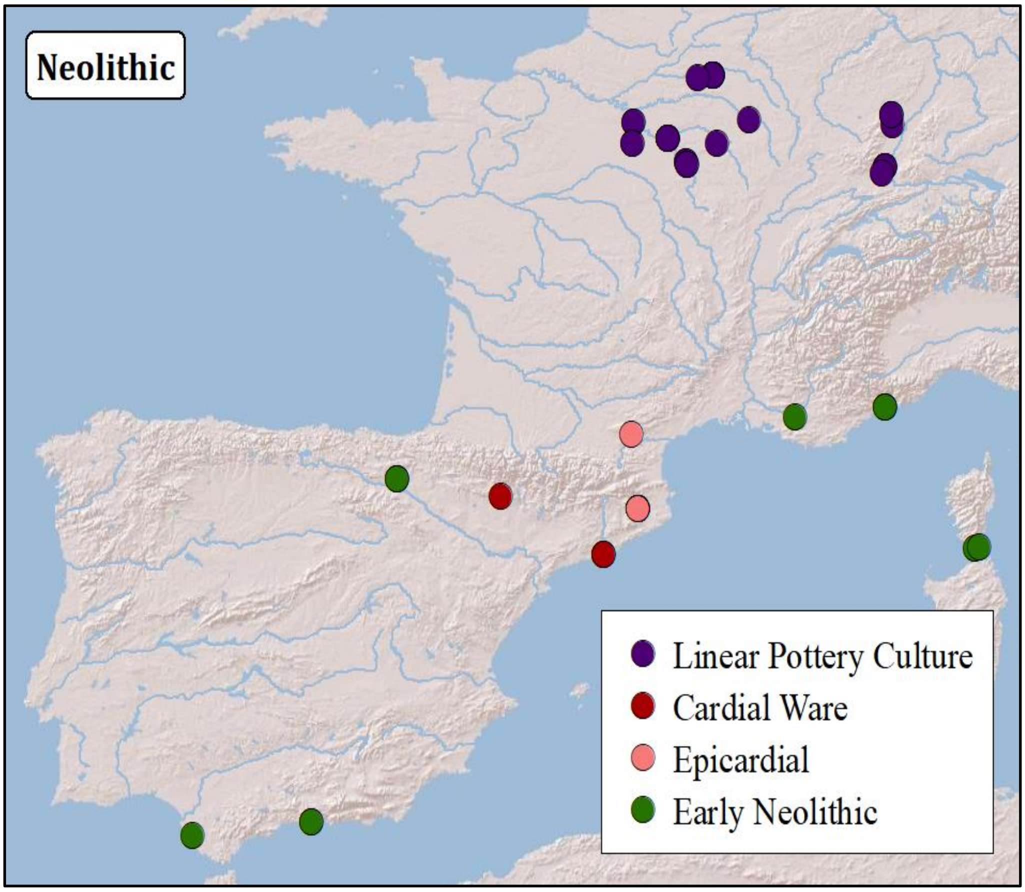


Figure 56: Geographical distribution of unmodified faunal remains and shells in funerary contexts during the Neolithic

Lastly, it is worth noting that the χ^2 test showed a correlation between types of funerary offering and location markers (p=0.000) which seems to be caused by 30 out of the 46 (65.2%) offerings in marked graves being tools and/or equipment. These do not follow any specific geographical pattern. Since only six of those items are made of pottery, one explanation for the correlation could be that those tools, or at least some of them, were used to craft the marker, as suggested by Little *et al.* (2017: 235) in the case of a stone adze found with a Mesolithic cremation at Hermitage in southwest Ireland.

6.2.1. Tools and instruments

Tools and equipment classified here as lithic and bone artefacts, such as knives, needles, shuttles or grindstones, and pottery containers are the types of items most frequently found as funerary offerings. The tools and equipment found in funerary contexts from the Upper Palaeolithic to Early Neolithic are highly variable. There are 53 types of tools and equipment, with half of them only appearing in a single context. The most frequent ones are blades, lithic flakes, pottery vessels, adzes, lithic and bone points and awls, lithic bladelets, scrapers and unmodified pebbles. There are also 13 (3.6%) tools and 26 (7.2%) instruments that could not be assigned to a type, either because it was not specified in the report or because they were fragmentary (*e.g.*, pottery sherds) (Figure 57).

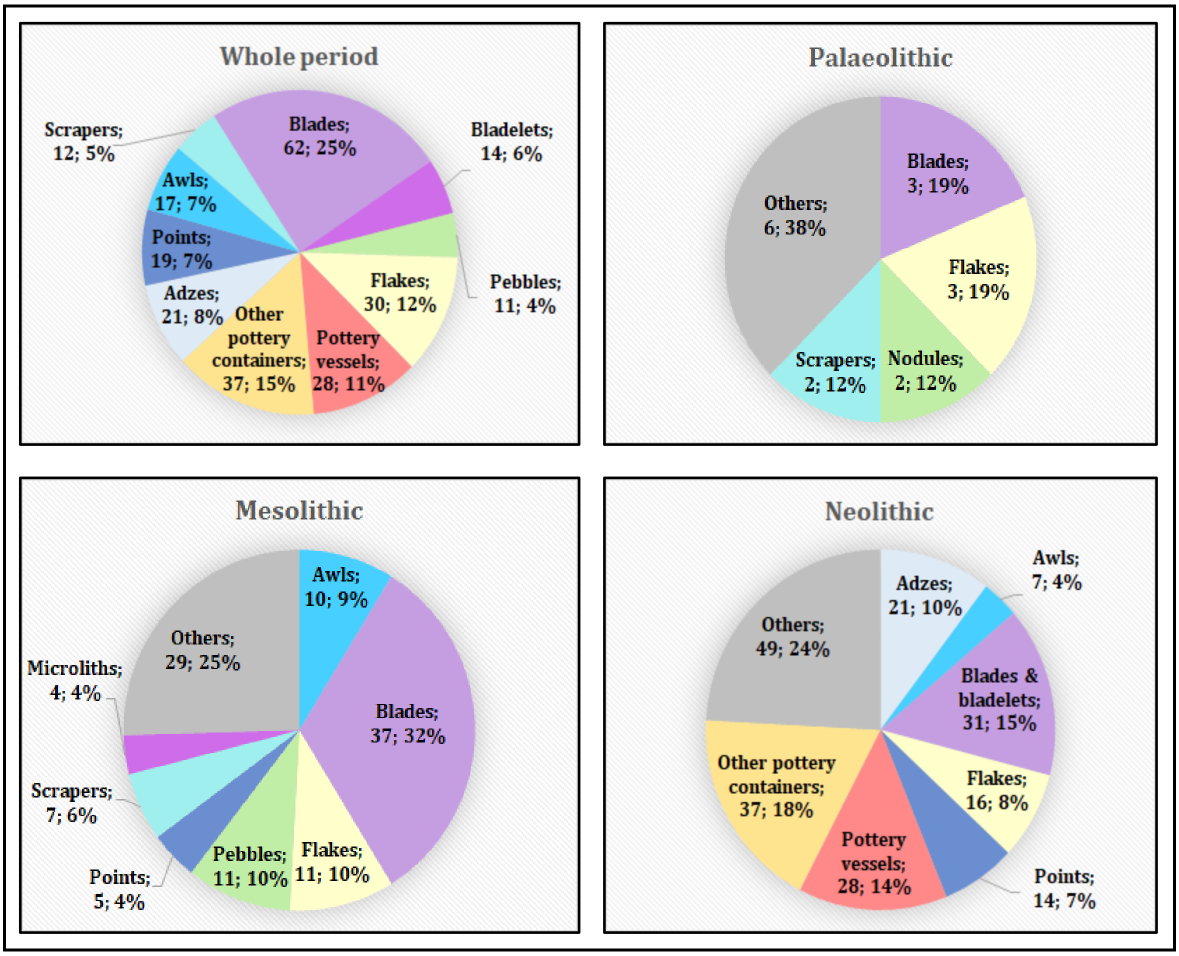


Figure 57: Graphs showing the quantities and percentages (N; %) of each type of tool and equipment per period. 'Others' is a category composed by items that have a very low occurrence

Given the high variability for the relatively small sample size (359 non-repeated items[3]), detailed analyses of the object types have not been performed. Nevertheless, blades (*e.g.*, Figure 58), especially those made of flint, were one of the most common items in funerary contexts in the study area, though they were outnumbered by pottery during the Early

[3] This total does not take into account items that repeat within the same context. See section 3.1.8. Funerary offerings in Chapter 3: Methods for further information about how compounds of the same type of item were counted.

Neolithic. During the Upper Palaeolithic, they were the most common item along with lithic flakes. During the Mesolithic, blades were the most frequent item, partly due to the large numbers in the Mesolithic cemeteries of Téviec, France and Hoëdic, France . However, during the Neolithic, blades (20 complete and two fragmented) were outnumbered by pottery vessels (27 complete and one fragmented) (Figure 57).

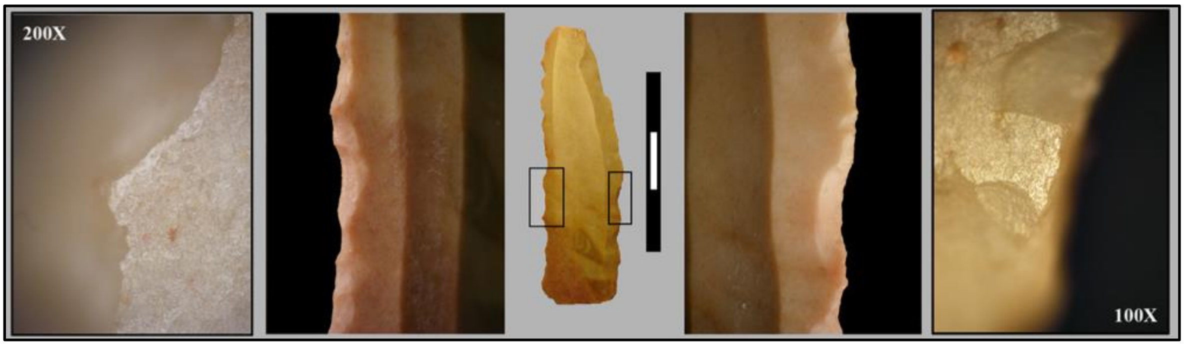
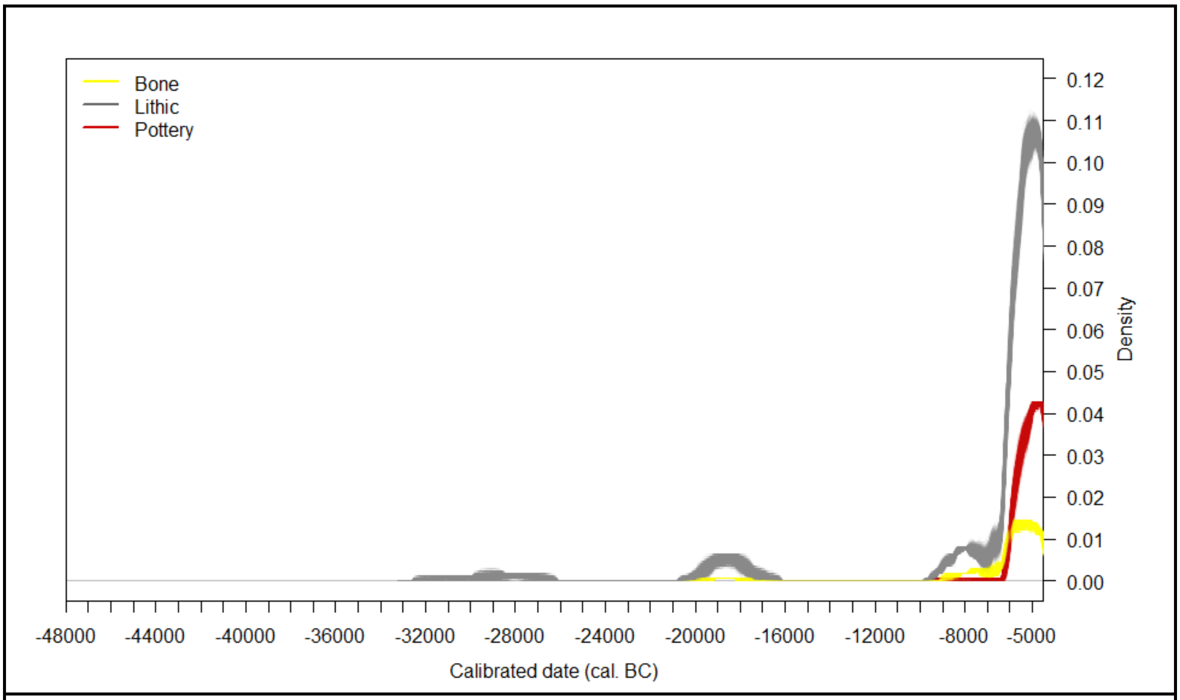


Figure 58: Flint blade deposited as a grave good in La Lámpara (Spain) Neolithic burial
Source: Rojo-Guerra *et al.,* 2016: 191

6.2.1.1. Materials

The study of material culture, in general, has traditionally centred on style, design and function, *i.e*., form, the part considered cultural, over material (Conneller, 2012: 24–27, 104; Cobb, 2014: 1205). When materials are considered, they tend to be analysed from a modern perspective that focuses on those properties considered 'real' and valued by modern society. For example, lithic materials are analysed in relation to their hardness and durability. Yet, other societies associate extra properties with specific kinds of material. Pre-Columbian Mesoamericans thought jade was magnetic, could impart greenness and fertility and absorb water (Saunders, 2001: 221; Conneller, 2012: 2–3, 8, 82). In the case of funerary offerings, details of the materials (*e.g.*, animal species and body part) used to craft the tools are not specified in many papers (*e.g.,* García Gazólaz, 2007; García Gazólaz & Sesma Sesma, 2007). In addition, when the materials of funerary offerings are used to make social interpretations, the rarity of the material has been the most frequent aspect considered, with more exotic or rare materials used to make inferences about the vertical status of the deceased (Chapa Brunet & Ruíz Zapatero, 1990: 28).

However, materials can communicate a wide array of information related to the person's identity (age, gender, etc.) (Cobb, 2014: 1208). Moreover, certain materials might be transformative, conferring on the wearer properties of the animal species used as raw material, as has been suggested for the Star Carr antler frontlets (Conneller, 2004). Material culture can also communicate information about cultural traditions, such as the use of specific materials for specific types of items. For example, in the Scandinavian Mesolithic different woods were used to make different things, *e.g.*, lime for canoes and elm for bows (Price, 2005).



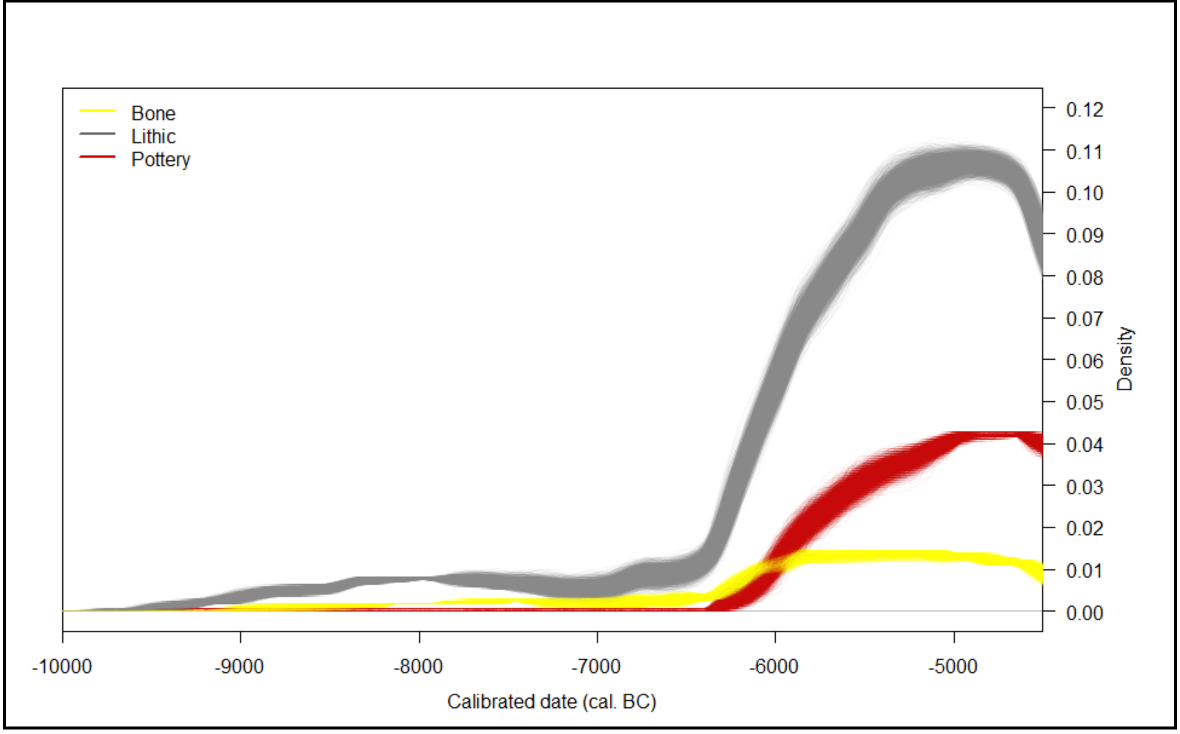


Figure 59: Monte Carlo graphs showing changes over time in the number of tools and equipment made of each material

In the study area, three main materials used to make tools and equipment were preserved: stone, bone and pottery; wood likely played an important role, but it rarely survives. Lithic tools were always the most frequent, even after the appearance of pottery during the Neolithic (c. 6500 cal BC) (Figure 59). The opposite happens with bone objects, which, except for a brief period between the appearance and spread of pottery, were always the least common. However, bone is more affected by taphonomic processes than other (mineral) materials. Therefore, the results of the analyses might be biased by differential preservation (Collins *et al.*, 2002; Hedges, 2002). No regional patterns could be determined in the spatial distribution of materials throughout the period of study.

The variability of subtypes of materials (types of lithics, animal species and body parts) used for tools and equipment is high for the sample size and, thus, it is not possible to perform significant in-depth analyses on them. In most cases, the rock type and animal species used to craft the tools is not specified (n=249, 69.2%). This is a serious omission, considering that each type of stone, animal species and their different body parts could have different functional and cultural properties (Conneller, 2012: 73–74, 82).

Nevertheless, according to the available information, the most frequent types of lithic materials, or at least the most frequently reported, were flint (n=73, 20.3%) (*e.g.*, Figure 60) and quartzite (n=11, 3%). Flint was also the most widespread geographically during all three periods examined. This could be because flint was a common and a highly regarded material to craft tools due to its physical properties (*e.g.*, hardness, lustre, predictable fracture) (Conneller, 2012) or due to research bias, since flint seems to be more frequently specified than other materials. In the case of quartzite, no geographical or temporal patterns were detected. Lastly, regarding bone tools and other equipment, too little is known about the kind of bone (animal species and body part) and so the sample size is too small to observe any patterns.

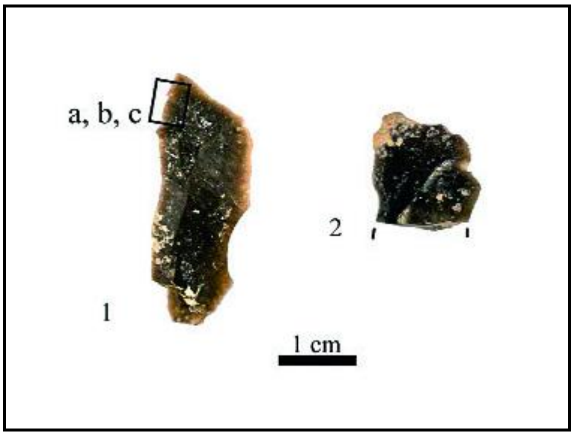


Figure 60: Flint flakes from the Palaeolithic site of Les Pièces de Monsieur Jarnac (Bourg-Charente)

Source: Henry-Gambier *et al.,* 2011

6.2.1.2. Use-wear

Tools and equipment are likely the types of funerary offering that provide more information about the life of the deceased with whom they were deposited. Use-wear analyses tells us if the object was used and what it was used for (Gibaja, 2007; Cuenca Solana *et al*., 2014).

Unused tools that were specifically crafted for funerary purposes could symbolically reflect the social role of the deceased. However, these symbolic funerary offerings do not necessarily reflect the activities the person carried out during their life, but the ones that are associated with their social role (age, sex, etc). For example, at Téviec and Hoëdic, males seem to be more associated with utilitarian objects than females (Schulting, 1996b). On the other hand, use-wear could be a result of activities the deceased carried out during their lives, offering a more realistic view of the life of the person. However, used funerary offerings might have belonged to the mourners rather than the deceased (Ucko, 1969: 265). Also, they might have been intentionally blunted before adding them to the grave and/or used to craft a part of the tomb, such as a grave marker (Little *et al.*, 2017: 233–235).

Only a small number of tools, deposited among 37 individuals distributed across the study area, have undergone use-wear analysis that allows us to know if the object was used or not, and only some of the analyses provide information on what the tool was used for. Only nine tools from four sites were unused: two flint blades from Les Pièces de Monsieur Jarnac (Bourg- Charente), France (8745–8355 cal BC) (Henry-Gambier *et al.*, 2011), a pick from Molino de Gasparín, Spain (8999–5000 BC) (Arias, 1990), five flint bladelets from Plaça Vila de Madrid, Spain (5535–5460 cal BC) (Pou Calvet *et al*., 2010) and a flint flake from

Saint-Léger-près-Troyes (Le Château de la Planche), France (5231–5026 cal BC) (Raynaud & Paresys, 2016).

The tools known to have been used comprise the flint tools from Le Figuier, France (25000–22000 BC), some of them used to cut soft materials and some to cut hard materials (*e.g.*, wood, horn) (Slimak & Plisson, 2008); a calcareous block from Les Pièces de Monsieur Jarnac (Bourg-Charente), France (8745–8355 cal BC) that could have been a hammerstone (Figure 61) (Henry-Gambier *et al.*, 2011); a quartzite stone from Sous Balme (Culoz), France (8270–7310 cal BC) used as a polishing stone or lissoir (Vilain, 1966); the flintstone bladelet from La Lámpara, Spain (5216–4848 cal BC), which had two uses: first, it was used to cut non-woody plants and then, when the edges blunted, they were retouched and used to cut wood (Kunst & Rojo Guerra, 1999; Rojo-Guerra *et al.*, 2016); 33 microliths from El Montico, Spain (5209–4983 cal BC) that were used as projectiles (Rojo-Guerra *et al.*, 2016); the flint tools from Buthiers-Boulancourt, France (4830–4610 cal BC) used to work hide (n=6), plant material (n=1), hard animal material (likely bone) (n=1) and an unidentified hard material (n=1) (Gosselin & Samzun, 2008); the bladelets from El Prado, Spain (4827–4692 cal BC) used to cut cereal (Alonso Fernández & Jiménez Echevarría, 2014); the flint blade from Ca l'Estrada, Spain (4696–4491 cal BC) used to cut plants at a height close to the ground (Subirà *et al.*, 2015); and a flint core from Los Cascajos, Spain (5194–4558 cal BC) that was used to light fire (García Gazólaz & Sesma Sesma, 2007; Rojo-Guerra *et al.*, 2016).

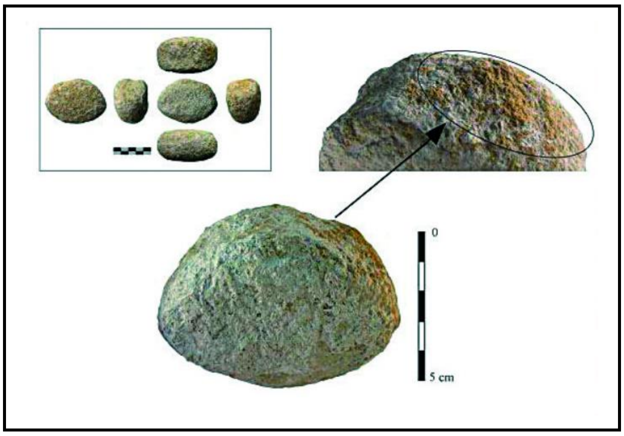


Figure 61: Calcareous block from Les Pièces de Monsieur Jarnac (Bourg-Charente)

Source: Henry-Gambier *et al.*, 2011

Used tools where the use could not be determined have been found in Cueva de Nerja, Spain (8612–4545 cal BC) (González-Tablas Sastre, 1990), Les Varennes (Val-de-Reuil), France (8250–7520 cal BC) (Billard *et al.*, 2001), Téviec, France (5490–5220 cal BC) (Boulestin, 2016), El Montico, Spain (5209–4983 cal BC) (Rojo-Guerra *et al.*, 2016), La Montagne des Glaises, France (5209–4953 cal BC) (Sarel *et al.*, 2010), and Aven de Montel (Lunel-Viel) France (5210–4990 cal BC) (Inrap, 2017).

6.2.2. Ornaments

Ornaments deposited as funerary offerings are frequently found across the studied area. They were likely worn by the deceased directly (*e.g.*, as necklaces, bracelets or hair ornaments) or as appliqués –attached to clothes or a shroud. As is the case with tools, ornaments deposited as funerary offerings might have been commissioned specifically to be deposited with the deceased, although they may have belonged to the deceased or the mourners (Arias, 2016: 693–694). As a result, they can offer important information about the social identity of the deceased (age, sex, etc.) including, as David (2016) suggested for the bone pins from Téviec, the belonging of individuals to the same community. For example, at Téviec (5490–5220 cal BC) and Hoëdic (6040–4440 cal BC) in France, young and middle-aged adults have more shell ornaments than younger and older individuals (Schulting, 1996b).

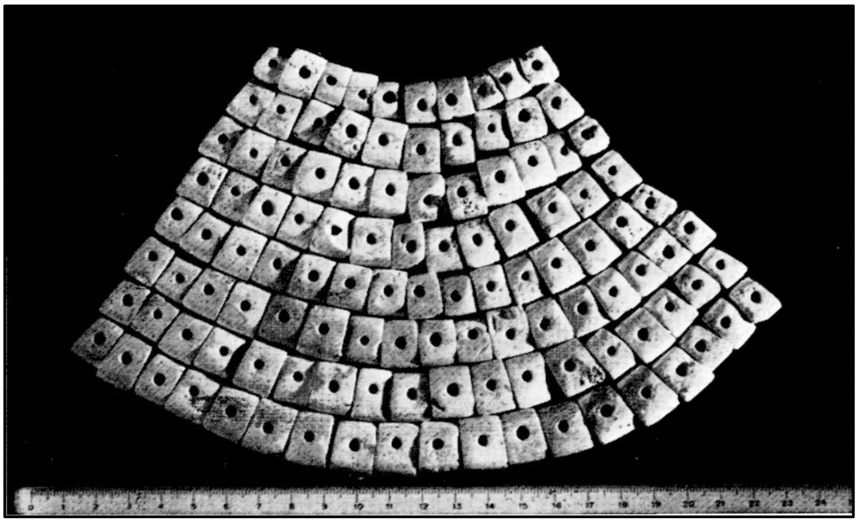


Figure 62: Gorget from the Neolithic site of Vert-la-Gravelle (Le Bas des Vignes)
Source: Chertier & Joffroy, 1966

Most ornament types are not specified in reports (n=100, 40.2%). Most of these unidentified ornaments were composed of bone, shell and/or lithic beads (n=30, 30%), perforated shells (n=29, 29%) and perforated teeth (n=28, 28%). Of the known types of ornament, the most frequent were necklaces, bracelets, rings, head ornaments, pendants, pins and compositions of clothing adornments (*e.g.*, Figure 62). Most were made of perforated shells (n=75, 72.1%). The prevalence of each type of ornament barely changed through time, except for pins, which were only found during the Mesolithic; and rings, which only appeared in the Neolithic (Figure 63).

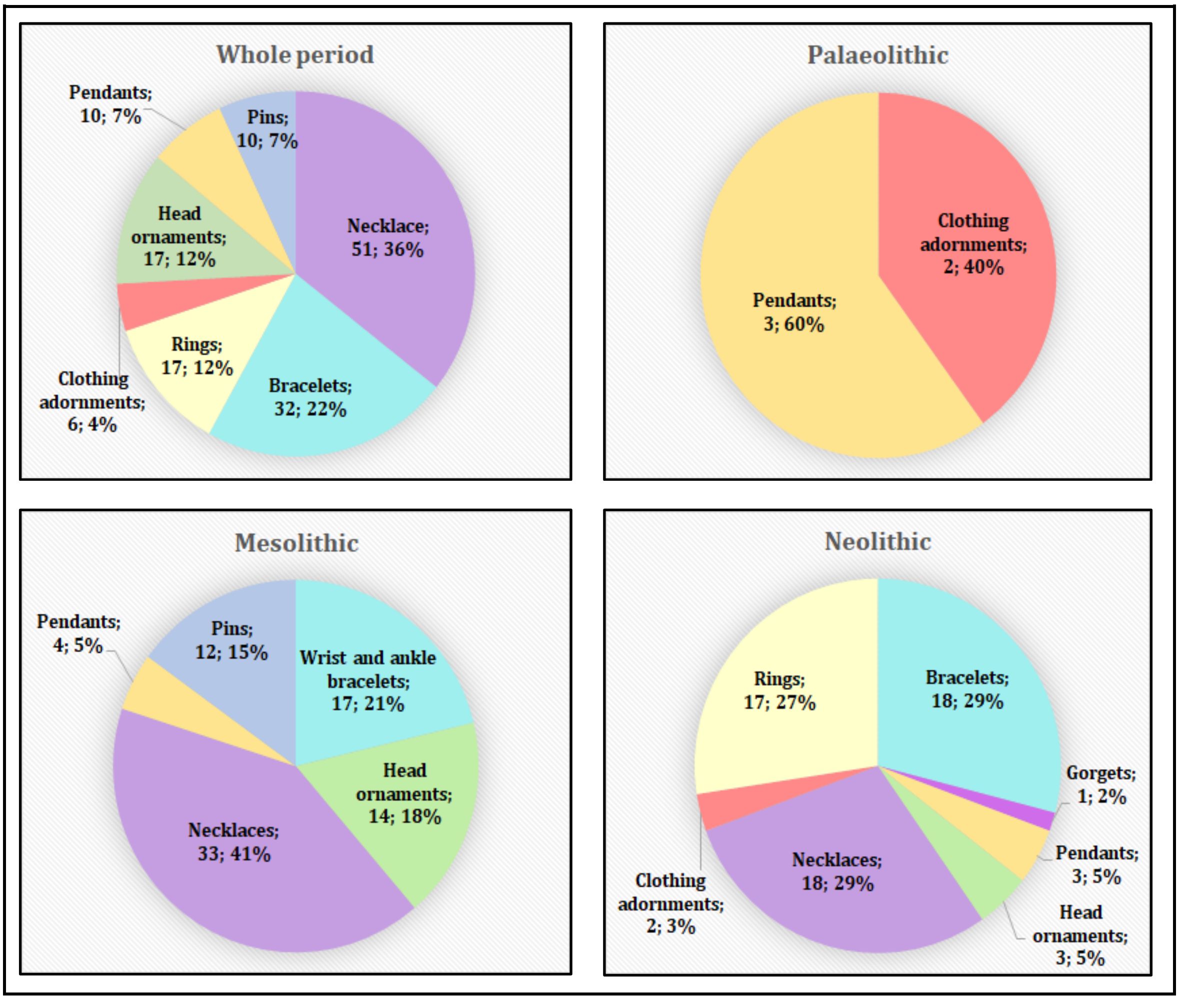


Figure 63: Graphs showing the quantities and percentages (N;%) of each type of ornament per period

Until the Neolithic, all identified ornaments came from a few sites: Cro-Magnon, France (30314–29108 cal BC) (Henry-Gambier *et al.*, 2000), Abri Pataud, France (29137–19641 cal BC) (Nespoulet *et al.*, 2006), La Paloma, Spain (22000–15000 cal BC) (Hoyos *et al.*, 1980), Saint-Germain-la-Rivière, France (19087–18271 cal BC) (Vanhaeren & d'Errico, 2003), Laugerie-Basse, France (17412– 16705 cal BC) (Cartailhac, 1872; Broca, 1873a; Hue, 1913) during the Upper Palaeolithic; and Abri du Squelette (Laugerie Haute), France (7590–7520, cal BC) (Chadelle, 2012), Cabeço da Amoreira, Portugal (6362–5370 cal BC) (Cunha & Cardoso, 2001; Roksandić & Jackes, 2014), Cabeço da Arruda, Portugal (6223–

5475 cal BC) (Roksandić, 2006; Jackes *et al.*, 2015a), Téviec, France (5490–5220 cal BC) (Boulestin, 2016) and Hoëdic, France (6040–4440 cal BC) (Boulestin, 2016) during the Mesolithic. No geographical pattern can be discerned in any period.

In terms of ornament composition, almost all beads (n=46, 93.9%) are Neolithic and the remaining ones are Palaeolithic. Perforated teeth were more common during the Upper Palaeolithic (n=15, 44.1%) and the Mesolithic (n=12, 35.3%) than during the Neolithic (n=7, 20.6%). The opposite occurs with perforated shells which were less frequent during the Upper Palaeolithic (n=7, 6.3%) than during the Mesolithic (n=85, 76.6%) and the Neolithic (n=19, 17.1%). The greater frequency of perforated shells during the Mesolithic period was influenced by the relatively large number recorded from shell middens, notably Téviec, France and Hoëdic, France. No geographical patterns in the distribution of the composition of ornaments are evident until the Neolithic, when most perforated shells and all perforated teeth are found in the Linear Pottery Culture. These patterns were likely cultural as these are not unusual materials in other areas. Most of the discoid and tubular ones are also located in the Linear Pottery Culture area (Figure 64).

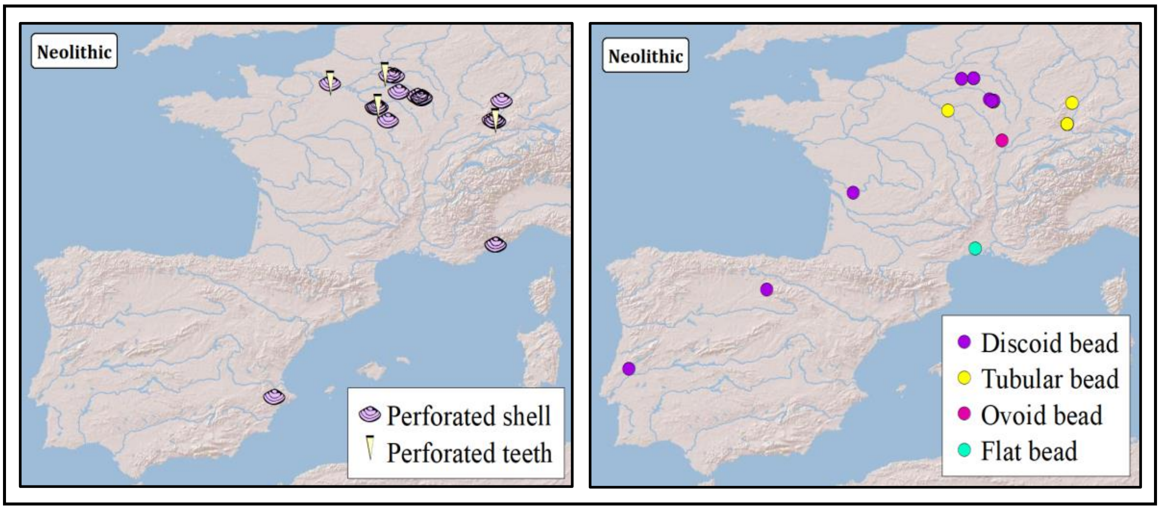


Figure 64: Geographical distribution of ornaments in funerary contexts composed of perforated shells and perforated teeth (left) and different types of beads (right) during the Neolithic

6.2.2.1. Materials

In Western Europe, the most common materials used for ornaments during the periods analysed were: shells (mainly marine, but also freshwater and terrestrial), animal teeth (usually canines), and other bones and lithic materials, although there were three ornaments made of ivory, two Palaeolithic and one Neolithic. Other types of ornaments might have existed but not been preserved, as the ethnographic record shows that ornamental beads can be made of insect body parts and plant materials, such as seeds, nuts, or leaves (Iliopoulos, 2016: 261).

The materials used to craft ornaments were usually different from those used for tools and equipment. There were no tools made of shell or teeth except for a knife made of a wild boar tusk from the Mesolithic site of Trou Violet (Montardit), France (7000–3500 cal BC) (Vaillant Couturier-Treat & Vaillant Couturier, 1928). On the other hand, there were no ornaments made of pottery and only 20 out of the 262 (7.6%) lithic items were ornaments. Bone (excluding teeth) was the only material used equally for both tools and ornaments . Where the rock type, animal species and body parts have been analysed, only limestone (n=11, 1.8%), schist (n=11, 1.8%), quartz (n=6, 1%) and wild boar (n=7, 1.1%), were used for both tools and ornaments, although their fibulae (n=6, 1%) were used for ornaments and tusks (n=1, 0.2%) for tools.

Raw materials used to craft tools rarely coincide with those used to craft ornaments due to the different properties of those materials. Some of these properties relate to functionality. For example, some bones are easier to work given the size of the bone itself and that of the marrow conduit or that have more lustre than others when polished. However, there are also properties that have to do with cultural symbolic associations, such as greenness and fertility, lustre and youth and redness and blood (Saunders, 2001; Price, 2005; Conneller, 2012).

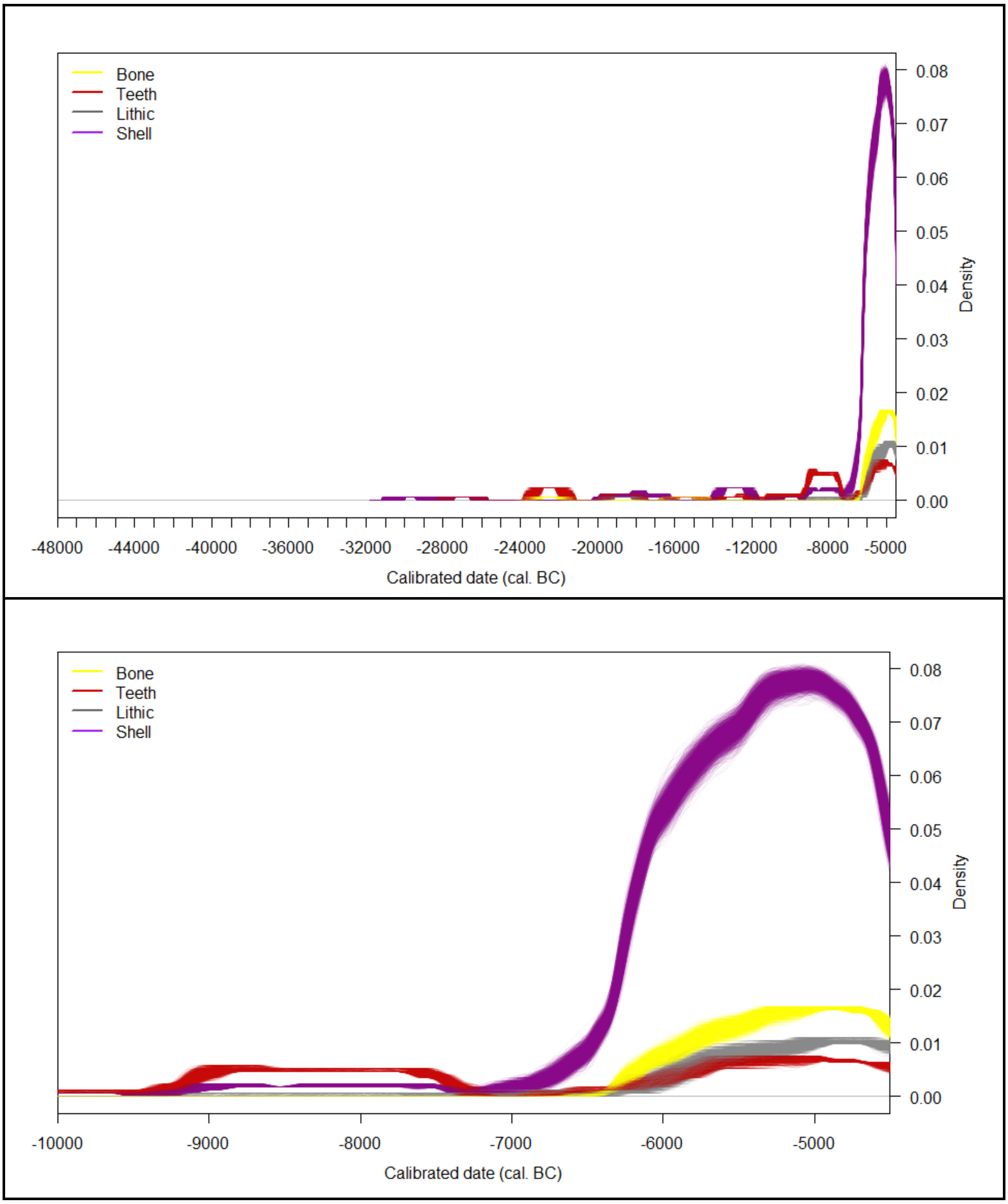


Figure 65: Monte Carlo graphs showing changes over time in the number of ornaments made of each material

In the study area, ornaments made of teeth and shells were equally frequent and remained the most common ones until c. 7000 cal BC (Figure 65). Thereafter, the number of ornaments made of shells increased rapidly. From c. 6500 cal BC, ornaments made of other bones and lithic materials increased, and those made of teeth became the least frequent ones. Geographically, the only obvious pattern corresponds with the Mesolithic, when all sites containing ornaments made of shell were found in or near the coast (Figure 66). Furthermore, most of these shells came from the French sites of Téviec, France and Hoëdic, France (Boulestin, 2016). The χ^2 test showed a correlation between ornament materials and shell middens (p=0.000) from 6500 cal BC caused by the only common material used to make ornaments being shells, unlike in non-shell midden sites. This result is also likely biased by the large numbers of shell ornaments at Téviec and Hoëdic. Ornaments made of shell were also common outside shell middens, particularly at Neolithic sites.

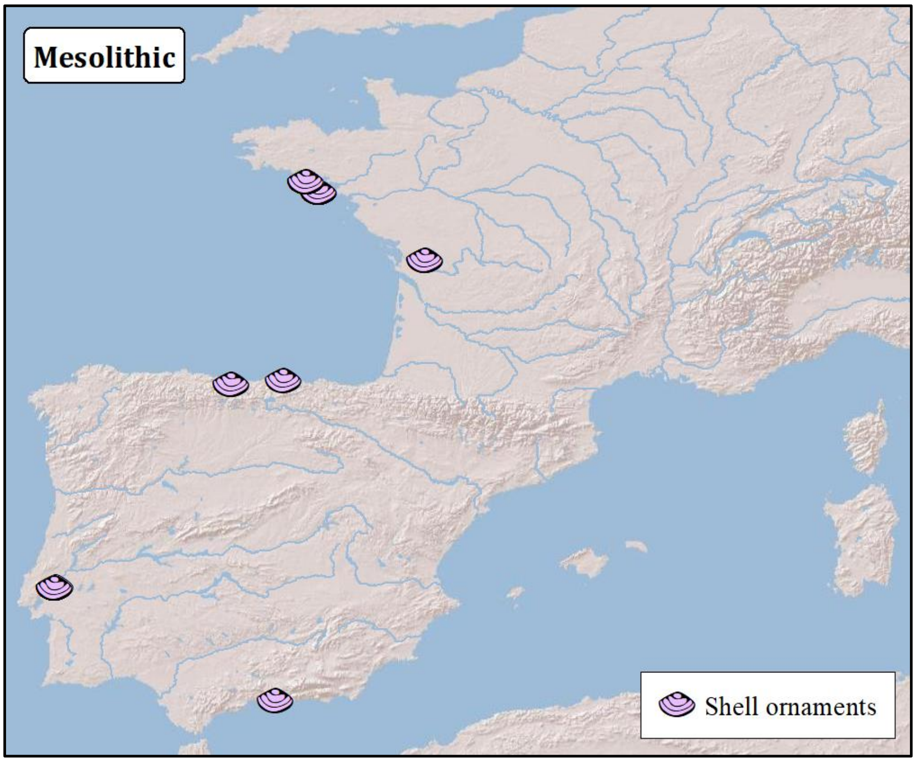


Figure 66: Geographical distribution of ornaments made of shell in Mesolithic funerary contexts

Variability among animal and shell species used to make ornaments was high (13 animal species and 34 shell species) with most species being used only once or twice. The most frequent animal used are deer (n=18, 42.9%) and wild boar (n=6, 14.3%); although there are also ornaments made of species such as pig (n=2, 4.8%), thornback ray (n=2, 4.8%) and even human teeth (n=1, 2.3%). Ornaments made of carnivore teeth were unusual, but they existed: bear (n=2, 4.8%), lion (n=2, 4.8%), lynx (n=2, 4.8%), fox (n=3, 7.1%) and wolf (n=1, 2.3%). The lion and bear teeth came from the Upper Palaeolithic site of Duruthy (Sorde), France (15045–10746 cal BC) (Chauvière, 2001) and the lynx teeth from Lapa do Suão, Portugal (13276–12484 cal BC) (Roche, 1982) and Mollet III, Spain (23000–22000 cal BC), where there were also fox canines (Soler *et al.*, 2013). More fox canines were found at the

Mesolithic site of La Vergne (La Grande Pièce) (8320–8200 cal BC), as well as wolf teeth (Courtaud & Duday, 1995; Duday & Courtaud, 1998).

Given the small sample, hardly any temporal change in the prevalence of the animal species used to make ornaments can be observed, although two things should be noted. Carnivore teeth were mostly Upper Palaeolithic, likely reflecting a different relationship with carnivores during that period, as carnivore bones, including modified ones, were relatively abundant in domestic spaces until the Magdalenian (Valente, 2004; Straus, 2018). Secondly, during the Neolithic, hardly any ornament was made of the materials that were the most common in earlier periods: only three ornaments, from the Neolithic sites of Bucy-le-Long (La Fosselle), France (5500–4500 cal BC), Ensisheim (Les Octrois), France (5216–4999 cal BC) and La Balance, Ilot P (Avignon), France (4942–4798 cal BC), were made of deer teeth (Jeunesse, 1997; Hachem, 2018) and one, from Vinneuf, France (5500–4700 cal BC), was made of a wild boar tusk (Jeunesse, 1997). On the other hand, pig was one of the most common species used to make ornaments during this period, even though there are only two examples (40%) that came from the site of Saint-Pierre-d'Autils, France (4992–4786 cal BC) (Aubry & Honoré, 2006). This is caused by most ornaments during this period being made of shells (54/97, 55.6%) and many of those made of animal bone being of unspecified species (17/24, 70.8%).

In the case of shells, *Littorina* (n=21, 17.2%), *Cypraea* (n=16, 13.1%), *Spondylus* (n=13, 10.6%) and *Tritia reticulata* (n=12, 9.8%) were the most common ones. Of these shells, all except *Spondylus* came from the Mesolithic cemeteries of Téviec and Hoëdic in France Conversely, *Spondylus* shells were only used during the Neolithic in the Linear Pottery Culture area (Figure 67) to make various types of ornaments (*e.g.*, rings, bracelets, necklaces). *Spondylus* shells were very common in the Linear Pottery Culture, where they appeared both in domestic and funerary contexts. In the case of the Linear Pottery Culture sites in the study area, the shells originated in the Aegean Sea, showing that they were a highly valued material (Müller, 1997; Bradley, 2001).

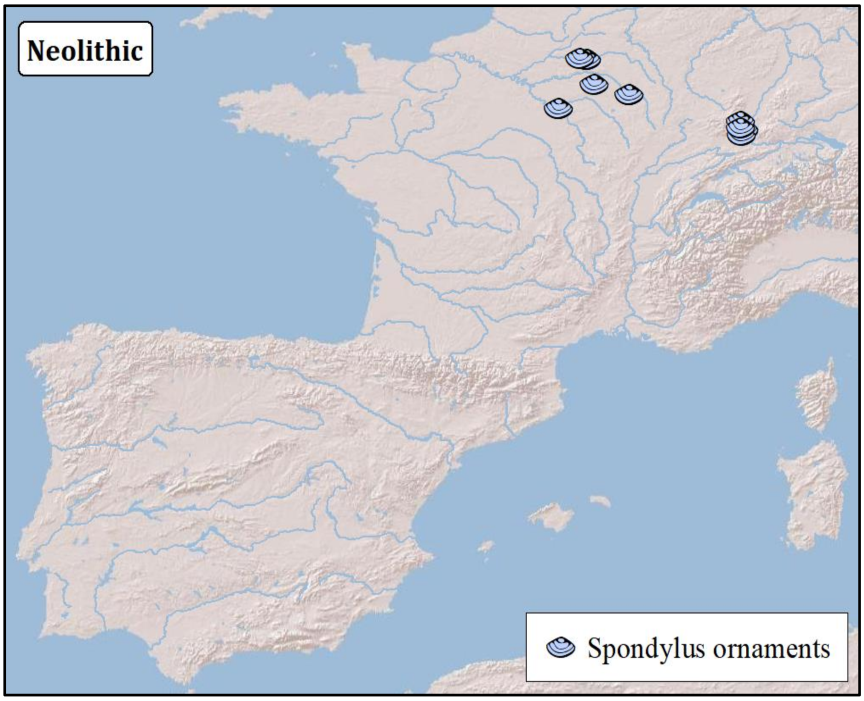


Figure 67: Geographical distribution of ornaments in funerary contexts made of *Spondylus*

Spondylus ornaments in the study area appear both with men and women. However, while females were generally only buried with the *Spondylus* ornaments, males were also buried with tools, such as hammerstones or fire-lighting kits. In addition, *Spondylus* ornaments appear more frequently with adults than subadults (eight with adults and three with juveniles). Despite the small sample of individuals of known sex and/or age-at-death who were associated with *Spondylus* (n=11), these results are similar to those observed in other Linear Pottery Culture sites with better information on sex and age (Masclans Latorre *et al.*, 2021). This suggests that *Spondylus* shells were used as group identity markers and the fact that they occur more frequently with adults may indicate that children had not yet developed a social persona.

One explanation of *Spondylus* ornaments in the Linear Pottery Culture is that body ornamentation used as markers of group identity played a more important role in female than in male identity construction. This seems to be the case in some modern hunter-gatherer and horticulturist groups in which females use more body ornamentation. For example, among the Gumuz and Dats'in in Ethiopia, scarification and beads are group-belonging markers exhibited by both men and women. However, men have a small fraction of the scarification practised by women and they only wear the beads during early childhood or if they need protection against the evil eye. Conversely, women wear the beads from birth and even after death as for them they are an important part of self (Hernando, 2017).

On the other hand, within the study region, there are only 15 ornaments made of lithic materials –nine of limestone (60%), four of schist (26.7%), one of steatite (6.7%), and one of unspecified greenstone (6.7%). All these lithic ornaments were from the Neolithic, except for the elongated steatite bead from the Upper Palaeolithic site of Saint-Germain-la-Rivière, France (19087–18271 cal BC). The source of the steatite has not been established, but steatite beads are also found in domestic contexts at the site (Vanhaeren & d'Errico, 2005).

In terms of Neolithic lithic ornaments, despite the wide availability of limestone and schist, most ornaments made of these materials are from the Linear Pottery culture (Figure 68), where they occur in both domestic and funerary contexts (Hamon, 2008). In previous periods, several of the unmodified pebbles are of schist (*e.g.*, at Téviec) (Boulestin, 2016). This is likely a result of two factors: 1) the Linear Pottery Culture area having more lithic ornaments in funerary contexts in general and 2) schist and limestone being more culturally appreciated than other materials in that area for the making of ornaments, as tools in that area are usually made of flint (Jeunesse, 1997; Lefranc *et al.*, 2014).

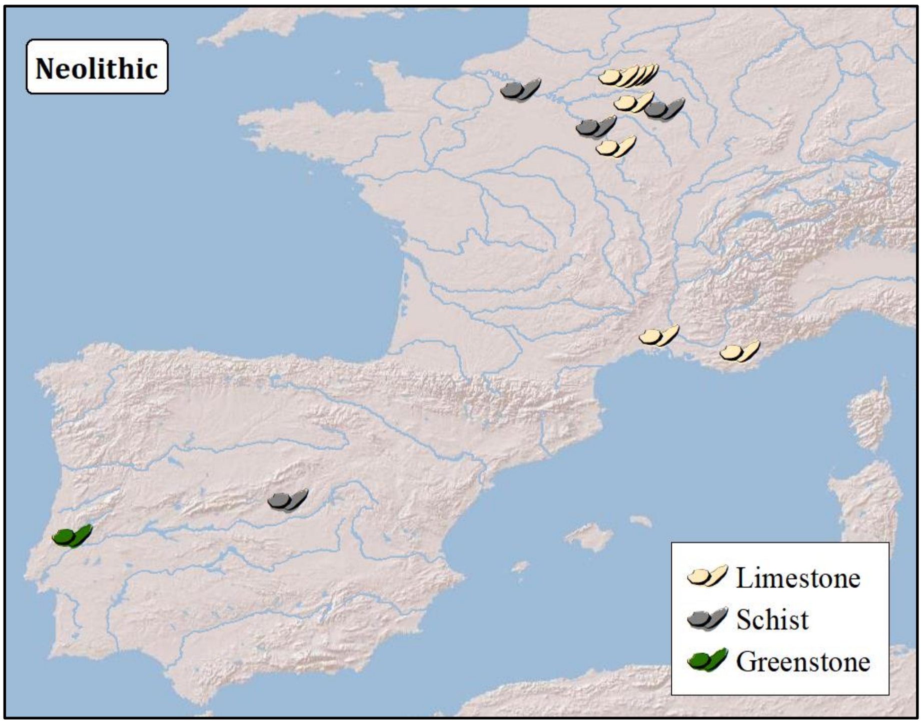


Figure 68: Geographical distribution of ornaments in funerary contexts made of each geology type during the Neolithic

The only Neolithic ornament composed of greenstone beads (Figure 68) comes from the Portuguese site of Gruta de Nossa Senhora das Lapas (5270–4830 cal BC) (Oosterbeek, 1993). This is an early example of ornaments made of greenstone beads, that became extremely popular throughout the study region from the Early Neolithic to the Chalcolithic (5th–3rd millennium BC), occurring in both domestic and funerary contexts. The efforts made to move these materials over long distances indicates that they were highly valued. Nonetheless, the early cases are mainly from after c. 4500 cal BC and the zenith was from the end of the 4th millennium cal BC and, particularly, during the 3rd millennium (Querré *et al.*, 2014; Rodríguez-Rellán *et al.*, 2019).

In the case of hard animal materials, the body part used to make the ornament is frequently unknown (n=43, 47.2%). Most ornaments were made of teeth (n=40, 83.3%), usually canines (n=20, 50%). The remaining ornaments made of identifiable body parts comprised: fibulae (5, 10.4%), specifically a dog and four wild boar, thornback ray pharyngeal jaws (2, 4.2%), and a femoral head of an unspecified animal (n=1, 2.1%) (Figure 69). While most body parts, especially small ones, were used to make beads, fibulae were used to make pins.

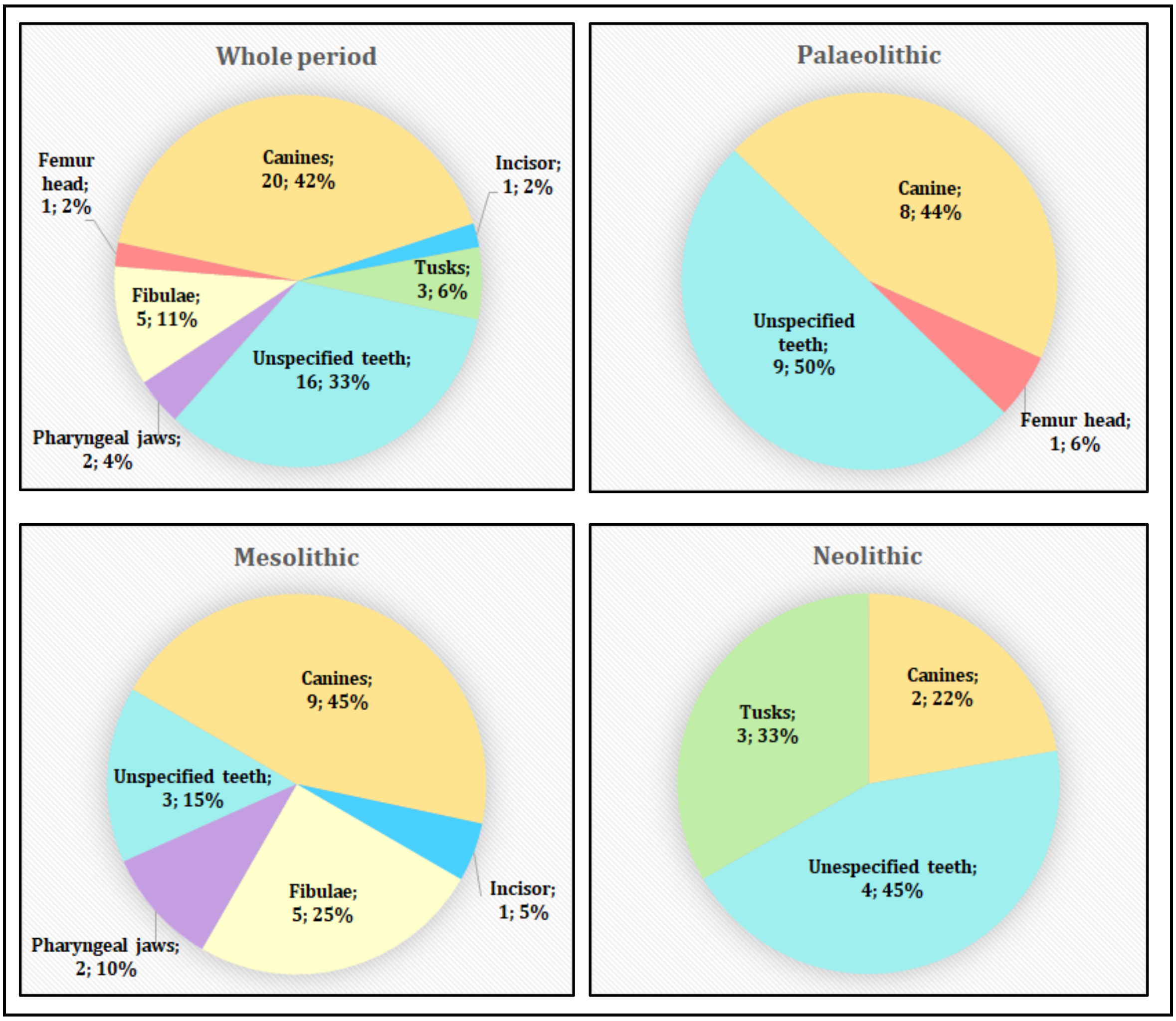


Figure 69: Graphs showing the quantities and percentages (N;%) of animal body parts used to make ornaments per period

In terms of temporal changes, the four perforated femoral heads came from the Upper Palaeolithic site of Mollet III (23000–22000 cal BC) (Soler *et al.*, 2013) and the fibulae and pharyngeal jaws were Mesolithic. The fibulae were used at Téviec, France (5490–5220 cal BC) to make pins and pharyngeal jaws were found in two graves at Hoëdic, France (6040–4440 cal BC) (Boulestin, 2016). The prevalence of teeth, however, barely changes through time. The change that seems more relevant is the larger proportion of unidentified body parts (n=35, 81.4%) dating to the Neolithic. This suggests there was an increase in the use of body parts other than teeth, which are more difficult to identify once they are modified. In this respect, most unidentified body parts were likely heavily modified as they were used to make rings (n=14, 32.5%), beads (n=10, 23.2), pins (n=7, 16.2%) or bracelets (n=2, 4.6%) and most of these items were Neolithic. The only geographical pattern concerning body parts is that, during the Neolithic, most ornaments made of teeth are in the Linear Pottery Culture area (Figure 70). This is expected, since teeth are the only body parts that could be identified for this period.

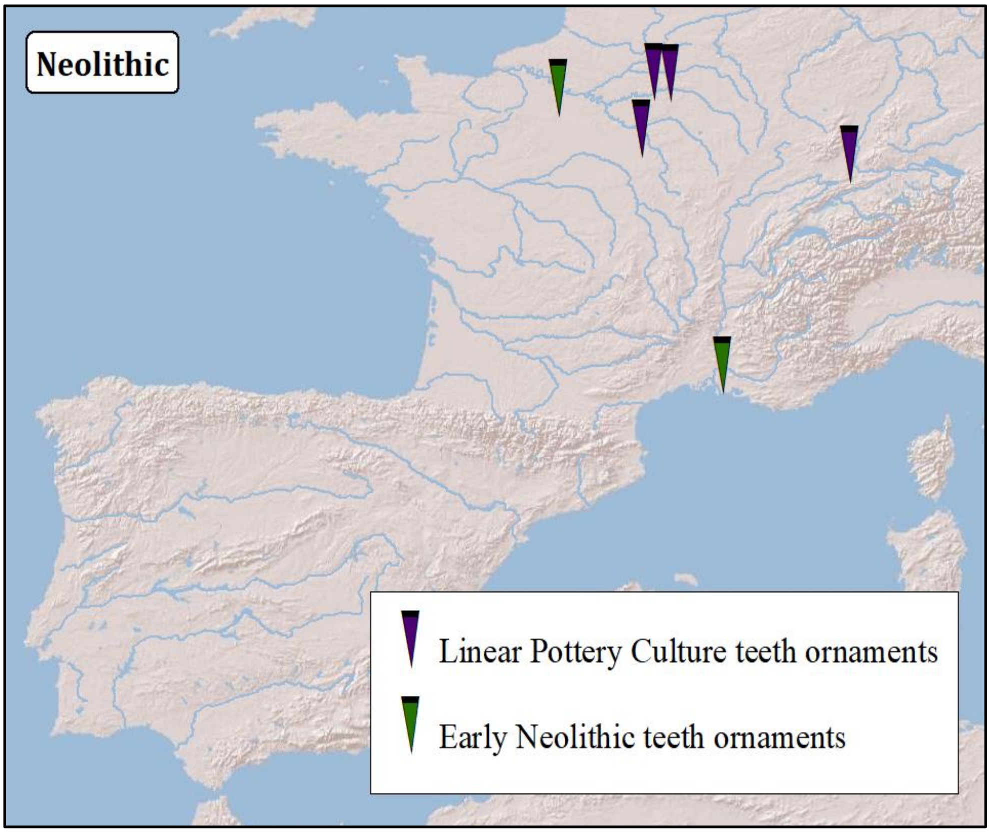


Figure 70: Geographical distribution of ornaments made of teeth in funerary contexts during the Neolithic

6.2.2.2. Use-wear

Use-wear analyses have been performed on some ornaments to understand how they were worn. Unfortunately, this information is only available for the ornaments deposited with 21 individuals from 4 sites: Saint-Germain-la-Rivière, France (19087–18271 cal BC), where a steatite bead, part of a larger set of funerary offerings that includes red deer canines, had an unclear means of attachment and was worn or intentionally polished (Vanhaeren & d'Errico, 2003); La Madeleine, France (10428–9449 cal BC), where 1275 perforated shells deposited alongside a child were shaped to produce beads that, according to breakage patterns and use-wear, were embroidered on the child's clothing and worn during their life (Vanhaeren & d'Errico, 2001); Germignac (Charente-Maritime), France (5068–4915 cal BC), where a 3288 discoid shell beads were used as garment ornamentation (Laporte & Gomez de Soto, 2001); and La Balance, Ilot P (Avignon), France (4942–4798 cal BC), where 158 perforated *Columbella rustica* shells and 16 red deer upper canines (Figure 71) were likely appliqués, part of the deceased's garment, according to Zemour *et al*. (2017), possibly a jacket.

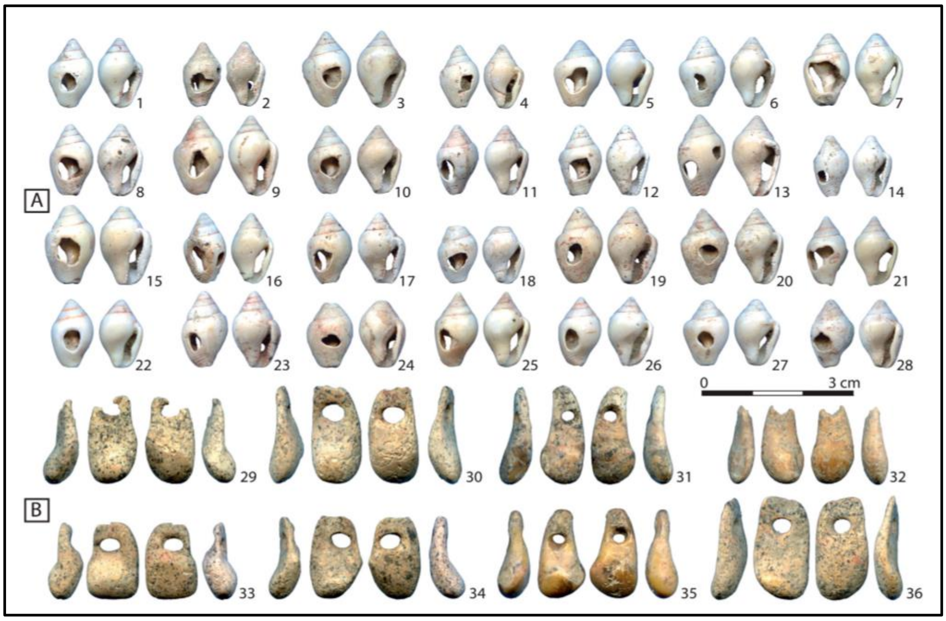


Figure 71: Perforated *Columbella rustica* shells and red deer canines from La Balance, Ilot P (Avignon)

Source: Zemour *et al.*, 2017

At some sites, the use of objects has been inferred by other means. At Laugerie-Basse, France (17412–16705 cal BC) approximately twenty shells were interpreted as garment decoration (Henry-Gambier, 1990); in La Paloma, Spain (10999–8000 cal BC) several perforated deer canines were interpreted as a pendant (Hoyos *et al.*, 1980); in Cueva de Chaves (Spain) one of the deceased (Chaves 1, 5370–5010 cal BC) wore a large ring. Given its size, Utrilla *et al*. (2008) concluded it was probably ritual. In Menneville (Derrière le Village) (5518–4705 cal BC), 200 *Cardita* circular beads were interpreted as a necklace from their position (Thevenet, 2016). In Vert-la-Gravelle (Le Bas des Vignes), France (5500–4500 BC), a collection of almost 1000 beads was interpreted as a gorget due to their shape and position (Chertier & Joffroy, 1966). In Larzicourt (Champ Buchotte), France (5500–4500 BC) an engraved *Spondylus* shell found on the deceased's head was likely a hair ornament (Chertier, 1986). Lastly, at Falaises de Prépoux (Villeneuve-la-Guyard), France (5340–4555 cal BC), 100 shells found around the deceased's hips and head seemed to have been part of a garment (Prestreau, 1992).

6.2.3. Unmodified faunal remains and shells

Unmodified faunal remains and shells are frequent across the whole study region (Jeunesse, 2001: 13). Shells were only abundant in a few sites, such as the Mesolithic sites of Téviec, Hoëdic, and La Vergne, France, although they could be found in smaller quantities in other sites, such as the Portuguese shell middens. Both faunal remains and shells can be interpreted as *viatica* (food provisions for the afterlife) in some cases (Arias, 2016: 693– 694). They can also be used as identity markers as has been proposed for Neolithic Linear Pottery Culture. This may also be the case at Téviec and Hoëdic, where men were deposited with more cowries and women with more periwinkles (Schulting, 1996b).

The presence of faunal remains in the funerary context does not necessarily mean that they were deposited as funerary offerings. There are instances where their presence likely has other intentions, such as the modification of the funerary space, which would make them part of the furnishings rather than funerary offerings. For example, Sebastião 25/1952-53 (6001–5733 cal BC) was deposited in a pit grave whose floor was covered with *Theodoxus fluviatilis* shells (Figueiredo, 2014).

There are also instances of articulated faunal remains in graves that could be interpreted as animal burials. For example, in the Neolithic site of Buthiers-Boulancourt, France (5000–4610 cal BC) there is a complete ovine buried at the feet of burial 416. This animal was interpreted as a funerary offering (Samzun *et al.*, 2006; Gosselin & Samzun, 2008), but it could also be an animal burial Some faunal remains apparently associated with the deceased might be remnants of funerary meals prepared for mourners as part of the funerary rites. This behaviour is known among modern hunter-gatherers and horticulturalists, such as the Evenks of Siberia (Grøn *et al.*, 2008: 67), and has been proposed for some prehistoric contexts (Arias *et al.*, 2009: 655). For example, this is the interpretation placed on the 280 animal pieces belonging to eight bovids, five ovicaprids and a suid, which were found with burial 265 of the Neolithic site of Los Cascajos, Spain (5311–3775 cal BC). This interpretation is based on the fact that the animals were consumed simultaneously (García Gazólaz & Sesma Sesma, 2007: 55).

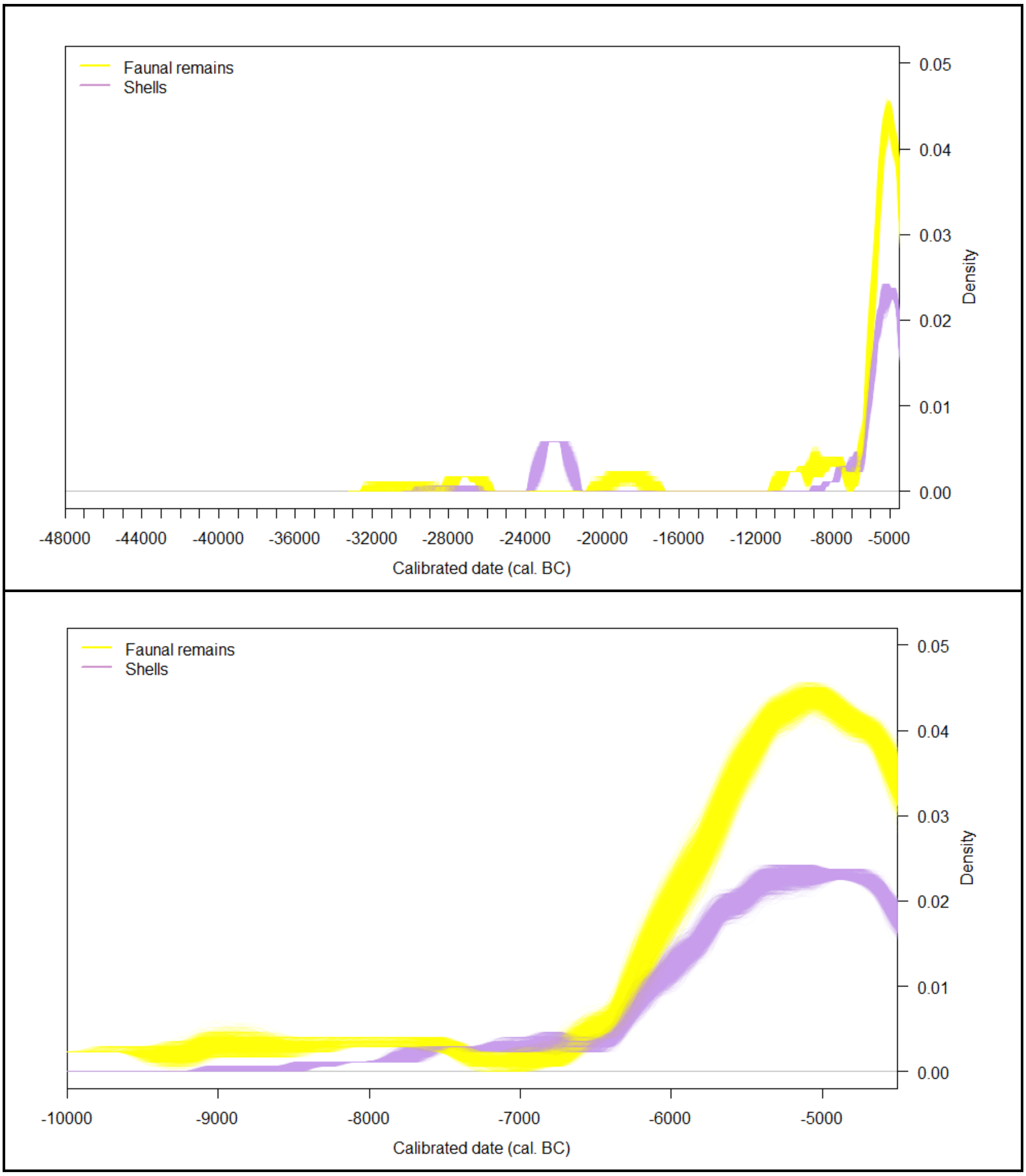


Figure 72: Monte Carlo graphs showing changes over time in the number of unmodified faunal remains and shells

In Western Europe, faunal remains were more frequently used as funerary offerings than shells, except for two brief periods: c. 25500–21000 cal BC and c. 7500–6500 cal BC. The frequency of both faunal remains and shells started rising c. 11000 cal BC (Figure 72), although there was no geographical patterning associated with this rise.

From 6500 cal BC, χ^2 tests show some interesting correlations between faunal remains and shells and the site type (p=0.000), shell middens (p=0.001) and the delimitation of the funerary space (p=0.003). This is likely caused by most shells in funerary contexts being found in delimited funerary spaces (23, 71.9%), usually in cemeteries (26, 83.9%) and shell middens (23, 54.8%), although these results are biased by the large number of shells found at Téviec, Hoëdic and La Vergne.

On the other hand, faunal remains were more often found in mixed funerary spaces (29, 61.7%) inside settlements (28, 51.9%) and out of shell middens (57, 75%). Most unmodified faunal remains and shells from the Neolithic period come from the Linear Pottery Culture and all the sites containing unmodified faunal remains in that area were in the open air. Most of the faunal remains in caves for the Neolithic came from one site: L'Avellaner, Spain (4934–4462 cal BC) (Bosch i Lloret & Tarrús i Galter, 1990). This site biases the sample; otherwise, there would also be a correlation between faunal remains and shells and the location of the site, since most faunal remains would come from Linear Pottery Culture open-air sites. However, the bias is only in terms of site location because it is not known if the funerary space of the cave was delimited or mixed and it is uncertain what type of site it was.

6.2.3.1. Species and body parts

Unmodified faunal remains (n=102) consisted mainly of mammal bones (n=99, 91.1%), although there are three cases of marine fauna: the crab claw found with individual Amoreira 2/2011 in Cabeço da Amoreira (Figueiredo, 2014), the fish vertebra from the French Palaeolithic site of La Madeleine (10428–9449 cal BC) (Vanhaeren & d'Errico, 2001) and the turtle shell deposited alongside individual 269 from the French Neolithic site of Buthiers-Boulancourt (4830–4610 cal BC) (Gosselin & Samzun, 2008).

The variety of mammal species is high. There were 34 different species deposited as funerary offerings, several of them only appearing once. The most frequent species were cervids (n=20, 20.2%), bovids (n=18, 18.2%), ovicaprids (n=12, 12.1%) and suidae (n=7, 7.1%). Bovines and ovicaprids were exclusive to the Early Neolithic (14 bovines, 11 ovicaprids), except for all aurochs (n=4) and a (presumably wild) caprine that were Mesolithic. Deer were mainly Mesolithic (n=16, 80%), but they were present in every period. Carnivores were rare, although lion and bear teeth occurred at the French Upper Palaeolithic site of Duruthy (Sorde) (15045–10746 cal BC) (Chauvière, 2001). No geographical patterning to the distribution of animal species was detected.

Regarding body parts, teeth (n=14, 14.1%), antlers (n=13, 13.1%), mandibles (n=6, 6.1%), crania (n=7, 7.1%) and ribs (n=7, 7.1%) were the most frequent unmodified animal remains in funerary contexts. In several cases, the bones were not complete, there were only fragments (n=18, 18.2%). Most antlers (n=10, 76.9%) and mandibles (n=5, 83.3%) were Mesolithic, and half of the teeth were Neolithic (n=7, 50%). All Mesolithic mandibles and most antlers came from the French Mesolithic sites of Téviec and Hoëdic (Boulestin, 2016). The remaining Mesolithic antlers were from the Spanish site of Los Azules (9310–8350 cal BC) (Arias, 2012b). Lastly, all the Neolithic teeth were from sites in the Linear Pottery Culture area (Figure 73)

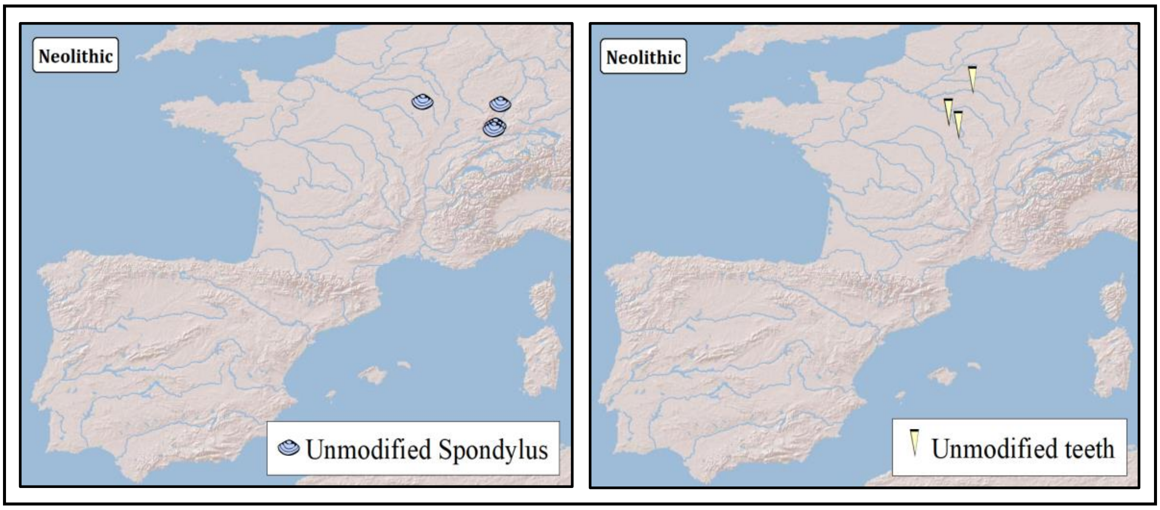


Figure 73: Geographical distribution of unmodified Spondylus (left) and teeth (right) in funerary contexts during the Neolithic

The total number of shells (n=60) and shell species (n=28) is lower than that of faunal remains. Most came from marine species but there are land snails' shells as well. As with faunal remains, most shell species only appear once. Nevertheless, the most common are *Columbella* (n=6, 10%), *Cardium edule* (n=5, 8.3%), *Cypraea* (n=5, 8.3%), *Spondylus* (n=5, 8.3%) and *Littorina* (n=5, 8.3%). *Cypraea* and *Littorina* were exclusive to the Mesolithic sites of Téviec, France and Hoëdic, France (Boulestin, 2016), while *Spondylus* only appeared during the Neolithic in the Linear Pottery Culture area (fig 68). This, as with ornaments, is likely the result of *Spondylus* shells playing an important role as group identity markers, especially for women, in the Linear Pottery Culture (Masclans Latorre *et al*., 2021).

6.2.4. Other offerings

In addition to tools and equipment, ornaments and unmodified faunal remains and shells, in the study area, there are some other funerary offerings. These are plants and plant-based foods, ochre nodules and portable art (Figure 74).

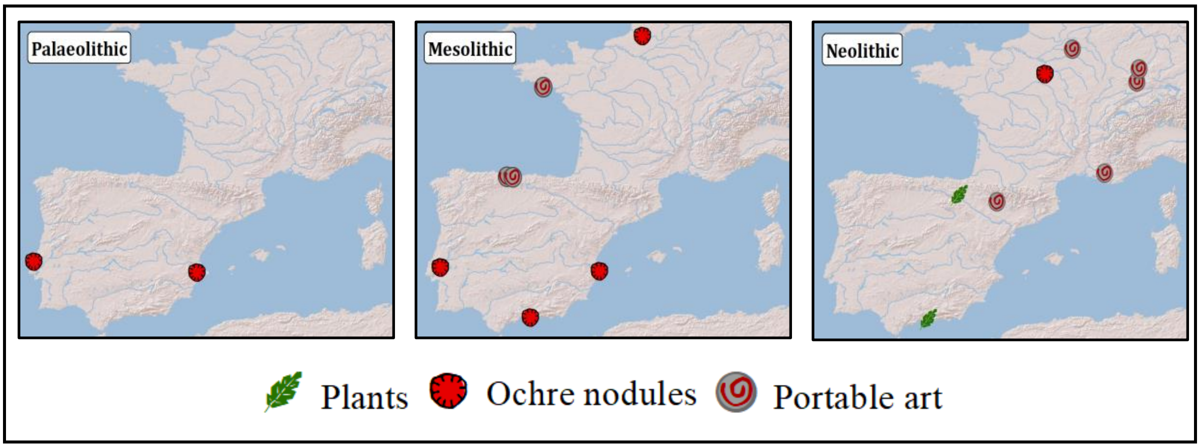


Figure 74: Geographical distribution of plants, ochre nodules and portable art in funerary contexts during the Palaeolithic (left), the Mesolithic (middle) and the Neolithic (right)

There are only two sites where plant materials were found in funerary contexts: Cueva de Nerja (8612–4545 cal BC) and Los Cascajos (5311–3775 cal BC). It is uncertain if the scarcity of these kinds of materials reflects reality or taphonomic bias, as plant materials are rarely preserved (Spicer, 1991). Regarding the context of the findings, in the Neolithic level of Cueva de Nerja, where two individuals were deposited in a natural niche, they were separated by funerary offerings and a tumulus containing seeds and a used mortar. In addition, one of the individuals was surrounded by seeds (González- Tablas Sastre, 1990: 62). In the case of Los Cascajos, a Neolithic open-air settlement cemetery, individual 265 was deposited with a pottery bowl containing a polished axe and carbonised cereal remains (García Gazólaz & Sesma Sesma, 2007: 55).

Like faunal remains, these funerary offerings may be *viatica* (Arias, 2016: 693–694). Nonetheless, given the context in which they were found at both Los Cascajos and Cueva de Nerja, it seems likely that they were included in the funerary context due to the symbolic meaning seeds and cereals had for those societies. In this respect, it is interesting to note that the burial at Nerja contained a man and a woman and that only the man was surrounded by seeds (González- Tablas Sastre, 1990: 62); and that the individual deposited with cereals at Los Cascajos was the only one in the cemetery to get that treatment (García Gazólaz & Sesma Sesma, 2007: 55).

Ochre nodules appeared on sites from the Upper Palaeolithic to the Early Neolithic. These sites are Beneito, Spain (19423–17022 cal BC) (Iturbe *et al.*, 1993), Lapa do Suão, Portugal (13276–12484 cal BC) (Roche, 1982), the Mesolithic layer of Le Petit Marais (La Chaussée-Tirancourt), France (8310–6490 cal BC) (Ducrocq & Ketterer, 1995), the Mesolithic layer of Cueva de Nerja, Spain (7600–6700 cal BC) (García Sánchez, 1982; González-Tablas Sastre, 1990), El Collado, Spain (7023–6648 cal BC) (Aparicio Pérez, 2015; Gibaja *et al.*, 2015), Cabeço da Amoreira, Portugal (6362–5370 cal BC) (Cardoso & Rolão, 1999), Moita do Sebastião, Portugal (6001–5733 cal BC) (Ferembach, 1974a; Cardoso & Rolão, 1999) and Buthiers-Boulancourt, France (5000–4610 cal BC) (Samzun *et al.*, 2006; Gosselin & Samzun, 2008).

A potential reason for the placing of ochre nodules in funerary contexts is their medical properties. Iron salts are astringent, have deodorizing properties, can arrest haemorrhage and are antiseptic (Velo, 1984). The healing properties of ochre might therefore be a reason why some ochre nodules were valued and deposited as funerary offerings, including an ochre nodule used as a prosthetic eye at the site of Cingle del Mas Nou, Spain (5842–5567 cal BC) (Figure 75) (Olària i Puyoles, 2005, 2010). Three of the individuals buried with ochre nodules also had ochre sprinkled either on the body or within the context. These are the two individuals from Beneito, Spain (19423–17022 cal BC) (Iturbe *et al.*, 1993) and individual 269 from Buthiers-Boulancourt, France (4830–4610 cal BC) (Samzun *et al.*, 2006). In these cases, if the sprinkled ochre was extracted from the nodules, another possible explanation for their inclusion in the graves is that it was considered 'dangerous' and placed with the dead to keep it from circulating amongst the living because it had been used for sacred rituals (Little *et al.*, 2017).

Figure 75: Pictures of the prosthetic eye from Cingle del Mas Nou in situ and in detail
Source: Enoch, 2009

Portable art can be divided into two main groups: decorated pebbles (painted or engraved) and bone figurines. Decorated pebbles could be found in sites from the Mesolithic to the Early Neolithic. These are Los Azules, Spain (9310–8350 cal BC), the Mesolithic level of Los Canes, Spain (6241–5010 cal BC), Cueva de Chaves, Spain (5471–5057 cal BC), Grotte de l'Adaouste, France (5999–4953 cal BC), Osthoffen-Breuschwickersheim, France (5500–4500 BC) and Bischoffsheim, France (5500–4500 BC). Decorated pebbles were not associated with a specific sex or age group, as they appeared alongside males and females of differing ages. However, they always appeared as part of large sets of funerary offerings, suggesting they were only deposited alongside special individuals (Arias & Pérez Suárez, 1990, 1992; Jeunesse, 1997; Onoratini *et al.*, 1997; Mafart *et al.*, 2004; Lefranc, 2007; Urtilla Miranda *et al.*, 2008; Arias, 2012b; Pérez Iglesias, 2013; Rojo-Guerra *et al.*, 2016).

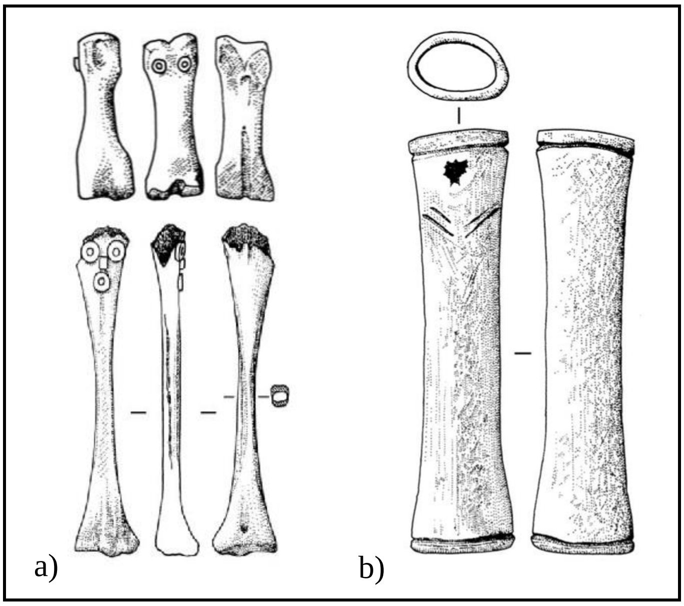


Figure 76: Figurines from Berry-au-Bac deposited with a child (a) and an adult female (b)

Source: Sidéra & Monthel, 2009

Bone figurines are only found during the Early Neolithic in the Linear Pottery Culture area, where they appear both in domestic and funerary contexts (Hofmann, 2005; Sidéra & Monthel, 2009). There were only four offerings of this type in the study region, three associated with children and one with an adult female. One of the children came from the site of Berry-au-Bac (Le Vieux-Tordoir), France (5500–4500 BC) and was associated with two anthropomorphic figurines. The adult female with a figurine was also buried at Berry-au-Bac. However, her figurine differs from the anthropomorphic design of those deposited with the child and could be considered an engraved fragment of a bovine radius (Figure 76) (Jeunesse, 1997; Sidéra & Monthel, 2009). The other child was also deposited with an anthropomorphic bone figurine, at the site of Ensisheim (Les Octrois) (Figure 77) (Sidéra & Monthel, 2009). The figurines from Berry-au-Bac did not have clear traces of use. The one from Ensisheim (Les Octrois), in comparison, had heavy traces of use in its posterior side. Given the stylistic similarities of the figurines associated with children, Sidéra & Monthel (2009: 25) suggested they might be some sort of standardized toy.

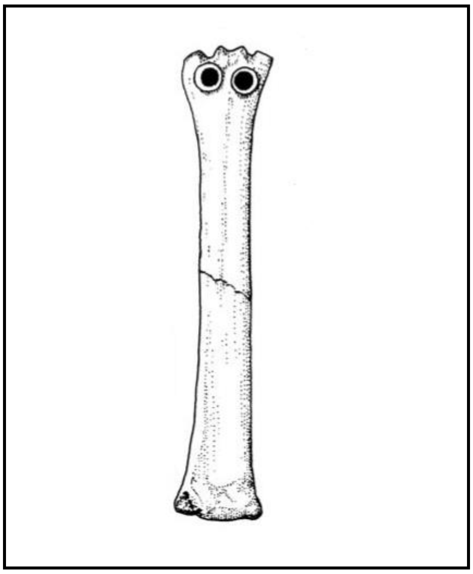


Figure 77: Bone figurine from Ensisheim (Les Octroirs)

Source: Sidéra & Monthel, 2009

Lastly, at the Mesolithic site of Téviec, France (5490–5220 cal BC) two offerings could be classed as portable art, but these do not fall into any of the previous categories –a decorated fishbone and an indeterminate engraved object. They came from different graves (K and C), containing seven of the 23 individuals from the cemetery. The fishbone was associated with six individuals of differing ages and sexes. The individual with the indeterminate engraved object was a neonate in a triple burial with two other children, although most funerary offerings were associated with the neonate. As with decorated pebbles, sex and age do not seem to have been important in determining who was given portable art at Téviec. However, we do see a connection between portable art and individuals with very large sets of funerary offerings (Boulestin, 2016).

6.3. Overview

From the Upper Palaeolithic to the Early Neolithic, the proportion of individuals with and without funerary offerings barely changed. The main observable changes happened in 1) c. 34000 cal BC, during the Upper Palaeolithic, with the first appearance of offerings; 2) in c. 7000 cal BC when there was an increase in their occurrence and a change in the type of context in which they appeared more frequently; and 3) in c. 5000 cal BC, during the Early Neolithic, when, for the first time, the number of individuals with funerary offerings surpassed the number of those without them.

These changes in the type of context in which offerings were more likely to appear can be observed in the fact that, before 7000 cal BC, funerary offerings appeared evenly distributed in 1) open air sites, caves and rockshelters and 2) settlements, activity areas and remains in non-domestic spaces. They were rarely found alongside individuals deposited alone. On the other hand, after c. 7000 cal BC, individuals deposited with grave goods were more frequently found at open air sites and rarely in activity areas. In addition, individuals deposited alone appear to have a higher tendency to be deposited with funerary offerings than the individuals deposited in collective funerary spaces.

All these changes continue and become clearer after c. 5000 cal BC when, for example, almost all of the individuals deposited in single funerary spaces have funerary offerings. This might be showing a change in the use of single spaces of inhumation, which might have stopped being places used to hide corpses and became a way of giving a particular funerary treatment to special individuals (Criado-Boado, 1991, 2012: 277–279; Pettitt, 2011). It might also be showing that social rules started to play an important role in the decisions being made in terms of who receives special treatment (Pettitt, 2011: 267). This special treatment could either be used to honour the deceased, giving them a privileged location and abundant offerings, or as a way to keep them from returning via isolation and offering goods as placation or bribery (Parker Pearson, 2003: 7; Roberts Kyle, 2012: 44).

Changes appear to be influenced by Early Neolithic cultures because, from c. 7000 cal BC and, particularly, from c. 5000 cal BC, the presence of funerary offerings was more frequent in the Linear Pottery Culture area, the Mediterranean Coast, and the Pyrenees. However, it was not only the prevalence and the context of funerary offerings that was affected by Neolithic culture, as the main changes that could be observed in the types of funerary offerings and the materials used to craft them also took place during the Neolithic. Despite lithic tools (lithic blades and especially flint ones) always being the most frequent type in funerary contexts in the Upper Palaeolithic and Mesolithic, in the Neolithic these offerings, though still very frequent, were outnumbered by pottery vessels. This change, alongside a shift in a predominance of red deer to a predominance of bovines and ovicaprids, as well as the appearance of plants and seeds in graves, could be explained by the changes in the economic system that took place during the Neolithic period.

This does not explain the previous prevalence of red deer, specifically their teeth, that likely had to do with the properties associated with the material, such as some deer qualities or the lustre of the teeth (Conneller, 2004, 2012). Economy does not explain the other geographical patterns from the Neolithic either. During this period, most perforated shells were located in the Linear Pottery Culture area and the ones there were of a specific species: *Spondylus*. This geographical pattern repeated in the case of unmodified *Spondylus* shells. *Spondylus* shells were a highly regarded material for the Linear Pottery Culture, where they appeared in both domestic and funerary contexts, as they were collected in the Aegean Sea and were not linked to specific functional uses (Müller, 1997; Bradley, 2001). They were likely used as identity markers of groups' belonging, as they appeared both alongside men and women. However, they appear to have played a more significant role in female than male identity construction as men tend to have more offerings other than *Spondylus*, but women do not (Masclans Latorre *et al.*, 2021). It is also worth noting that the few cases of bone figurines that have been interpreted as standardized toys by Sidéra & Monthel (2009: 25) belonged as well to the Linear Pottery Culture area.

There is also a geographical pattern regarding beads, as most of the lithic beads were located in the Linear Pottery Culture area, where they appeared both in domestic and funerary contexts. These were made of two widely available materials: limestone and schist (Hamon, 2008), so the shortage of beads made of these materials outside of this area is likely cultural. During the Neolithic, all perforated teeth were in the Linear Pottery Culture area, while, in the previous periods, they were widespread. This shows that teeth stopped being used as a material to make ornaments outside of the Linear Pottery Culture area, or that they were heavily modified to make beads so the body part could not be identified.

These patterns are pointing to a well-defined and differentiated culture regarding funerary offering types in the Linear Pottery Culture that was absent in previous periods except in the case of the Mesolithic cemeteries of Téviec, France (5490–5220 cal BC) and Hoëdic, France (6040–4440 cal BC) where almost all individuals were buried with shells, both unmodified and as part of ornaments, of very specific species (mainly *Littorina*, *Cypraea* and *Tritia reticulata*); red deer antlers; bone pins and well-defined sets of tools in which lithic blades played an important role. These cultural traditions were likely a way of demonstrating that individuals belonged to a group, either to society in general, as what seems to be the case of Téviec and Hoëdic bone pins (David, 2016); or to a subgroup within a given society, such as females or males –as seen in the case of sex associations between cowries and periwinkles (Schulting, 1996b).

Outside the Linear Pottery Culture area, it is worth noting that an early case of an ornament made from greenstone beads appeared in the Portuguese site of Gruta de Nossa Senhora das Lapas (5270–4830 cal BC) (Oosterbeek, 1993). Ornaments made of greenstone beads were very common in the analysed area from the Early Neolithic to the Chalcolithic – in both domestic and funerary contexts. However, most cases date to later, with most of the early examples coming from after c. 4500 cal BC, with the zenith taking place after the 4th millennium cal BC. The material was extracted from a few locations and exported throughout the whole study area. The efforts made to source these materials and the lack of apparent functionality indicates that it was highly valued, likely due to cultural reasons (Querré *et al.*, 2014; Rodríguez-Rellán *et al.*, 2019).

Lastly, not all funerary offerings can be recovered. Firstly, because if they were organic (*e.g.*, made of plant materials) they might have disappeared due to taphonomic issues (Spicer, 1991; Hedges, 2002). They might also have been ‘deposited’ only symbolically without the inclusion of the actual object in the funerary context, making them archaeologically undetectable (Goody, 1962: 73; Ucko, 1969: 266). And, even when they are detectable and well preserved, the excavation reports are usually not complete enough, as geology types, animal species and osseous materials used to craft ornaments and tools are rarely specified. Additionally, as Conneller (2012: 74–75) suggests, information about the age and sex of both the animals used as raw materials and those deposited unmodified should also be considered, but rarely are. All this information is vital for detecting patterns related to the relationship constructed between materials and personal identity and future research armed with this data could certainly help develop the findings presented here.

Chapter 7:
The treatment of the body

What 'death' is and how it is determined varies from society to society. For example, in Western culture death happens at the moment the brain stops working (Ohnuki-Tierney *et al.*, 1994). However, for many societies, death is not a discrete event, but a process. Among Melanesian societies, the words for being 'sick' or 'dead' are the same. Both states are considered part of a long dying process that is only complete when the body is skeletonised (Leenhardt, 1971: 53–54).

These different perceptions of death are profoundly interlinked with the ideas of the body present in each society and whether it is understood as an indivisible or a divisible entity (Fowler, 2004: 82–92). In Western culture death of the individual equals brain death because of Cartesian dualism (dualism between body and soul/mind), a concept introduced in 1641 by Descartes in his *Meditations on First Philosophy*, and *selfownership* (the body as property of the subject), developed by John Locke in 1764 (Beltrán Pedreira, 2015: 154–156; García Acevedo, 2015). Both of them set the body as a vehicle for the mind. However, the mind needs a body to interact with the world and the body influences the mind. Thus, they cannot be separated (García Acevedo, 2015). On the other hand, in Melanesia, the body is a whole divisible entity, in which each of the parts equals the whole, and the distinction between mind/soul and body does not exist. Consequently, death equals the complete disappearance of the flesh (Leenhardt, 1971).

The ideas and perceptions of death and the body become reflected in the treatment given to the deceased's body, for example, whether it was abandoned or ritualised, buried complete or underwent a postmortem process before final deposition (Fowler, 2004: 82–92; Gallego Lletjós, 2011). Moreover, the position of individuals in their primary position can reflect aspects of social beliefs and personal identity, such as females being buried in a different orientation to males (Sofaer & Sørensen, 2013: 533).

These notions of death and the body are also reflected in whether the deceased was deposited in an individual or a collective burial. Individual or simultaneous multiple depositions that are not ritualised can reflect strategies of hiding death, while diachronic collectiveness might reflect the beginning of death exhibition (Criado-Boado, 1991, 2012: 277–279). Furthermore, multiple burials can reveal social information about the importance of community, kinship and marriage (Aranzadi Martínez, 2008).

Individual and multiple burials can also reflect facets of identity construction, for example, if it was more individual (constructed through self-reflection) or relational (constructed through relationships and performance), or the degree of development of the social persona (Hernando, 2012a; Conneller, 2013). However, it must be noted that identity is not only born in and experienced by the individual. It is constructed through a give-and-take between what the individual projects to other people, what the people around them interpret and project back and how the individual reacts and adapts to the perception others have about them (Mead, 1967; Mizoguchi, 2002: 1–6; Lucy, 2005b: 96; Ramírez Goicoechea, 2011). Therefore, in the case of funerary practices, it is not an individuals' identity that can be glimpsed, but rather the perception the group had of that identity.

Numerous studies focus on the mortuary treatment given to the deceased from the Upper Palaeolithic to the Early Neolithic in the study region (*e.g.*, Newell *et al.*, 1979; Henry-Gambier, 1990; Duarte *et al.*, 1999; Verjux, 2004; Beyneix, 2008; Aura Tortosa, 2010; Boulestin, 2012; Orschiedt, 2013, 2016, 2018; Arias, 2014; Peyroteo Stjerna, 2016a; Rojo-Guerra *et al.*, 2016) and many of these attempt to identify patterns and changes. However, most do not explore all the social information mortuary treatment can offer about the perception of the body and the relationship with death. Nevertheless, there are some exceptions, such as Cauwe's (2001) paper on the Mesolithic collective tombs of southern Belgium or Gallego Lletjós's (2011) paper on Iberian Mesolithic identity. This chapter aims to improve existing knowledge on the treatment and deposition of the body and the ideas on personal identity, personhood and of 'death' itself that it reflects.

7.1. Primary and secondary depositions

Individuals classified as in primary position are those whose final place of deposition is the same as the first. They can end up in a location or arrangement different from the original one as a result of taphonomic processes, but have not been moved on purpose. Individuals in secondary positions are those whose final place of deposition is purposely different from the original one. An individual whose bones are moved to a different location (*e.g.*, another grave or a house) or rearranged after skeletonisation is in a secondary position (Armentano & Malgosa Morera, 2002; Aliaga, 2012).

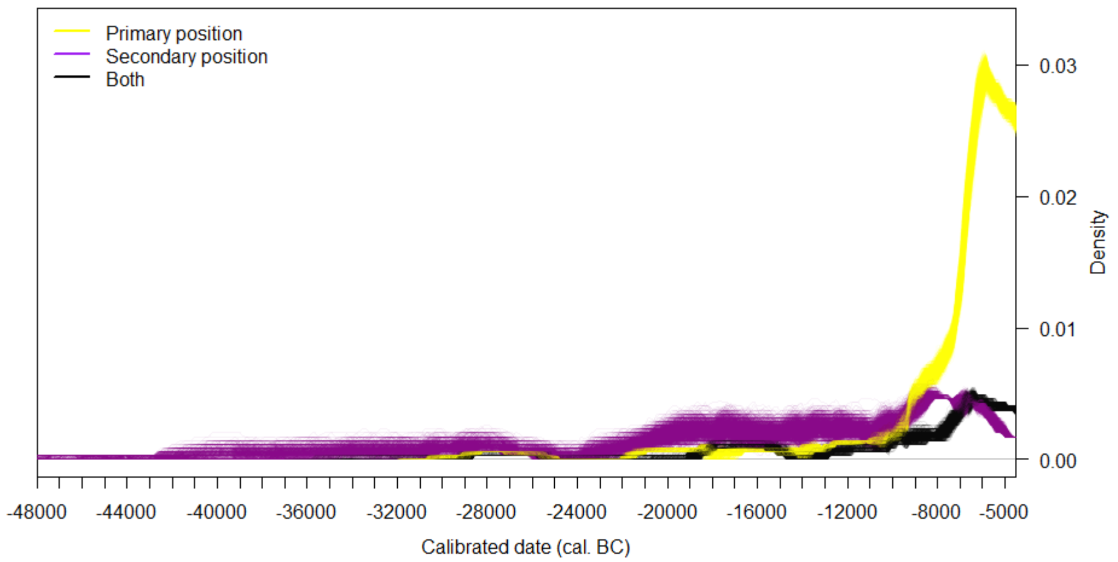
Primary deposition of the body is the most common practice in modern Western cultures, either in the shape of inhumation or full cremation. Nevertheless, this is not always the case in other societies, including modern and prehistoric hunter-gatherer and horticulturalist groups. The deposition of complete individuals in modified contexts likely reveals, at least in part, a desire to preserve the integrity of the body (Fowler, 2004; Beltrán Pedreira, 2015; García Acevedo, 2015). However, this is not so with cremations. There are several possible reasons why people choose to cremate the deceased, ranging from functional to social, such as identity transformation or communal integration (Cooney *et al.*, 2014: 12–15).

The secondary manipulation of human remains is unusual in modern Western cultures. However, it was widely practised in European Prehistory (Henry-Gambier, 1990: 20; Beyneix, 2008; Aura Tortosa, 2010; Gallego Lletjós, 2011; Arias, 2014) and, nowadays, is still practised by several non-Western societies (Bonogofsky, 2011a; *e.g.*, Lévy-Bruhl, 2003: 367–368) and is also common among modern hunter-gatherers and horticulturalists (Lévy-Bruhl, 2003; Fowler, 2004, 2016). The presence or absence of these practices is likely linked to the idea of the person and body held by each society (Fowler, 2004; Bonogofsky, 2011a). Some societies understand people as *dividuals* rather than *individuals*; each part of a *dividual* equals the whole and there is no difference between body, mind and soul (Fowler, 2004: 8–9; Bonogofsky, 2011a). On the other hand, in modern Western society the parts of the individual that are separated from the whole (where the head is) are not perceived as part of the subject anymore, only as things (Fowler, 2004: 8; Beltrán Pedreira, 2015; García Acevedo, 2015).

Thus, for societies that understand people as individuals, the removal of body parts from the deceased can be perceived as mutilation. On the other hand, for societies that understand people as *dividuals,* secondary treatment and use of funerary remains, including endocannibalism, can have a wide variety of purposes that range from preventing the deceased from returning (*e.g.*, Lyons, 1921: 435; Bonogofsky, 2011a: 14) or integrating the deceased into their new status in the social sphere (*e.g.*, Lévy-Bruhl, 2003: 367–368; Gallego Lletjós, 2011: 547), to ending the status of the deceased as an inhabitant of the land of the living and creating a nexus with their new status as an inhabitant of the land of the dead or to remove their identity to create a new identity as the collective group of ancestors (*e.g.*, Grimble, 1921: 46; Leenhardt, 1971: 61; Fowler, 2004: 87–90). Nevertheless, the secondary treatment of human remains might not be required for the whole of society (Bonogofsky, 2011a: 14). In addition, secondary practices, especially endocannibalism, might also be used as a way of making the body disappear, thereby hiding death (Clastres, 1981: 75–76; Criado-Boado, 1991: 94).

From the Upper Palaeolithic to the Early Neolithic, the practice of secondary mortuary practices likely reflects this idea of people as *dividuals*, since individuality is a modern social construct influenced by ideas of Cartesian dualism and *selfownership* (Beltrán Pedreira, 2015: 154–156; García Acevedo, 2015). The influence of these ideas was likely enhanced by an effect of literacy on human cognitive patterns: a greater tendency towards dichotomous thinking (Goody, 1977; Ong, 1982; Hernando, 2002: 10, 2012a: 139).

a)



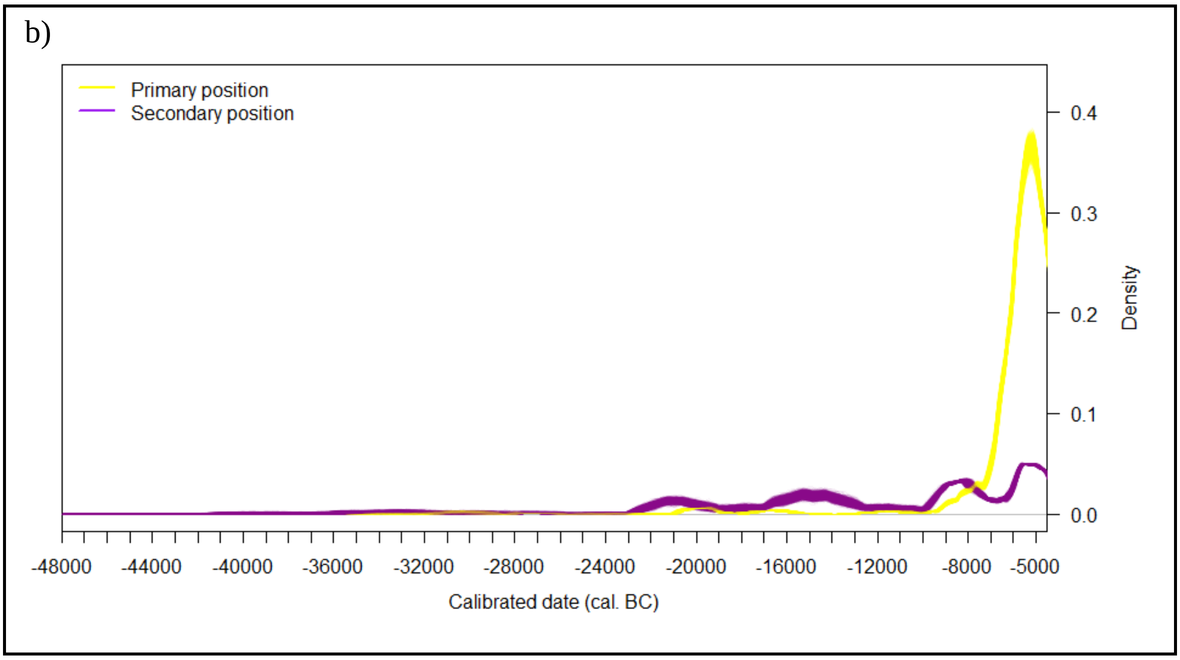


Figure 78: Monte Carlo graphs showing changes over time in the number of sites with individuals in primary and secondary position (a) and of individuals in primary and secondary position (b)

In the study region, the secondary treatment of the deceased was the main funerary treatment from the Upper Palaeolithic (c. 48000) to the beginning of the Late Mesolithic (c. 7500), after which primary depositions outnumbered secondary ones –a process of change that started c. 10000 cal BC (Figure 78). From c. 8000 cal BC, there was a decrease in the number of individuals in secondary positions that lasts until c. 6000 cal BC, when they start rising again. No geographical patterns can be detected.

Complete bodies are the only type of primary deposition. On the other hand, secondary depositions can be divided into skulls, disarticulated bones, isolated bones and ornaments made of human bone. Finally, full cremations (completely cremated individuals) can be either primary or secondary depending on whether the body was in a primary or secondary position before cremation.

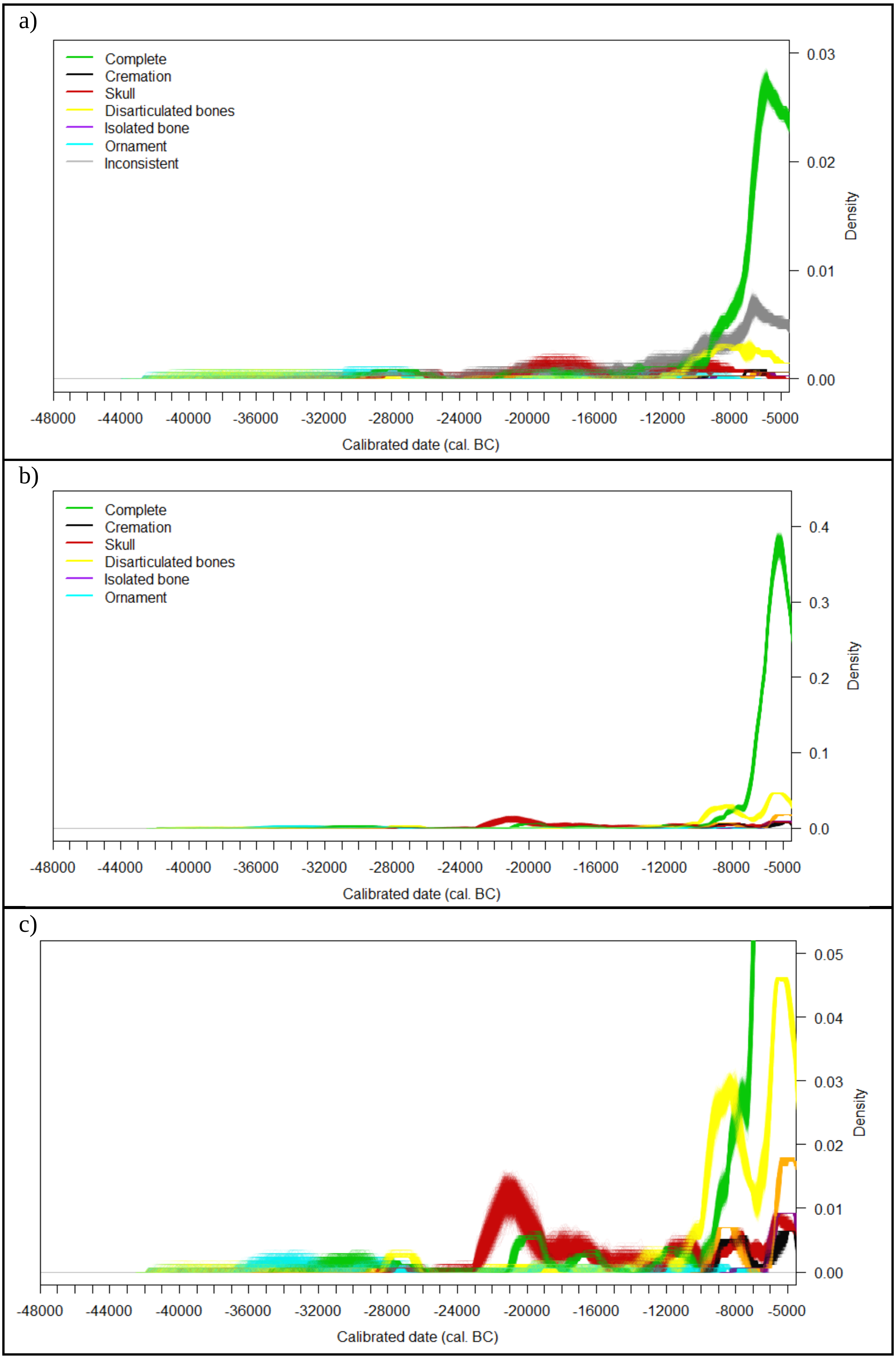


Figure 79: Monte Carlo graphs showing changes over time in the number of complete bodies, full cremations, skulls, disarticulated and isolated bones and ornaments by site (a) and individual (b & c)

At a site level (Figure 79a), the pattern of deposition was fairly mixed until c. 9000 cal BC, when the relative frequency of each kind of deposition stabilised: sites with complete bodies became the most frequent, followed by sites containing more than one type of deposition, sites with only disarticulated bones and sites with only skulls. Sites that only contained isolated bones, ornaments made of human bones or full cremations were always unusual.

The pattern is more variable at an individual level (Figure 79b & Figure 79c). At c. 10000 cal BC, disarticulated bones started to increase, becoming the most frequent deposition for a short time. From c. 9000 cal BC, the deposition of complete individuals became increasingly frequent, whereas the frequency of individuals in secondary positions started a decrease from c. 8500 cal BC to c. 6500 cal BC, such that, by c. 8000 cal BC, complete individuals outnumbered individuals represented by disarticulated bones.

Lastly, during the Solutrean (c. 23000–19000 cal BC at an individual level, c. 21000–15000 cal BC at the site level), individuals represented by partial or complete skulls became slightly more common than other kinds of deposition. Magdalenian sites, many of them with standard dates between 19000 to 9500 cal BC, likely strongly influence the peak of skull depositions.

However, these results might not be accurate, as identifying remains in a secondary position is complicated. Loose bones and remains that are not in anatomical connection might result from post-depositional displacement. The original treatment of the body could only be established in 57.5% of cases. Also, some cases are clearer than others, with only a few certainties. These are cases in which cut marks were found on the bones (*e.g.*, Le Mort & Gambier, 1991) or where the original position of the body could be determined through archaeothanatology. Archaeothanatological studies are extremely useful in distinguishing primary from secondary depositions. On the other hand, long bones, the cranium, the mandible and teeth are the body parts with higher preservation rates, so secondary depositions of other bones have less chance of being preserved, especially if they are left exposed.

A chi-squared test further supports the influence of taphonomic factors, returning a strong correlation between individuals in primary and secondary positions and the location of the site (p=0.000). Almost all sites with individuals in secondary positions are in caves (43/51, 84.3%), likely the result of caves offering better conditions for bone preservation. In addition, there is a correlation between primary and secondary depositions and delimited and mixed funerary spaces before 10000 cal BC (p=0.000), which is likely caused by most individuals in mixed funerary spaces being in secondary positions (66/76, 86.8%). In part, this may reflect the greater impact of taphonomic processes on Upper Palaeolithic remains compared to those from later periods (Surovell & Brantingham, 2007). However, this pattern may also reflect cultural factors, as the deposition of individuals among domestic structures can be used to hide bodies but the occurrence of bones among living structures can also be related to people keeping bones of their loved ones. There is no geographical pattern to these trends.

7.1.1. Primary position

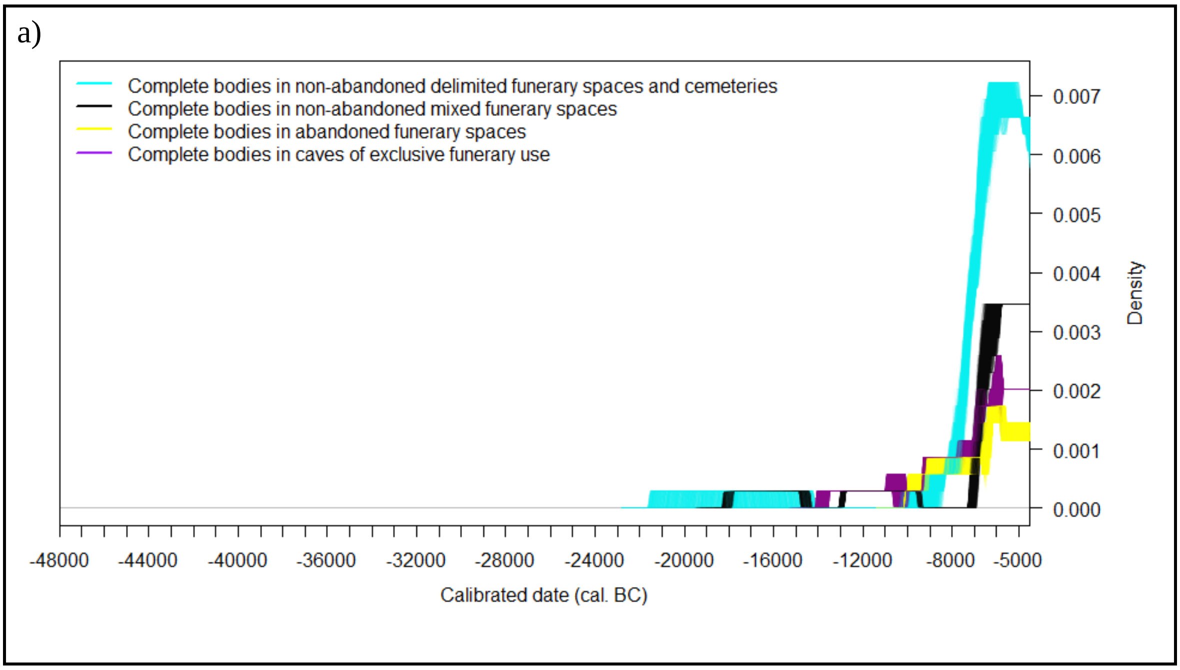
7.1.1.1. Complete bodies

The number of complete individuals was very low and stable until the end of the Upper Palaeolithic and beginning of the Mesolithic (c. 9500 cal BC), when it started rising. The rise accelerated c. 7000 cal BC and the number of complete individuals reached a peak c. 5500 cal BC, during the Early Neolithic. It must be noted that this rise was not exclusively caused by cemeteries, as individuals also started to be deposited complete in individual funerary spaces. In terms of geographic distribution, complete individuals are widespread throughout the study region. However, the information on the prevalence of individuals deposited complete is insufficient to draw inferences about its meaning, as the burial of complete bodies has two potential and opposing possibilities in terms of the human perception of death and the body depending on the treatment applied to the deceased.

1. Individuals buried under living structures, individuals subjected to rituals that make the body disappear (*e.g.*, by endocannibalism or throwing it to a river) and individuals left unburied, alone and with no ritual elements, in locations to which the group would never return (*e.g.*, abandoned settlements, caves with no domestic use) (Clastres, 1981; Woodburn, 1982; Criado-Boado, 1991; Weiss-Krejci, 2013). These treatments have been proposed as one of the potential causes of the small number of human remains from the Upper Palaeolithic (Criado-Boado, 1991: 94; Arias, 2014: 70), as many would have disappeared due to the greater impact of taphonomic processes on unburied individuals, especially in open-air locations.

These types of funerary behaviours which destroy or hide the evidence of death (strategies of hiding death) have been interpreted as a response to a fear of death and of the passing of time and the discontinuities generated by it, since change would be perceived as a risk for the continuity of the group. This interpretation comes from the fact that several modern hunter-gatherer and traditional agricultural groups whose funerary behaviours generate the destruction of the evidence of death, such as the Awá Guajá, the Yanomami or the Bororo (Amazonia), also make special efforts to forget their past, generating an illusion of everlasting present (Clastres, 1981: 74–78; Criado-Boado, 1991: 93–96, 1993: 51, 1995, 2012: 285–286; Hernando, 2002).

2. On the other hand, the primary deposition of individuals in burials and/or displaying ritual elements and/or in burial locations that were delimited and repeatedly used. This second type of burial demonstrates acknowledgement, ritualization and sometimes exhibition of death (Criado-Boado, 1991, 2012: 285–286; Pettitt, 2011: 267). The acknowledgement of death allows decisions such as burying the corpses in individual coffins to avoid the corruption of the body (Fowler, 2004: 84). It also allows the use of the deceased as territorial markers following strategies of death exhibition (Criado-Boado, 1991, 2012: 285–286).



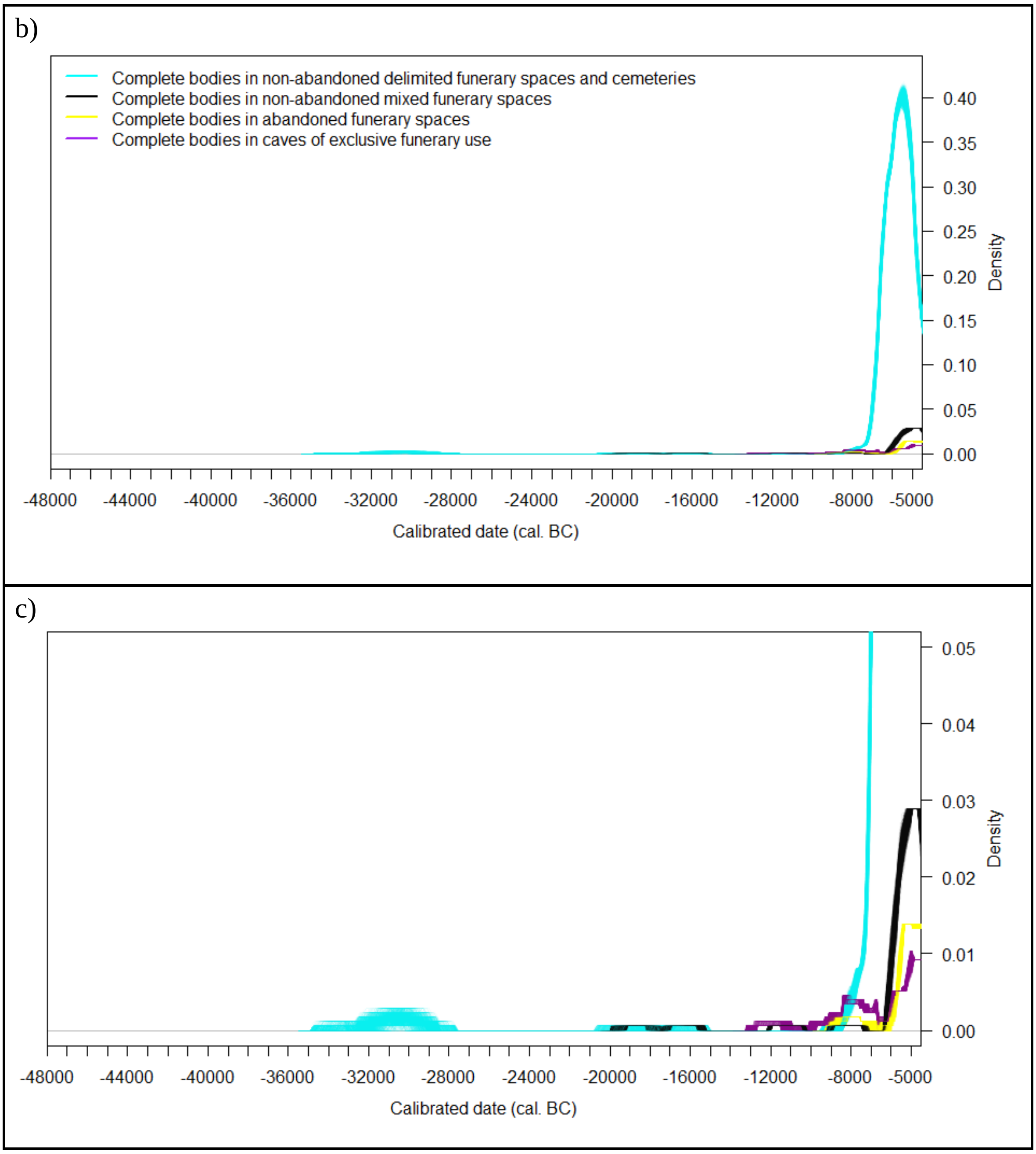


Figure 80: Monte Carlo graphs showing changes over time in the number of complete bodies in different contexts by site (a) and individual (b & c)

What the available information seems to show is that, before 20000 cal BC, the only complete individuals sufficiently well preserved to infer their original body treatment were placed in small non-abandoned delimited funerary spaces (Figure 80). There are only a few examples, but the fact that they have been preserved likely reveals that they were deposited in a way that attempted to protect the body. In this respect, one of the χ^2 tests showed a correlation between the treatment of the body and the use of graves (p=0.000) likely caused by almost all the complete individuals being buried (729/746, 97.7%). Most of the few individuals in sealed contexts (47/50, 94%) (p=0.011), and with furnishings (72/82, 87.8%) (p=0.005) were deposited complete, possibly showing an interest in the preservation of the integrity and position of the body. Lastly, the few complete individuals from before c. 20000 cal BC were placed in small funerary deposits. Although the sites were still in use after the deposition, no extra individuals were added. This likely means that these deposits were the result of burial selection practices. None of these patterns follows a specific geographical distribution.

From c. 20000 cal BC until c. 8000 cal BC, the few complete individuals were mainly found in small non-abandoned mixed funerary spaces and caves of exclusive funerary use. The deposition of individuals in the living space can result from strategies of hiding death, although it can also be used as a way of legitimising the use of the land via the ancestors in cases where there is a continuity of use of the funerary space (Criado-Boado, 1991: 93– 96, 105, 1993: 51, 1995). On the other hand, caves of exclusive funerary use can also be the result of the abandonment of bodies. However, this is not necessarily so, as caves can be considered liminal places with otherworldly properties that might make them good places to deposit the deceased (Schulting, 2016; Prijatelj & Skeates, 2019). Furthermore, many of these individuals are accompanied by ritual elements such as funerary offerings or mineral colourant (Blasco *et al.*, 2005; Palomino Lázaro *et al.*, 2011; Rojo-Guerra *et al.*, 2016), showing that they were not just abandoned. All caves with exclusive funerary use containing complete individuals are Neolithic and, to a lesser extent, Mesolithic. Most Neolithic examples are confined to the south of France and Northern Iberia (Figure 81).

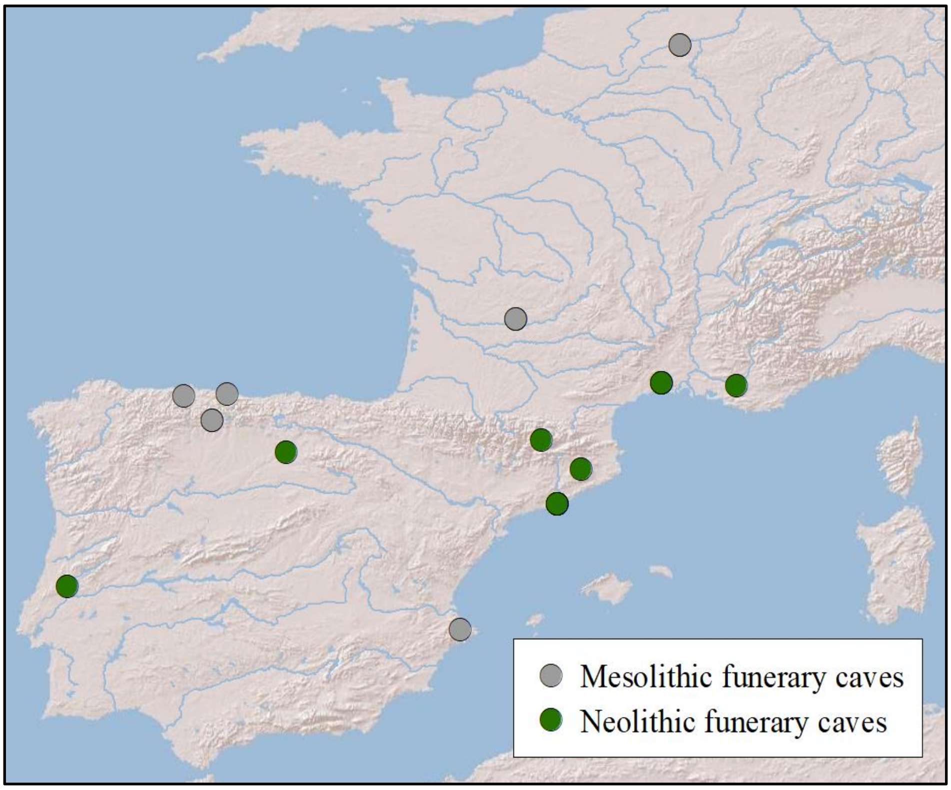


Figure 81: Geographical distribution of Mesolithic and Neolithic caves with exclusive funerary use containing complete individuals

Complete individuals in abandoned funerary spaces are recorded from c. 9000 cal BC in Mesolithic and Neolithic sites, but there are too few to establish geographical patterns. Nevertheless, the chronology might be biased, as the stratigraphic information used to infer the abandonment of sites is generally better for more recent periods. In this respect, χ^2 test showed a correlation between if individuals were in primary or secondary positions and if the site was abandoned (p=0.010), which is caused by almost all individuals in abandoned contexts (36/38, 94.7%) being in primary position. The abandonment of the deceased in places to which the group would never return is a strategy of hiding death documented among modern hunter-gatherers. In addition, when someone dies inside the village, the place is left (Woodburn, 1982; Criado-Boado, 1991, 2012).

There are only a few examples of unburied and unritualized skeletons (*i.e.*, isolated, without funerary offerings, mineral colourant, fire, etc.). An example of this is the French site of Les Garennes (Vilhonneur) (29370–28121 cal BC), where a young adult who was found in a very disturbed burial seems to have been left unburied and with no ritual element (Pettitt, 2011: 153). However, such depositions would be the most likely to have disappeared due to taphonomic processes or be in a very poor state of preservation. In this respect, it is impossible to know how 602 out of the 1984 individuals found in the study area (30.3%) were originally deposited, in most cases likely because only a few bones have been preserved; in 87 cases (14.5%) only teeth. There are also 220 individuals (11.1%) whose original method of deposition is uncertain. Both individuals in unknown and uncertain positions are widely represented during the Upper Palaeolithic, Mesolithic and Neolithic across the whole study region. Several of these, especially those from the Upper Palaeolithic, are thought to be primary depositions of complete bodies that were heavily affected and displaced by taphonomic processes (Fernández Crespo & Tejedor Rodríguez, 2011: 536).

After c. 7500 cal BC, most individuals were placed in cemeteries or smaller non-abandoned delimited funerary spaces. The χ^2 tests show a correlation between the type of body treatment and the site type (p=0.000), which, from c. 8000 cal BC, is partly caused by cemeteries mainly containing complete individuals. The same can be observed in shell middens, likely due to most large cemeteries being shell middens (p=0.000 and p=0.000).

Body treatment is correlated with whether the funerary space was collective or not, and the patterns responsible seem to change after c. 8000 cal BC (p=0.000). Before 8000 cal BC, the type of body treatment given to individuals in individual funerary spaces was mixed and the reason behind the correlation was the higher prevalence of disarticulated remains in collective funerary spaces. However, after 8000 cal BC, the correlation seems to be influenced by most individuals in individual funerary spaces starting to be deposited complete (49/60, 81.7%), especially after 6500 cal BC (40/42, 95.2%), but there is no geographical pattern to this trend. This, along with my previous observations concerning the presence of funerary offerings in these types of contexts, could point to a change in the perception of individual funerary spaces from a way to hide the deceased to places in which to bury 'special' people, making them among the few individuals to receive funerary treatment (Criado-Boado, 1991, 1993, 1995, 2012; Pettitt, 2011: 267). Nevertheless, most complete individuals after c. 8000 cal BC occur in collective funerary spaces.

After c. 6500 cal BC, body treatment correlates with the location of the site (p=0.001) and the delimitation of the funerary space (p=0.000). The first is caused by most open-air sites containing only complete bodies (59/74, 79.7%) and the second by most individuals in delimited funerary spaces (456/474, 96.2%) being deposited complete. This could show an increased interest in the preservation of the integrity of the body, as they were preserved in open-air locations, and on the visibilization of complete individuals, as they started to be placed in delimited locations (Criado-Boado, 1991: 93–96, 105, 1993: 51, 1995, 2012: 285–286). The occurrence of Neolithic complete individuals in delimited funerary spaces follows a geographical pattern, with most examples occurring in the Linear Pottery Culture, the Mediterranean Coast and the Pyrenees (Figure 82).

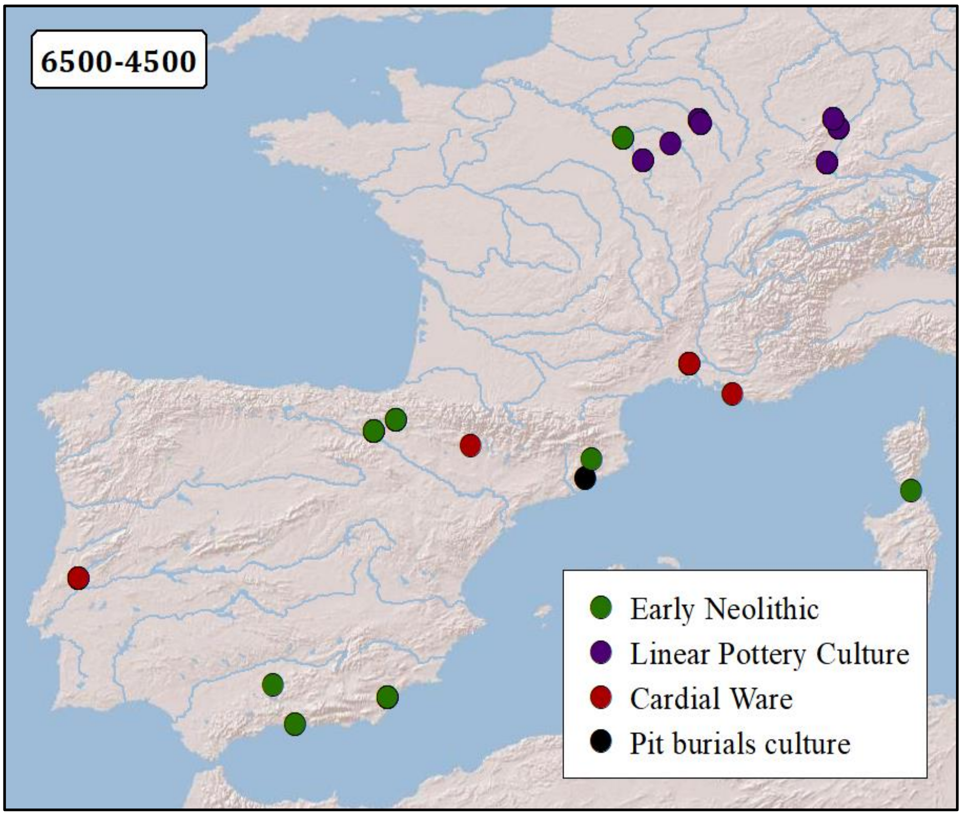


Figure 82: Geographical distribution of Neolithic complete individuals in delimited funerary spaces in 6500–4500 cal BC

To summarise, strategies of hiding death and strategies of death exhibition seem to have always coexisted in the treatment of complete bodies. Nevertheless, from c. 8000 cal BC, complete bodies in delimited non-abandoned funerary spaces and cemeteries, where they are the more preeminent type of deposition (*e.g.*, Figure 83), seemed to have outnumbered those in funerary spaces more clearly related to the practice of strategies of hiding death. However, the original purpose of mixed cemeteries, such as Téviec, France (5490– 5220 cal BC), is not clear. The remains seem to be mixed with the living structures, which could point to strategies of hiding death. However, given the type of funerary treatment these individuals received, with uniform sets of funerary offerings that served as identity markers (Boulestin, 2016; David, 2016), it could be argued that the disposition of the bodies among the living space is a result of legitimising the use of the land via the ancestors or of *strategies of inhibition* (Criado-Boado, 1991: 93–96, 105, 1993: 51, 1995, 2012: 285–286). The same could be argued for the mixed funerary spaces in some sites in the Linear Pottery Culture. These are too small to be considered cemeteries, but as at Téviec, the individuals buried there present more or less standardized sets of funerary offerings, with *Spondylus* shells serving as identity markers (Masclans Latorre *et al.*, 2021).

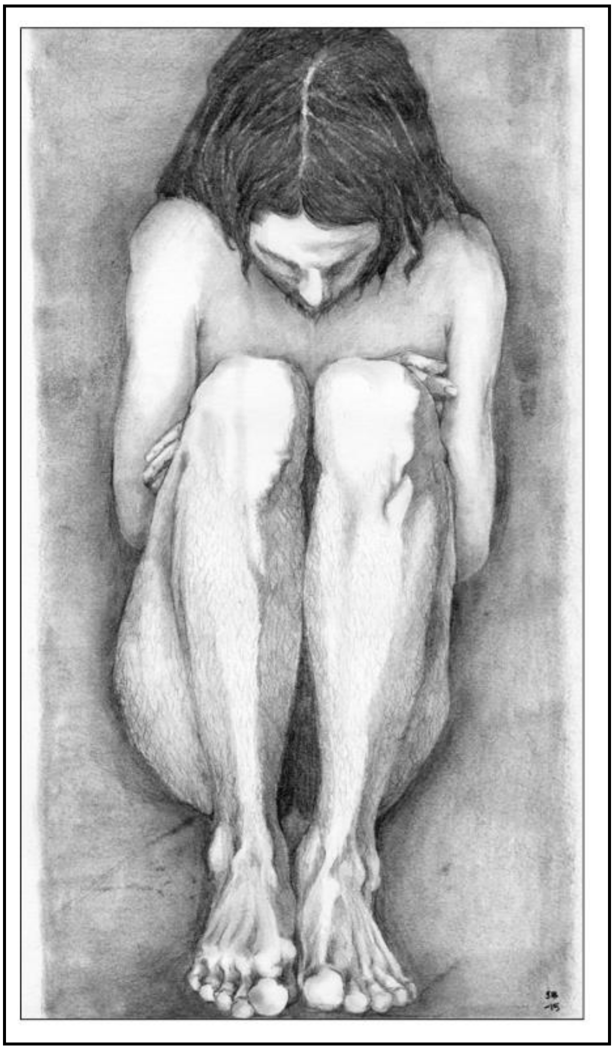


Figure 83: Reconstruction of typical elements of burials from the shell midden of Vale de Romeiras

Source: Peyroteo Stjerna, 2016a: 337

Finally, there is a correlation between the body treatment and funerary offerings from c. 19000 cal BC; however, the reasons behind it seemed to change. Until 6500 cal BC (p=0.003 and p=0.006), individuals represented by disarticulated bones were the ones with a higher frequency of funerary offerings (27/53, 50.9%). However, thereafter (p=0.008 and p=0.000), the individuals more likely to have funerary offerings were those deposited complete: almost half of the complete individuals (281/591, 47%) had funerary offerings. This might reflect a change in the treatment given to complete bodies, as this became the type of body treatment more likely to be ritualized. In this respect, it is worth noting that almost all individuals with location markers were deposited complete (25/26, 96.1%) (p=0.039) and all of them were from after c. 7000 cal BC, except for burial 8 from Morín, Spain (31725–29367 cal BC), which was covered with a tumulus (Freeman & González Echegaray, 1970).

7.1.1.1.1. The position of the body

The ritualization of death relies on social beliefs, such as the social role of individuals or religion, that can be reflected in the way the body was positioned and oriented. For example, the head is usually oriented toward where the land of the dead is thought to be (Mack, 1986; Carr, 1995: 118; Roberts Kyle, 2012). During the study period, some body positions could be the result of social beliefs. Given the lack of geographical patterning related to body positioning (general position, lateralization, degree of flexure and head orientation), all the observed patterns are intra-site. They are observed in Mesolithic and Neolithic sites, owing to the higher proportions of poorly preserved remains, individuals in secondary positions and individuals in funerary spaces containing less than four individuals during the Upper Palaeolithic.

Most individuals in the study region are in lateral (n=240) or supine decubitus (n=200), while there are only a few cases of individuals in prone decubitus (n=13), seating (n=15) and kneeling positions (n=2). In most sites, there are individuals in more than one position, although there are usually only two positionings per site. For example, at L'étang David (Chichery), France (4728–4174 cal BC) all individuals are in lateral decubitus, except for one who is in supine decubitus (Chambon *et al.*, 2010). This is likely influenced by cultural factors. However, there are also some sites with more than two positions. For example, at Téviec, France (5490–5220 cal BC) individuals can be found in supine and lateral decubitus, and in seating (Figure 84) and kneeling positions (Boulestin, 2016), which may indicate a lack of cultural preference in this regard.

Figure 84: Reconstruction of an individual from Téviec in seating position
Source: Boulestin, 2016

The variety of intra-site positions increases when the lateralization, the degree of flexure and head orientation are considered. For example, at Amoreiras individuals are oriented to the east or west (Peyroteo Stjerna, 2016a), but they can either be in left or right lateral decubitus and different flexed degrees. At Los Cascajos, individuals are in the foetal position either in supine or lateral decubitus, but, while most individuals (n=21) are oriented to the southeast, there are some (n=11) facing other locations (four are oriented to the east, three to the west, two are oriented to the north and two to the south) (García Gazólaz & Sesma Sesma, 2007).

Positioning some individuals differently could be marking them as deviant (Shay, 1985). For example, in the Trobriand Islands only suspected sorcerers were buried in prone decubitus as a way to prevent the spirit's return to the village (Bonogofsky, 2011a: 18). Different positionings could also respect the social role of individuals (Babić, 2005; Díaz-Andreu, 2005; Lucy, 2005a; Bickle & Fibiger, 2014). In Late Neolithic and Early Bronze cemeteries, the biological sex of individuals seems to be highly correlated with the orientation of the body (Sofaer & Sørensen, 2013: 533). Lastly, different head orientations might reflect beliefs in the afterlife. For example, in Inuit society, individuals can be found in different orientations depending on the afterlife to which they are going (Carr, 1995: 118). Head orientation can also be related to the orientation of the houses of the living or the beds where they slept, with the requirement that the deceased should not be in the same orientation (Mack, 1986; Roberts Kyle, 2012).

Sites containing individuals in a single uniform position are extremely rare. For example, at Falaises de Prépoux (Villeneuve-la-Guyard), France (5730–5550 cal BC) all individuals are in the foetal position and oriented to the east (Prestreau, 1992) and at Mulhouse-Est (Ile-Napoleón), France (5500–4500 cal BC) they are in left flexed lateral decubitus and oriented to the northeast (Jeunesse, 2003). These examples might be a response to social beliefs that applied to all members of society equally. We need to be mindful that the positions of some individuals from these sites are unknown and one or more could have been positioned differently.

7.1.2. Secondary position

7.1.2.1. Skulls

The secondary treatment and deposition of skulls is a phenomenon that is widespread in some prehistoric periods, as well as in several recent hunter-gatherer and traditional agricultural societies. In several recent hunter-gatherer and agricultural societies, such as the Lamet of Laos or the Kiwai Papuans of New Guinea, the head is the most important part of a person, representing the person as a whole (because of the facial features), its sacred part, or where its power lies (Needham, 1976: 71– 72; Lévy-Bruhl, 2003: 369; Bonogofsky, 2011a: 3,12). Likely as a result of this, the secondary treatment of the deceased in societies with such beliefs focuses on the head. Furthermore, beliefs focused on the head, along with the idea of *dividuality* (Fowler, 2004), might explain why secondary treatment of skulls was widespread in prehistory.

Secondary treatment of skulls is represented throughout the study region from the Upper Palaeolithic to the Early Neolithic, reaching a peak during the Solutrean (c. 23000–18000 cal BC). There are 189 individuals represented by crania, cranial elements, mandibles or maxillae. Of these, 80 seem likely to have been deposited originally as skulls or skull parts, and not as the result of post-depositional taphonomic processes. Some cases are clearer than others. For example, at Cova Beneito, Spain (19423–17022 cal BC), a young adult female and a subadult are represented by a cranial vault and cranial fragments (Figure 85). The remains were placed between two rocks, covered in ochre, and had grave goods (two lithic cores covered in ochre, a hammerstone, and a scraper) (Iturbe *et al.*, 1993). Another example is Grotte du Placard, France (22198–19814 cal BC) there are 24 individuals of all ages represented mainly by calvaria (possible skull cups), cranial fragments and teeth. The remains are well preserved and present cut marks (Le Mort & Gambier, 1991; Boulestin, 2012; Díez Fernández-Lomana & Romero, 2016).

Figure 85: Cranial vault from Cova Beneito

Source: MARQ

Whether the remains are the result of a secondary burial (Le Mort & Gambier, 1991), ritual cannibalism (Díez Fernández-Lomana & Romero, 2016) or trophy head collection (Boulestin, 2012), what is clear is that they received a secondary mortuary treatment focused on the head. However, there are also many cases in which isolated crania, cranial elements, mandibles or maxillae are found and thought to have been deposited in that condition due to their good preservation and/or isolation, since long bones have similar preservation rates and, if present, ought to have been preserved (Bello & Andrews, 2006).

Skulls are found in approximately equal proportions in delimited and mixed, individual and collective funerary spaces. This suggests that the secondary treatment of skulls could have been used as a way to prevent the deceased from coming back or as a transforming process that was aimed at visibilizing the deceased, integrating them in the group of the ancestors, or keeping the loved ones near after they died (*e.g.*, Grimble, 1921: 46; Leenhardt, 1971: 61; Criado-Boado, 1991, 1993, 1995, 2012; Fowler, 2004: 87–90; Gallego Lletjós, 2011). The χ^2 test showed a correlation between the body treatment and graves (p=0.000), sealing methods (p=0.011), furnishings (p=0.005) and funerary offerings (p=0.000). These results seem to be influenced by skulls. They are usually buried (23/34, 67.6%) and, although there are only a few cases, skulls are one of the few kinds of funerary deposition to be found sealed (n=3) or with furnishings (n=3). These come from the Spanish sites of Malladetes (27810–26696 cal BC), Parpalló (22076–18036 cal BC) and Beneito (19423–17022 cal BC) which are near to one another (Figure 86) (Pericot García, 1955; Iturbe *et al.*, 1993; Arsuaga *et al.*, 2002). Only a few skulls (11/71, 15.5%) have funerary offerings, but these show no geographical pattern.

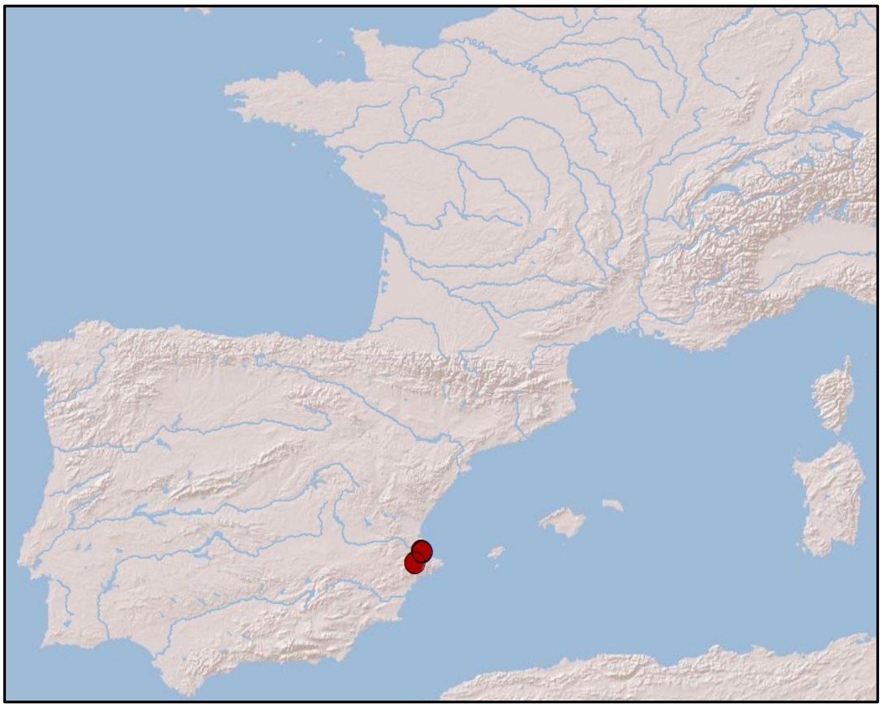


Figure 86: Location of Malladetes, Parpalló and Beneito

7.1.2.2. Disarticulated bones

Disarticulated remains can range from a few bones to a complete skeleton that were moved to a different location or rearranged in the same place after deliberate excarnation of the skeleton or the natural skeletonisation process. Disarticulation is a very common practice in several prehistoric periods (Fowler, 2004; Gallego Lletjós, 2011, 2013; Pettitt, 2011; Orschiedt, 2013), as well as among recent hunter-gatherer and traditional agricultural societies (Fowler, 2004; Gallego Lletjós, 2011, 2013; Pettitt, 2011; Orschiedt, 2013).

Like all kinds of secondary treatments of the body, the disarticulation of remains can have different purposes that range from transforming process that aims at destroying the persons' former identity and creating a new one (*e.g.*, Grimble, 1921: 46; Leenhardt, 1971: 61; Fowler, 2004: 87–90, 2013) to a way of preventing the deceased from returning (Lyons, 1921: 435; Bonogofsky, 2011a: 14) or a way of facilitating the disappearance of the body as a strategy of hiding death (Clastres, 1981: 75–76; Criado-Boado, 1991: 94). These reasons are not necessarily mutually exclusive, as sometimes it is feared the deceased will come back before the funeral ritual is performed, but once they have gone through the transforming process that integrates them with the ancestors, they are venerated (Grimble, 1921: 46; Leenhardt, 1971: 54–54, 61; Clastres, 1981: 75; Hertz, 1990: 28–29; Fowler, 2013). The disarticulation of human remains also reflects the ideas of death as a process and of *dividuality,* in which each part of the *dividual* equals the whole (Leenhardt, 1971; Fowler, 2004: 8–9; Bonogofsky, 2011a).

172 disarticulated individuals in the study region seem likely to have been purposely disarticulated. There are a further 602 individuals that might have been purposely disarticulated but, equally, could be disturbed primary burials. Disarticulated remains were present throughout the time range considered in this thesis, disarticulation being one of the most common funerary practices before c. 8000 cal BC, and their occurrence does not follow a specific geographical pattern.

The correlations between the body treatment and collective and individual funerary spaces (p=0.000), the delimitation of the funerary space (p=0.000), the site type (p=0.000), and the presence of funerary offerings (p=0.000) seems to be influenced by disarticulated remains. All disarticulated bones were in collective funerary spaces and most of them were in mixed funerary spaces. This could point to the communal integration of the deceased and intentional hiding of the dead under living structures, or their continuation in the social sphere, particularly in those cases where the remains were not buried (Clastres, 1981: 75–76; Criado-Boado, 1991: 94; Lévy-Bruhl, 2003; Fowler, 2004; Gallego Lletjós, 2011).

Between 10000 and 8000 cal BC (p=0.000), a large proportion of disarticulated individuals occur in caves of exclusive funerary use. All are Mesolithic and located in a small area of Belgium (Figure 87), which might show that caves there were being used to deposit communally integrated deceased due to their otherworldly properties on the one hand, or as places to abandon the dead and never go back to, on the other (Clastres, 1981: 75–76; Criado-Boado, 1991: 94; Fowler, 2004; Schulting, 2016). Only the individuals from Grotte Margaux (9150–8300 cal BC) are buried, and have mineral colourant and funerary offerings, making this case the most likely to be the result of ritualized communal integration (Cauwe, 2001; Toussaint, 2010b).

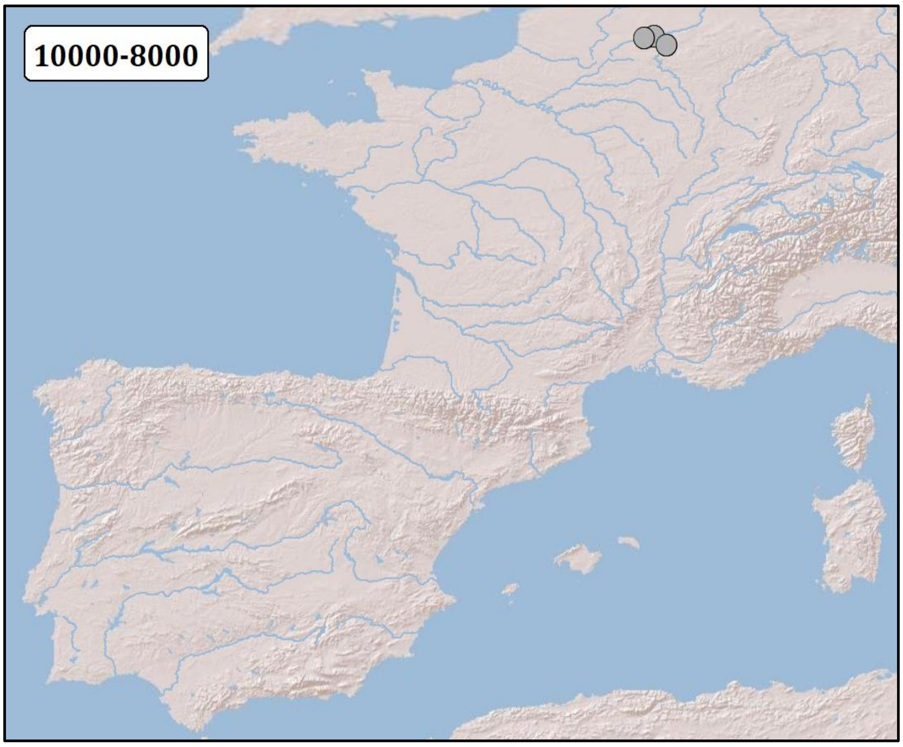


Figure 87: Geographical distribution of Mesolithic caves of exclusive funerary use

Lastly, before 6500 cal BC (p=0.003, p=0.006 and p=0.004), individuals represented by disarticulated bones were those with a greater tendency to have funerary offerings (26/50, 52%), which usually consisted of tools. After 6500 cal BC (p=0.000), complete (269/554, 48.5%) and cremated individuals (6/8, 75%) had a greater tendency to have funerary offerings. This does not follow any obvious geographical pattern and, thus, might simply show that, before 6500 cal BC, disarticulation was more commonly used as part of symbolic funerary rituals than leaving the body complete (Pettitt, 2011).

7.1.2.3. Post-decomposition bone removal and isolated bones

The removal of bones can be done either to redeposit them in a new location as part of a diachronic mortuary practice that might reflect ideas of *dividuality* and death as a process or to be kept by the living. Some societies keep one or more of the deceased's bones, either as a way of having their beloved ones close by and prolonging their presence in the social sphere (Gallego Lletjós, 2011), or to use them for a specific purpose such as divination (Lévy-Bruhl, 2003: 367–368).

Individuals with bones removed and isolated bones are likely two types of human remains evidencing the removal of bones from skeletons. Individuals with bones removed in a primary position and isolated bones in secondary position. Gallego Lletjós (2011: 546) linked isolated bones and individuals with bones removed with the loose bone phenomenon, well known for the Mesolithic, which consists of isolated human bones found outside funerary spaces, usually in occupational contexts. In the study region, the sample is small: there are 43 individuals with bones removed and 16 isolated bones that seem to be the result of intentional mortuary practice. These occur in 12 Mesolithic and Neolithic sites (c. 9120–4462 cal BC) that do not follow any geographical pattern.

There are 38 more cases of individuals with missing bones that might have been removed intentionally and 21 cases of bones in apparent isolation that are not linked to funerary practice. In many cases, it is impossible to know if the bones were purposely removed. The correlation between the post-decomposition removal of bones and the use of graves (p=0.026 and p=0.005) suggests that bone removal is easier to detect in well-preserved bodies, as most individuals with bones removed are buried (36/43, 83.7%) and burials allow better preservation of the remains.

χ^2 tests also show correlations between the post-decomposition bone removal and whether the funerary space was individual or collective (p=0.036), whether individuals were in primary or secondary position (p=0.009), and the presence of funerary offerings (p=0.000). All individuals with bones removed were in collective funerary spaces, which might point to a 'reduction' of the skeletons as part of diachronic burial practices (Cauwe, 2001; Gallego Lletjós, 2011). In addition, most had funerary offerings (34/43, 79%), which, as with the removal of bones, points to ritualization of these individuals. Moreover, 24 of the 42 individuals with bones removed (57.1%) were in primary position. All the individuals in primary positions with bones removed were articulated skeletons, while all in secondary positions were disarticulated remains (p=0.001). In addition, all the articulated skeletons with bones removed were Neolithic, when there was greater ritualization of complete individuals in general. These associations do not follow a specific geographical pattern.

In terms of isolated bones, the correlations between body treatment and graves (p=0.000), funerary offerings (p=0.000) and whether the funerary space was delimited or mixed (p=0.000) seem to be influenced by them, as all isolated bones were in mixed funerary spaces and buried; none were associated with funerary offerings. This suggests they were buried under living structures, perhaps as a way of keeping the loved ones close by. Similarly, none of these associations follows a clear geographical pattern.

7.1.2.4. Ornaments

There are several societies in which the bones of the deceased are not only kept but are also transformed into something else, usually to keep the beloved ones around after their death. One of the most popular options is jewellery, such as necklaces made of human teeth or mandibles (Lévy-Bruhl, 2003: 367–368), but human bones can also be used to make other items. For example, Lévy Bruhl (2003: 366) reports the example of a man in Aurora (Melanesia) who exhumed the bones of his brother to make arrow points. He went everywhere with the arrows and always talked about 'he and his brother'. Everyone was scared of him because they believed his brother was there to assist him. Again, the use of items made of human bones reflects ideas of *dividuality*, as well as a desire to keep the deceased in the social sphere.

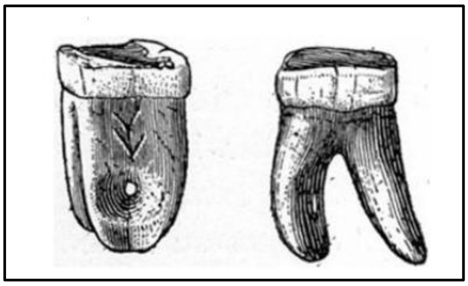


Figure 88: Engraved perforated human molar from La Combe

Source: MacCurdy, 1914

There are sixteen ornaments made of human bone in the study region, ranging in age from 42000 to 7662 cal BC, most consisting of perforated teeth. In the case of La Combe (42000-27000 cal BC), the teeth are engraved (Figure 88) (MacCurdy, 1914). There is also a perforated mandible fragment from Grotte d'Enlène (15651–9159 cal BC) (Bégouën *et al.*, 1936) and a pendant made out of a perforated circular-shaped fragment of an infant parietal from Veyrier Cave (11050–10350 cal BC) (Vallois, 1971; Stahl Gretsch, 2005). Apart from Veyrier, the sites where these ornaments were found are concentrated in the same area of southern France (Figure 89). Chronologically, all ornaments are from the Upper Palaeolithic, except those from Les Fieux (9251–7662 cal BC) (Champagne *et al.*, 1990) and La Vergne (La Grande Pièce) (8340–8020 cal BC) (Duday & Courtaud, 1998), which are Mesolithic.

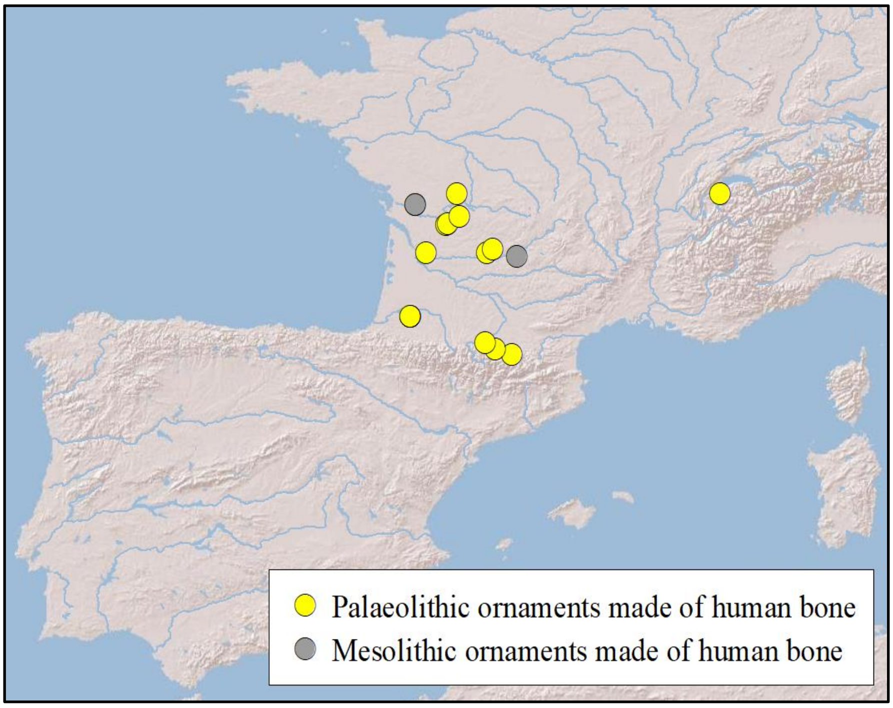


Figure 89: Geographical distribution of ornaments made of human bone

In addition, most ornaments are not from funerary contexts. The only exception is La Vergne (La Grande Pièce), where a perforated human tooth in a multiple grave was considered a funerary offering. $\chi 2$ contingency tables of the tests regarding body treatment in which the null hypothesis of an absence of correlation could be rejected showed that there are no open-air sites with ornaments made of human bone (p=0.000); they always appeared alone (p=0.000), in mixed contexts (p=0.000) and unburied (p=0.000). These results point to none of these ornaments having received any kind of mortuary treatment beyond their making.

7.1.3. Cremations

Cremation is a process rather than a discrete event, and it shows clear intentionality in transforming the deceased (Fowler, 2004: 84). This transformation is usually linked to the journey from life to death. Cremations can be full (when the whole body is cremated) or partial (when only a part of the body shows traces of fire). An example of partial cremation is the Spanish site of Isturitz (16171–13403 cal BC), where only a mandible showed fire traces (Henry-Gambier & Le Mort, 1996; Henry-Gambier *et al.*, 2013).

Unlike in modern Western culture, in some other societies the mourners are active agents in the cremation process (*e.g.*, removing the remaining bones from the ashes). Reasons behind cremation can be divided into three main groups: functional (*e.g.*, disease control, transport, space-saving), according to the social status of the deceased (*e.g.*, high status, low status, gender, age, outcast) and as part of a social process (*e.g.*, destroying identity, creating identity, transformation, ancestor creation/veneration, communal integration, destroying the past). A few cremations are not made for any of these reasons, but for reasons that are deliberately vague. The precise reasons why a society cremates all or some of their deceased is impossible to determine since these reasons vary from society to society (Cooney *et al.*, 2014: 12–15).

In the case of partial cremations, additional reasons can be offered. For example, in Samoa, only the 'sick' part of the body was severed and burnt, while the rest of the individual was inhumed (Rebay-Salisbury, 2015: 24). Another option is to use part of the body to represent the whole of the deceased and, thus, only that part is given mortuary treatment (Rebay-Salisbury, 2015: 24). Finally, fire can be used to clean the bones of the remaining soft tissue as part of a secondary mortuary treatment (Rebay- Salisbury, 2015: 28).

Cremation was thought to be an extremely rare practice from the Upper Palaeolithic to the Neolithic, but research has shown that during the Mesolithic and the Neolithic it was more frequent than previously thought, and that it was practised alongside inhumation (Jeunesse, 1997: 57–60; Verjux, 2004: 110, 113). There are 21 fully cremated and 29 partially cremated individuals in the study region. Of the partial cremations, 21 were performed on complete skeletons and 8 on disarticulated remains. Most of the full cremations are Mesolithic and Neolithic, ranging in age from 9120 to 4500 cal BC. Except for the site of La Vergne, all Mesolithic and Early Neolithic sites containing full cremations are located in the northeastern part of the study region (Figure 90). During the Early Neolithic, this was the area of the Linear Pottery Culture. Nevertheless, given the continuity between periods in the geographical distribution of cremated individuals, cremations might have been a cultural feature that passed from the Mesolithic to the Early Neolithic groups, since, even if limited, contact between Linear Pottery Culture farmers and Mesolithic hunter-gatherers seems to have occurred based on aDNA and material culture evidence (Nikitin *et al.*, 2019; Rivollat *et al.*, 2020; Vanmontfort, 2008).

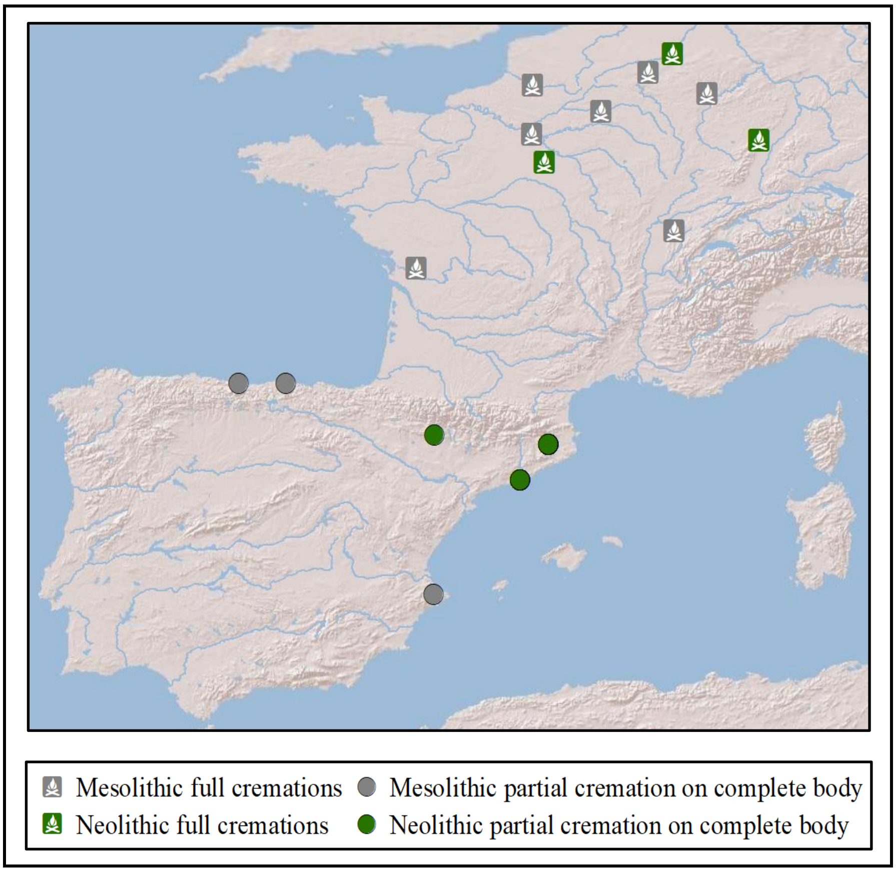


Figure 90: Geographical distribution of Mesolithic and Neolithic full and partial cremations

On the other hand, partial cremations on complete bodies take place mainly during the Mesolithic and Early Neolithic and are present only in northern Spain (Figure 90). Partial cremations on disarticulated remains are only recorded in three geographically distant sites. These are the Upper Palaeolithic site of Isturitz, France (16171– 13403 cal BC) (Henry-Gambier & Le Mort, 1996; Henry-Gambier *et al.*, 2013); and the Mesolithic sites of Noyen-sur-Seine, France (7242–6637 cal BC) (Valentin *et al.*, 2008) and Cuzoul de Gramat, France (c. 8400 cal BC) (Valdeyron *et al.*, 2011). In these cases, fire might have been used to clean the bones of the remaining soft tissue after they were defleshed (Rebay-Salisbury, 2015: 28). This idea is further supported by the presence of cut marks on the bones from Noyen-sur-Seine and Cuzoul de Gramat, pointing to active defleshing of the remains (Newell *et al.*, 1979; Valentin *et al.*, 2008).

The use of fire in secondary mortuary practices might also explain why, from 6500 cal BC, the use of fire on the remains is correlated with the removal of bones (p=0.000) due to more than half (16/28, 57.1%) of individuals with bones removed displaying evidence of fire, while the proportion of fire-affected individuals without bones removed is much lower (15/567, 2.6%).

Between 6500 and 4500 cal BC (p=0.000), most fire-affected individuals are found in caves (20/27, 74.1%). Also during that time, more than half of the individuals in sealed graves (19/33, 57.6%) were fully or partially cremated (p=0.000). In the case of funerary offerings, after 6500 cal BC (p=0.000), 25 out of the 27 (92.6%) cremated individuals had funerary offerings. Most of these come from the Neolithic cave site of L'Avellaner, Spain (4934–4462 cal BC), where there are 20 successive inhumations, likely of complete individuals, within four delimited and sealed funerary spaces. Some of the remains are partially cremated (Bosch i Lloret & Tarrús i Galter, 1990).

Nevertheless, the correlation between body treatment and the presence of funerary offerings after 6500 cal BC (p=0.000) shows that fully cremated individuals are the most likely to have funerary offerings. The association does not follow any geographical pattern. This suggests that cremation was done more as a transforming process than as a way of destroying the body and was, thus, a way of hiding death. Finally, there is a correlation between body treatment and graves (p=0.000), showing that full cremations were usually buried, which may have been done as a way of avoiding spreading the ashes. No geographical pattern is evident in the distribution of buried cremations.

7.1.4. Overview

The body treatment given to the deceased was very varied until c. 7000 cal BC, including the deposition of complete bodies, skulls, disarticulated remains, isolated bones and ornaments made of human bone. In addition, some of these bones were fire affected, either as part of a funerary ritual that aimed at burning the 'sick' part of the body or as a secondary mortuary practice to clean the bones from the remaining soft tissue (Rebay-Salisbury, 2015: 24, 28). All of these practices were approximately equally frequent, with the exception of skulls during the Solutrean when they became slightly more prominent than the remaining types of deposition.

There was likely a great variety of reasons behind all of these practices that coexisted. These reasons can range from hiding the evidence of death or trying to keep the loved ones near after their death in the case of ornaments or when a small number of the remains are found mixed with living structures, in abandoned camps or in caves with exclusive funerary use; to burial selection practices when one or a few deceased were deposited in delimited and recognisable places; or legitimizing strategies for the use of the territory when a large number of individuals was placed inside of a settlement. In addition, in the cases complete individuals were buried in delimited spaces, the preservation of the integrity of the body likely played an important role in the selection of the funerary practice (Lévi-Strauss, 1970; Clastres, 1981; Criado-Boado, 1991, 1993, 1995, 2012; Billard *et al.*, 2001; Lévy-Bruhl, 2003; Fowler, 2004; Gallego Lletjós, 2011)

Nevertheless, after c. 7000 cal BC, a large majority of individuals started to be deposited complete, showing a higher interest in the integrity of the body. However, most of these individuals came from large cemeteries or smaller delimited burial grounds within or at the entrance of domestic sites. While this shows a change towards a higher interest in the visibilization of death (Criado-Boado, 1991, 1993, 1995, 2012), it must be noted that the sample comes from a few sites, mainly the Mesolithic shell midden cemeteries, the Linear Pottery Culture and the area comprising the Mediterranean coast and the Pyrenees. As such, the secondary treatment of the deceased, the deposition of complete individuals in mixed and/or abandoned funerary spaces or caves of exclusive funerary use was still common, as well as all the reasons linked to these behaviours.

7.2. Mineral colourant applied to the body

The use of mineral colourants applied to the deceased's clothing, flesh or directly to the bones might be the result of an attributed symbolic meaning to certain colours, such as death for black or blood for red (Wreschner *et al.*, 1980; Hovers *et al.*, 2003; Zagorska, 2008: 122–123). Furthermore, the medical properties of ochre also need to be considered. Iron salts are astringent, have deodorizing properties, can arrest haemorrhage and are antiseptic (Velo, 1984). Velo (1984) suggests that a potential reason why ochre is found on the deceased's body is that it represents an attempt to heal the person. Others have suggested that ochre might have been applied only to certain individuals reflecting their social role (*e.g.*, sex, age, deviancy) (Shay, 1985; Babić, 2005; Díaz-Andreu, 2005; Lucy, 2005a; Chapman & Gaydarska, 2011).

The application of mineral colourant to the body of the deceased was always rare in the study region. Its first instances are from c. 33000 cal BC and the number of cases started to slowly increase in c. 11000 cal BC (Figure 91a). Olària i Puyoles (2003: 99) pointed out a reduction in the use of ochre in Europe between the Upper Palaeolithic and the Neolithic. Nevertheless, this decrease is only observable between c. 8000 and 6500 cal BC, after which it started to rise again. On the other hand, given the increase in skeletal remains from 11000 cal BC, the percentage of individuals associated with ochre is indeed reduced (Figure 91b).

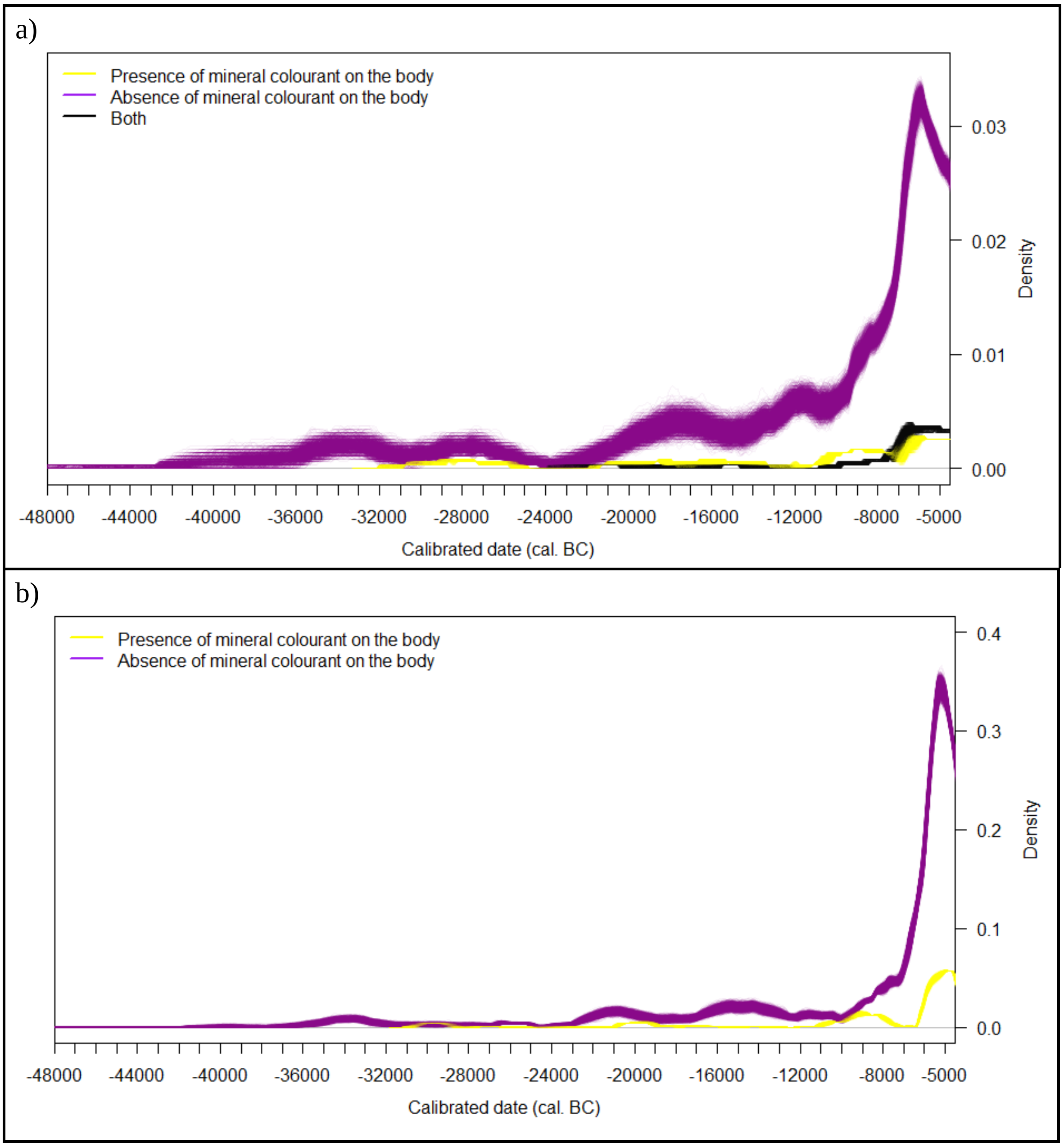


Figure 91: Monte Carlo graphs showing changes over time in the number of sites containing individuals with mineral colourant on the body (a) and of individuals with mineral colourant on the body (b)

The use of ochre and other mineral colourants was unusual in Western Europe as a whole. There are only 153 cases (7.7%) of colourant applied to the body of the deceased and most consist of ochre. An exception is the Upper Palaeolithic site of Abri Pataud, France (29137–19641 cal BC), where six individuals were deposited and several of the bones had traces of ochre and a black colourant, likely manganese (Nespoulet *et al.*, 2006). Nevertheless, most cases of mineral colourant applied to the body are Neolithic and come from the Linear Pottery Culture area, where most cases of mineral colourant within the context also occur (Figure 92). Although there are instances of the use of graphite in the Linear Pottery Culture of Central Europe (Jeunesse, 2003: 80), in the study region the colourant used is always ochre.

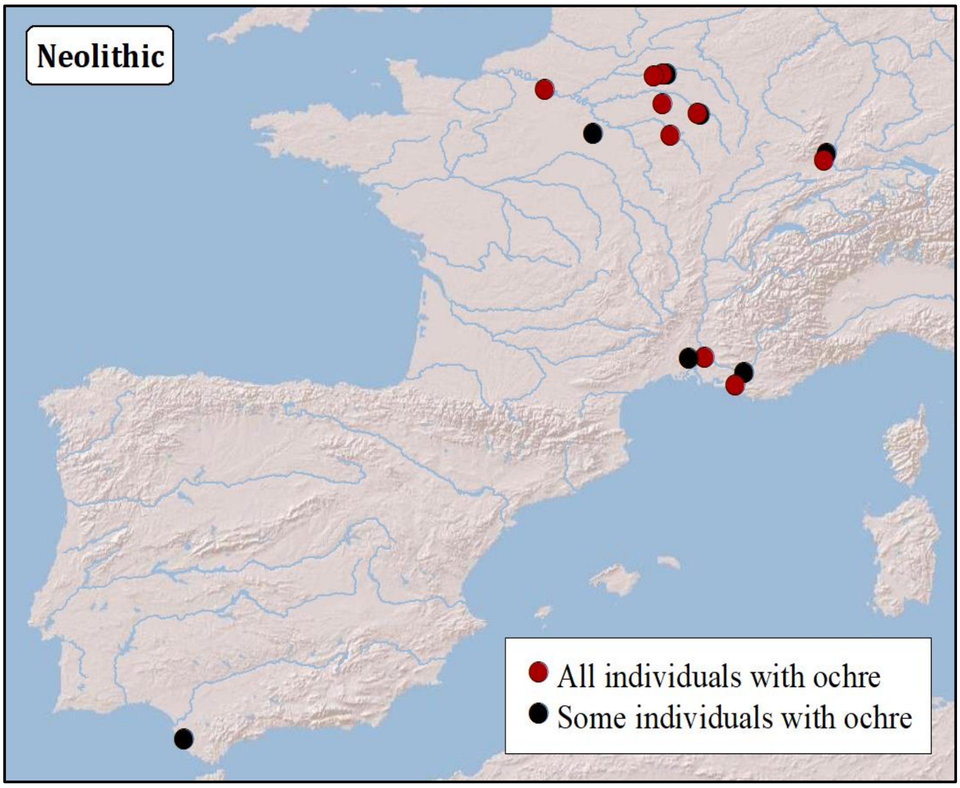


Figure 92: Geographical distribution of Neolithic sites containing individuals with ochre on the body

χ^2 tests show that there were changes in the context and body treatment of individuals with ochre applied to the body, as well as in the funerary offerings deposited with them. Before 6500 cal BC, individuals with ochre on the body were in caves or rockshelters (p=0.000), either in caves of exclusive funerary use (14/21, 66.7%) or settlements (7/21, 33.3%) (p=0.000) that did not follow any specific geographical patterns. From 6500 cal BC, most individuals with ochre started to be in open-air sites (89/99, 89.9%) (p=0.000). These individuals were mainly in cemeteries (44/70, 62.9%) and settlements (22/70, 31.4%), especially at Téviec, France (5490–5220 cal BC) and sites from the Linear Pottery Culture. In addition, they can either be in delimited funerary spaces, such as in Larzicourt (Champ Buchotte) (Chertier, 1986; Jeunesse, 1997), France (5500–4500 cal BC), or mixed ones such as Téviec, France (5490–5220 cal BC) (Boulestin, 2016).

A higher proportion of individuals with ochre applied to the body, both in mixed and delimited funerary spaces, had funerary offerings (108/343, 31.5%) compared to individuals without ochre (26/651, 4%) (p=0.000). This is likely the result of both offerings and colourant being associated with funerary rituals that imply a symbolic relationship with death, rather than a desire to hide it. During the Neolithic most individuals with ochre on the body and funerary offerings are in the Linear Pottery Culture area, but this is likely the result of most ochre use being recorded in that area in general.

Between 11000–6500 cal BC (p=0.027), most individuals with ochre applied to the body (27/32, 84.4%) were in secondary positions, deposited as disarticulated bones (p=0.000). Most of these disarticulated remains with ochre come from the Mesolithic Belgian caves with exclusive funerary use (9110–7990 cal BC). On the other hand, after 6500 cal BC (p=0.000), the opposite occurs and most individuals with ochre applied to the body (89/94, 94.7%) were in primary positions, deposited as complete bodies (p=0.033). The only geographical pattern regarding complete individuals with ochre is in the Neolithic, when they are mainly found in the Linear Pottery Culture, where most instances of ochre are during this period. This might be showing how, before 6500 cal BC, disarticulation was more often used as part of symbolic funerary rituals than leaving the body complete, even if it was largely within a small geographical area, but, after that time, the situation changed, perhaps as the result of a growing interest in the preservation of the integrity of the body (Pettitt, 2011: 267).

7.3. Individual and multiple deposits

The deposition of individuals in single graves, or spatially separated from other individuals when they are not buried, is more likely to reflect different perceptions the group had about peoples' identity than deposits containing more individuals. These perceptions could be, at least in part, related to a) whether the deceased's identity was more relationally or individually constructed and b) the degree of development of the individual's social persona.

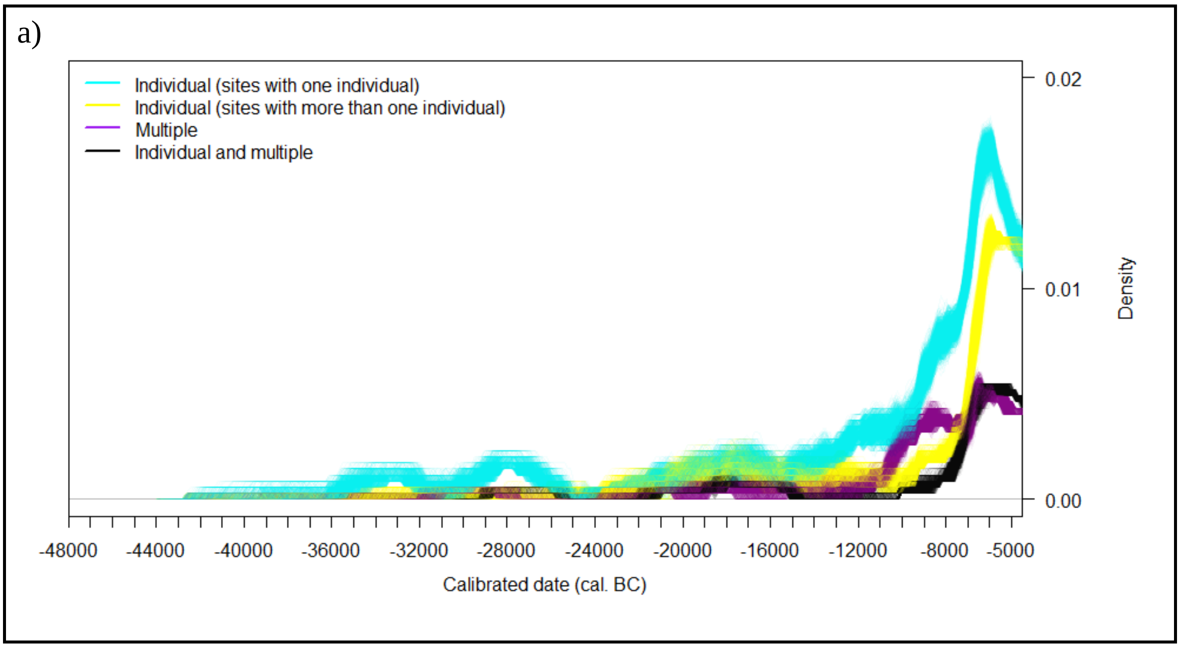
Hernando (2012a: 67) defines *relational identity* as the idea of oneself created in relation to other members of the group and to the group itself. For example, when being someone's relative and/or a member of a certain society is what defines the self. This type of identity is performative and, thus, is constructed through social links, actions, the body and material culture. On the other hand, *individual identity* is the one created exclusively around the individual, their desires, personal aims and achievements. As such, it is mainly constructed through self-reflection (Hernando, 2012a: 85, 2017). Both of these identities coexist, as they are complementary and not opposite. Furthermore, the degree to which individuality and relationality play a role in the creation of a person's identity varies depending on factors, such as the socio-economic system of the group and the social role of people in that group (Fowler, 2010: 373, 2016; Hernando, 2012a).

Individualisation relies heavily on specialized work division as it contributes to making the members of a group feel different from one another due to possessing knowledge and power in different areas. There was a wider variety of tasks to carry out during the Early Neolithic than in previous periods as the result of farming and all the tasks related to it (*e.g.*, cultivation, weeding, animal husbandry). However, a specialized work division was further developed during the Metal Ages (Chapman & Gaydarska, 2011; Hernando, 2012a: 86). Furthermore, it must be noted that individuality, as we understand it now, is a Western concept that did not exist until the 17th century, due to the degree of work division. It was then that the word *individual* started to be used as a synonym for person (Fowler, 2010: 369; Hernando, 2012a: 88).

Regarding the social persona, the persona is the individual's public self. A person can have multiple personas, as each of them is a projection of the individual's identity and which one to use can vary depending on the circumstances. As a result, some personas can be linked to the social role of the individual as well as other facets of a person's identity, such as individuality or relationality. Furthermore, it must be noted that adults have a more developed persona than children, as children have not faced as many social circumstances that allow them to have one or more well-defined public selves (Marshall *et al.*, 2019).

Kinship is another fundamental social framework when it comes to analysing multiple funerary deposits. Nevertheless, kinship is highly cultural and, even within Europe, what is included in the term ‘kinship’ differs from country to country. For example, in Spanish, the term for kinship (*parentesco*), includes marriage (Aranzadi Martínez, 2008: 17). This categorization and/or terminology problem is even greater with cultures that have more differences with ours. For example, there are some African cultures in which the same term is used for the father and his sisters (Aranzadi Martínez, 2008: 573), and Inuit who receive the name of a deceased individual can inherit their kinship relationships, so a newborn can become the aunt and the son of the same person (Crass, 2001: 108). This also implies that very distant collateral relatives that modern Western society would not even consider kin can be considered close kin in other cultures due to the different categorization (Aranzadi Martínez, 2008: 395).

We should be mindful that the association of kinship with a shared DNA is a modern Western idea (Aranzadi Martínez, 2008: 94). As a result, the absence of a shared DNA between individuals buried together does not imply that those individuals were not related. For example, in some societies, kinship is created via commensality (the practice of eating together), the sharing of food and/or breastfeeding. This is called nurture kinship (Aranzadi Martínez, 2008: 118–120).



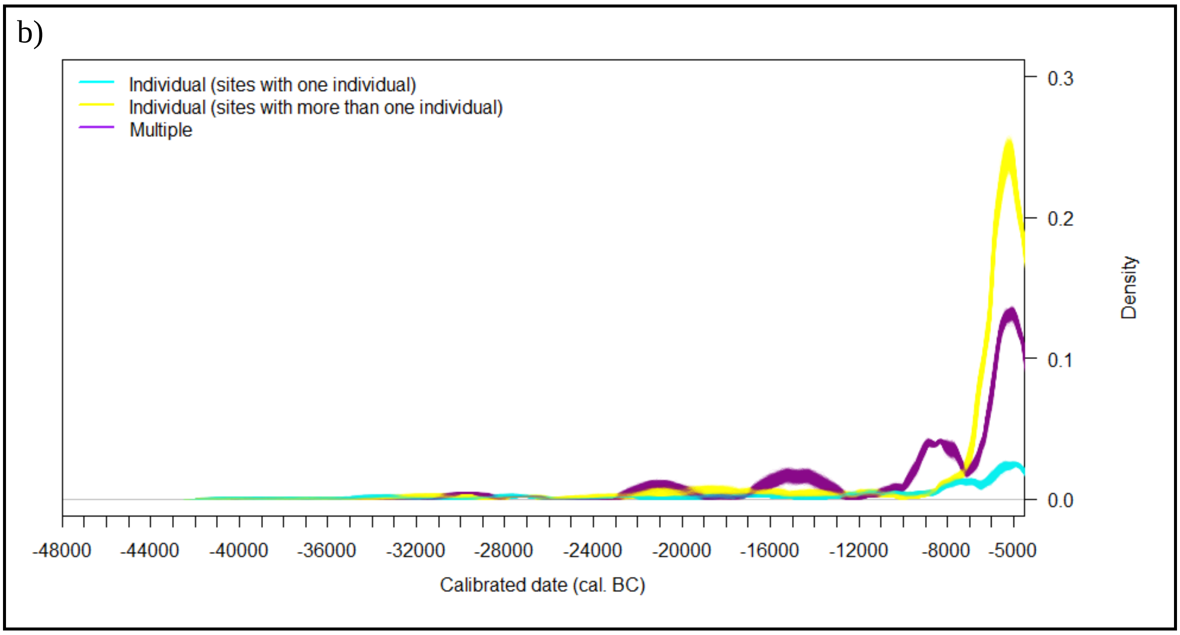


Figure 93: Monte Carlo graphs showing changes over time in the number of sites containing individual and multiple funerary deposits (a) and of individuals in individual and multiple funerary deposits (b)

In the study region, sites containing only one individual in single funerary deposits were the most frequent until the Early Neolithic (c. 5000 cal BC), when they became as common as sites with multiple individuals in single funerary deposits (Figure 93). Nevertheless, other changes can be observed. Around the end of the Upper Palaeolithic (c. 11000 cal BC), the frequency of sites containing only multiple funerary deposits started to rise. The same happened with sites containing multiple funerary deposits and sites with both individual and multiple funerary deposits. Their increase accelerated c. 7500 cal BC and stabilized at the end of the Mesolithic and beginning of the Neolithic (c. 6500 cal BC).

What this shows is an increase, from 10000 cal BC, in societies that buried their dead in collective spaces but as individual deposits. By 7000 cal BC, this funerary practice had outnumbered multiple depositions and, by 5000 cal BC, it was practised by as many groups as deposited only one body per site. This may reflect an increase in societies that perceived a certain degree of individuality in the members of the group from the Mesolithic and, especially, during the Early Neolithic period. This idea is further supported by the apparent resignification of individual funerary spaces from c. 7000 cal BC, when they started to contain mostly complete individuals, almost all of them with funerary offerings, likely showing how, at least from that time onwards, they were not used as a way of hiding death. However, during the Neolithic, there are still several multiple funerary deposits, almost all of them located in the Mediterranean Coast and the Pyrenees, which might indicate that, in this area, identity was more relationally constructed than in the Linear Pottery Culture (Figure 94).

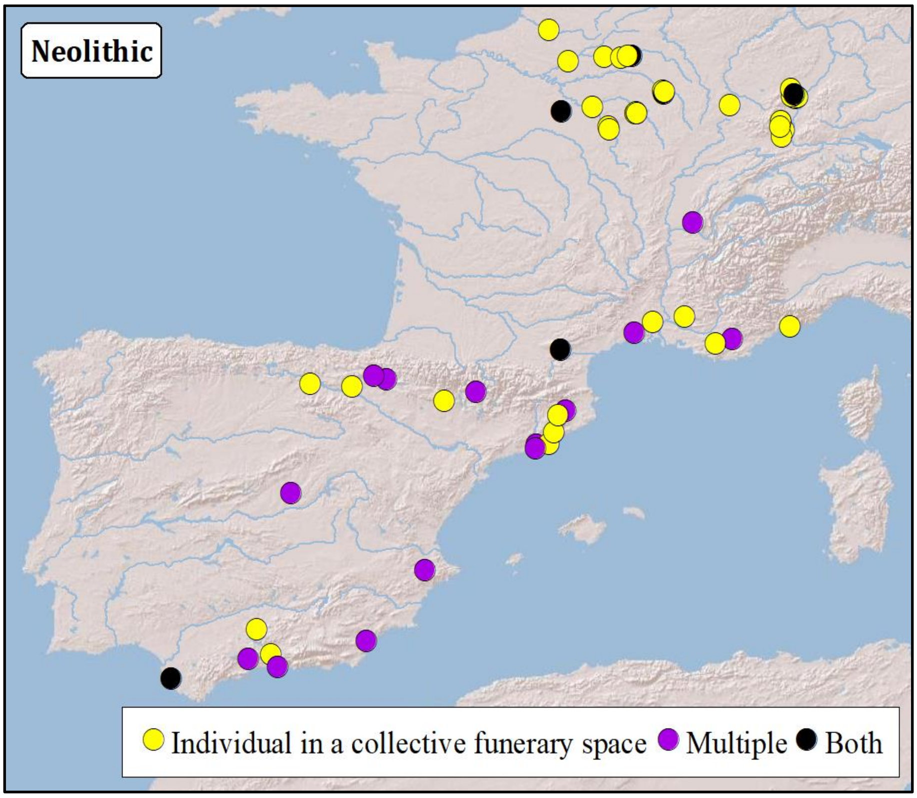


Figure 94: Geographical distribution of sites with more than one individual containing individual and multiple deposits

In addition, several sites from the entire study period contain both individual and multiple burials and, by c. 7500 cal BC, these slightly outnumbered those only containing multiple deposits. This is relevant because some individuals might be more affected by the individualisation process related to work division than others. For example, children are not yet on a path that makes them different from the rest of the group and, thus, their identity is more relational, and their social persona is not fully developed (Hernando, 2012a, 2017; Conneller, 2013; Bickle & Fibiger, 2014; Marshall *et al.*, 2019). Adults that carry out a small number of specialized tasks or mainly carry out activities aimed at taking care of the community (maintenance activities) are also likely to have a more developed relational identity (Hernando, 2002, 2012a; González Marcén *et al.*, 2008; Chapman & Gaydarska, 2011).

In this regard, it is relevant which members of society were being buried alone and which tended to be buried alongside others. For example, Grotte Margaux, Belgium (9150–8300 cal BC) is a multiple funerary deposit of disarticulated adult females (Cauwe, 2001; Toussaint, 2010b), that might be a good example of female communal integration (Figure 95), perhaps the result of a perceived relational identity. Another example is how in the Linear Pottery Culture children are more frequently part of multiple burials than adults (Bickle & Fibiger, 2014: 216). In both cases, kinship, either genetic or non-genetic, might have played an important role in selecting which individuals were going to share a funerary space (Aranzadi Martínez, 2008).

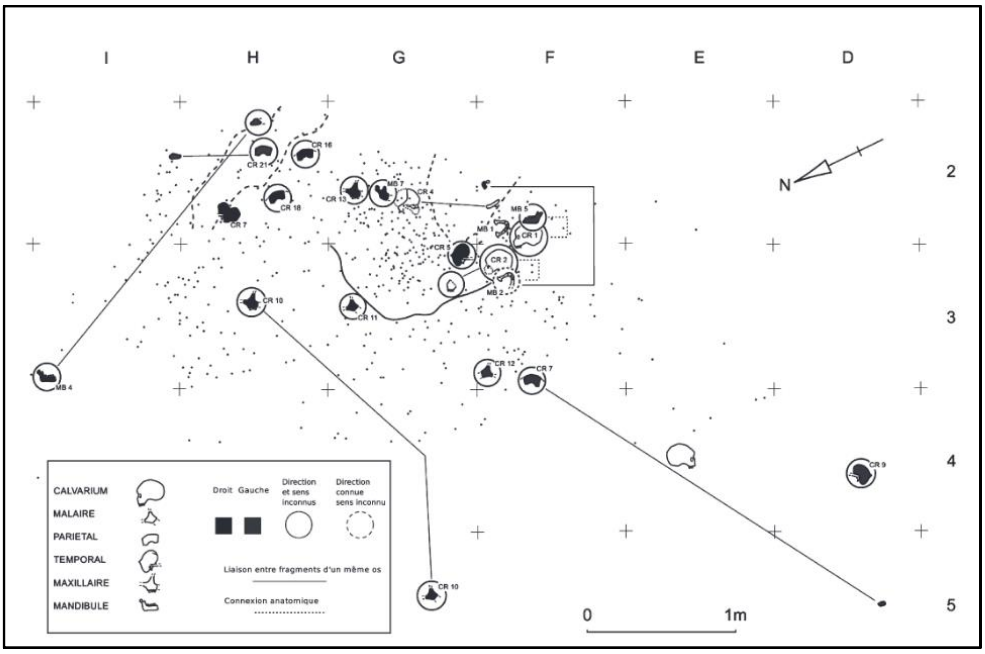


Figure 95: Plan of human bone distribution at Grotte Margaux

Source: Toussaint, 2010b: 72

In terms of the specific contexts of individual and multiple deposits, χ^2 tests show some relevant correlations. Individual and multiple deposits are correlated with the location of the site (p=0.000), shell middens (p=0.000) and site type (p=0.000). This is likely the result of the highest proportion of individuals in individual deposits being in open-air sites (483/678 71.2%), mainly due to cemeteries and sites from the Linear Pottery Culture area. In this respect, it must be noted that most individuals in shell middens, several of the large cemeteries, were in individual deposits (213/280, 76.1%). Furthermore, unlike most site types, from 10000 cal BC, caves of exclusive funerary use contain mainly multiple deposits. Most examples are from the Mesolithic Belgian caves.

In addition, from 7000 cal BC, individual and multiple deposits are also correlated with whether the funerary space was delimited or mixed (p=0.000) and with the use of graves (p=0.000). Most individuals in delimited funerary spaces (336/433, 77.6%) started to be in individual deposits, and graves started to be mainly used as individual deposits (495/693, 71.4%). These do not follow specific geographical patterns. The placing of the deceased in individual burials inside delimited funerary spaces might be the result of greater interest in the preservation of the integrity of the body, as the reopening of graves to add new deceased might have affected the remains of the previously deposited individuals. In addition, older graves might have been easier to locate if they were in a delimited space, making it easier not to disturb them in the process of digging new ones due to unintentional intercutting. The interest in the preservation of the body is likely linked to individuality, both in the sense of persons being understood as indivisible entities and with a more developed individual identity (Hernando, 2002, 2012a; Fowler, 2004, 2016)

The idea of individual deposits being used as a way of facilitating the preservation of the integrity of the body is further supported by most evidence of post-decomposition bone removal being from individuals in multiple deposits (38/42, 90.4%) (p=0.000). This is likely a result of the reduction in the number of old bodies as new ones were added (Cauwe, 2001; Borić, 2010; Gallego Lletjós, 2011). Fire affected remains are also mainly found in multiple deposits (31/41, 75.6%) (p=0.000), perhaps due to fire being used as a secondary mortuary practice to deflesh the remains (Rebay-Salisbury, 2015: 28). Most evidence of post-decomposition bone removal and fire-affected remains is from after c. 7000 cal BC.

Individual and multiple deposits are always correlated with individuals in primary and secondary positions (p=0.000), as individual deposits almost always contained individuals in primary position (516/573, 90%), while multiple deposits could contain both, with individuals in a secondary position being slightly more frequent (220/375, 58.7%). Most of these individuals in secondary positions are represented by disarticulated remains, which are almost always in multiple deposits (122/132, 92.4%), and skulls, although several of them are in individual deposits (30/74, 40.5%). On the other hand, ornaments always appear alone. This might be showing how both multiple deposits and disarticulation were used as a way of communal integration and could be reflecting that the individuals receiving those treatments were perceived as having a more developed relational identity and *dividuality*

(Fowler, 2004, 2016; Hernando, 2012a). None of these associations shows a meaningful geographical pattern.

Regarding ritual funerary elements, individual and multiple deposits are correlated with mineral colourant within context (from 7000 cal BC, p=0.010) and on the body (13000–7000 cal BC, p=0.000), and the presence (p=0.045) and types of funerary offerings (p=0.001). The reasons behind the correlation between mineral colourant on the body and individual and multiple funerary deposits seem to change over time. Between 13000–7000 cal BC (p=0.000) individuals with ochre on the body were usually in multiple deposits (27/31, 87.1%) and were widespread across the whole study area. This might be caused by a bias, as multiple deposits contain several individuals, but might also reflect greater ritualization of communal funerary deposits. Perhaps this is due to multiple funerary deposits being the most frequently used before c. 7000 cal BC to add successive individuals over time, instead of being abandoned and/or forgotten, showing a more symbolic relationship with death not based on an attempt of hiding its evidence. This idea is further supported by most individuals with mineral colourant on the body, both in individual and multiple deposits, being in sites that contain more than one individual (collective funerary spaces) (46/52, 88.4%).

On the other hand, after c. 7000 cal BC the correlation no longer exists, showing that, from then on, there were similar proportions of individuals with mineral colourant on the body in individual and multiple deposits. In addition, from 7000 cal BC, most individuals associated with contextual ochre were found in individual deposits (45/56, 82.1%). This might have been partly caused by collective funerary spaces containing individual depositions being more frequently used over long periods than funerary spaces containing a single multiple deposit. Consequently, individual deposits would have acquired more symbolic connotations, especially in areas such as the Mesolithic shell midden cemeteries and the Neolithic Linear Pottery Culture area. Both individuals in individual deposits associated with mineral colourant within context and with mineral colourant on the body are mainly Neolithic and from the Linear Pottery Culture, where most instances of ochre are found in general during the Neolithic.

Before 7000 cal BC (p=0.003), individuals in multiple deposits were more often deposited with funerary offerings (56/82, 68.3%). This might be partly the result of a bias, as the same funerary offering can be associated with multiple individuals in the same deposit, making it seem like there is an offering per person instead of only one. As with ochre, this might be showing greater reuse and ritualization of multiple deposits. Regardless, the correlation between funerary offerings and individual and multiple deposits no longer exists after 7000 cal BC (p=0.269), hence the difference in the number of individuals in individual deposits with funerary offerings and those in multiple deposits with funerary offerings is not statistically significant. There is, however, a higher proportion of individuals with funerary offerings in individual (189/292, 64.7%) compared to multiple deposits (103/292, 35.3%).

While individuals in individual deposits are more widespread, most individuals in multiple deposits with funerary offerings are in Neolithic sites from the Mediterranean coast and the Pyrenees (Figure 96), which is where most Neolithic multiple deposits occur. The fact that most of these individuals in multiple deposits had funerary offerings and most were in delimited funerary spaces shows that they were not merely abandoned or hidden.

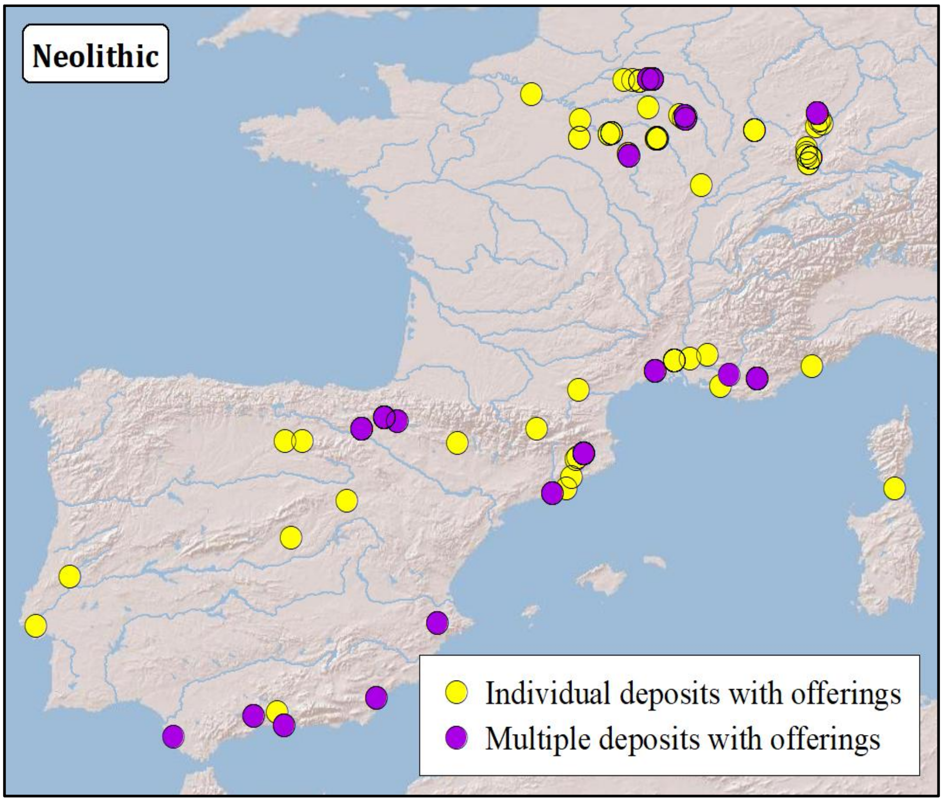


Figure 96: Geographical distribution of sites containing individuals in individual and multiple deposits with funerary offerings

After 10000 cal BC, individual and multiple deposits are also correlated with the types of funerary offerings (p=0.000), likely due to unmodified faunal remains and/or shells being found more often in multiple deposits, while tools and equipment are more frequently found in individual deposits. These associations do not follow specific geographical patterns and might be the result of unmodified faunal remains or shells being more frequently used as elements of group adscription while tools were more linked to specific individuals, as seems to be the case with *Spondylus* in the Linear Pottery Culture (Masclans Latorre *et al.*, 2021).

7.4. Overview

7.4.1. The treatment of the body before c. 7500-6500 cal BC

Before c. 7500 cal BC, most of the deceased received secondary mortuary treatment. This treatment resulted in the funerary deposition of disarticulated bones and, to a lesser extent, of human skulls, loose bones and the making of ornaments of human bone. These practices were similarly frequent, except for skulls and isolated bones. Skulls became slightly more prominent than other types of deposition during the Solutrean. Isolated bones appeared after c. 9120 cal BC and were always scarce.

All disarticulated bones were in collective funerary spaces, most in multiple deposits, which may indicate the use of disarticulation as a way of communal integration. In addition, most were in mixed funerary spaces, which suggests the use of disarticulation as intentional hiding of the dead, under and in living structures, or their extension in the social sphere, particularly in the cases in which the remains were not buried. Before c. 6500 cal BC, disarticulated individuals were the ones most likely to present ritual symbolic elements. They were the most likely to be deposited with funerary offerings and, between 11000–6500 cal BC, most individuals with ochre applied to the body were disarticulated. However, most disarticulated remains with ochre came from the Belgian Mesolithic caves with exclusive funerary use.

Regardless, this points to at least a part of the disarticulated bones being the result of death being seen as a process rather than a discrete event, which manifested in funerary treatment that could serve as a transforming process aimed at destroying the persons’ former identity and creating a new one or as a way of preventing the deceased from returning, as well as communal integration, partly based on the *dividuality* of the body.

Something similar happens with skulls, which occur in approximately equal proportions in delimited and mixed, individual and collective funerary spaces, as well as in individual and multiple funerary deposits. Nevertheless, the body part selection and any modifications could be made as a way of preventing the deceased from coming back or as a transforming process that is either aimed at visibilizing the deceased or keeping the loved ones near after they died. Ornaments made of human bone appear mainly in non-funerary spaces, likely to keep the loved ones nearby after their death.

In addition to remains in secondary positions, there were also individuals deposited as complete bodies. Before c. 20,000 cal BC, all complete skeletons occur in small delimited non-abandoned funerary spaces. After 20,000 cal BC, there were also several in small mixed funerary spaces and caves of exclusive funerary use. Moreover, complete individuals were frequently inside individual funerary deposits, as many of the sites where they occur contain only one individual. While the deposition of individuals in small mixed funerary spaces or caves of exclusive funerary use might reflect intentional hiding of the remains, those in delimited non-abandoned funerary spaces were likely the result of burial selection practices that attempted to preserve the integrity of the body, which was an important factor in the survival of bodies from before c. 20000 cal BC.

Unprotected remains have fewer chances of surviving or being properly preserved, which is likely one of the reasons why there are no human remains in open-air sites before c. 14000 cal BC, since they did not have the protection of caves and, probably, of deep graves. However, it is impossible to know how 602 out of the 1984 (30.3%) individuals found in the study region from the Upper Palaeolithic to the Early Neolithic were originally deposited, in most cases because they were heavily affected by post-depositional processes and only a few bones have been preserved –in 87 cases (14.5%) only teeth. There are 220 individuals (11.1%) whose original method of deposition is uncertain. Several of these, principally from the Upper Palaeolithic, are thought to be primary depositions of complete bodies that were heavily affected and displaced by post-depositional processes.

Some of the remains were fully or partially cremated, and some of the individuals had bones removed after decomposition, but most of this evidence falls after c. 7000 cal BC. Nevertheless, it is worth noting that both practices are mainly recorded from multiple deposits and could be part of secondary and diachronic funerary practices, such as the reduction of old bodies when new ones were being added, and fire was being used as a secondary mortuary practice to clean the flesh from the remains.

This material record seems to show that most human groups from the Upper Palaeolithic and part of the Mesolithic (before c. 7500–6500 cal BC) had two main ways of treating the body of the deceased. The first was the intentional hiding of the evidence of death, either depositing a few complete or disarticulated individuals under living structures, or leaving them unprotected so they would decay since secondary modification of human remains can facilitate the disappearance of the body. The second was the secondary treatment and often communal integration of the deceased, used as transforming processes that aimed at destroying the persons' former identity and creating a new one, or as ways of preventing the deceased from returning. Bones could also be kept and even modified to create ornaments as a way of keeping the loved ones near after their death, prolonging their presence in the social sphere.

These behaviours might be reflective of death as a process rather than a discrete event and of people being understood as *dividuals*. In addition, people's identity construction and the group's perception of that identity was likely highly relational, which means that they could not understand themselves, and likely others, apart from the group. These are probable reasons behind the tendency towards communal integration of disarticulated remains in multiple funerary deposits, in which kinship or marital relationships might have also played a role.

It seems there were always some human groups concerned with the preservation of the integrity of the body, which might have to do with a more developed idea of individuality, both in the sense of the body understood as an indivisible entity and of a more developed individual identity construction, as complete bodies in delimited non-abandoned funerary spaces are usually found in individual funerary deposits. Nevertheless, before c. 7000 cal BC, these were the exception and not the norm.

7.4.2. Treatment of the body after c. 7500–6500 cal BC

A series of processes that started around 10000 cal BC culminated c. 7500-6500 cal BC. The number of complete individuals, which was consistently low, started rising in c. 9500 cal

BC and outnumbered all other kinds of body treatment by c. 7500 cal BC. These complete individuals started to be mainly placed in single burials inside collective funerary spaces that, from c. 7500–6500 cal BC, usually consisted of delimited cemeteries or smaller burial grounds inside open-air settlements, including shell middens. Most individuals in individual funerary spaces also started to be deposited complete. They were usually associated with contextual ochre and were as frequently deposited with mineral colourant applied to the body and funerary offerings as were individuals in collective spaces.

Furthermore, from c. 7500 cal BC, complete bodies (along with full cremations) became the type of body treatment most likely to have funerary offerings. Complete individuals were frequently associated with all types of funerary offerings and were the only ones associated with plant materials and portable art. Moreover, from c. 7000 cal BC, these individuals had the same probability of being deposited with funerary offerings, regardless of whether they were in individual or multiple deposits. Complete bodies were also the most likely to be in marked graves, although those were very unusual. After 6500 cal BC, most individuals with ochre applied to the body were also complete.

Regarding other types of body treatment, after 6500 cal BC, full cremations were localized in the Linear Pottery Culture area, although most of them are Mesolithic, and partially cremated individuals in the Cantabrian Mountains and the Pyrenees. Furthermore, cremated remains were mostly found in caves, though some occur in open-air cemeteries, frequently in sealed graves, and often with funerary offerings. Half of the individuals with bones removed were partially cremated, perhaps due to fire being used as a secondary mortuary treatment to remove the remaining soft tissue after they were defleshed.

Unlike ornaments made of human bone, skulls in a secondary position and disarticulated individuals still existed. In the case of disarticulated remains, their number increases after c. 6500 cal BC. Nevertheless, the proportion is low compared to complete bodies and, usually, they did not have mineral colourant or fire applied to the body, nor funerary offerings. Some complete bodies and disarticulated individuals show evidence of bone removal. This might have been a long diachronic funerary practice responsible for the few isolated bones recorded during this period, which always appear in mixed funerary spaces. This suggests there were still human groups that viewed death as a long process, the body as a divisible entity and secondary mortuary practice as a way of either hiding the deceased, transforming them, integrating them with the community or prolonging their presence in the social sphere.

All of these practices were outnumbered by the deposition of complete individuals in individual graves, which were those most likely to be deposited with ritual elements (*e.g.*, ochre and funerary offerings). This suggests that most groups started to be preoccupied with preserving the integrity of the body and a higher degree of individual identity perceived by the group. The exception to this perceived individuality seems to be the area comprising the Mediterranean Coast and the Pyrenees which, from 6500 cal BC, contains the biggest concentration of sites containing only multiple funerary deposits. In other areas, such as the Linear Pottery Culture area, multiple deposits still exist, but they were only used for some of the deceased, usually children.

The placing of most of these complete individuals inside cemeteries or smaller non-abandoned delimited funerary spaces, and that the few signs of position markers are associated with these individuals, seems to show a strategy of death exhibition, likely used to claim property over the land. It should be kept in mind that death exhibition was not as common as other strategies, as cemeteries were mainly a Mesolithic phenomenon and delimited funerary spaces were always slightly less common than mixed ones. In addition, until c. 5000 cal BC, sites containing only one individual were still the most frequent ones. This shows that, even now these individuals are more likely to be deposited with funerary offerings, strategies of hiding death or strategies of inhibition, in which death is not hidden but nor is it exhibited, were likely still practised by many groups.

Chapter 8:
Death and the social role of the deceased

The previous chapters have focused on how a variety of aspects of identity and the relationship with death are reflected in the diverse facets of funerary practices. These facets are burial selection practices, the location in which the deceased are deposited, whether the funerary context is modified and how, the funerary treatment of the body, whether individuals were deposited individually or collectively, and the material culture deposited with the deceased. This chapter focuses on whether these elements interact with sex, biological age, life-altering pathologies and associated species depending on social categories and roles such as gender, social age and personhood. Geographical and chronological variations are also assessed.

8.1. Sex

Sex is defined through five different biological features: X and Y chromosomes (genetic sex), the balance of estrogens and androgens (hormonal sex), the presence of testicles or ovaries (gonadal sex), the morphology of the internal reproductive organs and the morphology of the external reproductive organs. These features can sometimes contradict each other (Money *et al.*, 1955; Fausto-Sterling, 2006: 72). In the case of skeletonized individuals, sex is usually identified through the morphology of the skeleton. Assessing sex from skeletal characteristics is difficult even when the whole skeleton is present. There is a bias of the order of 12% in favour of males when sexing complete individuals whose anatomy has not been modified by external factors (*e.g.*, hormonal issues or culturally-induced bodily transformations) (Weiss, 1972) and this percentage increases when the body is not complete (Kjellström, 2004). In the case of children, no reliable sexing method has been devised. Using genetic or amelogenin analysis is more reliable (Stewart *et al.*, 2017) but is not free of issues either, as, even if the sample is well-preserved, the genetic sex does not always match the remaining biological features that define biological sex (Money *et al.*, 1955; Fausto-Sterling, 2006: 72).

In addition to sex, there is gender: the idea of being a man or a woman and how men and women should behave in society. However, although gender and sex categories frequently coincide, this is not always the case as there are several societies with more than two genders (Blackwood, 1984, 2005; Díaz-Andreu, 2005; Lang & Kuhnle, 2008). Furthermore, depending on the society, the different gender roles may be linked or not with a higher or lower social status (Díaz-Andreu, 2005: 18–21). However, inferring differences of status from funerary remains is complicated. Furthermore, neither social status nor wealth are necessarily reflected in funerary rituals (Ucko, 1969: 267; Babić, 2005: 75; Weiss-Krejci, 2013). Some studies have inferred status through diet (nutritional stress markers, trace elements and stable isotope analyses) (*e.g.*, Danforth, 1999: 2–7), but foods that are highly regarded culturally are not necessarily the most nutritious.

The most direct way to know what tasks women and men developed through their lives are activity markers, osteological markers, such as enthesopathies or dental wear, that allow archaeologists to infer what kind of activities a person carried for a prolonged period. Unfortunately, the information about these activities can be very vague (*e.g.*, an activity that requires wide movements with the arms, strenuous activity with the upper limbs) and does not mean that the specific tasks can be known, although they can sometimes be inferred (*e.g.*, upper limb asymmetry can sometimes be indicative of hunting activities). The sample of individuals whose activity markers were analysed is extremely low for the whole study period (20 males, 17 females).

The information available (see Appendix II) seems to show that both men and women used their teeth as tools for processing plant and leather materials and carried out strenuous activities with the upper and/or the lower limbs. In some cases, information on specific activities is available. For example, it is suspected the individual from Grotte du Bichon, Belgium (11852–11295 cal BC) carried out hunting activities (Chauvière, 2008) and the individual from Aven des Iboussières, France (10430–9466 cal BC) suffers a bilateral exostosis on the auditory canals that seem to show that he developed water-related activities that would involve long and recurrent immersions (Aymard *et al.*, 2007). Unfortunately, this type of information is only available in the case of men and, thus, does not provide information about if labour division was influenced by sex.

Another direct way to understand if men and women developed different tasks is through the use-wear of the tools buried with them. Even if the sexual division of labour is not apparent from the types of tools, the same tool might have been used in different ways. For example, at the Neolithic site of Can Gambús, Spain (4100–3700 cal BC) axes and adzes were found with males and females. However, those deposited with males were used for woodworking and butchering and those with females for hide-processing, although both sexes were accompanied by some unutilised tools (Masclans *et al.*, 2017).

This way of inferring sexual division of labour assumes that the tools deposited as funerary offerings belonged to the deceased (Parker Pearson, 2003; Arias, 2016). Furthermore, the number of tools on which use-wear analyses were carried out is extremely low. For the Upper Palaeolithic to the Early Neolithic, there are 12 tools associated with women and 35 with men for which specific uses could be inferred. Those associated with women were used to work or cut hide (n=6), plants (n=4), and animal hard materials (n=2) and come from the sites of La Lámpara, Spain (5216– 4848 cal BC) (Kunst & Rojo Guerra, 1999; Rojo-Guerra *et al.*, 2016), Buthiers- Boulancourt, France (5000–4610 cal BC) (Gosselin & Samzun, 2008) and Ca l'estrada, Spain (4696–4491 cal BC) (Subirà *et al.*, 2015). Those associated with men were used as a lissoir (n=1), as projectiles (n=33, in association with a single individual) and to light fires (n=1). The lissoir is from Sous Balme (Culoz), France (8270–7310 cal BC) (Vilain, 1966), the projectiles from El Montico, Spain (5209–4983 cal BC) (Rojo-Guerra *et al.*, 2016) and the flint nodule used to light fire from Los Cascajos, Spain (5311–3775 cal BC) (García Gazólaz & Sesma Sesma, 2007; Rojo-Guerra *et al.*, 2016).

No inferences about gender can be made based on the activity markers or used tools, as the sample cases are too small. However, some inferences about gender can be made from the differences in the funerary treatment. The first source of information in this respect is who was given a funerary treatment, as burial selection has been suggested for the study period (Bickle & Fibiger, 2014; Cintas-Peña, 2018; Cintas-Peña & García Sanjuán, 2019; Cintas-Peña & Herrero-Corral, 2020).

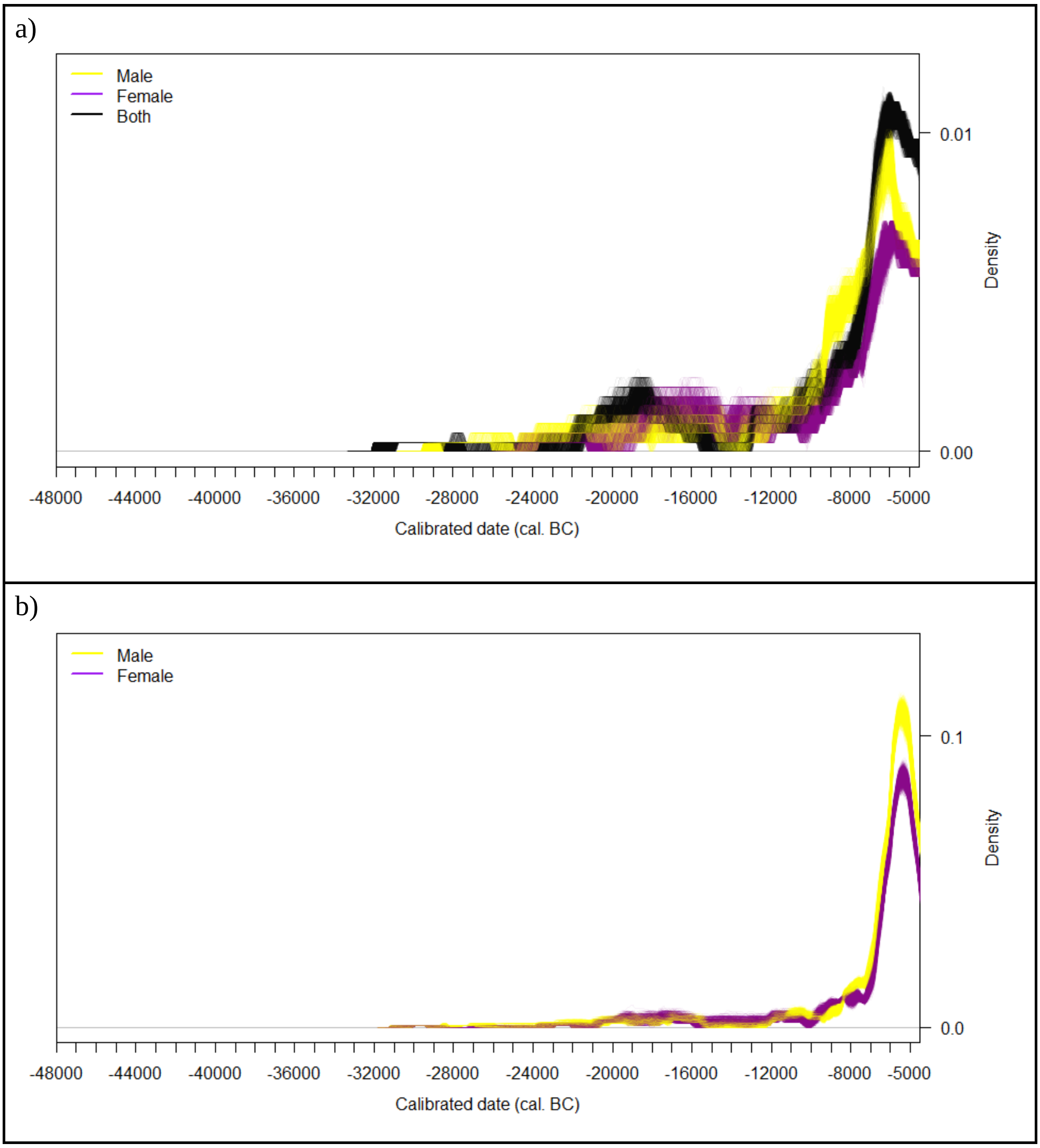


Figure 97: Monte Carlo graphs showing changes over time in the number of males and females by site (a) and individual (b)

Until c. 10000 cal BC, in the study region there were similar numbers of sites containing only males, only females and both males and females (Figure 97a). The total number of males and females was also similar (Figure 97b). There was a period between c. 10000 cal BC and c. 7000 cal BC in which sites containing only males were the most frequent ones. However, between c. 10000 and c. 8000 cal BC, the total number of females was higher than the total number of males. This shows that, during that time, females had a higher tendency than males to be deposited in sites that have individuals of both sexes. This could indicate that social gender started to play a role in how and where men and women were buried and/or that burial selection practices started to be performed only by some groups. From c. 8000 cal BC, males slightly outnumbered females and, from c. 7000 cal BC, sites containing individuals of both sexes became the most frequent ones. From c. 6000 cal BC, the number of males vs females increased, leading to a predominance of males. No geographical patterns in the distribution of sites containing only males, only females and both sexes were detected.

Demographic studies of age and sex composition of modern societies worldwide show that there is usually a very small excess of boys among births (Hobbs, 2004; Kramer *et al.*, 2017). Thus, we should expect to find similar numbers of males and females in funerary contexts, as was the case until c. 10000 cal BC. The differences in the numbers of men and women in funerary contexts could be influenced by the 12% bias towards males when sexing (Weiss, 1972) and by variations in the sexing methods used. Thus, the bias would likely be reduced at the end of the analysed time period, as there are more complete skeletons that are better preserved, and the completeness of the skeleton is key to more accurate sex assessment (Kjellström, 2004). However, the opposite pattern can be appreciated; the more recent the period, the higher the number of individuals identified as males. This evidence likely points to burial selection practices in most populations after c. 10000 cal BC, with exceptions like Téviec, France (5490–5220 cal BC) and Hoëdic, France (6040–4440 cal BC) that seem to have similar numbers of adult men and women (Schulting, 1996b; Boulestin, 2016). Nevertheless, methodological issues related to sex assessment as the cause of the sex gap cannot be disregarded entirely.

In addition to sex ratio, the treatment given to the body of the deceased and whether it was statistically different for males and females must be considered. χ^2 tests show that, from the Upper Palaeolithic to the Early Neolithic, males and females received equal funerary treatment in most cases, as sex is not correlated with most of the analysed variables. However, there are some exceptions. Sex is correlated with site type (p=0.001), likely influenced by almost half of the activity areas only having males buried (15/31, 48.4%), while six (19.3%) had only females; and almost all cemeteries containing both males and females (11/12, 91.7%). Neither of the activity areas containing only males or only females is concentrated in specific geographical areas.. A possible explanation for the male dominance in these types of sites is that men used them more often than women.

There is also a correlation between sex and location markers between 8000–6500 cal BC (p=0.016), as the only six sexed individuals with location markers are males. These came from the Spanish site of El Collado (7590–6648 cal BC) and the French sites of Sous Balme (Culoz) (8270–7310 cal BC), Abri Cornille (6000–4000 cal BC) and Trou Violet (Montardit) (7000–3500 cal BC) (Vilain, 1961; Newell *et al.*, 1979; Bouville *et al.*, 1983; Aparicio Pérez, 2008, 2015; Gibaja *et al.*, 2015). Nevertheless, given the possibility of perishable location markers, the sample of individuals in marked funerary contexts is too low to make gender interpretations.

The most significant difference in the funerary treatment given to men and women has to do with funerary offerings. In every single millennium block, men were more often deposited with offerings than women. The difference is statistically significant when the whole sample is analysed (p=0.014). In this case, 34.9% (59/169) of the females and 47.2% (100/212) of the males were deposited with funerary offerings. When split by millennium block, the difference is only statistically significant between 10000 and 8000 cal BC (p=0.006), when only 16.6% (3/18) of females had funerary offerings but 60% (12/20) males did. These females came from only two sites: Abri des Autours, Belgium (9120–7990 cal BC) and La Vergne, France (8530–8020 cal BC) (Courtaud & Duday, 1995; Duday & Courtaud, 1998; Polet & Cauwe, 2002). On the other hand, males with funerary offerings were spread across the whole study region.

Furthermore, there is always a difference in the types of funerary offerings associated with men and women (p=0.000). Between 48000–10000 cal BC (p=0.005), men were more often deposited with unmodified faunal remains and/or shells and women with ornaments. 86.7% (13/15) of the faunal remains were associated with men and 81.2% (9/11) of the ornaments were associated with women. It must be noted, however, that during this time men and women were associated with approximately the same number of tools and/or equipment. Between 10000–8000 cal BC, the correlation does not exist as only men had offerings of a known type. Between 8000 cal BC and 6500 cal BC (p=0.000), all tools and equipment (n=25) and all unmodified faunal remains and/or shells (n=6) were associated with men, while the only ornament was associated with a woman from Cueva de Nerja, Spain (7600–6700 cal BC) (García Sánchez, 1982).

After 6500 cal BC (p=0.006), most tools and equipment (89/132, 67.4%) and most unmodified faunal remains and/or shells (30/44, 68.2%) were associated with men. This is especially evident in the case of shells (p=0.008), as 14 out of the 15 (93.4%) unmodified shells or unmodified shell groups were associated with men. On the other hand, more than half of the ornaments were associated with women (61/118, 51.7%). The difference might not seem large, however, ornaments represent half (61/122) of the offerings associated with women and only 30% (57/190) of the offerings associated with men, as there were more offerings in general associated with men than women.

During this time, most women deposited with unmodified faunal remains and shells came from shell middens, specifically from Téviec, France (5490–5220 cal BC), Hoëdic, France (6040–4440 cal BC), Cabeço da Amoreira, Portugal (6200–5316 cal BC), Cabeço da Arruda (6223–5475 cal BC) and Moita do Sebastião, Portugal (6426–5390 cal BC) (Ferembach, 1974a; Cardoso & Rolão, 1999; Roksandić & Jackes, 2014; Jackes *et al.*, 2015a; Boulestin, 2016; Peyroteo Stjerna, 2016a). Those remaining came from Los Canes, Spain (6241–5010 cal BC), Cueva de Nerja, Spain (8612-4545 cal BC) and Buthiers-Boulancourt, France (5000–4610 cal BC) (Arias & Pérez Suárez, 1990, 1992; González-Tablas Sastre, 1990; Samzun *et al.*, 2006; Gosselin & Samzun, 2008) (Figure 98). Conversely, females with tools and equipment and/or ornaments and males with ornaments and/or faunal remains and/or shells could be found across the whole study region.

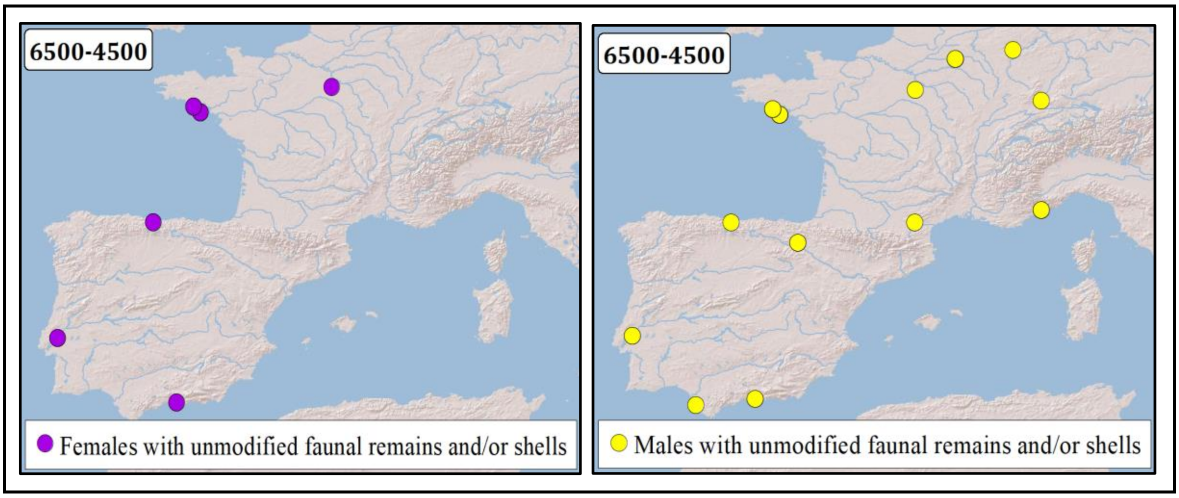


Figure 98: Map showing the geographical distribution of females (left) and males (right) with unmodified faunal remains and/or shells as funerary offerings

There are no statistically significant differences, however, in the materials used to craft the tools, equipment and ornaments deposited with males and females, as every type of material used to make tools and equipment (*e.g.*, flint, pottery) was more associated with males and materials used to make ornaments were evenly distributed between males and females. The same applies to the animal species and body parts, either deposited unmodified or used as raw materials.

These results show that, from the Upper Palaeolithic to Early Neolithic, there existed a difference in how society perceived men and women, which was reflected in both the number and types of offerings buried with them. The consistently lower number of women with funerary offerings might be for different reasons, such as a perception that women were less relevant in society, that the tasks carried out by women required fewer tools than those carried out by men, or that women were more frequently associated with items made of materials that were not preserved (Babić, 2005; Díaz-Andreu, 2005; Chapman & Gaydarska, 2011).

According to the *Ethnographic Atlas* of more than 1200 societies worldwide, in modern hunter-gatherer, foraging and horticultural groups men usually hunt and fish (including shellfishing and the pursuit of large aquatic animals), while women usually gather (including wild plants and hunting small land fauna), weave cloths and make pottery. Other activities, such as agriculture or leather working are more usually carried out by both sexes (Murdock, 1981; Gray, 1999). The more frequent association of men with tools and faunal remains might be a consequence of this. If men were preferentially hunting and fishing and women preferentially gathering, weaving and making pottery, men and women might have been buried with things related to those tasks. Faunal remains, pottery and the lithic and bone parts of some of the tools used to gather, hunt and fish would likely be preserved in contexts where the skeletons of the deceased have survived (Collins *et al.*, 2002; Hedges, 2002). Conversely, plant materials and textiles are seldom preserved (Spicer, 1991; Andersson Strand, 2012). The same happens with most of the tools used for creating textiles (*e.g.*, clubs for breaking the stalks, brushes for brushing the fibres or looms), as they are usually made of wood (Soffer, 2004; Hardy, 2008; Kvavadze *et al.*, 2009; Andersson Strand, 2012). In this scenario, the number of tools preferentially associated with women would be reduced.

In this respect, it must be noted that, despite the small sample size of offerings associated with sexed individuals compared to the high variability of offering types (n=181), men are more frequently associated with projectiles, adzes and lithic flakes and women with pottery, perforated batons, grinders and bladelets. It must be kept in mind, however, that divisions of labour among hunter-gatherers and horticulturalists are not rigid (Joks, 2006; González Marcén *et al.*, 2008). They are tendencies, not absolutes. This is likely why there are males associated with perforated batons and grinders and women associated with lithic flakes and adzes. In addition, males and females are equally associated with blades, although they could have been used for different purposes.

Lastly, there are three possible interpretations related to the more frequent association of women with ornaments. The first one is a sexing bias caused by the influence of offering type, although this is unlikely as most of the sexed individuals with funerary offerings were very well preserved, which facilitates the sexing. They were sexed relatively recently, several of them after 2000 (*e.g.*, Bueno Sánchez, 2002; Pou Calvet *et al.*, 2010; Soler *et al.*, 2013; Moreno Márquez, 2017; Zemour *et al.*, 2017), and some of them via DNA (Peyroteo Stjerna, 2016a). Since certain materials can be used as group belonging markers for specific gender groups, as proposed for the Linear Pottery Culture (Hachem, 2018), the second possibility is that the materials used for male ornaments are less likely to be preserved. A third possible interpretation is that ornamentation more often played a central role in the case of women. This is a phenomenon that can be observed in some modern hunter-gatherers where women use more ornamentation than men, such as among the Bororo (Amazonia) or the Gumuz and Dats'in (Ethiopia) (Lévi-Strauss, 1970: 243; Hernando, 2017). It has also been suggested for the Linear Pottery Culture (Masclans Latorre *et al.*, 2021).

In the Linear Pottery Culture, *Spondylus* ornaments are found with both sexes but, except for a few of the women aged above 35 years old, these ornaments are the only type of offering with women, while men also had toolsets (Masclans Latorre *et al.*, 2021). The individuals reported by Masclans Latorre *et al.* (2021) were sexed through osteological analysis (Tvrdý, 2016) and subsequently reevaluated (Masclans Latorre *et al.*, 2021). Assuming that the information is correct and since body ornamentation is usually used as a group belonging marker, its higher association with women could be explained by their identity being more relational than that of males and, thus, mainly built through their relationship with the group (Ramírez Goicoechea, 2011: 317; Hernando, 2012a, 2017).

To summarise, there were always differences in the treatment men and women received after death. These differences are mainly related to the frequency with which funerary offerings were deposited alongside them, with women being deposited with offerings less frequently, and, especially, the types of offerings associated with men and women. Most unmodified faunal remains and shells and tools and equipment were associated with men and most ornaments were associated with women. The differences are clearer after 6500 cal BC.

8.2. Age

Biological age is the stage of development (subadults) and decay (adults) of the organism. In the case of skeletonised individuals, it can be inferred differently for subadults and adults. Since subadults are still growing, age can be assessed based on diaphyseal lengths as well as the appearance and fusion of the secondary growth centres. However, since sexing subadults is extremely difficult and female maturation is around two years in advance of males, two-year errors might frequently occur (Lewis & Favel, 2006). In the case of adults, the ageing is based on bone and dental wear, degeneration and remodelling (Campillo & Subirà, 2004: 158–180; Baccino & Schmitt, 2006). Both in the case of adults and subadults, the reliability of the age assessment largely depends on the completeness of the skeleton (Bello *et al.*, 2006).

Biological age is different from chronological age, which is the time the individual has been alive. The relationship between the age-related processes that define the biological age, and the chronological age of individuals have a high intra- and inter-population variation (Campillo & Subirà, 2004: 158–180; Baccino & Schmitt, 2006). Moreover, in addition to biological and chronological age, there is the social age of individuals, the ideas society has about how people of differing ages should behave. Thus, categories such as 'adult', 'child' or 'elderly' might carry different meanings in past societies or not even exist (Lucy, 2005a: 43, 52–58).

Age has received less attention than sex in research on social differentiation (Lucy, 2005a: 43; Conneller, 2013: 350; Sánchez-Romero, 2017; Appleby, 2018). Here, the relationship between biological and social age during the Upper Palaeolithic to the Early Neolithic will be approached in three parts in an attempt to improve existing knowledge on the subject. Firstly, the difference in the treatment of adults and subadults will be analysed. Secondly, the differences in treatment of adults of different ages will be evaluated. Finally, the same evaluation will be carried out for subadults of different ages.

As with sex and gender, the best way to know what tasks people of differing ages undertook during their lives is through the analysis of activity markers. The sample is also extremely small in this case. Since enthesopathies are the marks left by muscles on the bone as a result of specific muscular developments caused by the performance of a specific activity during a long period, the younger the individual, the less likely they are to present these types of activity markers (Campillo Valero *et al.*, 2006; Galtés *et al.*, 2007). There are only four subadults with activity markers, all of them from the Mesolithic site of El Collado in Spain (7590–6648 cal BC) (Aparicio Pérez, 2008, 2015; Gibaja *et al.*, 2015). Three of these subadults have marks of paramasticatory activities as a result of processing plant fibres. The remaining one had deep marks of muscular insertion as a result of strenuous physical activity (Aparicio Pérez, 2008). These marks of strenuous activity are also present in most adults from El Collado, as well as from 20 other Upper Palaeolithic, Mesolithic and Early Neolithic sites from the study region. Paramasticatory activities can also be observed in several of the adults (n=16) (Montero Ruiz *et al.*, 1999; Polet & Cauwe, 2002; Aymard *et al.*, 2007). However, there is insufficient evidence to make inferences about the social roles of adults and subadults.

The issue of sample size also exists with tools on which use-wear analyses were performed. There are only six tools of known use associated with subadults. All of them are associated with the same individual from the Upper Palaeolithic site of Le Figuier, France (25000–22000 cal BC). These were used to cut both hard and soft materials (Slimak & Plisson, 2008). Used tools associated with adults (n=29) come from 16 Upper Palaeolithic, Mesolithic and Early Neolithic sites from the whole study region and were used in a wider variety of activities, *e.g.*, to cut plants, as hammers, as projectiles, to light fire (*e.g.*, Billard *et al.*, 2001; García Gazólaz & Sesma Sesma, 2007; Henry-Gambier *et al.*, 2011). Again, this information is too limited to make inferences about social age, even assuming the tools belonged to the deceased. Thus, in what follows, inferences about social age necessarily rely on age ratio, burial selection and the differences in the funerary treatment given to people of differing biological age.

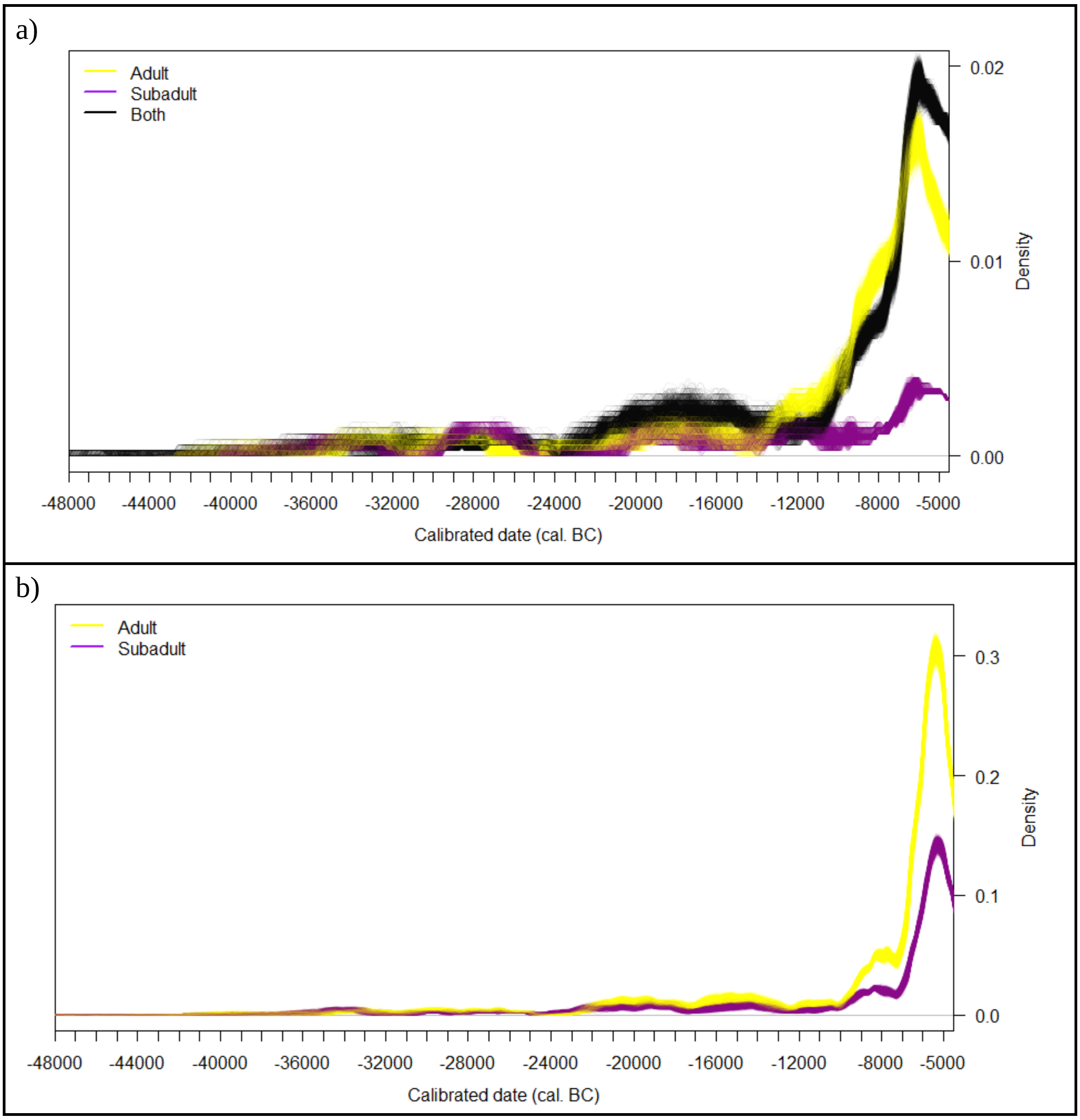


Figure 99: Monte Carlo graphs showing changes over time in the number of adults and subadults by site (a) and individual (b)

Before 14000 cal BC, sites containing only adults, only subadults and both adults and subadults were similarly frequent. From then until c. 6500 cal BC, sites containing only adults were the most frequent ones (Figure 99a). Thereafter, these sites are outnumbered by those containing both adults and subadults. Regarding the total number of individuals, from c. 22000 cal BC, adults are more frequent than subadults (Figure 99b). However, the difference is not great. It starts growing at 10000 cal BC and increases significantly during the Neolithic. This suggests that, despite sites with both adults and subadults being the most common during that period, they contain a greater number of adults than subadults. The distributions of sites containing only adults, only subadults and both adults and subadults show no geographical pattern.

This seems unlikely. According to cross-cultural demographic studies of 478 hunter-gatherer and forager-horticultural societies worldwide, child mortality rates among these societies are high: between 10% and 46% for infants and 20% to 61% for juveniles, with the mortality hazard being reduced by the age of 10 before it starts rising again by age 40 (Figure 100) (Marlowe, 2005; Gurven & Kaplan, 2007). Despite some hunter-gatherers and horticulturalists using preconception methods such as the prolongation of breastfeeding, women bear between 0.81 and 8.5 children during their reproductive years, so the representation of subadults in graves should be higher (Lucy, 2005a: 48; Marlowe, 2005; Hernando *et al.*, 2011).

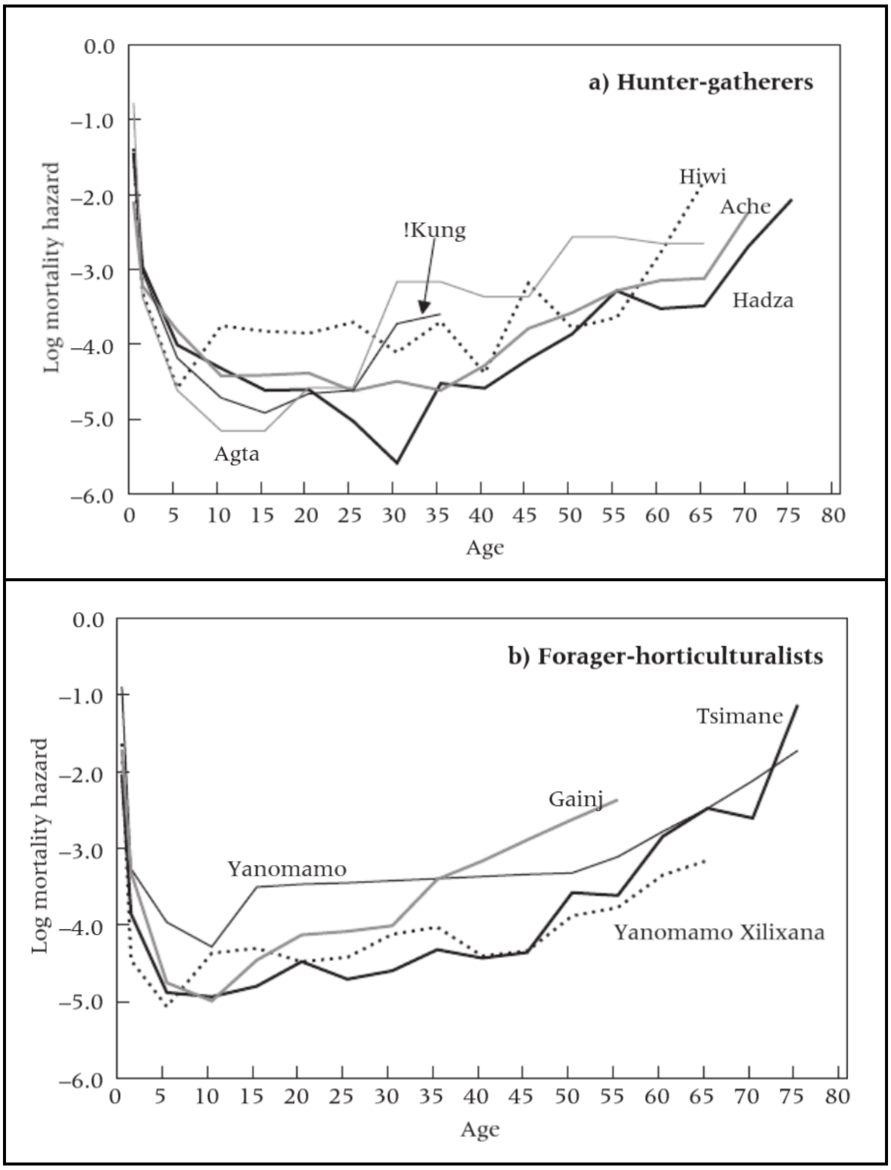


Figure 100: Log mortality hazards for hunter-gatherers (a) and forager-horticulturalists (b)

Source: Gurven & Kaplan, 2007: 329

Two biases might be influencing the lower frequency of subadults. The first is that taphonomic processes are more likely to affect the bones of younger individuals, as they have a lower bone density and their skeletons are not fully ossified. As a result, the bones of younger individuals are less likely to be preserved, especially in acidic soils with a low pH (Bello *et al.*, 2002; Gibaja *et al.*, 2010: 54–55). The second bias is caused by excavation methodologies. According to Gibaja *et al.* (2010: 54–55), before the 80s or 90s, in some excavations, subadult bones, especially the younger ones, were not considered important and, thus, they were not gathered or accidentally ended up with the faunal remains. This likely has to do with the fact that, culturally, the West has traditionally considered children as not playing an important role in society. Adults are the norm and, as such, children only matter in relation to how they affect adults' lives (Mizoguchi, 2000; Lucy, 2005a: 47; Sánchez-Romero, 2009: 18).

The differential effects of taphonomic processes in adults and subadults and the methodological biases should have been compensated for with a normal mortality curve for hunter-gatherer and early agricultural societies. As a result, the observable patterns are likely the result of one of the two following causes: many attritional deaths (*e.g.*, accidents, homicides, etc.) among adult individuals, or burial selection practices (Cintas-Peña, 2014: 50). The absence of children at many sites and their scarcity in others, with Mesolithic Téviec and Hoëdic in France being among the few sites that contained similar numbers of men, women and children, might mean children did not have a social persona yet. This hypothesis is further supported by the fact that children were usually buried with adults (presumably their parents) (Schulting, 1996b; Conneller, 2013: 351; Bickle & Fibiger, 2014; Boulestin, 2016).

Regarding differences in funerary treatment between adults and subadults, a χ^2 test shows there are more differences in relation to age than sex. The first statistically significant difference has to do with shell middens and it points to less egalitarian tendencies at shell midden sites. Between 10000–6500 cal BC ($p=0.040$), the proportion of subadults in shell middens was very low compared with the number of subadults not in shell middens. Only 17.8% (8/45) of the individuals in shell middens with an age assigned were subadults, while 33.5% (62/185) of the individuals out of shell middens were subadults. Non-shell midden sites with subadults were widespread, while the shell midden subadults came from two sites:

El Collado, Spain (7590–6648 cal BC) and Vale de Romeiras, Portugal (6598–5471 cal BC). These sites also contained adults (Aparicio Pérez, 2008, 2015; Gibaja *et al.*, 2015; Peyroteo Stjerna, 2016a).

After c. 6500 cal BC (p=0.038) the correlation still exists, but the difference in the proportion of subadults inside and outside of shell middens was lower: 27.8% (104/374) of the individuals in shell middens with an age assigned were subadults and 34.4% (169/491) of the individuals out of shell middens were subadults. Thus, at both shell midden and non-shell midden sites, subadults account for approximately one-third of individuals. This shows the shell midden societies were prioritising adults over subadults, especially before 6500 cal BC . This different treatment given to subadults in shell middens can be observed in Moita do Sebastião, Portugal (6426–5390 cal BC), where children were buried in a separate area (Morais Arnaud, 1989).

There is a correlation between adults and subadults and site type (p=0.007), caused by cemeteries (n=15), several of which were shell middens, being the only site type that always contained both adult and subadult individuals. The difference lies in the quantity, as the number of subadults was smaller than the number of adults, especially in the case of large shell midden cemeteries. Almost all these cemeteries (n=14), including Mesolithic (*e.g.*, Téviec, Hoëdic, the Portuguese shell middens) and Neolithic sites (*e.g.*, Cerro Virtud, Entzheim) (Montero Ruiz *et al.*, 1999; Boulestin, 2016; Peyroteo Stjerna, 2016a; Lefranc *et al.*, 2017), date to 6500–4500 cal BC (p=0.027).

In addition to the lower subadult ratio, other differences in the treatment of children can be observed after 6500 cal BC. Adults and subadults are correlated with the delimitation of the funerary space (p=0.005) and location markers (p=0.018). Subadults have a higher tendency to be deposited in mixed funerary spaces: 31.7% (67/211) of the subadults and 21.6% (100/462) of the adults are in mixed funerary spaces. Regarding location markers, only two out of the 24 (8.3%) individuals in funerary contexts with location markers were subadults. These two subadult individuals and 17 of the adults were also from 6500–4500 cal BC. These data are compatible with the age ratio data: a greater interest in the visibility of the bodies of adults than in those of subadults. It could also indicate a desire to keep the bones of children nearby after they died, perhaps in an attempt to protect them as suggested in the case of neonates and infants buried under houses at Lepenski Vir and Vlasac (Stefanović & Borić, 2004). There is no geographical patterning to these correlations, and they are not linked to specific sites.

Regarding the treatment of the body, from 10000 cal BC, there is a larger proportion of subadults than of adults in secondary positions. Between 10000 and 6500 cal BC (p=0.017), 66.7% (30/45) of the subadults and 45.5% (51/112) of the adults were in secondary positions, and, after 6500 cal BC (p=0.018), 18.1% (35/193) of the subadults and 11.2% (50/446) of the adults were in secondary positions. Adults and subadults in primary and secondary positions are never confined to a specific region or site. This trend affects the whole study region, showing a general change in the way the bodies of adults and subadults were treated, and likely perceived after c. 10000 cal BC. This could be pointing to burial selection practices from that moment onward. This assumes that subadults in a secondary position were subjected to that funerary treatment to facilitate the disappearance of the body, while adults were buried complete in an attempt to preserve them (Clastres, 1981; Criado-Boado, 1991). Nevertheless, this increased tendency of giving secondary treatment to children might also point to them going more often through processes of communal integration than adults (Fowler, 2004; Cooney *et al.*, 2014).

This second interpretation is compatible with the higher prevalence of subadults in multiple deposits from c. 10000 cal BC. Between 10000 and 6500 cal BC (p=0.001), 72.4% (42/58) of the subadults and 46.4% (64/138) of the adults were in multiple deposits and, after 6500 cal BC (p=0.001), 45.1% (88/195) of the subadults and 31.9% (137/430) of the adults were in multiple deposits. This trend affects the whole study region. The higher frequency of subadults in multiple burials, frequently with adults, might point to their social personae not being fully developed yet and, thus, subject to a higher importance of relationality in the construction of their identities than in the case of adults (Hernando, 2002, 2012a; Conneller, 2013; Fowler, 2016).

Adults and subadults have similar proportions of funerary offerings. However, from 10000 cal BC, there is a statistically significant difference between the types of offering deposited with adults and subadults. Between 10000 and 6500 cal BC (p=0.000), the offerings associated with subadults were ornaments (n=3) and unmodified faunal remains and/or shells (n=4), while adults were given offerings of all types. In this case, the sample is too small to make inferences, though the sample is bigger after 6500 cal BC.

After 6500 cal BC (p=0.003), subadults are more frequently associated with unmodified faunal remains and/or shells, and adults with tools and equipment. Of the offerings associated with subadults, 24.2% (31/128) were unmodified faunal remains and/or shells and 31.2% (40/128) were tools and equipment. In the case of adults, 15.6% (64/409) of the offerings were unmodified faunal remains and/or shells and 47.7% (195/409) were tools and equipment. Of the nine pieces of portable art, five (55.5%) were found with subadults, mainly anthropomorphic bone figurines from the Linear Pottery Culture area interpreted as standardized toys (Sidéra & Monthel, 2009). Finally, there is a relevant geographical pattern: subadults associated with faunal remains and/or shells are mainly located in the Linear Pottery Culture area, while adults associated with faunal remains and/or shells are present in the whole study area (Figure 101).

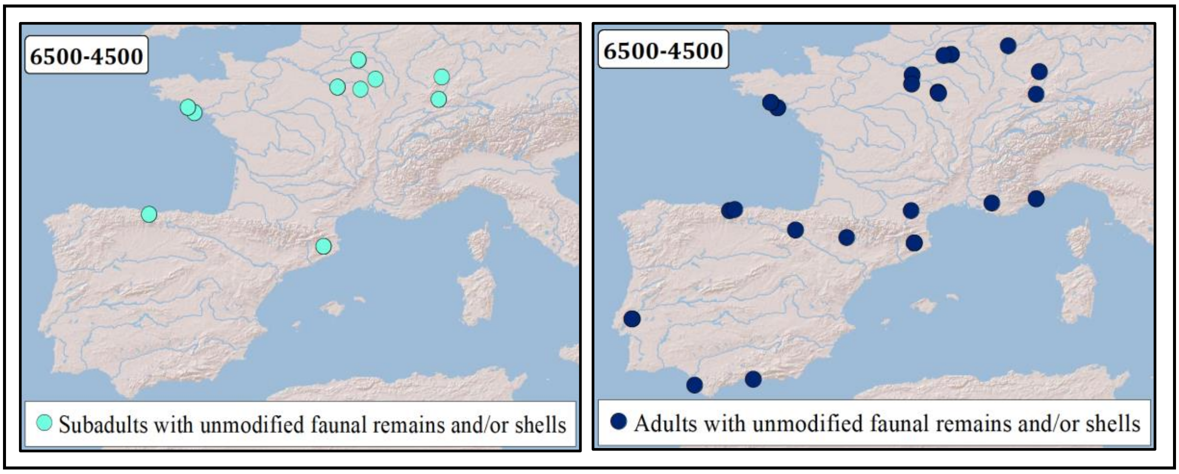


Figure 101: Maps showing the geographical distribution of subadults (left) and adults (right) with unmodified faunal remains and/or shells as funerary offerings

There are no significant differences in the materials (bone, lithic or pottery) used to make the tools deposited with subadults and the ones deposited with adults. However, from 6500 cal BC, there is a correlation between adults and subadults and the materials used to make ornaments (p=0.013). Despite there being more ornaments with adults than subadults, those with subadults were more frequently made of teeth (6/38, 15.8%) than those with adults (3/120, 2.5%).. On the other hand, during the same period, ornaments made of shell are more frequently associated with adults (98/120, 81.6%) than with subadults (24/38, 63.1%). Shell and teeth ornaments associated with children mainly come from shell middens and the Linear Pottery Culture area, while those associated with adults are more widespread (Figure 102).

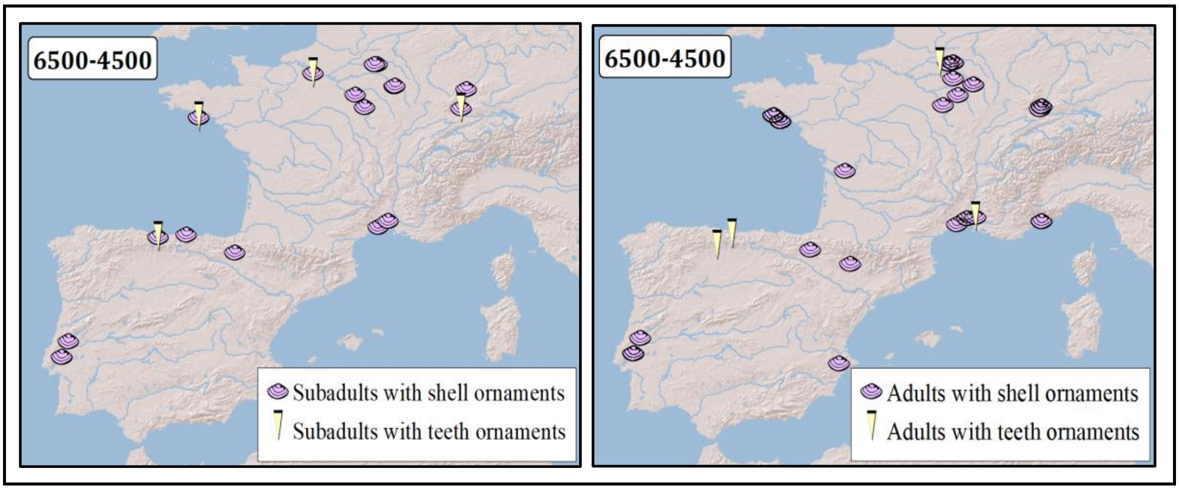


Figure 102: Map showing the geographical distribution of subadults (left) and adults (right) with ornaments made of shell and teeth

A similar pattern can be observed during the same period in terms of the correlation between adults and subadults and unmodified faunal remains and/or shells (p=0.017). Subadults are less frequently associated with unmodified shells than adults. Between 6500 and 4500 cal BC, 46.8% (29/62) of the unmodified faunal remains and/or shells associated with adults and 20.7% (6/29) of those associated with subadults were shells. Lastly, regarding the species of the unmodified faunal remains, almost all the bovids (10/12, 83.3%) were associated with subadults; they constitute 47.6% (10/21) of all the faunal remains of known species deposited with subadults. Adults with unmodified shells are widely distributed across the study region. On the other hand, most subadults with bovid remains and with unmodified shells come from the Linear Pottery Culture area. Although subadults are rarely associated with shells, they have two of the three (66.7%) *Spondylus* shells associated with individuals of known age, possibly because in the Linear Pottery Culture area they were used as group belonging markers (Lucy, 2005b; David, 2016; Masclans Latorre *et al.*, 2021). Also within the Linear Pottery Culture area, bovids might have played a similar role, acting as a group belonging marker for a specific age group rather than the whole of society (Hachem, 2018).

The same could be argued for the more frequent association of subadults with teeth ornaments and of adults with both ornaments made of shells and unmodified shells outside of the Linear Pottery Culture area. Shells might have been used as an identity marker of group belonging for adults and teeth for subadults. Another possible reason for this association, which is not incompatible, is that there were cultural perceptions that either associated some of the properties of those materials with or were more beneficial for a specific age group (Fowler, 2010; Conneller, 2012). As noted above (p. 147), among the Merina and the Zafimaniry (Madagascar) new things and young people are associated with softness and fluidity. A cultural association of properties like this might have linked children with teeth and adults with shells. Other societies think some materials or colours have certain properties. For example, pre-Columbian Mesoamericans thought that jade brought fertility (Saunders, 2001) and the Gumuz y Dats'in of Ethiopia believe red beads protect against the evil eye, which is why they are mainly worn by children and women as they are considered more vulnerable (Hernando, 2017). Similarly, teeth might have had properties that benefited children (*e.g.*, protection) and shells properties that benefited adults (*e.g.*, fertility).

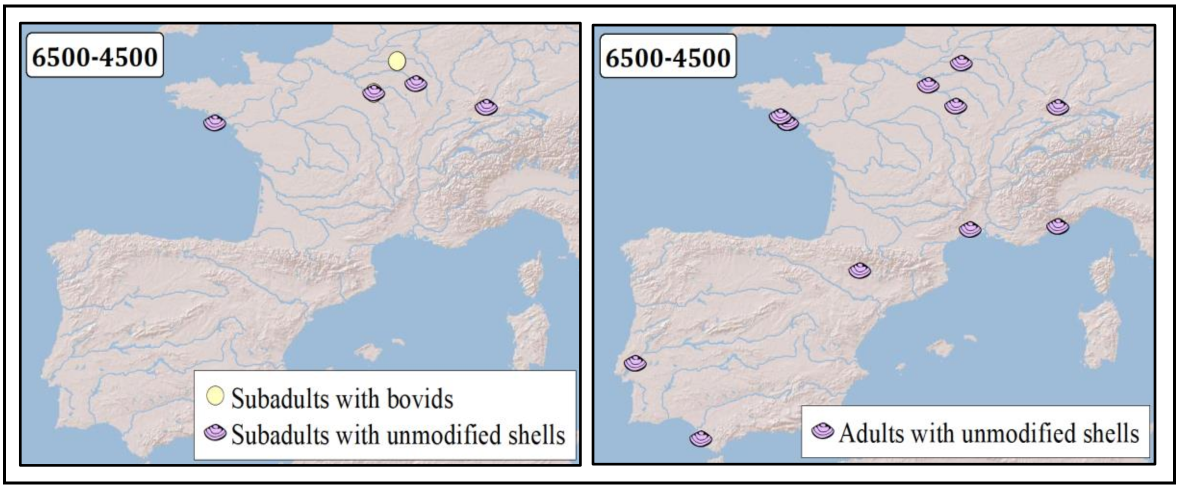


Figure 103: Map showing the geographical distribution of subadults with unmodified shells and bovid remains (left) and adults with unmodified shells (right)

To summarise, there were differences in the treatment of adults and subadults from c. 10000 cal BC, and the differences became more pronounced after c. 6500 cal BC. There were always more adults than subadults in funerary spaces, but the gap only becomes significant after 10000 cal BC. Between 10000 cal BC and 6500 cal BC, in non-shell midden sites, subadults were slightly better represented, with subadults constituting a third of individuals. However, after that moment, the number of subadults in shell middens increased and also became a third of the total number of individuals. From 10000 cal BC, subadults were more usually disarticulated and deposited in multiple deposits than adults, and had more frequently unmodified faunal remains and/or shells as funerary offerings, while adults were provided with more tools. Then, from 6500 cal BC, the ornaments associated with subadults were more usually made of teeth whilst those with adults were frequently made from shell. Lastly, also from c. 6500 cal BC, subadults were more usually associated with unmodified faunal remains than adults, usually with bovids, especially in the area of the Linear Pottery Culture. During the same time, adults were more usually associated with unmodified shells in the whole study area (Figure 103).

8.2.1. Adults

Adults are divided into four age groups (Table 3). The number of adults that could be fitted into one of these groups is very low, only 296 out of the 873 (33.9%) adults.

Age group	Age range
Young adult	18–25 years old
Young middle adult	26–35 years old
Old middle adult	36–45 years old
Mature adult	>46 years old

Table 3: Age groups and age ranges for adults

Source: Lewis & Falys, 2011

As a result, the sample of adults of known age with activity markers is too low for any pattern to be identified. The same applies to the tools associated with adults of known age on which use-wear analyses were performed. Despite the lower sample size, some inferences about the social age of adults can be made based on the age ratio of deceased adults and the differences in funerary treatment.

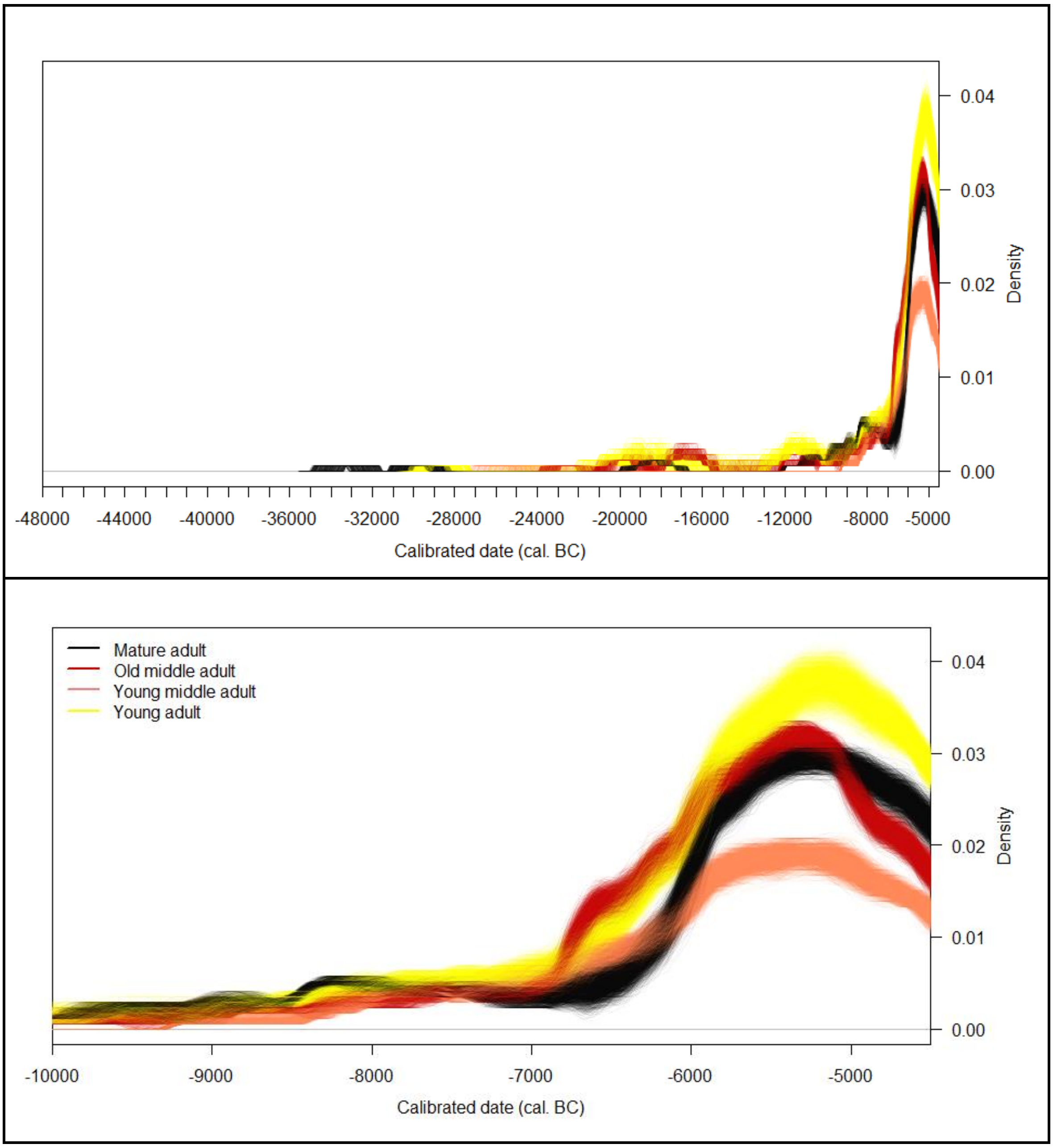


Figure 104: Graphs composed of 3000 runs of a Monte Carlo simulation showing changes by year in the number of mature adults, old middle adults, young middle adults and young adults

There were no significant differences in the representation of each age group of adults until c. 7000 cal BC, when the number of young adults started increasing faster, outnumbering old middle adults by 6000 cal BC (Figure 104). The number of young middle adults and mature adults also increased but, except for a brief period in c. 6900-6100 cal BC, always remained lower than that of young adults. However, after decreasing in c. 5000 cal BC, old middle adults were outnumbered by mature adults. Given the fact that mortality hazard in modern hunter-gatherer and horticultural societies is at its lowest between the ages of 10 and 40 (Gurven & Kaplan, 2007), the high representation of young adults (18–25 years old) is unusual. This could be the result of attritional deaths (*e.g.*, accidents, homicides, etc.) among young individuals due to carrying out more dangerous activities. On the other hand, it may reflect burial selection practices that would make adults of a younger age more likely to receive certain funerary treatments (Cintas-Peña, 2014: 50). No geographical patterns in the distribution of adult age groups were detected.

The χ^2 tests show some significant differences in the funerary treatment given to adults of differing ages, specifically mature adults. All these differences appeared after 6500 cal BC, reflected in the correlation between the adult group and the location of the site (p=0.000), shell middens (p=0.000) and site type (p=0.000). The first is the result of most adults being preferentially placed in open-air sites, while mature adults were preferentially placed in caves (28/53, 52.8%). There were barely any mature adults in shell middens, only four out of the 53 (7.5%) from the study area. These came from Moita do Sebastião, Portugal (n=3) and Hoëdic, France (n=1). Mature adults are absent from the remaining shell middens in the study region. Conversely, 35–45% of young adults (27/77, 35.1%), young middle adults (15/38, 39.5%) and old middle adults (26/58, 44.8%) are from shell middens. The same happens with site types: while most adults were preferentially placed in cemeteries, mature adults were usually located in smaller burial grounds inside settlements (27/44, 61.3%). The tendencies related to the site location and type are general to the whole study region, not to specific regions or sites.

There were also some differences regarding funerary offerings. From 6500 cal BC, χ^2 tests show correlations between the adult age group and the type of funerary offering (p=0.048), the materials of the ornaments (p=0.000), and the deposition of unmodified faunal remains or shells (p=0.013). Offerings associated with mature adults were mainly tools and equipment (22/36, 61.1%) and unmodified faunal remains or shells (8/36, 22.2%), of which only one was a shell. The only ochre nodule was associated with a mature adult. On the other hand, although there were also ornaments associated with mature adults (5/36, 13.9%), the proportion was very low compared with the proportion of ornaments associated with the other adult age groups. These groups presented similar proportions of tools and equipment and ornaments (c. 40% of each). A possible explanation for the scarcity of ornaments with mature adults is that old individuals passed their ornaments to their offspring, as in Bororo society (Amazonia), where female ornaments were transmitted from mother to daughter (above, p. 148).

Another possibility is that the ornaments used by mature individuals were made of perishable materials that were thought to be more fitting for their age. Moreover, from 6500 cal BC, none of the ornaments associated with mature adults was made of shell; this was the most common material used to make ornaments associated with the remaining age groups of adults –between 74% and 88%. The ornaments associated with mature adults were mainly lithic (2/3, 66.7%) or made of teeth (1/3, 33.3%) and were composed of cylindrical, tubular or discoid beads. The differences in the prevalence and materials of ornaments deposited with mature adults follow a regional pattern: a large number of the younger adults with ornaments made of shell come from shell middens, especially Téviec and Hoëdic in France (Boulestin, 2016), where there are barely any mature adults (Figure 105).

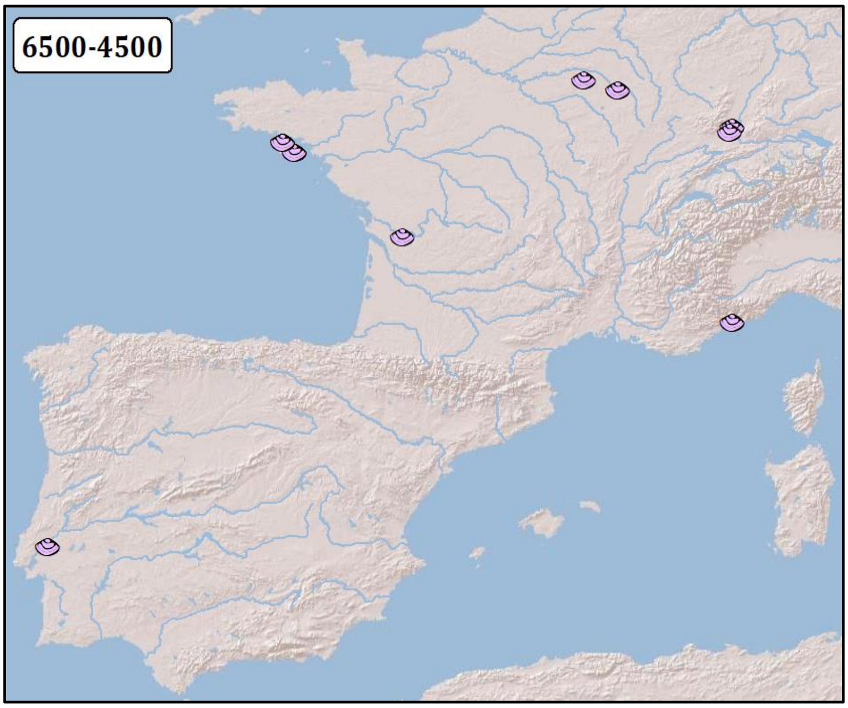


Figure 105: Map showing the geographical distribution of young adults, young middle adults and old middle adults with ornaments made of shell

However, this does not fully explain why none of the ornaments associated with mature adults was made of shell, as the few mature adults with ornaments come from sites where there are younger adults with shell ornaments. These sites are Los Canes, Spain (6241–5010 cal BC), Cueva de Chaves, Spain (5471–5057 cal BC), Moita do Sebastião, Portugal (6426–5390 cal BC) and Menneville (Derrière le Village), France (5500–4500 cal BC) (Ferembach, 1974a; Arias & Pérez Suárez, 1990, 1992; Urtilla Miranda *et al.*, 2008; Thevenet, 2016).

One explanation is that some materials were considered inappropriate for certain ages. Just as among the Merina and Zafimaniry of Madagascar, new things and young people are associated with softness and fluidity (Bloch, 1998: 27), societies between 6500–4500 cal BC might have thought that shells had a property (*e.g.*, lustre) that associated them with younger individuals.

To summarise, after 6500 cal BC, adults older than 46 years old (mature adults) started to receive a different funerary treatment than younger adults. Unlike younger adults, they were preferentially buried in caves and settlements that are not shell middens. The almost complete absence of mature adults in shell middens might be a result of one of two different factors: a lower life expectancy in shell midden societies or a burial selection that did not only exclude subadults, but also mature adults. The second option would suggest that, in shell midden societies, mature adults were not only part of a group sharing similar biological and chronological ages. The funerary treatment they received followed different social norms than the funerary treatment applied to the rest of society. This implies that mature adults were also part of a social age group, as their age made them be perceived and treated differently by their societies. Something similar can be observed outside of shell middens where, unlike younger adults, mature adults were rarely given ornaments. None of these ornaments were made of shell, which is the most frequent material used to make ornaments in the study area.

Older individuals have been disregarded in past archaeological interpretations (Lucy, 2005a; Appleby, 2010, 2011, 2018). This is not to say that they were completely ignored, but rather that they are frequently only mentioned tangentially, mainly in osteological studies (Appleby, 2010). It has been argued that this is likely the result of the modern West perceiving people of old age as divorced from society and, thus, being irrelevant to the social structure (Lucy, 2005a; Appleby, 2010, 2011, 2018). However, the evidence presented shows that, from the Upper Palaeolithic to the Early Neolithic, the elderly were likely not passive individuals of which the active part of society needed to take care of. They played an important role as active agents in the social structure.

Lastly, from 6500 cal BC, there is a correlation between the age group of adults and sex ($p=0.031$) that is not caused by mature adults. The correlation is likely caused by young middle adults (26–35 years old). Unlike in the remaining adult age groups, in which there were higher proportions of men than women, most of the young middle adults were women (21/31, 67.8%). This is caused by the low number of young middle adult males that were buried after c. 6500 cal BC (Figure 106), either as a result of reduced mortality rates for that age group or of burial selection practices.

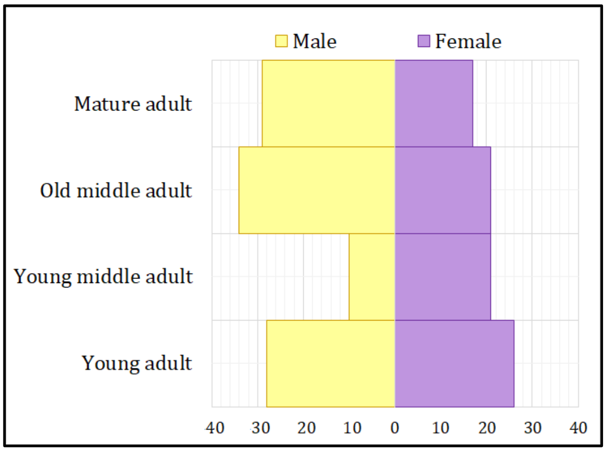


Figure 106: Sex and age at death distribution of adults after 6500 cal BC

8.2.2. Subadults

Subadults are divided into five main age groups: foetus, neonate, infant, juvenile and adolescent (see Table 4). Of the 442 subadults, 414 (93.6%) could be assigned to one of these groups, as they were given a narrow enough age range. The majority (307/414, 74.1%) are juveniles. However, the age ranges assigned to some individuals were very wide. As a result, when juveniles are subdivided into more precise categories (juvenile 1, 2 and 3) (Table 4), the sample size is reduced in 102 individuals.

Age group	Age range
Foetus	Up to 40 weeks in utero
Neonate	Around the time of birth
Infant	Following birth to one year
Juvenile	1-12 years old
Juvenile 1	1-5 years old
Juvenile 2	6-9 years old
Juvenile 3	10-12 years old
Adolescent	13-17 years old

Table 4: Age groups and age ranges for subadults

Source: Scheuer & Black, 2004: 6; Lewis & Falys, 2011

Subadults have sometimes been disregarded in past archaeological studies on the assumption that they did not have an important role in society. That is not to say they were ignored, but rather they were frequently studied from the point of view of their impact on the life of the adults (Lillehammer, 2010). This is likely a result of Western culture considering childhood as a period of innocence, lacking responsibilities and autonomy (Lucy, 2005a: 56) and children's activities have been considered to lack social importance (Politis, 1998; Lucy, 2005a: 56). However, in modern hunter-gatherer and horticultural societies, such as the Hausa of Nigeria, the Nunak of the Colombian Amazonia or the Maya of Chiapas, children play important active roles, for example, helping in the crafting of items or taking care of younger children (Politis, 1998; Greenfield, 2004). In addition, in some societies, adulthood is reached with puberty, which in the modern West is associated with adolescence (Lucy, 2005a: 52).

There are only four subadults with activity markers and six tools of known use associated with subadults. Therefore, no inferences about the tasks developed by the different subadult age groups can be made.

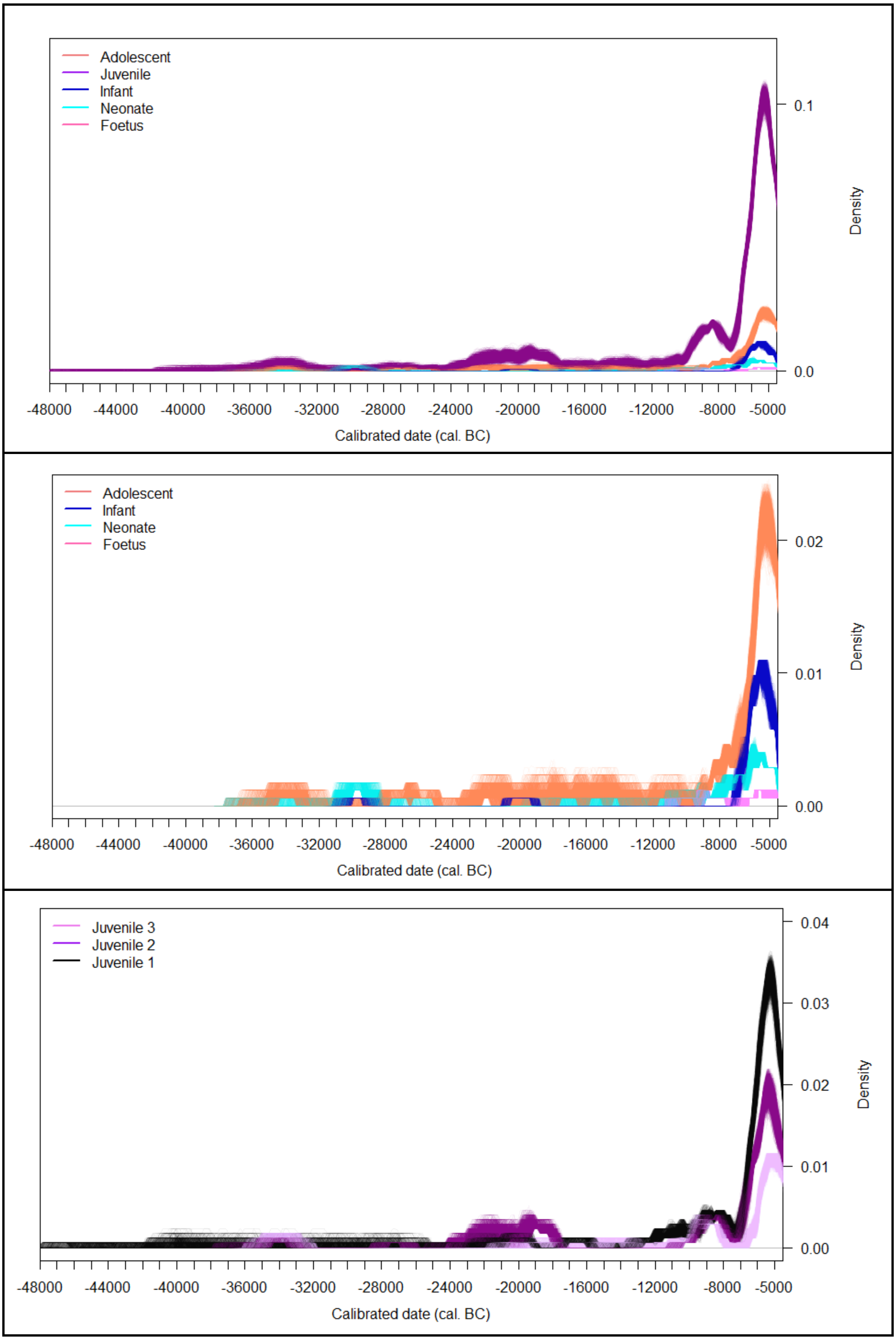


Figure 107: Monte Carlo graphs showing changes over time in the number of adolescents, juveniles, infants, neonates and foetuses

Regarding the prevalence of subadults in funerary contexts, the most frequent age group is always juveniles (between one and twelve years old). From 6500 cal BC, the most common age of juveniles in funerary deposits is juvenile 1, followed juvenile 2, then juvenile 3. Adolescents, infants, neonates and foetuses are always scarcer than juveniles, especially neonates and foetuses. This is likely due, at least in part, to bone preservation. Nevertheless, even if infant bones might be better preserved than those of neonates (Bello *et al.*, 2002; Gibaja *et al.*, 2010: 54–55), neonates are more frequent than infants until c. 6500 cal BC. The data, therefore, seem to suggest that from c. 6500 cal BC there is a predominance of children from one to five years old in funerary contexts (Figure 107).

This distribution is compatible with mortality hazards in modern hunter-gatherer and horticultural societies and taphonomic biases. According to cross-cultural demographic studies, hunter-gatherers, foragers and horticulturalists are likely to die before the age of ten. Subsequently, the mortality hazard falls, especially after the age of 15, and does not rise again until the age of 40 (Marlowe, 2005; Gurven & Kaplan, 2007). However, the remains of foetuses, neonates and infants are less likely to be preserved in the archaeological record. This explains the large numbers of juveniles compared to other age groups, as adolescents are less likely to die and individuals younger than one-year-old are less likely to be preserved. No geographical bias is evident in the distribution of subadults.

Regarding funerary treatment given to subadults, the χ^2 tests show some correlations. Sample sizes only allow the observation of patterns after 6500 cal BC. Regarding funerary context, from 6500 cal BC (p=0.045), the majority of subadults are preferentially placed in non-shell midden sites, except infants, which occur mainly in shell middens (13/19, 68.4%), specifically at Téviec and Hoëdic, in France, and Moita do Sebastião, in Portugal (6426–5390 cal BC).

From 6500 cal BC, infants and subadults are the most likely to have ochre applied to the body (6/14, 42.8%), while the proportion of ochre associated with adolescents (4/25, 16%), juveniles (8/134, 5.9%) and neonates (1/6, 16.7%) is lower (p=0.001). Most of the infants with ochre (4/6) come from the shell midden site at Téviec and the other two from Baume Bourbon and Menneville (Derrière le Village) also in France (5518–4705 cal BC).

Regarding funerary offerings with subadults (p=0.040), after 6500 cal BC, infants are more likely to be given them. Of the 15 infants, 11 (73%) have funerary offerings, while the proportion among the remaining subadults is never higher than the 50%. Of the 11 infants with funerary offerings, 7 come from shell middens (Téviec, Hoëdic and Moita do Sebastião) and the others from Baume Bourbon and Menneville (Derrière le Village). Other categories of subadults with funerary offerings, especially juveniles, can be found across the whole study region. Regarding differences in the types and materials of offerings, the sample size is too low to obtain any reliable information.

To summarise, from 6500 cal BC, most societies had burial practices that placed less emphasis on infants, as they were the only age group of subadults better represented within than outside shell middens, but only because more than half of infants are from Téviec and Moita do Sebastião. Infants were more frequently deposited with funerary offerings and more frequently had mineral colourant applied to the body than the other groups of subadults, but this is mainly the result of being found in just a few sites, and these were sites where ochre use, and the inclusion of funerary offerings was common practice.

The lower numbers of infants could be the result of post-depositional processes having a higher impact on their bones. However, the fact that they are well represented in a few sites, might show that their absence from others is caused by a) a research bias caused by inferior excavation methods for some sites, b) preservation factors caused by the burial environment (*e.g.*, greater soil acidity) or c) cultural reasons. Several societies treat infants and newborns differently from other individuals, likely because mortality hazard is higher. Among groups such as the Vezo of Madagascar, children younger than one-year-old are not considered persons and, thus, are less ritualized or not even buried (Astuti, 1998).

8.3. Loss of autonomy

Individuals with a loss of autonomy are those who, because of a pathology, would need temporary or permanent assistance to survive or would see their capacity for survival reduced. For example, an individual with a broken leg would need help to move, at least temporarily. However, assessing what pathologies could cause a loss of autonomy and which would be temporary compared to permanent is extremely difficult. There are only 88 cases of individuals without loss of autonomy, either because the anthropological report stated that they had no pathologies or because their pathologies were likely not limiting (*e.g.*, the loss of a tooth). On the other hand, 30 cases of individuals with possible loss of autonomy were detected. Of these, 13 were likely permanent and 17 temporary. Given the higher completeness of the bodies after 10000 cal BC, all except for two of these cases come from that moment onwards. Most of them are Mesolithic.

The cases of temporary loss of autonomy are mainly composed of fractures with evidence of healing in the lower or upper limbs, although there are more severe cases such as the individual with a healed facial polytrauma (right maxilla and left zygomatic arch) from La Braña-Arintero, Spain (Vidal Encinas *et al.*, 2008). The fact that these individuals did not die from those injuries and recovered demonstrates that someone was likely taking care of them during their recovery. Cases of permanent loss of autonomy are, for example, individuals with poorly healed leg fractures that would likely have caused a permanent limp, individuals with a probable permanent paralysis of one hand, *e.g.*, Araguina-Sennola (Bonifacio) in France (De Lanfranchi *et al.*, 1972), or more extreme cases such as the individual from Buthiers-Boulancourt, France (Figure 108), who had the left forearm and hand surgically amputated, suffered from osteoarthritis and had lost his teeth (Samzun *et al.*, 2006; Buquet-Marcon *et al.*, 2007, 2009; Gosselin & Samzun, 2008).

Figure 108: Individual 416 from Buthiers-Boulancourt with left forearm surgically amputated

Source: Buquet-Marcon *et al.*, 2009

To appreciate whether individuals with life-altering pathologies were treated differently from the rest of society, the best approach is to analyse the funerary treatment they were given. However, due to the extremely small sample size, χ^2 tests were not performed. For the same reason no geographical patterns to their distribution could be detected. Most individuals with life-altering pathologies were deposited alone or with other individuals with limiting pathologies. These do not seem to have received different treatment from individuals without limiting pathologies from other sites.

Sites where there are individuals with and without life-altering pathologies include Arapouco, Portugal (5970–5730 cal BC), Cingle del Mas Nou, Spain (5842– 5567 cal BC) and Los Canes, Spain (6241–5010 cal BC). At Los Canes and Arapouco, there are no apparent differences in how limited and healthy individuals were treated (Arias & Pérez Suárez, 1990, 1992; Cunha & Umbelino, 2001; Peyroteo Stjerna, 2016a). Conversely, in Cingle del Mas Nou, Mungo, a young adult male, was the only individual in primary position while the rest (a young adult woman and several juveniles) were deposited as disarticulated bones. While the woman and the juveniles did not exhibit pathologies, Mungo had abnormal protuberances on the frontal bone caused by an infection, an artificial eye and a depression in the left pelvis that could have been caused by Paget's disease. His sacroiliac joint was fused with the left coxal, possibly as a result of an aortic-iliac aneurysm or a left nephroptosis (Olària i Puyoles, 2005, 2010).

The information presented shows how individuals with temporary limiting pathologies were likely helped by their communities until they recovered. On the other hand, those with permanent limiting pathologies do not seem to have been discriminated against nor received special treatment, except Mungo. This is not uncommon for other prehistoric burials (*e.g.*, the Romito dwarf) and has been taken as evidence of compassion towards the disabled (Berkson, 2004; Formicola, 2007; Doat, 2016). Cases including more complex burial rites, such as Mungo's, have also been interpreted as reflecting fear of the disabled (Dettwyler, 1991; Formicola, 2007). However, the information available on this subject is too infrequent to generalise these observations to the whole study period, even to the whole Mesolithic, from which most of the sample comes.

8.4. Animal funerary treatment

The radical differentiation between human and non-human animals is a modern Western cultural construct influenced by a series of historical processes that have led to nature being perceived as an object rather than a subject (Haila, 2000; Hernando, 2002: 155, 2012a: 66, 85; Ingold, 2011b; Kopnina, 2019). Although it could be argued that the first step towards nature/culture dualism was the domestication of animals and plants and the demarcation of territories (Hernando, 2002: 155, 2012a: 66, 85), the idea of humans as different from other animal species is more recent and strongly influenced by factors such as Judeo-Christianism, the Enlightenment and capitalism (Haila, 2000; Ingold, 2011b; Overton & Hamilakis, 2013; Kopnina, 2019). Per contra, it has been argued that hunter-gatherer and traditional agricultural societies that have totemic or animistic beliefs do not have this dichotomous view of nature and culture, as they believe everything has a soul and, thus, consider that the main difference between humans and animals is their appearance. As a result, animals are considered non-human persons that possess sentience, intentionality, and agency (Lévi-Strauss, 1966; Descola, 1998; Bird-David, 1999; Willerslev, 2007; Ingold, 2011a; Hill, 2013; Živaljević, 2015).

The consideration of animals as persons with a different appearance allows that some hunter-gatherer and horticultural societies incorporate some animals into the group and have reciprocal interactions with them that adapt to social rules (Lévi-Strauss, 1966; Hill, 2013; Overton & Hamilakis, 2013). Examples of societies that integrate animals into the group are the Awá-Guajá (Amazonia), hunter-gatherers who frequently adopt orphaned animals, usually monkeys (Hernando *et al.*, 2008); or the Evenks (Siberia), nomadic hunters and reindeer herders who consider themselves to have a social contract with the reindeer they breed (Landerer, 2009) and have important relationships with the dogs that help them hunt (Safonova & Sántha, 2013). Animals that are part of human communities might receive the same type of funerary treatment as their human counterparts. Moreover, animals might be subject to burial selection practices, since not every member of society is thought to be deserving of the same funerary treatment. For example, some Siberian groups who live with dogs consider that only those dogs with particular talents have a soul and deserve a burial (Larsson, 1990; Grøn *et al.*, 2008).

Analysing prehistoric funerary practices, it is sometimes difficult to distinguish which animals might have received funerary treatment. In those cases where the context is clear, the difficulty in distinguishing animals that went through mortuary treatment from offerings is mainly a result of our own cultural biases. Dogs are the species more frequently reported as animal burials (Hill, 2013: 122). This is likely a consequence of a biased assumption in the West of the greater importance of dogs versus other animals. Cases of animals buried complete and in single graves are also more frequently reported as animals that underwent funerary treatment than unburied animals in funerary contexts or buried animals sharing graves with humans and/or in secondary positions. Nevertheless, these ideas might exclude other possible cases of funerary treatment given to animals that were part of the group, since dogs, burying the deceased, single graves and primary mortuary treatment do not have the same importance to other societies as they have in the modern West (Cauwe, 2001; Lévy-Bruhl, 2003; Fowler, 2004; Ingold, 2011b).

In the study region, there are only three cases of animals in funerary contexts that were reported as having received mortuary treatment. These are found in the Mesolithic Portuguese shell middens of Cabeço da Arruda (Figure 109), Cabeço das Amoreiras and Poças de São Bento. They are all burials of dogs in primary position (Detry & Cardoso, 2010; Grünberg, 2013; Arias *et al.*, 2015). The tendency of being more open towards considering mortuary practices when the animals are dogs can be appreciated at the Late Palaeolithic site of Abri du Morin (France), where there are human, dog and wolf remains (Boudadi-Maligne *et al.*, 2012). The wolf and dog present cut marks compatible with skinning and defleshing. In this case, Boudadi-Maligne *et al.* (2012) leave open the question of whether the cut marks are evidence of them being treated like the humans, one of which had cut-marks, or were butchered.

Figure 109: Canid remains from Cabeço da Arruda
Source: Detry & Cardoso, 2010: 2764

The question is not left open, however, in other cases that could also be interpreted as animals receiving funerary treatment. One example is the sheep buried in Buthiers-Boulancourt, France (5000–4610 cal BC), located at the feet of individual 416 and, like the human remains in the cemetery, in primary position and complete. This animal has been considered a grave good (Samzun *et al.*, 2006; Gosselin & Samzun, 2008), but it may have some other kind of connection with the individual it was buried with. Another example is Les Ouches (Sours), France, where the only trace of Mesolithic occupation is a suid in a pear-shaped pit. Given the unknown function of the pit, several options were offered: the presence of the suid being accidental, a way of preserving the meat if the context is domestic; or a ritual deposit or a grave good if the context is funerary (Dupont *et al.*, 2012). None of these options is animal burial. Although these cases might not be the result of funerary treatment given to animals, the option should at least be considered.

To summarise, in the study region there are only three cases of animals in funerary contexts and/or graves that have been considered to have received mortuary treatment by the authors interpreting them. However, this does not necessarily imply that some of the cases in which animals have been considered offerings were not animals that underwent funerary treatment. As a result, the few identified cases of animal burials could be the result of a difficulty to identify some of the existing ones due to cultural biases and/or of animals being subjected to burial selection practices.

8.5. Overview

In the study region, there are always differences in the treatment of men and women in funerary contexts and of individuals of different age groups. Regarding sex, the main differences are related to funerary offerings. These are more commonly found in association with men than with women. Men have a higher tendency to have tools and equipment and unmodified faunal remains and/or shells, while women are more typically associated with ornaments. The lower incidence of offerings with women could be the result of research biases, lesser importance of women in society or because the offerings with women were more often made of perishable materials.

In recent hunter-gatherer, foraging and horticultural groups hunting and fishing are tasks usually carried out by men, while gathering (of wild plants and small land fauna), weaving cloth and making pottery are usually carried out by women (Murdock, 1981; Gray, 1999). As a result, materials that are extremely unlikely to be preserved and that could be in preferential association with women are plant fibres, textiles and tools related to weaving, as they are usually made of wood. The tools and equipment found alongside males and females in the study region do not contradict this type of work division: men are more frequently associated with projectiles, adzes and lithic flakes and women with pottery equipment, perforated batons (thought to be weaving tools), grinders and bladelets.

Regarding the stronger association of women with ornaments, it may reflect the greater importance of relationality in women's identity construction, as body ornamentation is one of the technologies of self that are more frequently used as markers of group belonging. A clear example, which likely is not caused by sexing biases, comes from the Linear Pottery Culture, where *Spondylus* ornaments were found with both sexes, but they were the only type of offering with women and occurred in larger quantities, while men had fewer ornaments but also had tools. Another possible explanation is that, since some materials can be used as group belonging markers for specific gender groups rather than for the whole of society, male and female ornaments were made of different materials and, in some cases, the materials used for male ornaments are perishable.

Differences between the offerings associated with males and females became more pronounced after 6500 cal BC, when there started to be fewer numbers of women found in funerary spaces than men. However, there is an exception to this as there are more women aged between 26 and 35 years old (young middle adults) in funerary contexts than men of those ages. This is caused by the small number of young middle adult males that were buried after c. 6500 cal BC, rather than more women of that age being buried. This could be the result of reduced mortality rates for that age group among males or of burial selection practices.

Regarding age, there were always more adults than subadults in funerary spaces, but the gap only becomes significant after 10000 cal BC. Between 10000 and 6500 cal BC, subadults in shell middens account for c. 17% of individuals, while in non-shell midden sites they were around 34%. After 6500 cal BC, the number of subadults in shell middens increased and rose to around one-third of the total number of individuals. It is worth noting the low numbers of infants, which could be the result of taphonomic effects having a greater impact on their bones. However, more than half of infants come from just two sites (Téviec and Moita do Sebastião); their absence from the remaining sites may reflect a research bias resulting from poor excavation methods, differences in soil composition or cultural reasons. There are several societies in which infants and newborns were treated differently than other individuals, likely due to many children dying before they were one year old. As in some recent societies, children younger than one year may not have been considered persons and, thus, less ritualized or not even buried, which might partly explain their absence in most sites from the study region.

After 10000 cal BC, subadults were more frequently disarticulated and deposited in multiple deposits than adults. This suggests subadults went through processes of communal integration more often than adults, possibly due to not having a fully developed social persona and/or having an identity construction that was perceived as fundamentally relational. Other differences can be observed in the types of offerings, materials and animal species deposited with adults and subadults. Subadults more frequently had unmodified faunal remains and/or shells as funerary offerings, while adults had more tools. This is likely the result of subadults carrying out fewer tasks than adults, hence the lower frequency of tools, except perhaps in the Linear Pottery Culture, where shells and faunal remains may have acted as identity markers for both adults and children.

From 6500 cal BC, in the study region, the ornaments associated with subadults were more often made of teeth and those with adults were frequently of shell. Lastly, subadults were more frequently associated with unmodified faunal remains than adults, usually with bovids, especially in the Linear Pottery Culture area. Adults were more usually associated with unmodified shells. Most of the subadults associated with unmodified shells come from the Linear Pottery Culture area, likely because, in that area, *Spondylus* shells were used as markers of group belonging. The association of teeth and bovids with children and shells with adults might reflect similar reasons, as they might have acted as a group belonging marker for a specific age group rather than the whole of society. The selection of materials associated with each age group might be based on cultural perceptions that either associated some of the properties of those materials with or were more beneficial for, a specific age group. For example, certain properties of materials can be culturally associated with age, such as among the Merina and the Zafimaniry (Madagascar). Other societies, such as pre-Columbian Mesoamericans and the Gumuz and the Dats'in of Ethiopia, think that certain materials or colours can bring benefits. Some of these benefits might be more useful for adults (*e.g.*, fertility) and others for children (*e.g.*, protection).

For adults of differing ages, variation in treatment is evident after c. 6500 cal BC, when the number of young adults starts increasing and outnumbers other adults. This high representation of young adults (18–25 years old) is unusual as, according to cross-cultural demographic studies, mortality hazard in recent hunter-gatherer, forager and horticultural societies is at its lowest between the ages of 15 and 40. The high frequency of individuals between 18 and 25 years could be the result of these members of society suffering more attritional deaths (*e.g.*, accidents, homicides, etc.) associated with more dangerous activities, or the result of burial selection practices that favoured young adults (Cintas-Peña, 2014: 50).

After 6500 cal BC, mature adults (older than 46 years) began to receive different funerary treatment than younger adults. Unlike other adults, mature adults were rarely deposited with ornaments and none of these was made of shell, despite being the most frequent material used to make ornaments. They were preferentially buried in caves and small burial grounds inside settlements, while younger adults were usually placed in cemeteries and open-air funerary locations. Likely, this is partly but not exclusively a result of them being almost completely absent from shell middens, which contained the largest cemeteries. This near-absence might reflect one of two factors: a lower life expectancy in shell midden societies or a burial selection that excluded them. The distinct funerary treatment received by mature adults could be the result of different and sometimes opposing factors, such as being more or less respected than other age groups, or just equally respected but treated differently due to a culturally perceived difference of individuals above a certain age.

To summarize, everywhere in the study region, there were differences in the way individuals of different sexes and ages were treated after death. In the case of sex, this can be most readily appreciated in funerary offerings. The differences could be interpreted in two different ways. The first is that offerings reflect the tasks the deceased performed during life or what type of material culture was more involved in the construction of their identities. The second is that they symbolise tasks associated with social roles and, thus, are more reflective of the idea society had about the deceased than of the idea the deceased had about themselves. From 6500 cal BC, there appears to have been burial selection practices in shell middens that favoured adults, especially young ones, over subadults, notably over those younger than one year old. Adults and subadults were also linked to different offerings, materials, and animal species; and subadults were more usually placed disarticulated and in multiple deposits, pointing to a higher relationality in their identity construction and/or a less developed social persona. Mature adults did also receive a different funerary treatment than the rest of society and were rarely present in shell middens.

Individuals with disabilities or life-altering pathologies do not seem to have received a different funerary treatment, which could be interpreted as evidence of compassion. However, the sample is too small to generalize. The same happens with animals that received funerary treatment. The available evidence suggests animals received similar treatment to the humans buried at the same site, but there are only three cases in the study region of animals in funerary contexts that were interpreted as having received mortuary treatment.

Beyond the specific interpretations, what the differences in the treatment of individuals of different sexes and ages show is that, in societies from the Upper Palaeolithic to Early Neolithic in Western Europe, sex and age were constituents of the social categories of gender and social age. Within these societies, gender systems appear to have been linked to the sex of the individual, as this had an influence on burial selection practices and is correlated to the funerary treatment they received. This shows how, in general, there were different social perceptions of biologically male and female individuals and how they should be treated after death. This is not to say that there were not more genders than two. However, detecting third genders through the funerary record is complicated and is beyond the scope of this study, as it would require a site-by-site approach. Regarding age, social age systems seem to have been partly linked to a dichotomy between childhood and adulthood, but with youth and the elderly also playing an important role. Disabilities and life-altering pathologies do not seem to have created new social categories. Lastly, there are too few cases of animals undergoing funerary treatment to reach any conclusions about this aspect of the mortuary record.

Chapter 9: Conclusions

The analyses of the use of landscape, modifications of the funerary space, funerary offerings, treatment of the body and the social role of the deceased have shown that, in Western Europe, there are many continuities in the type of treatment given to the deceased from the Upper Palaeolithic to the Early Neolithic. However, some changes can also be observed. These take place around 7500–6000 cal BC and seem to be the result of processes that started between 14000 and 10000 cal BC, depending on the variable being analysed. These changes are not linked diachronically to the progression of archaeological periods, as many of the most dramatic changes, such as the deposition of the deceased in large cemeteries, were carried out by Mesolithic populations.

9.1. Funerary practices in Western Europe before c. 7500–6000 cal BC

Before 7500–6000 cal BC, the bodies of the deceased were deposited in small numbers (usually one and almost always below ten individuals) inside domestic contexts, usually placed in caves and rockshelters. No human remains were found at open-air sites before c. 14000 cal BC; the deceased seem to have been deposited during the occupation of the sites in funerary spaces that were not separated or delimited from the daily life structures. In addition, the sites do not seem to have been abandoned after the deposition of the remains. From c. 10000 cal BC, some of the deceased were found in shell middens, mounds of shells that could be in association with habitation sites and were potentially rubbish heaps.

Modifications of the funerary space were also extremely unusual. These were the use of location markers, sealing methods, furnishings and fire and mineral colourant within the burial context. However, location markers and furnishings were likely to have been made of perishable materials and so it is impossible to know to what extent their scarcity is real or the result of preservation biases. Mineral colourant and fire applied to the body were also unusual, as was the deposition of funerary offerings. The few funerary offerings recovered from before c. 7500 cal BC usually consisted of flint flakes and blades, ornaments made of teeth (frequently of red deer), unmodified faunal remains and, between c. 25500 cal BC and

c. 21000 cal BC, unmodified shells. There were also some painted pebbles and ochre nodules.

Buried individuals are extremely rare before c. 21500 cal BC and buried remains only outnumber unburied ones after c. 9500 cal BC. It is impossible to know to what extent the lack of graves represents the true picture or is a result of preservation issues or simply a lack of information. Nevertheless, burial was likely an unusual funerary practice. This would partly explain the absence of human remains in open-air sites before c. 14000 cal BC, as, like caves, deep burials offer stable environmental conditions that improve the chances of survival of bone. Though, unlike caves, deep graves offer protection from scavengers. Leaving non-buried deceased in open-air locations might have resulted in the complete disappearance of the remains.

The unusuality of burial is likely one of the reasons behind the poor preservation of many remains from the Upper Palaeolithic to the Early Neolithic. It is impossible to know the body treatment received by 602 out of the 1984 (30.3%) individuals from the study region as they were heavily affected by taphonomic processes and only a few bones have been recovered –in 87 cases (14.5%) only teeth. There are also 220 individuals (11.1%) whose original mode of deposition is unclear. Several of these are thought to have been originally complete bodies in primary positions..

Leaving the deceased unburied in unmodified funerary contexts and with no funerary offerings, on the one hand, and depositing them in daily life spaces mixed with domestic structures, on the other, is likely related to what has been called strategies of hiding death, funerary practices that effectively destroy or hide the bodies of the deceased. Burying the bodies under houses, depositing the bodies in trees to ensure their disappearance by natural causes, the abandonment of the deceased in places to which the group will never return, cremation, defleshing, or even endocannibalism are common strategies of hiding death. These behaviours have been observed in recent hunter-gatherer and horticultural societies. For example, societies, such as the Hadza of Tanzania or the Mbuti Pygmies of Zaire, leave the deceased *in situ* and avoid that place thereafter. If the person dies in the village, the group moves to a new place. Other examples include the Bororo and Yanomami of Amazonia. The Bororo deposit the deceased’s bones in an urn which is then thrown into the nearest river, whereas the Yanomami eat the ashes of their dead.

Several groups whose funerary behaviours destroy the evidence of death also make special efforts to forget their past, generating an illusion of everlasting present. This has led some authors to interpret the hiding of death as a response to a fear of the passing of time and the discontinuities generated by it. In this scenario, change would be perceived as a risk for the continuity of the group. Destruction of the evidence of death in the course of funerary practices might not be intentional in all cases. In many societies that carry out these practices, the treatment given to the deceased is considered a way of ending the former status of the person and creating or destroying a nexus with the new one. This is particularly the case of secondary mortuary practices, which were more frequent before c. 7500 cal BC, as they are likely evidence of death being seen as a long process rather than a discrete event.

Where the original manner of deposition is known, most remains consisted of a few disarticulated bones and, less frequently, skulls, isolated bones and ornaments made of human bone. All of these practices were similarly frequent, except for skulls and isolated bones. Skulls were more frequent during the Solutrean. Isolated bones occur after c. 9120 cal BC and were always scarce.

All disarticulated remains were found in collective funerary spaces, most of them in multiple deposits and mixed with domestic structures. Disarticulation may have been a way of hiding the dead under living structures or ensuring the continuation of the deceased in the social sphere, particularly where the remains were not buried. That disarticulated individuals are usually in multiple deposits could indicate that their identity was constructed more through relationality (through social links, actions, the body and material culture) than individuality (through self-reflection). Thus, the deposition of disarticulated remains in multiple deposits might have been a way of strengthening the community.

Individuals receiving this type of body treatment were those more likely to be deposited with funerary offerings and, between 11000–6500 cal BC, most individuals with ochre applied to the body were disarticulated. The presence of these symbolic elements likely shows that disarticulation was not carried out as a way of hiding the remains. However, disarticulated individuals with ochre applied to the body were not common in the study region; they come from a few caves of exclusive funerary use located in a small area in Belgium, dated between 9110 cal BC and 7990 cal BC.

Skulls are found in approximately equal proportions in delimited and mixed, individual and collective funerary spaces, as well as in individual and multiple funerary deposits. This points to the secondary treatment of skulls being a transforming process applied to a body part that represents the whole of the individual, either as a way of creating a nexus with the individual in its new status or as a way of preventing the deceased from returning. In many societies, the head is the most important part of the person, representing the person as a whole, its sacred part, or where their power lies. Skulls can be deposited in funerary spaces or kept by the families as a way of keeping their loved ones nearby after death (*e.g.*, the Kiwai Papuans). Ornaments made of human bone appear mainly in non-funerary spaces. Jewellery made of parts of the deceased, for example, necklaces made of teeth or lower maxillae, is not an uncommon occurrence among hunter-gatherers and horticulturalists to maintain the presence of the deceased in the social sphere. Thus, it is expected that these remains will occur in domestic spaces rather than funerary ones**.**

Regardless of the specific interpretation, what the prevalence of secondary mortuary treatment of the deceased points to is that, in most human groups, before c. 7000 cal BC, people were understood as partible entities or *dividuals*, where each part equals the whole, rather than *individuals*, and, as a consequence, they were not concerned with the preservation of the integrity of the body. There are a few individuals that were deposited as complete bodies and most of these were in non-abandoned delimited funerary spaces. This shows that, throughout this period, some groups were concerned with the preservation of the integrity of the body, even if it was the exception. Unlike individuals in a secondary position, they were usually in individual funerary deposits. This might signify an interest in the preservation of the integrity of the body related to a more developed individuality, both in the sense of the body being understood as an indivisible entity and of a more developed individual identity construction.

Regarding differences in the treatment of individuals according to their social role, men were more often deposited with funerary offerings than women and the types of offerings were also different. Men were more frequently associated with tools and equipment and unmodified faunal remains and/or shells and women with ornaments. The consistently smaller number of women with funerary offerings might be a result of different factors, such as a perceived lesser relevance of women in society, that the tasks carried out by women required fewer tools than those carried out by men, or merely that women were more frequently associated with items made of perishable materials (*e.g.*, textiles, plant fibres and weaving tools).

The more frequent association of women with ornaments might be the result of the materials used for male ornaments being less likely to be preserved. Different materials might have been used for male and female ornaments since materials can act as group belonging markers for specific gender groups. Another possibility is that ornamentation more often played a central role as a technology of self in the case of women. This phenomenon has been observed in some recent hunter-gatherer societies in which women use more ornamentation than men, such as the Bororo (Amazonia) and the Gumuz or the Dats'in (Ethiopia) and in the Linear Pottery Culture. Since ornamentation is usually used as a group belonging marker, the more frequent association of women with ornamentation could be explained by women's identity being more relational than that of males and, thus, more constructed through their relationship with the group.

On the other hand, adults and subadults were equally associated with funerary offerings. From c. 10000 cal BC, subadults represent a third of the total number of individuals in non-shell midden sites and 17% of individuals in shell middens. Mortality hazard in hunter-gatherer, foraging and agriculturalist societies is highest under the age of ten and, particularly, under the age of one. Hence, the scarcity of subadults might be a result of taphonomic or research bias, as subadult bones are less well preserved due to the lower bone density; also, they were sometimes overlooked or discarded in excavations. However, this might also be the result of a very large number of attritional deaths among adults or of burial selection practices that were more prominent in shell midden societies. Furthermore, subadults were more commonly deposited in multiple deposits and disarticulated than adults and more commonly associated with unmodified faunal remains and/or shells, while adults were more frequently associated with tools and equipment. This could be the result of the subadult's identity being perceived as more relational and/or having a less developed social persona**.**

To summarise, the most common treatment given to the deceased before c. 7500–6000 cal BC appears to have been leaving bodies unburied or burying them disarticulated, mixed with domestic structures. Sites with funerary remains usually only contained one individual and when they contained more (almost always less than ten), they were placed together, rather than in individual deposits. The funerary context was rarely modified and the bodies were not frequently fire affected nor presented use of mineral colourant. The presence of funerary offerings was unusual as well. Finally, men and women were deposited with different types of funerary offerings, as well as adults and subadults. Subadults were underrepresented in funerary spaces and they were more often deposited disarticulated and in multiple deposits. This, regardless of more specific interpretations, shows that the gender and social age of the deceased played a role in funerary practices.

9.2. Funerary practices in Western Europe after c. 7500–6000 cal BC

Processes that started between c. 14000 and c. 10000 cal BC culminated around 7500-6000 cal BC, resulting in changes in the overall picture of funerary practices in Western Europe. Nevertheless, continuities can be observed. Human remains were still frequently placed in domestic spaces. However, these domestic spaces moved from caves and rockshelters to open-air locations, first in the Linear Pottery Culture area, then, c. 5500 cal BC, in the remainder of the study region. Funerary spaces were still rarely abandoned after human remains were deposited and there was an increasing frequency of delimited funerary spaces. Nevertheless, funerary places mixed with domestic structures were still more common. Most modifications of the funerary space (location markers, sealing methods, furnishings and fire and mineral colourant within the context) remained rare.

The size of these funerary spaces also changed, but only in a few places. MNI was still frequently under 10 individuals, but we now see cemeteries with more than 10 individuals and even some with hundreds of burials. Of the 177 sites dated after 7500 cal BC, only 38 sites contained 10 or more individuals, 13 sites contained 30 or more individuals, and only 2 contained more than 100 individuals. These sites were mostly concentrated in two areas: the Portuguese shell middens and, in lesser measure, the Linear Pottery Culture area. Most of these cemeteries were still inside settlements, although some (*e.g.*, Ingenheim) were in nearby locations.

One reason for the change might be the climatic warming at the beginning of the Holocene since funerary spaces are usually linked to domestic sites and these might have moved to open-air locations in the search for arable land. However, several of the sites in open-air locations are not Neolithic and cannot be explained in the same way. Another influencing factor could be a generalisation of inhumation as funerary practice, as buried remains are better preserved than non-buried ones, especially in open-air locations. Buried individuals, which had outnumbered unburied ones at c. 9500 cal BC, increased further c. 7000 cal BC. The use of death exhibition strategies needs to be considered, especially in the case of delimited cemeteries, but also in the case of non-abandoned delimited smaller burial grounds. Death visibility has often been linked to territorial behaviour and the demarcation of territories. In this view, cemeteries and, sometimes, smaller collective funerary spaces would act as territorial markers.

The results of this thesis indicate that a degree of territorial behaviour might have existed among some groups from c. 7500 cal BC. For these groups, the reiterative deposition of the deceased in a visible place would have created meaningful ‘persistent places’ to be seen and remembered, both by the group inhabiting the land as a way to legitimise their existence and use of the land through their ancestors, and by other groups to transmit this same message. However, before c. 4500 cal BC, this type of behaviour was always the exception.

Furthermore, there was an apparent shift of meaning of individual funerary spaces; before c. 7000 cal BC, individuals in individual funerary spaces were rarely associated with funerary offerings but thereafter were likely to have them. This is even clearer after c. 5000 cal BC, when nearly all individuals deposited in individual funerary spaces had funerary offerings. This meaning shift might have been caused by single depositions starting to be used as a way of giving special funerary treatment to some individuals rather than as an attempt to hide corpses.

The great majority of individuals, from after c. 7500 cal BC, were deposited as complete bodies. This type of body treatment started to increase in frequency c. 9500 cal BC and outnumbered all other treatments by c. 7500 cal BC. The prevalence of complete individuals as well as their being mostly placed in single burials shows an increasing interest in the preservation of the integrity of the body and a higher-level perception of individual identity. The exception to this is the area of the in the Mediterranean Coast and the Pyrenees, where complete individuals were usually deposited in multiple deposits, perhaps showing greater importance of relationality in this area. Furthermore, complete individuals were usually deposited inside delimited collective funerary spaces, either cemeteries or smaller burial grounds inside settlements, indicating that this was the type of body treatment given to individuals used to mark territories.

Secondary mortuary treatment did not disappear, except human bone ornaments. The number of disarticulated individuals increased from 6500 cal BC, but at a lower rate than for complete bodies. Some individuals who were deposited complete or disarticulated start to show evidence of post-decomposition bone removal. Half of these individuals with bones removed were partly cremated, perhaps due to fire being used as a secondary mortuary treatment to remove the remaining soft tissue after they were naturally defleshed. These partially cremated remains occur at sites in the Cantabrian Mountains and the Pyrenees. As well as partial cremations, from 6500 cal BC, full cremations existed in the Linear Pottery Culture area, although most were Mesolithic. Cremated remains were mostly found in caves, although some occur in open-air cemeteries, often in sealed graves. These individuals frequently had funerary offerings, suggesting that cremation was not practised simply as a way of ensuring the disappearance of the body.

Complete individuals became those most likely to have ochre applied to their body, to be in marked graves and to be deposited with funerary offerings –even though these practices were still unusual in most of the study region. Nevertheless, ochre, both within context and applied to the body, was common in the Linear Pottery Culture. Funerary offerings were common in this and in the area of the Mediterranean Coast and the Pyrenees, as well as at Téviec and Hoëdic, and individuals with funerary offerings outnumbered individuals without them c. 5000 cal BC. Offerings frequently consisted of pottery, flint blades, bladelets and flakes, adzes, ornaments made of shell and unmodified faunal remains and/or shells. Some cereals, ochre nodules, painted pebbles and bone figurines were also found in funerary contexts. Figurines were exclusive to the Linear Pottery Culture area.

Téviec, Hoëdic and the Linear Pottery Culture area were the only places that had a well-defined cultural tradition regarding the types of offerings to include in graves. In the Linear Pottery Culture, this is mainly reflected in the *Spondylus* shells, either unmodified or made into ornaments; while at Téviec and Hoëdic almost all individuals were buried with shells, both unmodified and as part of ornaments, of very specific species (mainly *Littorina*, *Cypraea* and *Tritia reticulata*). These were accompanied by red deer antlers, bone pins and well-defined sets of tools in which lithic blades played an important role. These cultural traditions are likely ways of demonstrating belonging to a group, either to society in general (as seems to be the case with bone pins at Téviec and Hoëdic) or to a subgroup within society, as in the case of females with periwinkles and males with cowries.

These well-defined traditions can only be traced in the case of offerings and, in the case of the Linear Pottery Culture, the use of mineral colourant. In other aspects, there were huge differences in the treatment of the deceased from site to site. For example, ochre is very common at Téviec but not at Hoëdic, and Téviec has a mixed funerary space but Téviec has a delimited one. Moreover, each site of the Linear Pottery Culture area has its preference regarding the position and orientation of the deceased. This likely shows that material culture was used as a way of performing ethnicity, defined as 'feelings of social belonging based on culturally constructed notions of a shared origin' (Lucy, 2005: 101), or other types of communal identities, that do not have to do with cultural uniformity. This can be observed among some modern hunter-gatherer and horticultural groups that have cultural ties with neighbouring residential groups (*e.g.*, the Telefol of Papua New Guinea). These groups use elements of material culture to enact their sharing of an origin, although they can have several cultural differences. Furthermore, the items can have stylistic differences, depending on the group, to acknowledge their differences.

In terms of the funerary treatment given to individuals according to their social roles, most of the differences appeared after c. 6500 cal BC and the few pre-existing ones became more pronounced after that time. After c. 6500 cal BC, the differences between the offerings associated with males and females became more pronounced, with men even more frequently associated with tools and equipment and unmodified faunal remains and/or shells and women with ornaments. In this respect, the Linear Pottery Culture is remarkable, as *Spondylus* ornaments are associated with both sexes, but they were usually the only type of offering associated with women, while men also had toolsets.

Also after c. 6500 cal BC, the number of subadults in shell middens increased, representing one-third of the individuals in shell midden and non-shell midden sites combined. It is worth noting the low numbers of infants and that more than half of infants come from just two sites, Téviec and Moita do Sebastião. In part, this may reflect taphonomic effects on the bones of infants or research bias against the recovery of child remains in old excavations. The near-absence of infants could also be due to cultural factors. In some hunter-gatherer and horticultural societies, individuals under the age of one are not considered persons and, thus, are either not buried or are buried in a different location from the rest of the group.

Subadults were more frequently deposited in multiple deposits and disarticulated than adults. They were also more frequently associated with unmodified faunal remains and/or shells. Conversely, adults had more tools and equipment. After c. 6500 cal BC, the unmodified remains deposited with subadults were usually faunal remains, frequently bovids, while those with adults were usually shells. Most associations of subadults with unmodified shells come from the Linear Pottery Culture area. Generally, the ornaments associated with subadults were often teeth and, those with adults, shells. It could be that these materials were thought to bring different benefits (*e.g.*, protection, fertility) or that certain properties of shells, bovids and teeth were culturally associated with age**.**

After c. 6500 cal BC, differences appear in the treatment of adults, depending on their age. From then on, the number of young adults (18-25 years) increases and exceeds all others. This high representation of young adults is surprising, as the mortality hazard in recent hunter-gatherer and horticultural societies is at its lowest between the ages of 10 and 40. The high representation of individuals between 18 and 25 years old could, thus, be the result of more attritional deaths (*e.g.*, accidents, homicides, etc.) among this age group. It may also indicate burial selection practices that favour young adults.

Adults older than 46 years (mature adults) start to receive a different funerary treatment than younger adults. They were rarely deposited with ornaments as funerary offerings and none were made of shell, which is the material most commonly used to make ornaments. They were preferentially buried in caves and small burial grounds inside settlements, while younger adults were usually placed in cemeteries and open-air locations. Likely, this is partly but not exclusively the result of them being virtually absent from shell middens, where the largest cemeteries are located. This near-absence may be the result of one of two factors: either a lower life expectancy in shell midden societies or burial selection that excluded mature adults. Distinct funerary treatments received by mature adults may result from different and sometimes opposing factors, such as mature adults being more or less respected than other individuals, or equally respected but treated differently.

Lastly, there were some individuals with life-altering pathologies. These people were not treated differently from other individuals, which could be interpreted as evidence of compassion. The sample is, however, too small to draw firm conclusions in this respect. The same applies to animal burials with only three clear examples from the study region that were treated similarly to their human counterparts. Their scarcity might be due to animals being less commonly integrated as members of human groups or being subject to burial selection practices, the sample is, again, too small to reach firm conclusions.

To summarise, after c. 7500–6000 cal BC, the most common treatment given to the deceased changed from leaving bodies unburied or burying them disarticulated in multiple deposits to burying most individuals as complete bodies in individual deposits. The exception was the Mediterranean Coast and the Pyrenees, where individuals were usually deposited in multiple burials. Funerary spaces mixed with domestic structures remain most common, but delimited funerary spaces increase dramatically in frequency. Sites containing one individual always remained the most common, but the meaning of single funerary spaces seem to have changed and cemeteries commence. The funerary context was rarely modified except for in the Linear Pottery Culture area, where ochre was common. Some bodies were fully or partly cremated, although this remained an unusual practice. The presence of funerary offerings remained unusual, although the number of individuals with offerings increased and outnumbered those without offerings by c. 5000 cal BC.

Men were more likely to be associated with tools and other equipment, and women, who had less offerings, were more associated with ornaments. Adults and subadults were associated with different types of offerings and their ornaments were made of different materials. Subadults remain underrepresented in funerary spaces, especially infants, who were still more often deposited disarticulated and in multiple deposits. Adults of different ages also start to be treated differently, with young adults now becoming overrepresented in funerary spaces and mature adults now deposited in different contexts than other adult individuals. This shows how, after c. 7500–6000 cal BC, gender and social age became more important than before for deciding what type of funerary treatment should be given to members of society. Lastly, there were some instances of individuals with life altering pathologies, but they do not seem to have been treated differently than the other members of society: implying that disabilities did not generate new social categories. Nevertheless, the cases are too few to have absolute conclusions and the same can be said for animals in funerary contexts.

9.3. Summary of main findings

There are several changes in funerary practices from the Upper Palaeolithic to the Early Neolithic of Western Europe, most occurring or culminating around 7500–6000 cal BC. The main changes are those regarding the treatment of the body, that went from a predominance of secondary mortuary practices to that of primary deposition of complete bodies, the use of burials, the change from multiple to individual deposits except for in the Mediterranean Coast and the Pyrenees, and changes in the offerings deposited alongside the deceased – including the virtual disappearance of ornaments made of deer teeth, the appearance of pottery equipment, and the appearance of cultural traditions regarding offerings in Téviec, Hoëdic and the Linear Pottery Culture area (*e.g.*, the *Spondylus* shells). The influence of gender and social age in funerary customs becomes more prominent after that time, although several of the differences were pre-existing.

Nevertheless, there were also continuities. The context in which the remains were deposited changed very little: most sites still contained one individual and there were only a few containing more than ten; the funerary space was still rarely modified, except for the use of graves, and, even if the frequency of delimited funerary spaces increased, funerary remains were still frequently deposited in the same area as the domestic structures. Furthermore, most of the changes were not linked to the progression of archaeological periods. Bodies were deposited complete and in single burials in both Mesolithic and Neolithic sites, and differences in age and sex existed in every period, even if they manifested in different ways. Delimited funerary spaces are evident in both the Mesolithic and Neolithic, and most cemeteries, especially the very large ones, were Mesolithic. By contrast, the area of the Mediterranean Coast and the Pyrenees was the place in which funerary customs changed least: maintaining burials in caves and multiple deposits. However, material culture does appear linked to the progression of periods. This is unsurprising, as periods were defined partly on material culture typo-chronologies.

Anatolian farmer migrations had a big impact on the Iberian gene pool during the Early Neolithic (Olalde *et al.*, 2019). However, the evidence presented in this thesis shows that these migrations were unlikely to be the driving force for change regarding funerary practices nor the cultural changes responsible for them (*e.g.*, territoriality as an influence for death exhibition or an interest in the preservation of the body as an influence for the increase in primary burials), or at least not the only one.

9.4. Strengths and limitations

This thesis has successfully achieved its aim of collating all available data on human remains from the Upper Palaeolithic, Mesolithic and Early Neolithic from Portugal, Spain, France, Luxembourg, Belgium, Switzerland and Andorra. Variations and continuities in mortuary practices through time and space were assessed and the interpretation of the results offered some new approaches to the study of funerary remains from the Upper Palaeolithic to the Early Neolithic of Western Europe.

The most obvious limitation of this project is the scarcity of remains from the analysed periods, with only 368 sites and 1984 individuals for a time span of 43,500 years. The sample size has conditioned the way data were analysed, as geographically distant sites with different chronologies had to be analysed together. Even so, sometimes the number of cases was very low for some of the analyses, particularly from the Upper Palaeolithic.

The state of preservation of most of the remains and changing research methods have also been important limitations to the project. The information available is biased, especially in the case of unburied remains. In part, this reflects taphonomic processes, as bone is better preserved in deep burials, especially in open-air locations, while most of the human remains left unburied in open-air locations will have disappeared. However, research biases have probably also shaped the available information about non-buried human remains. Archaeologists have placed importance on the meaning of the act of burial, equating it to a funeral. As a result, non-buried remains have been frequently considered as evidence for a lack of funerary behaviour: something that contradicts the ethnographic record, and as a result, these remains have received less research attention compared to buried individuals.

To a lesser extent, taphonomic and research biases have also affected the preserved record. Examples include their impact on the quality of information about the physical context of the remains (its relationship with the other finds in the site), especially in Iberia where it was frequently unspecified; information about the sex and age of the individuals, which could only be assessed in a few cases; information about funerary offerings, as some made of organic materials may have perished, and existing information was frequently focused on typology rather than materials; information about animal burials, as papers were focused more on domestication; or information about the original treatment given to the body, which, due to preservation issues, is frequently difficult to discern.

As a result, some of the theories discussed in this thesis, especially those regarding burial as an unusual practice, are based on a small quantity of data. Despite all the limitations, I would argue that the large quantity of data collated is a strength of the project, as it is one of the most ambitious data collations done of Western European funerary remains from the periods in question. The interpretations offered are also a strength of this thesis. They are based on an innovative method: Monte Carlo simulations, as well as others more widely used (χ^2 tests and ArcGIS maps), and they undeniably represent an advance in knowledge of the topic.

9.5. Implications and future directions

This research has produced some relevant findings. They show how c. 7500–6000 cal BC several changes in funerary practices occurred in Western Europe. The main changes are that the deceased started to be buried rather than left unburied, that individuals started to be generally deposited complete and in single deposits rather than disarticulated in multiple deposits, changes in the offerings deposited alongside the deceased, the appearance of cultural traditions regarding offerings at Téviec, Höedic and in the Linear Pottery Culture area, and an increasing influence of gender and social age in funerary customs.

Regarding the limitations discussed above, I am confident that future research on funerary customs through time and space in Western Europe and its social implications will provide more data on funerary remains dating to the Upper Palaeolithic to the Early Neolithic, allowing these hypotheses to be tested more rigorously. Future research will hopefully benefit from another important element of this thesis: the data collated during the process, which is presented in Microsoft Excel data tables.

Appendix I:
Data table by site

Appendix II: Data table by individual

Appendix III:
Data table by funerary offering

Appendix IV:
Data availability per variable

	Chapter 4: Locations							
	By site				By individual			
	Sure		All		Sure		All	
	N	%	N	%	N	%	N	%
Location	346	94%	346	94%	1953	98.4%	1953	98.4%
Shell midden	330	89.7%	332	90.2%	1930	97.3%	1944	97.9%
Collective funerary space	299	81.2%	315	85.6%	1871	97.1%	1926	97.1%
MNI	317	86.1%	317	86.1%	-	-	-	-
Site type	267	72.5%	294	80.2%	1756	88.5%	1850	93.2%
Delimited / Mixed	125	34%	140	38%	1202	60.6%	1295	65.3%
Abandoned/Non-abandoned	122	33.1%	140	38%	1358	68.4%	1412	71.2%

Table 5: Data availability for the variables analysed in Chapter 4: Death and the use of landscape

	Chapter 5: Modifications of the funerary context							
	By site				By individual			
	Sure		All		Sure		All	
	N	%	N	%	N	%	N	%
Grave	199	54.1%	223	60.6%	1262	63.6%	1358	68.4%
Location marker	223	60.6%	253	68.7%	1001	50.4%	1194	60.2%
Sealed	244	66.3%	250	67.9%	1212	61.1%	1265	63.8%
Furnishings	231	62.8%	245	66.6%	1042	52.5%	1192	60%
Fire	243	66%	251	68.2%	1118	56.3%	1154	58.2%
Fire within context	242	65.8%	246	66.8%	1094	55.1%	1143	57.6%
Mineral colourant	242	65.8%	248	67.4%	1193	60.1%	1210	61%
Colourant within context	239	64.9%	245	66.6%	1137	57.3%	1206	60.8%

Table 6: Data availability for the variables analysed in Chapter 5: Modifications of the funerary context

	Chapter 6: Funerary offerings							
	By site				By individual			
	Sure		All		Sure		All	
	N	%	N	%	N	%	N	%
Presence of funerary offerings	248	67.4%	262	71.2%	1179	59.4%	1271	64.1%
Quantity of funerary offerings	254	69%	254	69%	1117	56.3%	1143	57.6%
Type of funerary offering	252	68.5%	258	70.1%	1136	57.3%	1163	68.6%
Presence and quantity of tools	254	69%	254	69%	1122	56.5%	1143	57.6%
Use of tools	-	-	-	-	37	1.9%	37	1.9%
Presence and quantity of ornaments	253	68.7%	253	68.7%	1150	58%	1159	58.4%
Use of ornaments	-	-	-	-	20	1%	20	1%
Presence and quantity of faunal remains / shells	253	68.7%	253	68.7%	1151	58%	1155	58.2%
Presence and quantity of plants and derivatives	253	68.7%	253	68.7%	1157	58.3%	1157	58.3%
Presence and quantity of portable art	253	68.7%	253	68.7%	1154	58.2%	1155	58.2%
Ochre nodules	243	66%	245	66.6%	1188	59.9%	1206	60.8%

Table 7: Data availability for the variables analysed in Chapter 6: Funerary offerings (1)

	By funerary offering			
	Sure		All	
	N	%	N	%
Type of funerary offering	828/913	90.7%	848/913	92.9%
General object type	850/913	93.1%	874/913	95.7%
Tool general object type	357/359	99.4%	358/359	99.7%
Ornament general object type	258/267	96.6%	264/267	100%
Unmodified faunal remains/ shells general object types	166/174	95.4%	174/174	100%
Material category	835/913	91.4%	843/913	92.3%
Tool materials	352/359	98%	352/359	98%
Ornament materials	247/267	92.5%	247/267	92.5%
Ornament composition	206/267	77.1%	206/267	77.1%
Use-wear	63/913	6.9%	63/913	6.9%
Animal species / geology type	477/913	52.2%	483/913	52.9%
Tool's animal species/ geology type	109/359	30.4%	109/359	30.4%
Ornament's animal species / geology type	186/267	69.7%	186/267	69.7%
Species of unmodified faunal remains / shells	144/174	82.7%	153/174	87.9%
Animal body parts	130/446	29.1%	130/446	29.1%
Tool animal body parts	3/359	0.8%	3/359	0.8%
Ornament animal body parts	48/267	18%	48/267	18%
Body parts of unmodified faunal remains	72/104	69.2%	72/104	69.2%

Table 8: Data availability for the variables analysed in Chapter 6: Funerary offerings (2)

	Chapter 7: The treatment of the body							
	By site				By individual			
	Sure		All		Sure		All	
	N	%	N	%	N	%	N	%
Primary / secondary	215	58.4%	245	69%	1140	57.5%	1332	67.1%
Body treatment at deposition	207	56.2%	256	69.6%	1161	58.5%	1382	70%
Fire affected body	239	64.9%	246	66.8%	1117	56.3%	1143	57.6%
Post- decomposition bone removal	242	65.8%	246	66.8%	1330	67%	1368	69%
Position	100/ 155	64.5%	115/ 165	69.7%	458/ 855	53.6%	470/ 933	50.4%
Flexed degree	94/ 155	60.6%	107/ 165	64.8%	452/ 855	52.9%	460/ 933	49.3%
Lateralization	56/ 66	83.3%	66/ 76	86.8%	191/ 237	80.6%	194/ 240	80.8%
Head orientation	74/ 155	47.7%	81/ 165	49.1%	399/ 855	46.6%	402/ 933	43.1%
Mineral colourant on body	241	65.5%	246	66.8%	1168	58.9%	1207	60.8%
Individual / multiple	241	65.5%	252	68.5%	1160	58.5%	1306	65.8%

Table 9: Data availability for the variables analysed in Chapter 7: The treatment of the body

	Chapter 8: Death and the social role of the deceased							
	By site				By individual			
	Sure		All		Sure		All	
	N	%	N	%	N	%	N	%
Sex	145	39.4%	150	40.8%	501	25.2%	545	27.5%
Adult/Subadult	247	67.1%	254	69%	1316	66.3%	1324	66.7%
Age group	-	-	-	-	710	35.8%	715	36%
Age range (min)	-	-	-	-	1248	63%	1248	63%
Age range (max)	-	-	-	-	681	34.3%	681	34.3%
Life altering pathologies	25	6.8%	55	14.9%	118	5.9%	175	8.8%
Activity markers	-	-	-	-	51	2.6%	51	2.6%
Animal funerary treatment / Species	346	94%	346	94%	1963	98.9%	1963	98.9%

Table 10: Data availability for the variables analysed in Chapter 8: Death and the social role of the deceased

Appendix V:
Tables with the χ2 and Kruskal-Wallis test p-values[4]

χ^2 p-values

Chapter 4: Death and the use of landscape

		Shell middens		
		14000-7000	**7000-5500**	**5500-4500**
Location	**By site**	0.056		
		0.151	0.110	0.304
	By individual	0.000		
		0.000	0.000	0.000

Table 11: χ^2 p-values for the variable 'Shell midden' by site and individual

		Collective funerary spaces					
		48000-24000	**24000-14000**	**14000-10000**	**10000-7000**	**7000-5500**	**5500-4500**
Location	**By site**	0.024					
		0.563	0.836	0.859	0.946	0.001	0.004
	By individual	0.000					
		0.705	0.854	0.206	0.263	0.000	0.000
Shell midden	**By site**	0.989					
		-	-	0.401	0.103	0.269	0.783
	By individual	0.000					
		-	-	0.351	0.195	0.000	0.000

Table 12: χ^2 p-values for the variable 'Collective funerary space' by site and individual

[4] Continuity correction values have been taken into consideration but are not registered in these tables.

		MNI				
		48000-24000	24000-10000	10000-7000	7000-5500	5500-4500
Location	**By number**	0.729				
		0.229	0.777	0.457	0.985	0.995
	By category	0.002				
		0.491	0.823	0.294	0.055	0.214
Shell midden	**By number**	0.000				
		-	0.738	0.214	0.016	0.005
	By category	0.000				
		-	0.675	0.063	0.008	0.064
Collective funerary space	**By number**	0.000				
		0.000	0.000	0.000	0.000	0.000
	By category	0.000				
		0.000	0.000	0.000	0.000	0.000

Table 13: χ^2 p-values for the variable 'MNI' by site

		Site type				
		48000-24000	24000-10000	10000-6500	6500-5500	5500-4500
Location	By site	0.000				
		0.544	0.245	0.046	0.018	0.161
	By individual	0.000				
		0.742	0.010	0.000	0.000	0.000
Shell midden	By site	0.000				
		-	0.365	0.027	0.002	0.003
	By individual	0.000				
		-	0.065	0.000	0.000	0.000
Collective funerary space	By site	0.000				
		0.039	0.118	0.059	0.055	0.071
	By individual	0.000				
		0.004	0.001	0.000	0.000	0.000
MNI	By number	0.000				
		0.119	0.531	0.000	0.053	0.226
	By category	0.000				
		0.148	0.477	0.000	0.000	0.000

Table 14: χ^2 p-values for the variable 'Site type' by site and individual

		Delimited / Mixed				
		48000-24000	24000-11000	11000-7500	7500-6000	6000-4500
Location	By site	0.153				
		0.891	0.884	0.073	0.364	0.261
	By individual	0.000				
		0.650	0.361	0.013	0.000	0.000
Shell midden	By site	0.041				
		-	-	0.430	1	0.074
	By individual	0.000				
		-	-	0.051	0.000	0.000
Collective funerary space	By site	0.019				
		0.142	0.916	0.370	0.599	0.391
	By individual	0.000				
		0.002	0.607	0.939	0.001	0.001
MNI	By number	0.009				
		0.132	0.390	0.662	0.431	0.077
	By category	0.008				
		0.065	0.768	0.496	0.122	0.023
Site type	By site	0.001				
		0.527	0.660	0.772	0.805	0.007
	By individual	0.000				
		0.902	0.000	0.117	0.000	0.000

Table 15: χ^2 p-values for the variable 'Delimited / Mixed' by site and individual

		Abandoned / Non-abandoned			
		48000-32000	32000-10000	10000-6000	6000-4500
Location	By site	0.166			
		-	0.734	0.022	0.286
	By individual	0.000			
		-	0.764	0.000	0.000
Shell midden	By site	0.172			
		-	-	0.089	0.196
	By individual	0.000			
		-	-	0.000	0.000
Collective funerary space	By site	0.479			
		-	0.340	0.523	0.078
	By individual	0.000			
		-	0.012	0.014	0.000
MNI	By number	0.982			
		-	0.998	0.338	0.901
	By category	0.688			
		-	0.905	0.173	0.413
Site type	By site	0.000			
		-	0.000	0.019	0.002
	By individual	0.000			
		-	0.000	0.000	0.000
Delimited / Mixed	By site	0.026			
		-	-	0.091	0.433
	By individual	0.019			
		-	-	0.401	0.277

Table 16: χ^2 p-values for the variable 'Abandoned / Non-abandoned' by site and individual

		Grave				
		48000-21500	21500-18000	18000-10000	10000-6500	6500-4500
Location	By site	0.000				
		0.661	0.576	0.829	0.066	0.000
	By individual	0.000				
		0.309	0.063	0.269	0.000	0.000
Shell midden	By site	0.455				
		-	-	-	0.528	0.644
	By individual	0.000				
		-	-	-	0.000	0.000
Collective funerary space	By site	0.303				
		0.295	0.171	0.109	0.473	0.439
	By individual	0.003				
		0.943	0.101	0.000	0.863	0.227
MNI	By number	0.484				
		0.073	0.599	0.352	0.095	0.782
	By category	0.018				
		0.162	0.392	0.342	0.054	0.291
Site type	By site	0.081				
		0.301	0.361	0.552	0.220	0.490
	By individual	0.000				
		0.037	0.255	0.052	0.000	0.000

Delimited / Mixed	**By site**	0.021				
		0.054	-	0.391	0.247	0.622
	By individual	0.000				
		0.000	-	0.000	0.061	0.000
Abandoned / Non-abandoned	**By site**	0.812				
		-	-	0.040	0.319	0.277
	By individual	0.318				
		-	-	0.001	0.323	0.000

Table 17: χ^2 p-values for the variable 'Grave' by site and individual

		Location marker			
		48000-34000	**34000-11000**	**11000-6000**	**6000-4500**
Location	**By site**	0.686			
		0.567	0.825	0.208	0.362
	By individual	0.120			
		-	0.727	0.911	0.006
Shell midden	**By site**	0.352			
		-	-	0.366	0.668
	By individual	0.066			
		-	-	0.079	0.485
Collective funerary space	**By site**	0.072			
		0.165	0.298	0.220	0.635
	By individual	0.680			
		-	0.534	0.181	0.441

MNI	**By number**	0.001			
		0.003	0.248	0.142	0.083
	By category	0.093			
		0.003	0.519	0.004	0.492
Site type	**By site**	0.100			
		0.335	0.653	0.042	0.519
	By individual	0.000			
		-	0.533	0.014	0.015
Delimited / Mixed	**By site**	0.025			
		-	-	0.110	0.123
	By individual	0.000			
		-	0.005	0.220	0.006
Abandoned / Non-abandoned	**By site**	0.096			
		-	0.083	0.007	0.687
	By individual	0.512			
		-	-	0.552	0.873
Grave	**By site**	0.018			
		0.002	0.002	0.002	0.002
	By individual	0.018			
		-	0.001	0.081	0.892

Table 18: χ^2 p-values for the variable 'Location marker' by site and individual

		Sealed		
		48000-30000	30000-6000	6000-4500
Location	By site	0.998		
		-	0.619	0.084
	By individual	0.000		
		-	0.626	0.000
Shell midden	By site	0.217		
		-	0.138	0.362
	By individual	0.000		
		-	0.790	0.000
Collective funerary space	By site	0.045		
		-	0.327	0.122
	By individual	0.820		
		-	0.061	0.399
MNI	By number	0.005		
		-	0.055	0.172
	By category	0.214		
		-	0.024	0.335
Site type	By site	0.163		
		-	0.113	0.946
	By individual	0.312		
		-	0.053	0.052

Delimited / Mixed	**By site**	0.211		
		-	0.740	0.253
	By individual	0.623		
		-	0.278	0.270
Abandoned / Non-abandoned	**By site**	0.287		
		-	0.222	0.660
	By individual	0.691		
		-	0.274	0.926
Grave	**By site**	0.001		
		-	0.016	0.000
	By individual	0.000		
		-	0.012	0.017
Location marker	**By site**	0.000		
		-	0.000	0.000
	By individual	0.324		
		-	0.794	0.571

Table 19: χ^2 p-values for the variable 'Sealed' by site and individual

<table>
<tr><th></th><th></th><th colspan="3">Furnishings</th></tr>
<tr><th></th><th></th><th>48000-29000</th><th>29000-8000</th><th>8000-4500</th></tr>
<tr><td rowspan="4">Location</td><td rowspan="2">By site</td><td colspan="3">0.448</td></tr>
<tr><td>0.567</td><td>0.479</td><td>0.849</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="3">0.000</td></tr>
<tr><td>-</td><td>0.611</td><td>0.053</td></tr>
<tr><td rowspan="4">Shell midden</td><td rowspan="2">By site</td><td colspan="3">0.003</td></tr>
<tr><td>-</td><td>0.087</td><td>0.049</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="3">0.000</td></tr>
<tr><td>-</td><td>0.003</td><td>0.000</td></tr>
<tr><td rowspan="4">Collective funerary space</td><td rowspan="2">By site</td><td colspan="3">0.002</td></tr>
<tr><td>0.205</td><td>0.202</td><td>0.003</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="3">0.349</td></tr>
<tr><td>-</td><td>0.209</td><td>0.175</td></tr>
<tr><td rowspan="4">MNI</td><td rowspan="2">By number</td><td colspan="3">0.000</td></tr>
<tr><td>0.003</td><td>0.004</td><td>0.001</td></tr>
<tr><td rowspan="2">By category</td><td colspan="3">0.000</td></tr>
<tr><td>0.037</td><td>0.160</td><td>0.002</td></tr>
<tr><td rowspan="4">Site type</td><td rowspan="2">By site</td><td colspan="3">0.022</td></tr>
<tr><td>0.388</td><td>0.809</td><td>0.155</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="3">0.000</td></tr>
<tr><td>-</td><td>0.886</td><td>0.003</td></tr>
</table>

Delimited / Mixed	By site	0.914		
		-	0.923	0.844
	By individual	0.414		
		-	0.436	0.047
Abandoned / Non-abandoned	By site	0.201		
		-	0.077	0.542
	By individual	0.979		
		-	0.082	0.460
Grave	By site	0.002		
		0.000	0.015	0.081
	By individual	0.000		
		-	0.000	0.000
Location marker	By site	0.005		
		0.000	0.001	0.082
	By individual	0.008		
		-	0.807	0.016
Sealed	By site	0.000		
		-	0.000	0.002
	By individual	0.000		
		-	0.000	0.000

Table 20: χ^2 p-values for the variable 'Furnishings' by site and individual

		Fire within context		
		48000-33000	33000-10000	10000-4500
Location	By site	0.197		
		0.567	0.974	0.560
	By individual	0.000		
		-	0.809	0.005
Shell midden	By site	0.390		
		-	-	0.780
	By individual	0.597		
		-	-	0.840
Collective funerary space	By site	0.009		
		0.165	0.107	0.053
	By individual	0.606		
		-	0.009	0.873
MNI	By number	0.000		
		0.003	0.737	0.001
	By category	0.000		
		0.003	0.393	0.003
Site type	By site	0.170		
		0.335	0.197	0.390
	By individual	0.135		
		-	0.210	0.187

Delimited / Mixed	**By site**	0.009		
		-	0.050	0.102
	By individual	0.709		
		-	0.001	0.031
Abandoned / Non-abandoned	**By site**	0.015		
		-	0.000	0.269
	By individual	0.608		
		-	0.000	0.774
Grave	**By site**	0.000		
		0.002	0.002	0.000
	By individual	0.000		
		-	0.000	0.004
Location marker	**By site**	0.000		
		0.000	0.000	0.000
	By individual	0.000		
		-	0.000	0.000
Sealed	**By site**	0.000		
		-	0.000	0.000
	By individual	0.001		
		-	0.000	0.029
Furnishings	**By site**	0.000		
		0.000	0.000	0.000
	By individual	0.000		
		-	0.000	0.002

Table 21: χ^2 p-values for the variable 'Fire within context' by site and individual

		Mineral colourant within context			
		48000-37000	37000-9500	9500-6500	6500-4500
Location	By site	0.063			
		-	0.632	0.803	0.198
	By individual	0.000			
		-	0.368	0.000	0.000
Shell midden	By site	0.390			
		-	-	0.582	0.320
	By individual	0.005			
		-	-	0.114	0.002
Collective funerary space	By site	0.001			
		-	0.049	0.223	0.039
	By individual	0.221			
		-	0.152	0.644	0.242
MNI	By number	0.002			
		-	0.644	0.271	0.018
	By category	0.013			
		-	0.771	0.535	0.107
Site type	By site	0.001			
		-	0.319	0.592	0.008
	By individual	0.000			
		-	0.646	0.367	0.000
Delimited / Mixed	By site	0.066			
		-	0.338	0.325	0.203
	By individual	0.007			
		-	0.000	0.001	0.773

Abandoned / Non-abandoned	**By site**	0.392			
		-	0.842	0.437	0.145
	By individual	0.490			
		-	0.834	0.484	0.094
Grave	**By site**	0.007			
		-	0.000	0.380	0.510
	By individual	0.000			
		-	0.000	0.003	0.028
Location marker	**By site**	0.018			
		-	0.003	0.070	0.065
	By individual	0.102			
		-	0.000	0.121	0.400
Sealed	**By site**	0.034			
		-	0.859	0.027	0.267
	By individual	0.024			
		-	0.144	0.366	0.014
Furnishings	**By site**	0.000			
		-	0.000	0.381	0.000
	By individual	0.414			
		-	0.222	0.878	0.668
Fire within context	**By site**	0.000			
		-	0.004	0.001	0.000
	By individual	0.000			
		-	0.000	0.000	0.001

Table 22: χ^2 p-values for the variable 'Mineral colourant within context' by site and individual

<table>
<tr><th colspan="2" rowspan="2"></th><th colspan="6">Presence of funerary offerings</th></tr>
<tr><th>48000-34000</th><th>34000-11000</th><th>11000-8000</th><th>8000-7000</th><th>7000-5000</th><th>5000-4500</th></tr>
<tr><th rowspan="4">Location</th><th rowspan="2">By site</th><td colspan="6">0.000</td></tr>
<tr><td>0.567</td><td>0.602</td><td>0.073</td><td>0.236</td><td>0.014</td><td>0.176</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="6">0.000</td></tr>
<tr><td>-</td><td>0.000</td><td>0.000</td><td>0.106</td><td>0.002</td><td>0.030</td></tr>
<tr><th rowspan="4">Shell midden</th><th rowspan="2">By site</th><td colspan="6">0.296</td></tr>
<tr><td>-</td><td>-</td><td>0.781</td><td>0.493</td><td>0.087</td><td>0.439</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="6">0.000</td></tr>
<tr><td>-</td><td>-</td><td>0.481</td><td>0.039</td><td>0.000</td><td>0.448</td></tr>
<tr><th rowspan="4">Collective funerary context</th><th rowspan="2">By site</th><td colspan="6">0.000</td></tr>
<tr><td>0.165</td><td>0.101</td><td>0.086</td><td>0.009</td><td>0.000</td><td>0.000</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="6">0.487</td></tr>
<tr><td>-</td><td>0.049</td><td>0.059</td><td>0.006</td><td>0.003</td><td>0.000</td></tr>
<tr><th rowspan="4">MNI</th><th rowspan="2">By number</th><td colspan="6">0.000</td></tr>
<tr><td>0.003</td><td>0.349</td><td>0.126</td><td>0.019</td><td>0.002</td><td>0.017</td></tr>
<tr><th rowspan="2">By category</th><td colspan="6">0.000</td></tr>
<tr><td>0.003</td><td>0.627</td><td>0.108</td><td>0.007</td><td>0.000</td><td>0.000</td></tr>
<tr><th rowspan="4">Site type</th><th rowspan="2">By site</th><td colspan="6">0.000</td></tr>
<tr><td>0.335</td><td>0.005</td><td>0.556</td><td>0.520</td><td>0.023</td><td>0.025</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="6">0.000</td></tr>
<tr><td>-</td><td>0.270</td><td>0.297</td><td>0.418</td><td>0.001</td><td>0.003</td></tr>
<tr><th rowspan="4">Delimited / Mixed</th><th rowspan="2">By site</th><td colspan="6">0.001</td></tr>
<tr><td>-</td><td>0.001</td><td>0.845</td><td>0.404</td><td>0.092</td><td>0.014</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="6">0.000</td></tr>
<tr><td>-</td><td>0.000</td><td>0.158</td><td>0.004</td><td>0.679</td><td>0.000</td></tr>
</table>

Abandoned / Non-abandoned	**By site**	0.544					
		-	0.956	0.198	0.070	0.571	0.681
	By individual	0.609					
		-	0.818	0.320	0.974	0.792	0.376
Grave	**By site**	0.000					
		0.002	0.000	0.025	0.021	0.003	0.012
	By individual	0.000					
		-	0.000	0.000	0.013	0.077	0.007
Location marker	**By site**	0.000					
		0.000	0.923	0.100	0.025	0.033	0.112
	By individual	0.000					
		-	0.009	0.060	0.007	0.034	0.065
Sealed	**By site**	0.000					
		-	0.021	-	0.041	0.023	0.261
	By individual	0.000					
		-	0.000	-	0.846	0.094	0.000
Furnishings	**By site**	0.000					
		0.000	0.022	0.005	0.117	0.006	0.004
	By individual	0.000					
		-	0.000	0.110	0.245	0.067	0.018
Fire within context	**By site**	0.000					
		0.000	0.000	0.021	0.040	0.002	0.001
	By individual	0.000					
		-	0.000	0.012	0.024	0.000	0.214
Mineral colourant within context	**By site**	0.000					
		0.000	0.054	0.016	0.187	0.003	0.002
	By individual	0.000					
		-	0.000	0.000	0.008	0.000	0.001

Table 23: χ^2 p-values for the variable 'Presence of funerary offerings' by site and individual

		Quantity of funerary offerings					
		48000-34000	34000-11000	11000-8000	8000-7000	7000-5000	5000-4500
Location	By site	0.730					
		-	0.566	0.521	0.693	0.926	0.829
	By individual	0.000					
		-	0.255	0.000	0.000	0.778	0.000
Shell midden	By site	0.018					
		-	-	0.803	0.594	0.068	0.066
	By individual	0.000					
		-	-	0.786	0.004	0.000	0.000
Collective funerary space	By site	0.551					
		-	0.352	0.295	0.442	0.341	0.802
	By individual	0.001					
		-	0.052	0.000	0.124	0.064	0.009
Site type	By site	0.322					
		-	0.475	0.408	0.582	0.215	0.162
	By individual	0.605					
		-	0.899	0.054	0.044	0.034	0.121
Delimited / Mixed	By site	0.424					
		-	0.135	0.261	0.082	0.228	0.661
	By individual	0.000					
		-	0.190	-	0.135	0.001	0.003
Abandoned / Non-abandoned	By site	0.696					
		-	-	0.405	0.261	0.998	0.105
	By individual	0.001					
		-	-	0.119	0.112	0.104	0.000

<table>
<tr><td rowspan="4">Grave</td><td rowspan="2">By site</td><td colspan="6">0.932</td></tr>
<tr><td>-</td><td>0.629</td><td>0.453</td><td>0.786</td><td>0.907</td><td>1</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="6">0.248</td></tr>
<tr><td>-</td><td>0.036</td><td>0.001</td><td>0.002</td><td>0.335</td><td>0.151</td></tr>
<tr><td rowspan="4">Location marker</td><td rowspan="2">By site</td><td colspan="6">0.148</td></tr>
<tr><td>-</td><td>-</td><td>0.422</td><td>0.594</td><td>0.103</td><td>0.630</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="6">0.008</td></tr>
<tr><td>-</td><td>0.132</td><td>0.000</td><td>0.001</td><td>0.000</td><td>0.794</td></tr>
<tr><td rowspan="4">Sealed</td><td rowspan="2">By site</td><td colspan="6">0.029</td></tr>
<tr><td>-</td><td>0.705</td><td>-</td><td>0.616</td><td>0.384</td><td>0.000</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="6">0.000</td></tr>
<tr><td>-</td><td>0.119</td><td>-</td><td>0.297</td><td>0.059</td><td>0.000</td></tr>
<tr><td rowspan="4">Furnishings</td><td rowspan="2">By site</td><td colspan="6">0.386</td></tr>
<tr><td>-</td><td>0.128</td><td>0.572</td><td>0.231</td><td>0.358</td><td>0.477</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="6">0.000</td></tr>
<tr><td>-</td><td>0.113</td><td>0.071</td><td>0.000</td><td>0.002</td><td>0.000</td></tr>
<tr><td rowspan="4">Fire within context</td><td rowspan="2">By site</td><td colspan="6">0.246</td></tr>
<tr><td>-</td><td>0.172</td><td>0.792</td><td>0.149</td><td>0.362</td><td>0.343</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="6">0.000</td></tr>
<tr><td>-</td><td>0.026</td><td>0.000</td><td>0.003</td><td>0.000</td><td>0.015</td></tr>
<tr><td rowspan="4">Mineral colourant within context</td><td rowspan="2">By site</td><td colspan="6">0.010</td></tr>
<tr><td>-</td><td>0.125</td><td>0.273</td><td>0.090</td><td>0.080</td><td>0.062</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="6">0.000</td></tr>
<tr><td>-</td><td>0.123</td><td>0.004</td><td>0.000</td><td>0.599</td><td>0.046</td></tr>
</table>

Table 24: χ^2 p-values for the variable 'Quantity of funerary offerings' by site and individual

	Types of funerary offerings (by funerary offering)			
	48000-33000	33000-10000	10000-6500	6500-4500
Location	0.002			
	-	0.178	0.004	0.002
Shell midden	0.000			
	-	-	0.003	0.000
Collective funerary space	0.278			
	-	0.017	0.554	0.077
Site type	0.296			
	-	0.887	0.108	0.109
Delimited / Mixed	0.070			
	-	0.260	0.047	0.062
Abandoned / Non-abandoned	0.727			
	-	-	0.025	0.960
Grave	0.022			
	-	0.433	0.521	0.035
Location marker	0.000			
	-	0.171	0.002	0.000
Sealed	0.016			
	-	0.186	0.430	0.000
Furnishings	0.000			
	-	0.782	0.038	0.010
Fire within context	0.654			
	-	0.302	0.001	0.091
Mineral colourant within context	0.040			
	-	0.389	0.015	0.001

Table 25: χ^2 p-values for the variable 'Types of funerary offering' by funerary offering

	Tool materials (by funerary offering)			
	48000-33000	33000-10000	10000-6500	6500-4500
Location	0.099			
	-	0.110	0.496	0.737
Shell midden	0.000			
	-	-	0.044	0.000
Collective funerary space	0.269			
	-	0.446	0.077	0.353
Site type	0.000			
	-	0.633	0.220	0.000
Delimited / Mixed	0.006			
	-	0.251	0.248	0.010
Abandoned / Non-abandoned	0.765			
	-	-	0.571	0.648
Grave	0.070			
	-	-	-	0.076
Location marker	0.687			
	-	-	0.238	0.257
Sealed	0.015			
	-	0.331	0.556	0.069
Furnishings	0.000			
	-	-	0.204	0.000
Fire within context	0.417			
	-	0.707	0.200	0.823
Mineral colourant within context	0.647			
	-	0.388	0.765	0.003

Table 26: χ^2 p-values for the variable 'Material category' for tools by funerary offering

	Ornament materials (by funerary offering)			
	48000-33000	33000-9500	9500-6500	6500-4500
Location	0.002			
	-	0.779	0.900	0.023
Shell midden	0.000			
	-	-	0.223	0.000
Collective funerary space	0.009			
	-	0.336	0.091	0.015
Site type	0.000			
	-	0.684	0.392	0.000
Delimited / Mixed	0.323			
	-	0.487	0.386	0.217
Abandoned / Non-abandoned	0.282			
	-	-	-	0.028
Grave	0.942			
	-	0.726	-	0.453
Location marker	0.100			
	-	-	-	0.178
Sealed	0.657			
	-	0.336	0.143	0.669
Furnishings	0.282			
	-	0.801	0.679	0.249
Fire within context	0.002			
	-	0.549	0.337	0.106
Mineral colourant within context	0.000			
	-	0.249	0.591	0.099

Table 27: χ^2 p-values for the variable 'Material category' for ornaments by funerary offering

	Unmodified faunal remains and shells (by funerary offering)						
	48000-33000	**33000-25500**	**25500-21000**	**21000-11000**	**11000-7500**	**7500-6500**	**6500-4500**
Location	0.421						
	-	0.361	-	-	0.346	0.171	0.052
Shell midden	0.005						
	-	-	-	-	0.350	0.171	0.001
Collective funerary space	0.042						
	-	0.576	-	-	0.190	-	0.100
Site type	0.000						
	-	0.386	-	-	0.011	0.171	0.000
Delimited / Mixed	0.037						
	-	-	-	-	-	0.171	0.003
Abandoned / Non-abandoned	0.209						
	-	-	-	-	0.053	0.171	-
Grave	0.735						
	-	-	-	-	0.588	-	0.693
Location marker	0.204						
	-	0.576	-	-	0.326	-	0.919
Sealed	0.124						
	-	0.576	-	-	-	-	0.198
Furnishings	0.288						
	-	0.361	-	-	0.490	0.171	0.543
Fire within context	0.169						
	-	0.025	-	-	0.588	-	0.348
Mineral colourant within context	0.351						
	-	0.576	-	-	0.099	0.171	0.816

Table 28: χ^2 p-values for the variable 'General object type' for unmodified faunal remains and shells by funerary offering

<table>
<tr><th colspan="2"></th><th colspan="6">Quantity of tools</th></tr>
<tr><th colspan="2"></th><th>48000-34000</th><th>34000-10000</th><th>10000-8000</th><th>8000-7000</th><th>7000-5000</th><th>5000-4500</th></tr>
<tr><th rowspan="4">Location</th><th rowspan="2">By site</th><td colspan="6">0.800</td></tr>
<tr><td>-</td><td>0.287</td><td>0.297</td><td>0.439</td><td>0.692</td><td>0.941</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="6">0.000</td></tr>
<tr><td>-</td><td>0.221</td><td>0.000</td><td>0.000</td><td>0.255</td><td>0.591</td></tr>
<tr><th rowspan="4">Shell midden</th><th rowspan="2">By site</th><td colspan="6">0.001</td></tr>
<tr><td>-</td><td>-</td><td>0.428</td><td>0.710</td><td>0.018</td><td>0.087</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="6">0.000</td></tr>
<tr><td>-</td><td>-</td><td>0.045</td><td>0.000</td><td>0.000</td><td>0.618</td></tr>
<tr><th rowspan="4">Collective funerary space</th><th rowspan="2">By site</th><td colspan="6">0.596</td></tr>
<tr><td>-</td><td>0.287</td><td>0.079</td><td>0.628</td><td>0.695</td><td>0.793</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="6">0.031</td></tr>
<tr><td>-</td><td>0.221</td><td>0.000</td><td>-</td><td>0.418</td><td>0.097</td></tr>
<tr><th rowspan="4">Site type</th><th rowspan="2">By site</th><td colspan="6">0.823</td></tr>
<tr><td>-</td><td>0.287</td><td>0.586</td><td>0.321</td><td>0.661</td><td>0.431</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="6">0.725</td></tr>
<tr><td>-</td><td>0.221</td><td>0.004</td><td>0.006</td><td>0.375</td><td>0.615</td></tr>
<tr><th rowspan="4">Delimited / Mixed</th><th rowspan="2">By site</th><td colspan="6">0.645</td></tr>
<tr><td>-</td><td>0.157</td><td>0.261</td><td>0.248</td><td>0.530</td><td>0.774</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="6">0.000</td></tr>
<tr><td>-</td><td>0.135</td><td>-</td><td>0.223</td><td>0.000</td><td>0.001</td></tr>
<tr><th rowspan="4">Abandoned / Non-abandoned</th><th rowspan="2">By site</th><td colspan="6">0.326</td></tr>
<tr><td>-</td><td>-</td><td>0.261</td><td>0.368</td><td>1</td><td>0.095</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="6">0.550</td></tr>
<tr><td>-</td><td>-</td><td>0.019</td><td>0.112</td><td>1</td><td>0.725</td></tr>
</table>

Grave	**By site**	0.944					
		-	-	0.656	0.907	0.740	0.999
	By individual	0.005					
		-	-	0.008	0.002	0.000	0.661
Location marker	**By site**	0.600					
		-	-	0.543	0.367	0.109	0.174
	By individual	0.482					
		-	0.223	0.034	0.000	0.016	0.858
Sealed	**By site**	0.380					
		-	0.261	-	0.358	0.522	0.004
	By individual	0.000					
		-	0.221	-	0.318	0.002	0.000
Furnishings	**By site**	0.671					
		-	0.261	0.731	0.702	0.407	0.508
	By individual	0.000					
		-	0.199	0.190	0.000	0.010	0.018
Fire within context	**By site**	0.139					
		-	-	0.227	0.492	0.395	0.464
	By individual	0.000					
		-	0.221	0.000	0.002	0.000	0.025
Mineral colourant within context	**By site**	0.129					
		-	0.261	0.114	0.286	0.255	0.184
	By individual	0.000					
		-	0.221	0.000	0.000	0.455	0.069

Table 29: χ^2 p-values for the variable 'Quantity of tools' by site and individual

		Quantity of ornaments				
		48000-34000	34000-10000	10000-6000	6000-5000	5000-4500
Location	By site	0.728				
		-	0.423	0.754	0.593	0.085
	By individual	0.000				
		-	0.133	0.009	0.000	0.000
Shell midden	By site	0.229				
		-	-	0.163	0.280	0.000
	By individual	0.001				
		-	-	0.317	0.003	0.093
Collective funerary space	By site	0.856				
		-	0.368	0.773	0.580	0.618
	By individual	0.011				
		-	0.031	0.046	0.009	0.001
Site type	By site	0.003				
		-	0.099	0.379	0.120	0.077
	By individual	0.858				
		-	0.531	0.778	0.178	0.260
Delimited / Mixed	By site	0.720				
		-	0.083	0.663	0.400	0.675
	By individual	0.014				
		-	0.007	0.980	0.017	0.117
Abandoned / Non-abandoned	By site	0.159				
		-	-	0.713	0.987	0.030
	By individual	0.000				
		-	-	0.691	0.000	0.000

Grave	**By site**	0.998				
		-	0.570	0.780	0.706	0.905
	By individual	0.055				
		-	0.073	0.696	0.001	0.000
Location marker	**By site**	0.138				
		-	-	0.015	0.123	0.237
	By individual	0.937				
		-	-	0.368	0.994	0.700
Sealed	**By site**	0.124				
		-	0.922	0.384	0.236	0.023
	By individual	0.003				
		-	0.306	0.754	0.000	0.978
Furnishings	**By site**	0.105				
		-	0.644	0.387	0.413	0.219
	By individual	0.099				
		-	0.649	0.191	0.263	0.002
Fire within context	**By site**	0.506				
		-	0.136	0.660	0.412	0.319
	By individual	0.014				
		-	0.024	0.499	0.037	0.884
Mineral colourant within context	**By site**	0.128				
		-	0.299	0.050	0.449	0.189
	By individual	0.015				
		-	0.250	0.022	0.668	0.754
Presence of tools	**By site**	0.365				
		-	0.464	0.344	0.353	0.496
	By individual	0.013				
		-	0.522	0.078	0.093	0.365

Table 30: χ^2 p-values for the variable 'Quantity of ornaments' by site and individual

<table>
<tr><th colspan="2"></th><th colspan="5">Quantity of faunal remains and/or shells</th></tr>
<tr><th colspan="2"></th><th>48000-29000</th><th>29000-10000</th><th>10000-6000</th><th>6000-5000</th><th>5000-4500</th></tr>
<tr><td rowspan="4">Location</td><td rowspan="2">By site</td><td colspan="5">0.841</td></tr>
<tr><td>-</td><td>0.392</td><td>0.425</td><td>0.905</td><td>0.948</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="5">0.002</td></tr>
<tr><td>-</td><td>0.525</td><td>0.138</td><td>0.993</td><td>0.000</td></tr>
<tr><td rowspan="4">Shell midden</td><td rowspan="2">By site</td><td colspan="5">0.022</td></tr>
<tr><td>-</td><td>-</td><td>0.292</td><td>0.231</td><td>0.345</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="5">0.008</td></tr>
<tr><td>-</td><td>-</td><td>0.100</td><td>0.033</td><td>0.566</td></tr>
<tr><td rowspan="4">Collective funerary space</td><td rowspan="2">By site</td><td colspan="5">0.909</td></tr>
<tr><td>-</td><td>0.659</td><td>0.704</td><td>0.860</td><td>0.544</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="5">0.716</td></tr>
<tr><td>-</td><td>0.753</td><td>0.213</td><td>0.904</td><td>0.714</td></tr>
<tr><td rowspan="4">Site type</td><td rowspan="2">By site</td><td colspan="5">0.127</td></tr>
<tr><td>-</td><td>0.329</td><td>0.132</td><td>0.122</td><td>0.459</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="5">0.018</td></tr>
<tr><td>-</td><td>0.223</td><td>0.202</td><td>0.241</td><td>0.320</td></tr>
<tr><td rowspan="4">Delimited / Mixed</td><td rowspan="2">By site</td><td colspan="5">0.176</td></tr>
<tr><td>-</td><td>-</td><td>-</td><td>0.313</td><td>0.221</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="5">0.176</td></tr>
<tr><td>-</td><td>-</td><td>-</td><td>0.020</td><td>0.111</td></tr>
<tr><td rowspan="4">Abandoned / Non-abandoned</td><td rowspan="2">By site</td><td colspan="5">0.541</td></tr>
<tr><td>-</td><td>-</td><td>0.421</td><td>0.815</td><td>-</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="5">0.795</td></tr>
<tr><td>-</td><td>-</td><td>0.019</td><td>0.933</td><td>-</td></tr>
</table>

Grave	**By site**	0.926				
		-	0.599	0.194	0.616	0.876
	By individual	0.496				
		-	0.599	0.042	0.067	0.439
Location marker	**By site**	0.118				
		-	-	0.125	0.531	0.508
	By individual	0.005				
		-	-	0.066	0.000	0.405
Sealed	**By site**	0.037				
		-	0.670	0.230	0.280	0.103
	By individual	0.000				
		-	0.753	-	0.582	0.000
Furnishings	**By site**	0.402				
		-	0.112	0.586	0.864	0.622
	By individual	0.181				
		-	0.082	0.820	0.165	0.643
Fire within context	**By site**	0.458				
		-	0.292	0.383	0.314	0.547
	By individual	0.003				
		-	0.392	0.022	0.009	0.001
Mineral colourant within context	**By site**	0.760				
		-	0.525	0.839	0.516	0.324
	By individual	0.142				
		-	0.343	0.694	0.170	0.000

Presence of tools	By site	0.778				
		-	0.292	0.343	0.876	0.451
	By individual	0.033				
		-	0.292	0.255	0.540	0.000
Presence of ornaments	By site	0.660				
		-	0.525	0.366	0.312	0.168
	By individual	0.052				
		-	0.525	0.137	0.204	0.359

Table 31: χ^2 p-values for the variable 'Quantity of faunal remains and/or shells' by site and individual

Chapter 7: The treatment of the body

		Primary and secondary depositions			
		48000-10000	**10000-7500**	**7500-6000**	**6000-4500**
Location	**By site**	0.000			
		0.033	0.014	0.050	0.001
	By individual	0.000			
		0.000	0.000	0.000	0.000
Shell midden	**By site**	0.105			
		-	0.961	0.010	0.075
	By individual	0.000			
		-	0.000	0.000	0.000
Collective funerary space	**By site**	0.000			
		0.022	0.005	0.032	0.004
	By individual	0.496			
		0.001	0.003	0.004	0.024

MNI	By number	0.007			
		0.158	0.024	0.106	0.005
	By category	0.001			
		0.141	0.004	0.043	0.028
Site type	By site	0.014			
		0.126	0.116	0.052	0.663
	By individual	0.000			
		0.036	0.015	0.000	0.000
Delimited / Mixed	By site	0.034			
		0.849	0.415	0.149	0.190
	By individual	0.000			
		0.000	0.948	0.000	0.000
Abandoned / Non-abandoned	By site	0.034			
		0.031	0.096	0.129	0.317
	By individual	0.010			
		0.009	0.289	0.354	0.069
Grave	By site	0.000			
		0.000	0.054	0.032	0.000
	By individual	0.000			
		0.000	0.001	0.000	0.000
Location marker	By site	0.006			
		0.537	0.164	0.014	0.205
	By individual	0.000			
		0.000	0.048	0.052	0.055

Sealed	**By site**	0.057			
		0.211	0.372	0.173	0.850
	By individual	0.000			
		0.017	0.000	0.357	0.015
Furnishings	**By site**	0.001			
		0.007	0.108	0.317	0.321
	By individual	0.000			
		0.000	0.000	0.042	0.902
Fire within context	**By site**	0.001			
		0.247	0.163	0.213	0.002
	By individual	0.000			
		0.001	0.008	0.197	0.093
Mineral colourant within context	**By site**	0.000			
		0.000	0.019	0.461	0.484
	By individual	0.000			
		0.000	0.000	0.247	0.011
Presence of funerary offerings	**By site**	0.000			
		0.025	0.000	0.008	0.007
	By individual	0.000			
		0.000	0.100	0.009	0.000
Quantity of funerary offerings	**By site**	0.938			
		0.412	0.728	0.380	0.869
	By individual	0.382			
		0.553	0.022	-	0.574
Type of funerary offering	**By funerary offering**	0.080			
		0.136	0.017	-	0.091

Tool materials	**By funerary offering**	0.599			
		0.388	0.790	-	0.951
Ornament materials	**By funerary offering**	0.009			
		0.630	-	-	0.003
Ornament composition	**By funerary offering**	0.003			
		0.164	-	-	0.002
Shell / Faunal remains	**By funerary offering**	0.583			
		0.488	-	-	0.316
Quantity of tools	**By site**	0.918			
		0.265	0.606	0.333	0.867
	By individual	0.008			
		0.221	0.007	-	0.825
Quantity of ornaments	**By site**	0.823			
		0.744	0.405	0.387	0.322
	By individual	0.465			
		0.644	0.241	-	0.734
Quantity of faunal remains/ shells	**By site**	0.827			
		0.692	0.827	0.287	0.267
	By individual	0.606			
		0.525	-	-	0.896

Table 32: χ^2 p-values for the variable 'Primary / Secondary position' by site, individual and funerary offering

	Body treatment at deposition (by site)			
	48000-23000	23000-8000	8000-6500	6500-4500
Location	0.000			
	0.469	0.265	0.854	0.001
Shell midden	0.265			
	-	0.323	0.020	0.509
Collective funerary space	0.000			
	0.012	0.000	0.016	0.005
MNI	0.962			
	0.422	0.130	0.730	0.989
MNI categories	0.000			
	0.130	0.004	0.035	0.040
Site type	0.130			
	0.881	0.064	0.831	0.454
Delimited / Mixed	0.317			
	0.264	0.484	0.229	0.835
Abandoned / Non-abandoned	0.207			
	-	0.147	0.402	0.169
Grave	0.000			
	0.250	0.005	0.003	0.000
Location marker	0.002			
	0.611	0.854	0.916	0.001
Sealed	0.845			
	0.167	0.240	0.845	0.975
Furnishings	0.237			
	0.590	0.118	0.664	0.921

Fire within context	0.089			
	0.548	0.564	0.500	0.236
Mineral colourant within context	0.525			
	0.082	0.437	0.996	0.955
Presence of funerary offerings	0.000			
	0.486	0.075	0.469	0.010
Quantity of funerary offerings	0.923			
	0.238	0.193	0.674	0.786
Quantity of tools	0.991			
	0.157	0.460	0.729	0.862
Quantity of ornaments	0.881			
	-	0.709	-	0.230
Quantity of faunal remains/shells	0.946			
	0.287	0.368	0.135	0.230

Table 33: χ^2 p-values for the variable 'Body treatment at deposition' by site

	Body treatment at deposition (by individual)					
	48000-23000	**23000-19000**	**19000-10000**	**10000-8000**	**8000-6500**	**6500-4500**
Location	0.000					
	0.792	0.001	0.006	0.000	0.008	0.000
Shell midden	0.000					
	-	-	-	0.000	0.000	0.000
Collective funerary space	0.000					
	0.098	0.029	0.001	0.000	0.009	0.267
Site type	0.000					
	0.055	0.090	0.102	0.000	0.000	0.000

Delimited / Mixed	0.000					
	0.000	0.031	0.217	0.013	0.791	0.000
Abandoned / Non-abandoned	0.169					
	-	-	0.189	0.170	0.779	0.313
Grave	0.000					
	0.025	0.710	0.006	0.000	0.000	0.000
Location marker	0.039					
	0.202	-	-	0.270	0.055	0.305
Sealed	0.011					
	0.054	0.580	0.213	-	0.176	0.155
Furnishings	0.005					
	0.529	0.059	0.405	0.010	0.000	0.330
Fire within context	0.009					
	0.107	0.966	0.816	0.394	0.118	0.165
Mineral colourant within context	0.000					
	0.161	0.059	0.001	0.000	0.311	0.000
Presence of funerary offerings	0.000					
	0.214	0.614	0.003	0.006	0.004	0.000
Quantity of funerary offerings	0.996					
	0.261	0.092	0.532	0.210	0.090	0.984
Type of funerary offering	0.009					
	-	0.083	0.459	0.031	-	0.003
Presence of tools	0.000					
	0.252	0.437	0.633	0.015	0.001	0.000
Quantity of tools	0.124					
	-	0.172	0.172	0.140	0.189	0.656

Presence of ornaments	0.000					
	0.580	0.040	0.151	0.000	0.821	0.051
Quantity of ornaments	0.935					
	-	0.361	0.717	0.394	-	0.481
Presence of faunal remains/shells	0.001					
	0.138	0.590	0.881	0.000	0.821	0.103
Quantity of faunal remains/shells	0.861					
	0.513	0.157	0.287	-	-	0.972

Table 34: χ^2 p-values for the variable 'Body treatment at deposition' by individual

	Body treatment at deposition (by funerary offering)					
	48000-23000	**23000-19000**	**19000-10000**	**10000-8000**	**8000-6500**	**6500-4500**
Type of funerary offering	0.010					
	0.532	0.291	0.132	0.000	0.493	0.094
Tool materials	0.492					
	-	0.217	0.217	0.786	0.794	0.208
Ornament materials	0.060					
	-	0.392	0.459	-	-	0.026
Ornament composition	0.003					
	-	0.082	0.011	-	-	0.001
Shell/faunal remains	0.312					
	0.576	-	-	0.657	0.088	0.579

Table 35: χ^2 p-values for the variable 'Body treatment at deposition' by funerary offering

<table>
<tr><th colspan="2" rowspan="2"></th><th colspan="4">Body position</th></tr>
<tr><th>48000-21000</th><th>21000-10000</th><th>10000-7000</th><th>7000-4500</th></tr>
<tr><th rowspan="4">Location</th><th rowspan="2">By site</th><td colspan="4">0.074</td></tr>
<tr><td>0.386</td><td>0.376</td><td>0.242</td><td>0.320</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="4">0.537</td></tr>
<tr><td>0.505</td><td>0.131</td><td>0.069</td><td>0.969</td></tr>
<tr><th rowspan="4">Shell midden</th><th rowspan="2">By site</th><td colspan="4">0.046</td></tr>
<tr><td>-</td><td>-</td><td>0.500</td><td>0.016</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="4">0.000</td></tr>
<tr><td>-</td><td>-</td><td>0.016</td><td>0.000</td></tr>
<tr><th rowspan="4">Collective funerary space</th><th rowspan="2">By site</th><td colspan="4">0.000</td></tr>
<tr><td>0.386</td><td>0.376</td><td>0.436</td><td>0.000</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="4">0.030</td></tr>
<tr><td>0.505</td><td>0.614</td><td>0.450</td><td>0.014</td></tr>
<tr><th rowspan="4">MNI</th><th rowspan="2">By number</th><td colspan="4">0.045</td></tr>
<tr><td>0.223</td><td>0.615</td><td>0.501</td><td>0.032</td></tr>
<tr><th rowspan="2">By category</th><td colspan="4">0.000</td></tr>
<tr><td>0.386</td><td>0.721</td><td>0.217</td><td>0.000</td></tr>
<tr><th rowspan="4">Site type</th><th rowspan="2">By site</th><td colspan="4">0.066</td></tr>
<tr><td>0.157</td><td>0.402</td><td>0.511</td><td>0.234</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="4">0.231</td></tr>
<tr><td>0.083</td><td>0.440</td><td>0.105</td><td>0.094</td></tr>
<tr><th rowspan="4">Delimited / Mixed</th><th rowspan="2">By site</th><td colspan="4">0.034</td></tr>
<tr><td>-</td><td>0.495</td><td>0.057</td><td>0.244</td></tr>
<tr><th rowspan="2">By individual</th><td colspan="4">0.000</td></tr>
<tr><td>-</td><td>0.887</td><td>0.032</td><td>0.000</td></tr>
</table>

Abandoned / Non-abandoned	**By site**	0.291			
		-	0.171	0.383	0.327
	By individual	0.829			
		-	0.121	0.283	0.816
Grave	**By site**	0.210			
		0.386	0.646	0.389	0.577
	By individual	0.773			
		-	-	0.735	0.897
Location marker	**By site**	0.195			
		0.386	-	0.605	0.286
	By individual	0.438			
		0.505	-	0.316	0.317
Sealed	**By site**	0.039			
		-	0.747	0.950	0.004
	By individual	0.000			
		-	0.347	0.910	0.000
Furnishings	**By site**	0.149			
		0.223	0.151	0.843	0.008
	By individual	0.038			
		0.505	0.308	0.022	0.000
Fire within context	**By site**	0.089			
		0.223	0.296	0.615	0.075
	By individual	0.001			
		0.248	0.333	0.846	0.000

Mineral colourant within context	**By site**	0.047			
		0.386	0.240	0.357	0.702
	By individual	0.467			
		0.248	0.876	0.392	0.298
Presence of funerary offerings	**By site**	0.189			
		0.233	0.285	0.206	0.011
	By individual	0.001			
		0.248	0.505	0.460	0.000
Quantity of funerary offerings	**By site**	0.058			
		-	0.261	0.039	0.345
	By individual	0.000			
		-	0.287	0.613	0.000
Type of funerary offering	**By funerary offering**	0.000			
		-	0.085	0.087	0.000
Tool materials	**By funerary offering**	0.115			
		-	-	0.309	0.060
Ornament materials	**By funerary offering**	0.009			
		-	0.522	0.817	0.057
Ornament composition	**By funerary offering**	0.002			
		-	0.549	0.395	0.001
Shell / Faunal remains	**By funerary offering**	0.012			
		-	-	0.133	0.013
Quantity of tools	**By site**	0.210			
		-	0.157	0.319	0.114
	By individual	0.009			
		-	0.157	0.727	0.005

Quantity of ornaments	**By site**	0.866			
		-	0.261	0.277	0.756
	By individual	0.841			
		-	0.261	0.384	0.437
Quantity of faunal remains and/or shells	**By site**	0.589			
		-	-	0.047	0.634
	By individual	0.000			
		-	-	0.174	0.000

Table 36: χ² p-values for the variable 'Position' by site, individual and funerary offering

		Lateralization			
		48000-23000	**23000-10000**	**10000-6000**	**6000-4500**
Location	**By site**	0.080			
		-	-	0.390	0.021
	By individual	0.000			
		-	0.659	0.226	0.002
Shell midden	**By site**	0.010			
		-	-	0.218	0.009
	By individual	0.183			
		-	-	0.236	0.267
Collective funerary space	**By site**	0.000			
		-	-	0.019	0.005
	By individual	0.000			
		-	0.212	0.153	0.004

MNI	By number	0.019			
		-	-	0.171	0.267
	By category	0.000			
		-	-	0.073	0.007
Site type	By site	0.014			
		-	-	0.033	0.065
	By individual	0.034			
		-	0.088	0.070	0.071
Delimited / Mixed	By site	0.153			
		-	-	0.325	0.380
	By individual	0.552			
		-	-	0.027	0.234
Abandoned / Non-abandoned	By site	0.749			
		-	-	0.276	0.097
	By individual	0.018			
		-	-	0.332	0.222
Grave	By site	0.640			
		-	-	0.138	0.714
	By individual	0.203			
		-	-	0.694	0.072
Location marker	By site	0.406			
		-	-	0.209	0.159
	By individual	0.131			
		-	-	0.708	0.197

Sealed	**By site**	0.219			
		-	-	0.144	0.392
	By individual	0.256			
		-	0.361	0.439	0.251
Furnishings	**By site**	0.571			
		-	-	0.552	0.143
	By individual	0.770			
		-	-	0.078	0.307
Fire within context	**By site**	0.159			
		-	-	0.366	0.225
	By individual	0.659			
		-	-	0.110	0.594
Mineral colourant within context	**By site**	0.451			
		-	-	0.319	0.551
	By individual	0.055			
		-	0.439	0.349	0.129
Presence of funerary offerings	**By site**	0.131			
		-	-	0.226	0.234
	By individual	0.002			
		-	0.361	0.429	0.017
Quantity of funerary offerings	**By site**	0.451			
		-	-	0.590	0.519
	By individual	0.409			
		-	-	0.238	0.527

<table>
<tr><td rowspan="2">Type of funerary offering</td><td rowspan="2">By funerary offering</td><td colspan="4">0.151</td></tr>
<tr><td>-</td><td>-</td><td>0.178</td><td>0.260</td></tr>
<tr><td rowspan="2">Tool materials</td><td rowspan="2">By funerary offering</td><td colspan="4">0.533</td></tr>
<tr><td>-</td><td>-</td><td>0.658</td><td>0.322</td></tr>
<tr><td rowspan="2">Ornament materials</td><td rowspan="2">By funerary offering</td><td colspan="4">0.424</td></tr>
<tr><td>-</td><td>-</td><td>0.346</td><td>0.474</td></tr>
<tr><td rowspan="2">Ornament composition</td><td rowspan="2">By funerary offering</td><td colspan="4">0.143</td></tr>
<tr><td>-</td><td>-</td><td>0.290</td><td>0.194</td></tr>
<tr><td rowspan="2">Shell / Faunal remains</td><td rowspan="2">By funerary offering</td><td colspan="4">0.239</td></tr>
<tr><td>-</td><td>-</td><td>1</td><td>0.190</td></tr>
<tr><td rowspan="4">Quantity of tools</td><td rowspan="2">By site</td><td colspan="4">0.615</td></tr>
<tr><td>-</td><td>-</td><td>0.783</td><td>0.468</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="4">0.406</td></tr>
<tr><td>-</td><td>-</td><td>0.392</td><td>0.722</td></tr>
<tr><td rowspan="4">Quantity of ornaments</td><td rowspan="2">By site</td><td colspan="4">0.405</td></tr>
<tr><td>-</td><td>-</td><td>0.484</td><td>0.137</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="4">0.324</td></tr>
<tr><td>-</td><td>-</td><td>0.084</td><td>0.076</td></tr>
<tr><td rowspan="4">Quantity of faunal remains and/or shells</td><td rowspan="2">By site</td><td colspan="4">0.295</td></tr>
<tr><td>-</td><td>-</td><td>0.287</td><td>0.207</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="4">0.106</td></tr>
<tr><td>-</td><td>-</td><td>-</td><td>0.122</td></tr>
</table>

Table 37: χ^2 p-values for the variable 'Lateralization' by site, individual and funerary offering

		Flexed degree				
		48000-38000	38000-22000	22000-11000	11000-6500	6500-4500
Location	**By site**	0.011				
		-	-	0.149	0.358	0.031
	By individual	0.000				
		-	-	0.031	0.002	0.000
Shell midden	**By site**	0.012				
		-	-	-	0.456	0.056
	By individual	0.000				
		-	-	-	0.001	0.000
Collective funerary space	**By site**	0.000				
		-	-	0.388	0.146	0.000
	By individual	0.001				
		-	-	0.757	0.169	0.118
MNI	**By number**	0.838				
		-	-	0.538	0.229	0.999
	By category	0.002				
		-	-	0.579	0.005	0.103
Site type	**By site**	0.266				
		-	-	0.188	0.147	0.334
	By individual	0.000				
		-	-	0.209	0.013	0.000
Delimited / Mixed	**By site**	0.054				
		-	-	0.494	0.045	0.117
	By individual	0.010				
		-	-	0.495	0.000	0.066

Abandoned / Non-abandoned	**By site**	0.354				
		-	-	0.135	0.741	0.504
	By individual	0.028				
		-	-	0.082	0.017	0.850
Grave	**By site**	0.304				
		-	-	0.135	0.232	0.262
	By individual	0.076				
		-	-	-	0.406	0.011
Location marker	**By site**	0.345				
		-	-	-	0.260	0.827
	By individual	0.003				
		-	-	-	0.915	0.000
Sealed	**By site**	0.210				
		-	-	0.682	0.374	0.151
	By individual	0.014				
		-	-	0.961	0.591	0.015
Furnishings	**By site**	0.473				
		-	-	0.050	0.860	0.251
	By individual	0.033				
		-	-	0.153	0.031	0.554
Fire within context	**By site**	0.275				
		-	-	0.330	0.534	0.811
	By individual	0.000				
		-	-	0.382	0.005	0.000

Mineral colourant within context	**By site**	0.128				
		-	-	0.112	0.189	0.934
	By individual	0.485				
		-	-	0.054	0.164	0.890
Presence of funerary offerings	**By site**	0.065				
		-	-	0.549	0.277	0.073
	By individual	0.011				
		-	-	0.413	0.131	0.002
Quantity of funerary offerings	**By site**	0.299				
		-	-	0.157	0.311	0.246
	By individual	0.260				
		-	-	0.199	0.079	0.205
Type of funerary offering	**By funerary offering**	0.005				
		-	-	0.676	0.008	0.000
Tool materials	**By funerary offering**	0.002				
		-	-	-	0.020	0.002
Ornament materials	**By funerary offering**	0.004				
		-	-	0.392	0.935	0.235
Ornament composition	**By funerary offering**	0.000				
		-	-	0.135	0.276	0.000
Shell / Faunal remains	**By funerary offering**	0.010				
		-	-	-	0.138	0.008
Quantity of tools	**By site**	0.733				
		-	-	-	0.660	0.623
	By individual	0.821				
		-	-	-	0.490	0.055

Quantity of ornaments	**By site**	0.411				
		-	-	0.157	0.287	0.712
	By individual	0.155				
		-	-	0.157	0.109	0.298
Quantity of faunal remains and/or shells	**By site**	0.295				
		-	-	-	0.149	0.667
	By individual	0.022				
		-	-	-	0.105	0.866
Lateralization	**By site**	0.000				
		-	-	-	0.011	0.000
	By individual	0.117				
		-	-	-	0.323	0.019

Table 38: χ2 p-values for the variable 'Flexed degree' by site, individual and funerary offering

		Head orientation			
		48000-10000	**10000-8000**	**8000-6500**	**6500-4500**
Location	**By site**	0.012			
		0.287	0.806	0.740	0.243
	By individual	0.000			
		0.306	0.648	0.339	0.004
Shell midden	**By site**	0.323			
		-	0.075	0.506	0.700
	By individual	0.000			
		-	0.092	0.012	0.000

Collective funerary space	**By site**	0.000			
		0.287	0.477	0.363	0.001
	By individual	0.002			
		0.306	0.140	0.101	0.062
MNI	**By number**	0.956			
		0.241	0.352	0.776	0.997
	By category	0.017			
		0.302	0.446	0.554	0.019
Site type	**By site**	0.095			
		0.223	0.474	0.470	0.061
	By individual	0.000			
		0.713	0.409	0.007	0.000
Delimited / Mixed	**By site**	0.086			
		-	0.223	0.392	0.065
	By individual	0.020			
		0.421	-	0.029	0.119
Abandoned / Non-abandoned	**By site**	0.128			
		-	0.405	0.472	0.974
	By individual	0.060			
		-	0.552	0.110	0.311
Grave	**By site**	0.711			
		0.409	0.422	0.386	0.075
	By individual	0.166			
		0.634	-	-	0.037

Location marker	**By site**	0.887			
		0.172	0.781	0.201	0.620
	By individual	0.112			
		0.136	-	0.035	0.001
Sealed	**By site**	0.074			
		0.199	-	0.377	0.175
	By individual	0.034			
		0.156	-	0.655	0.128
Furnishings	**By site**	0.336			
		0.265	0.166	0.848	0.482
	By individual	0.410			
		0.713	0.323	0.019	0.242
Fire within context	**By site**	0.089			
		0.151	0.128	0.304	0.823
	By individual	0.040			
		0.319	0.328	0.697	0.042
Mineral colourant within the context	**By site**	0.153			
		0.277	0.200	0.876	0.522
	By individual	0.001			
		0.572	0.510	0.917	0.000
Presence of funerary offerings	**By site**	0.003			
		0.265	0.604	0.068	0.053
	By individual	0.088			
		0.549	0.133	0.873	0.038

Quantity of funerary offerings	**By site**	0.940			
		0.213	0.684	0.482	0.792
	By individual	0.211			
		0.213	0.183	0.433	0.231
Type of funerary offering	**By funerary offering**	0.002			
		0.160	0.172	0.837	0.000
Tool materials	**By funerary offering**	0.002			
		-	-	0.092	0.003
Ornament materials	**By funerary offering**	0.005			
		0.659	0.540	-	0.003
Ornament composition	**By funerary offering**	0.000			
		0.441	0.269	-	0.000
Shell / Faunal remains	**By funerary offering**	0.018			
		-	0.072	0.135	0.009
Quantity of tools	**By site**	0.972			
		-	0.254	0.145	0.961
	By individual	0.203			
		-	0.286	0.265	0.177
Quantity of ornaments	**By site**	0.821			
		0.223	0.157	-	0.628
	By individual	0.258			
		0.223	0.135	-	0.199
Quantity of faunal remains and/or shells	**By site**	0.986			
		0.223	0.342	-	0.911
	By individual	0.486			
		0.223	0.238	-	0.492

Body position	**By site**	0.023			
		0.287	0.419	0.061	0.114
	By individual	0.000			
		0.199	0.814	0.016	0.000
Lateralization	**By site**	0.001			
		-	0.092	0.174	0.016
	By individual	0.162			
		-	0.261	0.778	0.038
Flexed degree	**By site**	0.006			
		0.287	0.536	0.142	0.003
	By individual	0.007			
		0.199	0.861	0.396	0.000

Table 39: χ^2 p-values for the variable 'Head orientation' by site, individual and funerary offering

		Post-decomposition bone removal		
		48000-10000	**10000-6500**	**6500-4500**
Location	**By site**	0.123		
		0.705	0.261	0.199
	By individual	0.000		
		-	0.000	0.000
Shell midden	**By site**	0.702		
		-	0.387	0.743
	By individual	0.000		
		-	0.210	0.000

Collective funerary space	**By site**	0.015		
		-	0.153	0.080
	By individual	0.036		
		-	0.103	0.193
MNI	**By number**	0.000		
		0.726	0.000	0.000
	By category	0.000		
		0.635	0.000	0.028
Site type	**By site**	0.040		
		0.612	0.013	0.372
	By individual	0.011		
		-	0.685	0.001
Delimited / Mixed	**By site**	0.795		
		-	0.558	0.832
	By individual	0.022		
		-	0.508	0.002
Abandoned / Non-abandoned	**By site**	0.658		
		-	0.445	0.644
	By individual	0.321		
		-	0.651	0.351
Grave	**By site**	0.504		
		-	0.510	0.415
	By individual	0.541		
		-	0.026	0.005

Location marker	**By site**	0.633		
		-	0.959	0.615
	By individual	0.270		
		-	0.390	0.319
Sealed	**By site**	0.452		
		0.888	0.952	0.408
	By individual	0.000		
		-	0.400	0.000
Furnishings	**By site**	0.098		
		0.799	0.001	0.829
	By individual	0.354		
		-	0.102	0.752
Fire within the context	**By site**	0.302		
		0.842	0.796	0.679
	By individual	0.108		
		-	0.337	0.180
Mineral colourant within the context	**By site**	0.834		
		0.937	0.577	0.832
	By individual	0.094		
		-	0.233	0.192
Presence of funerary offerings	**By site**	0.356		
		0.000	0.415	0.717
	By individual	0.000		
		-	0.000	0.000

Quantity of funerary offerings	**By site**	0.257		
		0.983	0.284	0.270
	By individual	0.000		
		-	0.001	0.000
Type of funerary offering	**By funerary offering**	0.000		
		-	0.867	0.000
Tool materials	**By funerary offering**	0.344		
		-	0.940	0.316
Ornament materials	**By funerary offering**	-		
		-	-	-
Ornament composition	**By funerary offering**	-		
		-	-	-
Shell / Faunal remains	**By funerary offering**	0.012		
		-	-	0.022
Quantity of tools	**By site**	0.950		
		-	0.023	0.982
	By individual	0.000		
		-	0.000	0.432
Quantity of ornaments	**By site**	0.021		
		-	-	0.068
	By individual	-		
		-	-	-
Quantity of faunal remains and/or shells	**By site**	0.028		
		0.494	-	0.021
	By individual	0.000		
		-	-	0.000

Primary and secondary depositions	**By site**	0.562		
		0.646	0.116	0.139
	By individual	0.009		
		-	0.004	0.031
Body treatment at deposition	**By site**	0.384		
		0.679	0.887	0.786
	By individual	0.001		
		-	0.008	0.489
Body position	**By site**	0.245		
		-	0.693	0.023
	By individual	0.413		
		-	0.869	0.389
Lateralization	**By site**	0.074		
		-	-	0.099
	By individual	0.162		
		-	-	0.173
Flexed degree	**By site**	0.173		
		-	0.562	0.171
	By individual	0.441		
		-	0.461	0.445
Head orientation	**By site**	0.645		
		-	0.902	0.754
	By individual	0.090		
		-	0.504	0.042

Table 40: χ^2 p-values for the variable 'Post-decomposition bone removal' by site, individual and funerary offering

<table>
<tr><th colspan="2" rowspan="2"></th><th colspan="4">Fire affected body</th></tr>
<tr><th>48000-17000</th><th>17000-10000</th><th>10000-6500</th><th>6500-4500</th></tr>
<tr><td rowspan="4">Location</td><td rowspan="2">By site</td><td colspan="4">0.503</td></tr>
<tr><td>0.580</td><td>0.722</td><td>0.351</td><td>0.192</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="4">0.014</td></tr>
<tr><td>-</td><td>0.610</td><td>0.004</td><td>0.000</td></tr>
<tr><td rowspan="4">Shell midden</td><td rowspan="2">By site</td><td colspan="4">0.188</td></tr>
<tr><td>-</td><td>-</td><td>0.600</td><td>0.139</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="4">0.004</td></tr>
<tr><td>-</td><td>-</td><td>0.053</td><td>0.005</td></tr>
<tr><td rowspan="4">Collective funerary space</td><td rowspan="2">By site</td><td colspan="4">0.222</td></tr>
<tr><td>0.333</td><td>0.406</td><td>0.643</td><td>0.819</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="4">0.910</td></tr>
<tr><td>-</td><td>0.604</td><td>0.841</td><td>0.523</td></tr>
<tr><td rowspan="4">MNI</td><td rowspan="2">By number</td><td colspan="4">0.000</td></tr>
<tr><td>0.229</td><td>0.905</td><td>0.667</td><td>0.000</td></tr>
<tr><td rowspan="2">By category</td><td colspan="4">0.036</td></tr>
<tr><td>0.407</td><td>0.793</td><td>0.606</td><td>0.019</td></tr>
<tr><td rowspan="4">Site type</td><td rowspan="2">By site</td><td colspan="4">0.728</td></tr>
<tr><td>0.510</td><td>0.016</td><td>0.526</td><td>0.805</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="4">0.128</td></tr>
<tr><td>-</td><td>0.319</td><td>0.011</td><td>-</td></tr>
<tr><td rowspan="4">Delimited / Mixed</td><td rowspan="2">By site</td><td colspan="4">0.234</td></tr>
<tr><td>-</td><td>-</td><td>0.013</td><td>0.603</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="4">0.704</td></tr>
<tr><td>-</td><td>0.750</td><td>0.243</td><td>0.056</td></tr>
</table>

Abandoned / Non-abandoned	**By site**	0.267			
		-	0.000	0.367	0.788
	By individual	0.087			
		-	0.000	0.248	0.528
Grave	**By site**	0.000			
		0.005	0.122	0.003	0.004
	By individual	0.475			
		-	0.121	0.014	0.062
Location marker	**By site**	0.000			
		0.000	-	0.003	0.472
	By individual	0.286			
		-	-	0.571	0.291
Sealed	**By site**	0.000			
		0.886	0.000	0.009	0.100
	By individual	0.000			
		-	0.000	0.567	0.000
Furnishings	**By site**	0.000			
		0.000	0.000	0.077	0.044
	By individual	0.617			
		-	0.000	0.277	0.651
Fire within context	**By site**	0.000			
		0.000	0.000	0.000	0.000
	By individual	0.000			
		-	0.000	0.012	0.002

Mineral colourant within context	**By site**	0.062			
		0.000	0.944	0.025	0.655
	By individual	0.053			
		-	0.748	0.360	0.096
Presence of funerary offerings	**By site**	0.000			
		0.000	0.920	0.003	0.022
	By individual	0.000			
		-	0.709	0.872	0.000
Quantity of funerary offerings	**By site**	0.007			
		0.174	-	0.270	0.020
	By individual	0.000			
		-	-	0.946	0.000
Type of funerary offering	**By funerary offering**	0.000			
		-	-	-	0.000
Tool materials	**By funerary offering**	0.403			
		-	-	-	0.539
Ornament materials	**By funerary offering**	0.907			
		-	-	-	0.927
Ornament composition	**By funerary offering**	0.775			
		-	-	-	0.840
Shell / Faunal remains	**By funerary offering**	0.003			
		-	-	-	0.002
Quantity of tools	**By site**	0.000			
		0.287	-	0.071	0.000
	By individual	0.242			
		-	-	0.758	0.175

Quantity of ornaments	**By site**	0.851			
		-	-	0.953	0.929
	By individual	0.999			
		-	-	-	0.998
Quantity of faunal remains and/or shells	**By site**	0.007			
		0.223	-	0.349	0.038
	By individual	0.000			
		-	-	-	0.000
Body position	**By site**	0.558			
		0.301	0.292	0.491	0.310
	By individual	0.582			
		-	0.251	-	0.846
Lateralization	**By site**	0.341			
		-	-	0.466	0.389
	By individual	-			
		-	-	-	-
Flexed degree	**By site**	0.169			
		0.392	0.405	0.188	0.505
	By individual	0.599			
		-	0.180	-	0.960
Head orientation	**By site**	0.129			
		0.157	-	0.188	0.988
	By individual	-			
		-	-	-	-

Post-decomposition bone removal	**By site**	0.058			
		-	0.814	0.954	0.000
	By individual	0.000			
		-	-	0.369	0.000

Table 41: χ^2 p-values for the variable 'Fire affected body' by site, individual and funerary offering

		Mineral colourant on body			
		48000-33000	**33000-11000**	**11000-6500**	**6500-4500**
Location	**By site**	0.596			
		-	0.782	0.100	0.066
	By individual	0.012			
		-	0.000	0.000	0.000
Shell midden	**By site**	0.272			
		-	-	0.371	0.432
	By individual	0.075			
		-	-	0.001	0.296
Collective funerary space	**By site**	0.001			
		-	0.303	0.153	0.009
	By individual	0.922			
		-	0.799	0.091	0.358
MNI	**By number**	0.000			
		-	0.001	0.000	0.047
	By category	0.000			
		-	0.000	0.000	0.007

Site type	**By site**	0.000			
		-	0.123	0.017	0.000
	By individual	0.000			
		-	0.519	0.000	0.000
Delimited / Mixed	**By site**	0.310			
		-	0.061	0.776	0.910
	By individual	0.735			
		-	0.000	0.005	0.004
Abandoned / Non-abandoned	**By site**	0.363			
		-	0.835	0.054	0.823
	By individual	0.852			
		-	0.868	0.898	0.897
Grave	**By site**	0.586			
		-	0.170	0.482	0.616
	By individual	0.961			
		-	0.041	0.052	0.726
Location marker	**By site**	0.385			
		-	0.951	0.290	0.258
	By individual	0.216			
		-	0.744	0.670	0.072
Sealed	**By site**	0.117			
		-	0.008	0.114	0.466
	By individual	0.029			
		-	0.000	0.325	0.001

Furnishings	**By site**	0.001			
		-	0.009	0.287	0.087
	By individual	0.540			
		-	0.000	0.264	0.964
Fire within context	**By site**	0.000			
		-	0.796	0.247	0.000
	By individual	0.000			
		-	0.362	0.210	0.001
Mineral colourant within context	**By site**	0.000			
		-	0.006	0.031	0.000
	By individual	0.000			
		-	0.000	0.694	0.000
Presence of funerary offerings	**By site**	0.000			
		-	0.001	0.003	0.000
	By individual	0.000			
		-	0.000	0.000	0.000
Quantity of funerary offerings	**By site**	0.135			
		-	0.571	0.381	0.188
	By individual	0.001			
		-	0.150	0.030	0.000
Type of funerary offering	**By funerary offering**	0.000			
		-	0.636	0.222	0.000
Tool materials	**By funerary offering**	0.080			
		-	0.506	0.407	0.109
Ornament materials	**By funerary offering**	0.307			
		-	0.535	-	0.156

Ornament composition	**By funerary offering**	0.585			
		-	0.175	-	0.596
Shell / Faunal remains	**By funerary offering**	0.184			
		-	0.236	-	0.098
Quantity of tools	**By site**	0.060			
		-	0.261	0.121	0.229
	By individual	0.000			
		-	0.199	0.001	0.003
Quantity of ornaments	**By site**	0.087			
		-	0.821	-	0.078
	By individual	0.505			
		-	0.132	-	0.238
Quantity of faunal remains and/or shells	**By site**	0.623			
		-	0.343	0.292	0.931
	By individual	0.000			
		-	0.392	0.330	0.000
Primary and secondary depositions	**By site**	0.005			
		-	0.074	0.481	0.002
	By individual	0.000			
		-	0.000	0.027	0.000
Body treatment at deposition	**By site**	0.444			
		-	0.311	0.252	0.477
	By individual	0.036			
		-	0.000	0.000	0.033

Body position	**By site**	0.342			
		-	0.887	0.900	0.179
	By individual	0.000			
		-	0.282	0.787	0.000
Lateralization	**By site**	0.047			
		-	-	0.258	0.175
	By individual	0.000			
		-	0.273	0.427	0.001
Flexed degree	**By site**	0.555			
		-	0.828	0.649	0.391
	By individual	0.000			
		-	0.568	0.346	0.000
Head orientation	**By site**	0.242			
		-	0.261	0.513	0.267
	By individual	0.000			
		-	0.473	0.439	0.000
Post-decomposition bone removal	**By site**	0.467			
		-	0.011	0.000	0.713
	By individual	0.031			
		-	-	0.136	0.097
Fire affected body	**By site**	0.604			
		-	0.953	0.119	0.853
	By individual	0.020			
		-	0.665	0.306	0.039

Table 42: χ^2 p-values for the variable 'Mineral colourant on body' by site, individual and funerary offering

	Individual and multiple funerary deposits (by site)		
	48000-11000	**11000-7500**	**7500-4500**
Location	0.166		
	0.719	0.929	0.011
Shell midden	0.000		
	-	0.238	0.000
Collective funerary space	0.000		
	0.001	0.000	0.000
MNI	0.000		
	0.000	0.000	0.000
MNI category	0.000		
	0.000	0.000	0.000
Site type	0.000		
	0.324	0.005	0.009
Delimited / Mixed	0.442		
	0.044	0.720	0.601
Abandoned / Non-abandoned	0.235		
	0.619	0.420	0.092
Grave	0.000		
	0.147	0.009	0.000
Location marker	0.038		
	0.188	0.110	0.097
Sealed	0.054		
	0.581	0.299	0.118
Furnishings	0.000		
	0.024	0.245	0.000

<table>
<tr><td rowspan="2">Fire within context</td><td colspan="3">0.000</td></tr>
<tr><td>0.310</td><td>0.279</td><td>0.000</td></tr>
<tr><td rowspan="2">Mineral colourant within context</td><td colspan="3">0.000</td></tr>
<tr><td>0.019</td><td>0.200</td><td>0.014</td></tr>
<tr><td rowspan="2">Presence of funerary offerings</td><td colspan="3">0.000</td></tr>
<tr><td>0.702</td><td>0.022</td><td>0.001</td></tr>
<tr><td rowspan="2">Quantity of funerary offerings</td><td colspan="3">0.287</td></tr>
<tr><td>0.725</td><td>0.612</td><td>0.064</td></tr>
<tr><td rowspan="2">Quantity of tools</td><td colspan="3">0.298</td></tr>
<tr><td>0.285</td><td>0.458</td><td>0.253</td></tr>
<tr><td rowspan="2">Quantity of ornaments</td><td colspan="3">0.061</td></tr>
<tr><td>0.742</td><td>0.046</td><td>0.012</td></tr>
<tr><td rowspan="2">Quantity of faunal remains/shells</td><td colspan="3">0.271</td></tr>
<tr><td>0.405</td><td>0.402</td><td>0.240</td></tr>
<tr><td rowspan="2">Primary and secondary depositions</td><td colspan="3">0.000</td></tr>
<tr><td>0.002</td><td>0.000</td><td>0.000</td></tr>
<tr><td rowspan="2">Body treatment at deposition</td><td colspan="3">0.000</td></tr>
<tr><td>0.660</td><td>0.020</td><td>0.000</td></tr>
<tr><td rowspan="2">Body position</td><td colspan="3">0.000</td></tr>
<tr><td>0.234</td><td>0.905</td><td>0.000</td></tr>
<tr><td rowspan="2">Lateralization</td><td colspan="3">0.002</td></tr>
<tr><td>-</td><td>0.419</td><td>0.001</td></tr>
<tr><td rowspan="2">Flexed degree</td><td colspan="3">0.180</td></tr>
<tr><td>0.559</td><td>0.529</td><td>0.186</td></tr>
<tr><td rowspan="2">Head orientation</td><td colspan="3">0.092</td></tr>
<tr><td>0.287</td><td>0.271</td><td>0.475</td></tr>
</table>

Post-decomposition bone removal	0.000		
	0.870	0.021	0.000
Fire affected body	0.267		
	0.060	0.005	0.275
Mineral colourant on body	0.000		
	0.141	0.043	0.000

Table 43: χ^2 p-values for the variable 'Individual / Multiple deposition' by site

	Individual and multiple funerary deposits (by individual)					
	48000-23000	**23000-19500**	**19500-13000**	**13000-10000**	**10000-7000**	**7000-4500**
Location	0.000					
	0.000	0.001	0.051	0.534	0.128	0.000
Shell midden	0.000					
	-	-	-	-	0.000	0.002
Collective funerary space	0.000					
	0.019	0.005	0.001	0.001	0.000	0.000
Site type	0.000					
	0.466	-	0.000	-	0.000	0.000
Delimited / Mixed	0.000					
	0.002	-	0.814	0.156	0.967	0.000
Abandoned / Non-abandoned	0.500					
	-	-	-	0.588	0.380	0.166
Grave	0.000					
	0.080	-	0.062	0.239	0.000	0.000
Location marker	0.525					
	0.537	-	-	-	0.056	0.077

Sealed	0.040					
	0.537	-	1	0.692	0.191	0.002
Furnishings	0.089					
	0.537	0.341	0.602	0.544	0.000	0.853
Fire within context	0.004					
	0.272	0.351	0.157	0.567	0.191	0.000
Mineral colourant within context	0.099					
	0.001	0.341	0.077	0.431	0.231	0.010
Presence of funerary offerings	0.070					
	0.000	0.086	0.222	0.003	0.000	0.269
Quantity of funerary offerings	0.003					
	0.054	-	0.259	-	0.013	0.000
Quantity of tools	0.010					
	-	-	0.172	-	0.003	0.005
Quantity of ornaments	0.197					
	0.005	-	0.615	-	0.001	0.281
Quantity of faunal remains/shells	0.001					
	-	-	-	-	0.307	0.000
Primary and secondary depositions	0.000					
	0.424	0.011	0.004	0.182	0.000	0.000
Body treatment at deposition	0.000					
	0.034	0.003	0.520	0.004	0.000	0.000
Body position	0.001					
	-	-	0.571	-	0.299	0.001
Lateralization	0.438					
	-	-	0.014	-	0.314	0.511

Flexed degree	0.097					
	-	-	0.459	-	0.701	0.009
Head orientation	0.020					
	-	-	-	-	0.754	0.033
Post-decomposition bone removal	0.000					
	-	-	-	-	0.019	0.000
Fire affected body	0.000					
	-	-	0.157	0.684	0.270	0.000
Mineral colourant on body	0.050					
	0.000	0.932	0.618	0.000	0.000	0.240

Table 44: χ^2 p-values for the variable 'Individual / Multiple deposition' by individual

	Individual and multiple funerary deposits (by funerary offering)					
	48000-23000	**23000-19500**	**19500-13000**	**13000-10000**	**10000-7000**	**7000-4500**
Type of funerary offering	0.001					
	0.118	-	0.210	-	0.013	0.000
Tool materials	0.006					
	-	-	0.460	-	0.545	0.001
Ornament materials	0.312					
	0.386	-	0.819	-	0.227	0.075
Ornament composition	0.100					
	-	-	0.580	-	0.235	0.036
Shell / Faunal remains	0.001					
	-	-	-	-	0.049	0.006

Table 45: χ^2 p-values for the variable 'Individual / Multiple deposition' by funerary offering

		Sex			
		48000-10000	10000-8000	8000-6500	6500-4500
Location	**By site**	0.391			
		0.477	0.943	0.979	0.121
	By individual	0.424			
		0.505	0.555	0.903	0.624
Shell midden	**By site**	0.069			
		-	-	0.769	0.014
	By individual	0.709			
		-	-	0.940	0.299
Collective funerary space	**By site**	0.000			
		0.005	0.037	0.013	0.000
	By individual	0.835			
		0.350	0.018	0.366	0.409
MNI	**By number**	0.005			
		0.023	0.086	0.281	0.186
	By category	0.000			
		0.023	0.090	0.015	0.000
Site type	**By site**	0.001			
		0.548	0.417	0.181	0.020
	By individual	0.224			
		0.639	0.023	0.294	0.405

<table>
<tr><td rowspan="4">Delimited / Mixed</td><td rowspan="2">By site</td><td colspan="4">0.652</td></tr>
<tr><td>0.194</td><td>0.489</td><td>0.167</td><td>0.170</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="4">0.535</td></tr>
<tr><td>0.181</td><td>-</td><td>0.132</td><td>0.855</td></tr>
<tr><td rowspan="4">Abandoned / Non-abandoned</td><td rowspan="2">By site</td><td colspan="4">0.036</td></tr>
<tr><td>0.466</td><td>0.231</td><td>0.658</td><td>0.154</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="4">0.139</td></tr>
<tr><td>0.347</td><td>0.114</td><td>0.210</td><td>0.206</td></tr>
<tr><td rowspan="4">Grave</td><td rowspan="2">By site</td><td colspan="4">0.985</td></tr>
<tr><td>0.777</td><td>0.232</td><td>0.774</td><td>0.960</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="4">0.566</td></tr>
<tr><td>0.429</td><td>0.422</td><td>0.517</td><td>0.224</td></tr>
<tr><td rowspan="4">Location marker</td><td rowspan="2">By site</td><td colspan="4">0.682</td></tr>
<tr><td>0.428</td><td>0.318</td><td>0.815</td><td>0.738</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="4">0.202</td></tr>
<tr><td>-</td><td>0.110</td><td>0.016</td><td>0.719</td></tr>
<tr><td rowspan="4">Sealed</td><td rowspan="2">By site</td><td colspan="4">0.017</td></tr>
<tr><td>0.110</td><td>-</td><td>0.279</td><td>0.143</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="4">0.647</td></tr>
<tr><td>0.187</td><td>-</td><td>0.924</td><td>0.991</td></tr>
<tr><td rowspan="4">Furnishings</td><td rowspan="2">By site</td><td colspan="4">0.003</td></tr>
<tr><td>0.371</td><td>0.095</td><td>0.050</td><td>0.032</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="4">0.985</td></tr>
<tr><td>0.578</td><td>0.429</td><td>0.986</td><td>0.767</td></tr>
</table>

Fire within context	**By site**	0.046			
		0.574	0.179	0.443	0.203
	By individual	0.086			
		0.662	0.079	0.691	0.127
Mineral colourant within context	**By site**	0.314			
		0.355	0.179	0.735	0.446
	By individual	0.121			
		0.954	0.090	0.473	0.211
Presence of funerary offerings	**By site**	0.011			
		0.689	0.197	0.516	0.032
	By individual	0.014			
		0.059	0.006	0.095	0.229
Quantity of funerary offerings	**By site**	0.513			
		0.428	0.261	0.635	0.604
	By individual	0.786			
		0.677	0.041	0.729	0.837
Type of funerary offering	**By funerary offering**	0.000			
		0.005	-	0.000	0.006
Tool materials	**By funerary offering**	0.990			
		0.408	0.659	0.752	0.936
Ornament materials	**By funerary offering**	0.187			
		0.644	-	-	0.269
Ornament composition	**By funerary offering**	0.000			
		0.124	-	-	0.000
Shell / Faunal remains	**By funerary offering**	0.008			
		0.591	0.361	-	0.008

Quantity of tools	**By site**	0.854			
		0.199	0.430	0.109	0.748
	By individual	0.461			
		0.223	0.109	0.570	0.409
Quantity of ornaments	**By site**	0.604			
		0.268	-	-	0.468
	By individual	0.299			
		0.387	0.083	-	0.377
Quantity of faunal remains and/or shells	**By site**	0.868			
		0.287	0.172	0.223	0.920
	By individual	0.566			
		0.135	0.172	-	0.315
Primary and secondary depositions	**By site**	0.019			
		0.497	0.965	0.279	0.026
	By individual	0.099			
		0.710	0.015	0.781	0.403
Body treatment at deposition	**By site**	0.036			
		0.788	0.934	0.432	0.066
	By individual	0.408			
		0.240	0.245	0.514	0.725
Body position	**By site**	0.017			
		0.638	0.077	0.625	0.015
	By individual	0.271			
		0.477	0.031	0.308	0.410

Lateralization	**By site**	0.000			
		-	0.659	0.406	0.000
	By individual	0.199			
		0.495	-	1	0.062
Flexed degree	**By site**	0.016			
		0.421	0.048	0.162	0.085
	By individual	0.091			
		0.915	0.217	0.570	0.091
Head orientation	**By site**	0.005			
		0.157	0.292	0.365	0.003
	By individual	0.540			
		0.157	0.392	0.618	0.526
Post-decomposition bone removal	**By site**	0.683			
		0.303	0.246	0.468	0.268
	By individual	0.555			
		-	0.619	0.773	0.484
Fire affected body	**By site**	0.799			
		0.393	0.580	0.654	0.323
	By individual	0.279			
		0.358	-	0.347	-
Mineral colourant on body	**By site**	0.250			
		0.251	0.603	0.735	0.128
	By individual	0.442			
		0.532	0.700	0.219	0.746

Individual and multiple funerary deposits	By site	0.000			
		0.269	0.430	0.039	0.000
	By individual	0.106			
		0.311	0.264	0.978	0.441

Table 46: χ^2 p-values for the variable 'Sex' by site, individual and funerary offering

		Adults and subadults			
		48000-14000	14000-10000	10000-6500	6500-4500
Location	By site	0.638			
		0.545	0.794	0.664	0.006
	By individual	0.053			
		0.312	0.693	0.070	0.619
Shell midden	By site	0.679			
		-	-	0.166	0.577
	By individual	0.094			
		-	-	0.040	0.038
Collective funerary space	By site	0.000			
		0.000	0.001	0.000	0.000
	By individual	0.313			
		0.305	0.231	0.657	0.066
MNI	By number	0.000			
		0.003	0.067	0.000	0.002
	By category	0.000			
		0.000	0.021	0.000	0.000

Site type	**By site**	0.002			
		0.089	0.187	0.472	0.026
	By individual	0.001			
		0.463	0.718	0.089	0.066
Delimited / Mixed	**By site**	0.125			
		0.573	-	0.435	0.117
	By individual	0.004			
		0.203	0.191	0.350	0.005
Abandoned / Non-abandoned	**By site**	0.186			
		-	0.382	0.739	0.026
	By individual	0.296			
		-	0.511	0.838	0.063
Grave	**By site**	0.724			
		0.608	0.518	0.730	0.675
	By individual	0.058			
		0.181	0.787	0.436	0.252
Location marker	**By site**	0.044			
		0.320	-	0.242	0.494
	By individual	0.003			
		0.396	-	0.049	0.018
Sealed	**By site**	0.340			
		0.881	0.435	0.750	0.549
	By individual	0.123			
		0.945	0.466	0.098	0.400

Furnishings	**By site**	0.006			
		0.840	0.468	0.601	0.003
	By individual	0.138			
		0.932	0.587	0.125	0.261
Fire within context	**By site**	0.010			
		0.064	0.435	0.601	0.023
	By individual	0.669			
		0.169	0.299	0.118	0.801
Mineral colourant within context	**By site**	0.009			
		0.010	-	0.404	0.098
	By individual	0.439			
		0.910	0.183	0.748	0.572
Presence of funerary offerings	**By site**	0.000			
		0.869	0.757	0.704	0.000
	By individual	0.083			
		0.624	0.187	0.880	0.189
Quantity of funerary offerings	**By site**	0.531			
		0.369	0.369	0.369	0.369
	By individual	0.857			
		0.504	0.405	0.521	0.746
Type of funerary offering	**By funerary offering**	0.000			
		0.284	0.065	0.000	0.003
Tool materials	**By funerary offering**	0.060			
		0.689	-	0.626	0.116
Ornament materials	**By funerary offering**	0.000			
		0.735	0.187	0.336	0.013

Ornament composition	**By funerary offering**	0.000			
		0.342	0.076	0.091	0.001
Shell / Faunal remains	**By funerary offering**	0.001			
		0.747	-	0.039	0.017
Quantity of tools	**By site**	0.309			
		0.285	-	0.215	0.303
	By individual	0.841			
		0.421	-	0.208	0.377
Quantity of ornaments	**By site**	0.788			
		0.601	-	0.626	0.712
	By individual	0.699			
		0.576	0.368	0.652	0.521
Quantity of faunal remains and/or shells	**By site**	0.954			
		0.120	0.157	0.690	0.766
	By individual	0.710			
		0.525	0.083	0.624	0.621
Primary and secondary depositions	**By site**	0.000			
		0.049	0.367	0.006	0.001
	By individual	0.002			
		0.577	0.109	0.017	0.018
Body treatment at deposition	**By site**	0.000			
		0.061	0.446	0.002	0.001
	By individual	0.271			
		0.792	0.791	0.051	0.328

Body position	**By site**	0.000			
		0.453	0.223	0.021	0.000
	By individual	0.001			
		0.117	0.248	0.119	0.001
Lateralization	**By site**	0.000			
		-	-	0.008	0.003
	By individual	0.823			
		-	-	0.738	0.871
Flexed degree	**By site**	0.007			
		0.349	0.157	0.069	0.010
	By individual	0.646			
		0.565	0.386	0.547	0.496
Head orientation	**By site**	0.000			
		0.238	-	0.122	0.000
	By individual	0.040			
		0.261	-	0.061	0.201
Post-decomposition bone removal	**By site**	0.094			
		0.585	0.347	0.702	0.131
	By individual	0.565			
		-	-	0.223	0.185
Fire affected body	**By site**	0.647			
		0.574	0.435	0.894	0.206
	By individual	0.774			
		0.085	0.236	0.620	0.609

Mineral colourant on body	**By site**	0.018			
		0.493	0.191	0.814	0.017
	By individual	0.114			
		0.759	0.337	0.577	0.120
Individual and multiple funerary deposits	**By site**	0.000			
		0.022	0.046	0.000	0.000
	By individual	0.002			
		0.404	0.194	0.001	0.001
Sex	**By site**	0.000			
		0.246	0.514	0.033	0.000
	By individual	0.429			
		0.786	0.034	0.955	0.217

Table 47: χ^2 p-values for the variable 'Adult / Subadult' by site, individual and funerary offering

		Age groups (Adults)		
		48000-12000	**12000-6500**	**6500-4500**
Location	**By individual**	0.002		
		0.500	0.817	0.000
Shell midden	**By individual**	0.000		
		-	0.128	0.000
Collective funerary space	**By individual**	0.826		
		0.852	0.700	0.982
Site type	**By individual**	0.002		
		0.809	0.117	0.001

Delimited / Mixed	**By individual**	0.373		
		0.060	0.225	0.166
Abandoned / Non-abandoned	**By individual**	0.659		
		0.690	0.630	0.612
Grave	**By individual**	0.293		
		0.190	0.091	0.252
Location marker	**By individual**	0.545		
		-	0.041	0.918
Sealed	**By individual**	0.234		
		0.464	0.421	0.242
Furnishings	**By individual**	0.239		
		0.672	0.240	0.560
Fire within context	**By individual**	0.810		
		0.732	0.502	0.555
Mineral colourant within context	**By individual**	0.330		
		0.897	0.838	0.016
Presence of funerary offerings	**By individual**	0.224		
		0.860	0.625	0.115
Quantity of funerary offerings	**By individual**	0.334		
		0.353	0.478	0.422
Type of funerary offering	**By funerary offering**	0.011		
		0.225	0.003	0.048
Tool materials	**By funerary offering**	0.300		
		-	0.206	0.238
Ornament materials	**By funerary offering**	0.000		
		0.362	-	0.000

Ornament composition	**By funerary offering**	0.398		
		0.273	-	0.396
Shell / Faunal remains	**By funerary offering**	0.006		
		0.157	0.273	0.013
Quantity of tools	**By individual**	0.601		
		-	0.584	0.698
Quantity of ornaments	**By individual**	0.422		
		0.235	-	0.483
Quantity of faunal remains and/or shells	**By individual**	0.803		
		-	0.386	0.763
Primary and secondary depositions	**By individual**	0.906		
		0.408	0.362	0.413
Body treatment at deposition	**By individual**	0.229		
		0.308	0.267	0.335
Body position	**By individual**	0.187		
		0.659	0.312	0.184
Lateralization	**By individual**	0.279		
		-	0.481	0.687
Flexed degree	**By individual**	0.016		
		0.907	0.645	0.005
Head orientation	**By individual**	0.390		
		-	0.048	0.787
Post-decomposition bone removal	**By individual**	0.381		
		-	0.343	0.129
Fire affected body	**By individual**	0.153		
		0.732	0.197	0.321

Mineral colourant on body	**By individual**	0.197		
		0.849	0.102	0.111
Individual and multiple funerary deposits	**By individual**	0.374		
		0.617	0.084	0.424
Sex	**By individual**	0.022		
		0.072	0.188	0.031

Table 48: χ^2 p-values for the variable 'Age group' for adults by individual and funerary offering

		Age groups (Subadults)		
		48000-10000	**10000-6500**	**6500-4500**
Location	**By individual**	0.025		
		0.027	0.099	0.058
Shell midden	**By individual**	0.003		
		-	0.833	0.045
Collective funerary space	**By individual**	0.570		
		0.799	0.855	0.921
Site type	**By individual**	0.094		
		0.798	0.713	0.366
Delimited / Mixed	**By individual**	0.449		
		0.424	0.634	0.430
Abandoned / Non-abandoned	**By individual**	0.152		
		-	0.755	0.449
Grave	**By individual**	0.112		
		0.616	0.090	0.011
Location marker	**By individual**	0.047		
		-	-	0.039

Sealed	**By individual**	0.806		
		0.861	-	0.946
Furnishings	**By individual**	0.918		
		0.749	0.111	0.872
Fire within context	**By individual**	0.515		
		0.911	0.929	0.493
Mineral colourant within context	**By individual**	0.037		
		0.760	0.167	0.129
Presence of funerary offerings	**By individual**	0.004		
		0.001	0.154	0.040
Quantity of funerary offerings	**By individual**	0.925		
		0.706	0.965	0.427
Type of funerary offering	**By funerary offering**	0.022		
		0.041	-	0.054
Tool materials	**By funerary offering**	0.027		
		-	-	0.030
Ornament materials	**By funerary offering**	0.877		
		0.190	-	0.685
Ornament composition	**By funerary offering**	0.325		
		0.571	-	0.447
Shell / Faunal remains	**By funerary offering**	0.210		
		-	-	0.251
Quantity of tools	**By individual**	0.001		
		0.223	0.537	0.004
Quantity of ornaments	**By individual**	0.379		
		0.970	0.809	0.035

Quantity of faunal remains and/or shells	**By individual**	0.038		
		0.392	0.223	0.016
Primary and secondary depositions	**By individual**	0.054		
		0.355	0.257	0.229
Body treatment at deposition	**By individual**	0.245		
		0.026	0.832	0.049
Body position	**By individual**	0.892		
		0.576	0.627	0.877
Lateralization	**By individual**	0.642		
		-	0.223	0.721
Flexed degree	**By individual**	0.300		
		-	0.450	0.032
Head orientation	**By individual**	0.332		
		0.386	0.092	0.492
Post-decomposition bone removal	**By individual**	0.811		
		-	0.909	0.923
Fire affected body	**By individual**	0.570		
		-	0.820	0.762
Mineral colourant on body	**By individual**	0.000		
		0.000	0.067	0.001
Individual and multiple funerary deposits	**By individual**	0.320		
		0.065	0.762	0.921
Sex	**By individual**	0.149		
		0.099	0.414	0.140

Table 49: χ^2 p-values for the variable 'Age group' for subadults by individual and funerary offering

Kruskal-Wallis p-values[5]

		Quantity of funerary offerings					
		48000-34000	34000-11000	11000-8000	8000-7000	7000-5000	5000-4500
MNI	By site	0.036					
		-	0.287	0.567	0.845	0.065	0.158

Table 50: Kruskal-Wallis p-values for the variable 'Quantity of funerary offerings' by site

		Quantity of tools					
		48000-34000	34000-10000	10000-8000	8000-7000	7000-5000	5000-4500
MNI	By site	0.374					
		-	0.766	0.820	0.937	0.139	0.558
Quantity of funerary offerings	By site	0.000					
		-	0.406	0.115	0.117	0.006	0.021
	By individual	0.000					
		-	0.306	0.000	0.000	0.000	0.000

Table 51: Kruskal-Wallis p-values for the variable 'Quantity of tools' by site and individual

[5] The Shapiro-Wilks normality test showed that all the numeric variables present in the data table, except for the ones concerning the dates, are non-parametric.

<table>
<tr><th colspan="2"></th><th colspan="5">Quantity of ornaments</th></tr>
<tr><th colspan="2"></th><th>48000-34000</th><th>34000-10000</th><th>10000-6000</th><th>6000-5000</th><th>5000-4500</th></tr>
<tr><td rowspan="2">MNI</td><td rowspan="2">By site</td><td colspan="5">0.155</td></tr>
<tr><td>-</td><td>0.107</td><td>0.300</td><td>0.266</td><td>0.147</td></tr>
<tr><td rowspan="4">Quantity of funerary offerings</td><td rowspan="2">By site</td><td colspan="5">0.001</td></tr>
<tr><td>-</td><td>0.178</td><td>0.157</td><td>0.065</td><td>0.045</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="5">0.000</td></tr>
<tr><td>-</td><td>0.028</td><td>0.000</td><td>0.000</td><td>0.000</td></tr>
<tr><td rowspan="4">Quantity of tools</td><td rowspan="2">By site</td><td colspan="5">0.213</td></tr>
<tr><td>-</td><td>0.368</td><td>0.234</td><td>0.315</td><td>0.124</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="5">0.023</td></tr>
<tr><td>-</td><td>0.223</td><td>0.078</td><td>0.032</td><td>0.735</td></tr>
</table>

Table 52: Kruskal-Wallis p-values for the variable 'Quantity of ornaments' by site and individual

<table>
<tr><th colspan="2"></th><th colspan="5">Quantity of faunal remains and/or shells</th></tr>
<tr><th colspan="2"></th><th>48000-34000</th><th>34000-10000</th><th>10000-6000</th><th>6000-5000</th><th>5000-4500</th></tr>
<tr><td rowspan="2">MNI</td><td rowspan="2">By site</td><td colspan="5">0.228</td></tr>
<tr><td>-</td><td>0.773</td><td>0.374</td><td>0.287</td><td>0.293</td></tr>
<tr><td rowspan="4">Quantity of funerary offerings</td><td rowspan="2">By site</td><td colspan="5">0.135</td></tr>
<tr><td>-</td><td>0.384</td><td>0.336</td><td>0.319</td><td>0.361</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="5">0.000</td></tr>
<tr><td>-</td><td>0.404</td><td>0.122</td><td>0.033</td><td>0.000</td></tr>
<tr><td rowspan="4">Quantity of tools</td><td rowspan="2">By site</td><td colspan="5">0.411</td></tr>
<tr><td>-</td><td>0.317</td><td>0.311</td><td>0.454</td><td>0.438</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="5">0.408</td></tr>
<tr><td>-</td><td>0.368</td><td>0.739</td><td>0.149</td><td>0.240</td></tr>
<tr><td rowspan="4">Quantity of ornaments</td><td rowspan="2">By site</td><td colspan="5">0.097</td></tr>
<tr><td>-</td><td>0.368</td><td>0.423</td><td>0.293</td><td>0.310</td></tr>
<tr><td rowspan="2">By individual</td><td colspan="5">0.495</td></tr>
<tr><td>-</td><td>0.368</td><td>0.105</td><td>0.823</td><td>0.408</td></tr>
</table>

Table 53: Kruskal-Wallis p-values for the variable 'Quantity of faunal remains / shells' by site and individual

Appendix VI:
Contingency tables of χ2 tests

This appendix contains χ^2 contingency tables organised by chapter and section. Only the tables for the correlations mentioned in the main text are included, as correlation does not necessarily imply causality and, thus, not every correlation is relevant. Examples of irrelevant correlations that have been systematically excluded are those caused by truisms (*e.g.*, the correlation between the MNI and if a site is an individual or a collective funerary space), the consequence of the absence of two rare funerary features (*e.g.*, furnishings and location markers) or those caused by only one or two sites biasing the results. An example of this is a correlation between the site type and furnishings mainly caused by all individuals from the cemetery of El Collado, Spain (7590–6648 cal BC) being in furnished graves.

Chapter 4: Death and the use of landscape

Intra-site spatial distribution of the remains

Variables 'Delimited / Mixed' and 'Site type'

		SiteType			
		Activity area	Settlement	Settlement cemetery	Total
DelimitedMixed	Both	0	3	2	5
	Delimited	3	8	11	22
	Mixed	4	24	2	30
Total		7	35	15	57

Table 54: Contingency table of the variables 'Delimited / Mixed' and 'Site type' by site in 6000-4500 cal BC

Chapter 5: Modification of the funerary context

Graves

Variables 'Grave' and 'Location'

		Location			
		Cave	Open air	Rockshelter	Total
Grave	No	168	24	30	222
	Yes	182	795	43	1020
Total		350	819	73	1242

Table 55: Contingency table of the variables 'Grave' and 'Location' by individual in 48000-4500 cal BC

Variables 'Delimited / Mixed' and 'Grave'

		DelimitedMixed		
		Delimited	Mixed	Total
Grave	No	39	126	165
	Yes	510	177	687
Total		549	303	852

Table 56: Contingency table of the variables 'Delimited / Mixed' and 'Grave' by individual in 48000-4500 cal BC

Location markers

Variables 'Grave' and 'Location marker'

		Grave		
		No	Yes	Total
LocationMarker	No	210	558	768
	Yes	2	26	28
Total		212	584	796

Table 57: Contingency table of the variables 'Grave' and 'Location marker' by individual in 48000-4500 cal BC

Variables 'Delimited / Mixed' and 'Location marker'

		DelimitedMixed		
		Delimited	Mixed	Total
LocationMarker	No	236	257	493
	Yes	20	3	23
Total		256	260	516

Table 58: Contingency table of the variables 'Delimited / Mixed' and 'Location marker' by individual in 48000-4500 cal BC

Sealing methods

Variables 'Sealed' and 'Grave'

		Grave		
		No	Yes	Total
Sealed	No	219	684	903
	Yes	3	109	112
Total		222	793	1015

Table 59: Contingency table of the variables 'Sealed' and 'Grave' by individual in 48000-4500 cal BC

Furnishings

Variables ‘Furnishings’ and ‘Grave’

		Furnishings		
		No	Yes	Total
Grave	No	220	0	220
	Yes	554	77	631
Total		774	77	851

Table 60: Contingency table of the variables ‘Furnishings’ and ‘Grave’ by individual in 48000-4500 cal BC

Fire within context

Variables ‘Fire within context’ and ‘Grave’

		FireWithinContext		
		No	Yes	Total
Grave	No	210	3	213
	Yes	604	87	691
Total		814	90	904

Table 61: Contingency table of the variables ‘Fire within context’ and ‘Grave’ by individual in 48000-4500 cal BC

Variables ‘Fire within context’ and ‘Location marker’

		FireWithinContext		
		No	Yes	Total
LocationMarker	No	788	45	833
	Yes	10	17	27
Total		798	62	860

Table 62: Contingency table of the variables ‘Fire within context’ and ‘Location marker’ by individual in 48000-4500 cal BC

Mineral colourant within context

Variables ‘Mineral colourant within context’ and ‘Location’

		MineralColourantWithinContext		
		No	Yes	Total
Location	Cave	466	13	479
	Open air	463	72	535
	Rockshelter	103	7	110
Total		1032	92	1124

Table 63: Contingency table of the variables ‘Mineral colourant within context’ and ‘Location’ by individual in 48000-4500 cal BC

Variables ‘Mineral colourant within context’ and ‘Grave’

		MineralColourantWithinContext No	Yes	Total
Grave	No	202	2	204
	Yes	634	85	719
Total		836	87	923

Table 64: Contingency table of the variables ‘Mineral colourant within context’ and ‘Grave’ by individual in 48000-4500 cal BC

Variables ‘Mineral colourant within context’ and ‘Delimited / Mixed’

		MineralColourantWithinContext No	Yes	Total
DelimitedMixed	Delimited	300	46	346
	Mixed	276	20	296
Total		576	66	642

Table 65: Contingency table of the variables ‘Mineral colourant within context’ and ‘Delimited / Mixed’ by individual in 48000-4500 cal BC

Chapter 6: Funerary offerings

Presence of funerary offerings

Variables ‘Presence of funerary offerings’ and ‘Grave’

		PresenceOfFuneraryOfferings No	Yes	Total
Grave	No	174	37	211
	Yes	372	339	711
Total		546	376	922

Table 66: Contingency table of the variables ‘Presence of funerary offerings’ and ‘Grave’ by individual in 48000-4500 cal BC

Variables ‘Presence of funerary offerings’ and ’Site type’

		PresenceOfFuneraryOfferings No	Yes	Total
SiteType	Activity area	120	12	132
	Isolated burial	0	3	3
	Settlement	273	114	387
	Settlement cemetery	236	109	345
Total		629	238	867

		PresenceOfFuneraryOfferings No	Yes	Total
SiteType	Activity area	14	1	15
	Isolated burial	0	3	3
	Settlement	114	81	195
	Settlement cemetery	43	44	87
Total		171	129	300

Table 67: Contingency table of the variables ‘Presence of funerary offerings’ and ’Site type’ by individual in the whole period (left) and 5000-4500 cal BC (right)

Variables ‘Presence of funerary offerings’ and ’Collective funerary space’

a)

		PresenceOfFuneraryOfferings No	PresenceOfFuneraryOfferings Yes	Total
CollectiveFunerarySpace	No	17	1	18
	Yes	49	32	81
Total		66	33	99

b)

		PresenceOfFuneraryOfferings No	PresenceOfFuneraryOfferings Yes	Total
CollectiveFunerarySpace	No	18	27	45
	Yes	420	257	677
Total		438	284	722

c)

		PresenceOfFuneraryOfferings No	PresenceOfFuneraryOfferings Yes	Total
CollectiveFunerarySpace	No	3	25	28
	Yes	200	208	408
Total		203	233	436

Table 68: Contingency table of the variables ‘Presence of funerary offerings’ and ’Collective funerary space’ by individual in 8000-7000 cal BC (a), 7000-5000 cal BC (b) and 5000-4500 cal BC (c)

Variables ‘Presence of funerary offerings’ and ‘Delimited / Mixed’

		PresenceOfFuneraryOfferings No	PresenceOfFuneraryOfferings Yes	Total
DelimitedMixed	Delimited	259	161	420
	Mixed	230	74	304
Total		489	235	724

		PresenceOfFuneraryOfferings No	PresenceOfFuneraryOfferings Yes	Total
DelimitedMixed	Delimited	66	100	166
	Mixed	68	30	98
Total		134	130	264

Table 69: Contingency table of the variables ‘Presence of funerary offerings’ and ‘Delimited / Mixed’ by individual in the whole period (left) and 5000-4500 cal BC (right)

Variables ‘Presence of funerary offerings’ and ‘Location marker’

		PresenceOfFuneraryOfferings No	PresenceOfFuneraryOfferings Yes	Total
LocationMarker	No	499	289	788
	Yes	3	15	18
Total		502	304	806

Table 70: Contingency table of the variables ‘Presence of funerary offerings’ and ‘Location marker’ by individual in 48000-4500 cal BC

Variables ‘Presence of funerary offerings’ and ‘Sealed’

		PresenceOfFuneraryOfferings No	PresenceOfFuneraryOfferings Yes	Total
Sealed	No	646	311	957
	Yes	12	38	50
Total		658	349	1007

		PresenceOfFuneraryOfferings No	PresenceOfFuneraryOfferings Yes	Total
Sealed	No	178	195	373
	Yes	1	23	24
Total		179	218	397

Table 71: Contingency table of the variables ‘Presence of funerary offerings’ and ‘Sealed’ by individual in the whole period (left) and 5000-4500 cal BC (right)

Variables ‘Presence of funerary offerings’ and ‘Furnishings’

		PresenceOfFuneraryOfferings		
		No	Yes	Total
Furnishings	No	589	270	859
	Yes	35	40	75
Total		624	310	934

		PresenceOfFuneraryOfferings		
		No	Yes	Total
Furnishings	No	168	175	343
	Yes	4	15	19
Total		172	190	362

Table 72: Contingency table of the variables ‘Presence of funerary offerings’ and ‘Furnishings’ by individual in the whole period (left) and 5000-4500 cal BC (right)

Variables ‘Presence of funerary offerings’ and ‘Fire within context’

		PresenceOfFuneraryOfferings		
		No	Yes	Total
FireWithinContext	No	623	280	903
	Yes	24	51	75
Total		647	331	978

		PresenceOfFuneraryOfferings		
		No	Yes	Total
FireWithinContext	No	352	229	581
	Yes	20	41	61
Total		372	270	642

Table 73: Contingency table of the variables ‘Presence of funerary offerings’ and ‘Fire within context’ by individual in the whole period (left) and 7000-4500 cal BC (right)

Variables ‘Presence of funerary offerings’ and ‘Mineral colorant within context’

		PresenceOfFuneraryOfferings		
		No	Yes	Total
MineralColourantWithinContext	No	640	248	888
	Yes	14	53	67
Total		654	301	955

Table 74: Contingency table of the variables ‘Presence of funerary offerings’ and ‘Mineral colorant within context’ by individual in 48000-4500 cal BC

Type of funerary offering

Introduction

Variables ‘Type of funerary offering’ and ‘Location marker’

		-	Ochre nodules	Ornaments	Plants and derivatives	Portable art	Tools and equipment	Unmodified faunal remains / shells	Total
LocationMarker	No	12	5	133	0	6	191	108	455
	Yes	3	1	1	2	0	30	9	46
Total		15	6	134	2	6	221	117	501

Table 75: Contingency table of the variables ‘Type of funerary offering’ and ‘Location marker’ by funerary offering in 48000-4500 cal BC

Ornaments

Materials

Variables ‘Material category’ for ornaments and ‘Shell midden’

		MaterialCategory				Total
		Bone	Lithic	Shell	Teeth	
ShellMidden	No	14	16	53	11	94
	Yes	14	1	87	1	103
Total		28	17	140	12	197

Table 76: Contingency table of the variables ‘Material category’ for ornaments and ‘Shell midden’ by funerary offering in 6500-4500 cal BC

Unmodified faunal remains and shells

Variables ‘General object type’ for faunal remains and shells and ‘Delimited / Mixed’

		GeneralObjectType		Total
		Faunal remains	Shell	
DelimitedMixed	Delimited	18	23	41
	Mixed	29	9	38
Total		47	32	79

Table 77: Contingency table of the variables ‘General object type’ for faunal remains and shells and ‘Delimited / Mixed’ by funerary offering in 6500-4500 cal BC

Variables ‘General object type’ for faunal remains and shells and ‘Site type’

		GeneralObjectType		Total
		Faunal remains	Shell	
SiteType	Activity area	6	0	6
	Isolated burial	0	1	1
	Settlement	28	4	32
	Settlement cemetery	20	26	46
Total		54	31	85

Table 78: Contingency table of the variables ‘General object type’ for faunal remains and shells and ‘Site type’ by funerary offering in 6500-4500 cal BC

Variables ‘General object type’ for faunal remains and shells and ‘Shell midden’

		GeneralObjectType		Total
		Faunal remains	Shell	
ShellMidden	No	57	19	76
	Yes	19	23	42
Total		76	42	118

Table 79: Contingency table of the variables ‘General object type’ for faunal remains and shells and ‘Shell midden’ by funerary offering in 6500-4500 cal BC

Chapter 7: The treatment of the body

Primary and secondary depositions

Variables ‘Primary / Secondary position’ and ‘Location’

		PrimarySecondary			
		Both	Primary position	Secondary position	Total
Location	Cave	7	32	43	82
	Open air	15	71	2	88
	Rockshelter	6	19	6	31
Total		28	122	51	201

Table 80: Contingency table of the variables ‘Primary / Secondary position’ and ‘Location’ by site in 48000-4500 cal BC

Variables ‘Primary / Secondary position’ and ‘Delimited / Mixed’

		PrimarySecondary		
		Primary position	Secondary position	Total
DelimitedMixed	Delimited	8	4	12
	Mixed	10	66	76
Total		18	70	88

Table 81: Contingency table of the variables ‘Primary / Secondary position’ and ‘Delimited / Mixed’ by individual in 48000-10000 cal BC

Primary position

Complete bodies

Variables ‘Primary / Secondary position’ and ‘Grave’

		PrimarySecondary		
		Primary position	Secondary position	Total
Grave	No	19	124	143
	Yes	721	99	820
Total		740	223	963

Table 82: Contingency table of the variables ‘Primary / Secondary position’ and ‘Grave’ by individual in 48000-4500 cal BC

Variables ‘Body treatment at deposition’ and ‘Grave’

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
Grave	No	17	1	58	0	6	11	93
	Yes	729	14	60	15	0	23	841
Total		746	15	118	15	6	34	934

Table 83: Contingency table of the variables ‘Body treatment at deposition’ and ‘Grave’ by individual in 48000-4500 cal BC

Variables 'Primary / Secondary position' and 'Sealed'

		PrimarySecondary		
		Primary position	Secondary position	Total
Sealed	No	562	275	837
	Yes	47	3	50
Total		609	278	887

Table 84: Contingency table of the variables 'Primary / Secondary position' and 'Sealed' by individual in 48000–4500 cal BC

Variables 'Body treatment at deposition' and 'Sealed'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
Sealed	No	563	17	131	16	10	64	801
	Yes	47	0	0	0	0	3	50
Total		610	17	131	16	10	67	851

Table 85: Contingency table of the variables 'Body treatment at deposition' and 'Sealed' by individual in 48000-4500 cal BC

Variables 'Primary / Secondary position' and '**Furnishings'**

		PrimarySecondary		
		Primary position	Secondary position	Total
Furnishings	No	453	266	719
	Yes	70	10	80
Total		523	276	799

Table 86: Contingency table of the variables 'Primary / Secondary position' and 'Furnishings' by individual in 48000-4500 cal BC

Variables 'Body treatment at deposition' and 'Furnishings'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
Furnishings	No	448	17	122	16	10	64	677
	Yes	72	0	7	0	0	3	82
Total		520	17	129	16	10	67	759

Table 87: Contingency table of the variables 'Body treatment at deposition' and 'Furnishings' by individual in 48000-4500 cal BC

Variables 'Primary / Secondary position' and 'Abandoned / Non-abandoned'

		PrimarySecondary		
		Primary position	Secondary position	Total
AbandonedNonabandoned	Abandoned	36	2	38
	Non-abandoned	608	183	791
Total		644	185	829

Table 88: Contingency table of the variables 'Primary / Secondary position' and 'Abandoned / Non-abandoned' by individual in 48000-4500 cal BC

Variables 'Body treatment at deposition' and 'Site Type'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
SiteType	Activity area	7	0	11	1	0	1	20
	Funerary cave	6	0	5	0	0	0	11
	Settlement	4	7	5	0	1	0	17
	Settlement cemetery	34	0	0	0	0	1	35
Total		51	7	21	1	1	2	83

		BodyTreatment					
		Complete	Cremation	Disarticulated bones	Isolated bone	Skull	Total
SiteType	Activity area	25	0	8	0	2	35
	Funerary cave	10	0	0	0	0	10
	Isolated burial	3	0	0	0	0	3
	Settlement	121	1	67	15	10	214
	Settlement cemetery	411	0	5	0	1	417
Total		570	1	80	15	13	679

Table 89: Contingency table of the variables 'Body treatment at deposition' and 'Site Type' by individual in 8000-6500 cal BC (top) and 6500-4500 cal BC (bottom)

Variables 'Body treatment at deposition' and 'Shell midden'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
ShellMidden	No	26	9	40	0	1	4	80
	Yes	36	0	0	1	0	2	39
Total		62	9	40	1	1	6	119

		BodyTreatment					
		Complete	Cremation	Disarticulated bones	Isolated bone	Skull	Total
ShellMidden	No	451	11	75	16	15	568
	Yes	293	0	5	0	2	300
Total		744	11	80	16	17	868

Table 90: Contingency table of the variables 'Body treatment at deposition' and 'Shell midden' by individual in 8000-6500 cal BC (top) and 6500-4500 cal BC (bottom)

Variables 'Body treatment at deposition' and 'Collective funerary space'

		CollectiveFunerarySpace No	CollectiveFunerarySpace Yes	Total
BodyTreatment	Complete	10	12	22
	Disarticulated bones	0	18	18
	Ornament	3	1	4
	Skull	5	23	28
Total		18	54	72

		CollectiveFunerarySpace No	CollectiveFunerarySpace Yes	Total
BodyTreatment	Complete	5	23	28
	Cremation	1	7	8
	Disarticulated bones	0	55	55
	Ornament	3	1	4
	Skull	3	11	14
Total		12	97	109

		CollectiveFunerarySpace No	CollectiveFunerarySpace Yes	Total
BodyTreatment	Complete	11	49	60
	Cremation	2	6	8
	Disarticulated bones	0	39	39
	Isolated bone	1	0	1
	Ornament	0	1	1
	Skull	1	5	6
Total		15	100	115

		CollectiveFunerarySpace No	CollectiveFunerarySpace Yes	Total
BodyTreatment	Complete	40	698	738
	Cremation	0	10	10
	Disarticulated bones	0	80	80
	Isolated bone	1	15	16
	Skull	1	15	16
Total		42	818	860

Table 91: Contingency table of the variables 'Body treatment at deposition' and 'Collective funerary space' by individual in 19000-10000 cal BC (top left), 10000-8000 cal BC (top right), 8000-6500 cal BC (bottom left) and 6500-4500 cal BC (bottom right)

Variables 'Body treatment at deposition' and 'Location'

		BodyTreatment Complete	Cremation	Disarticulated bones	Inconsistent	Isolated bone	Skull	Total
Location	Cave	18	0	5	6	0	0	29
	Open air	59	1	0	13	1	0	74
	Rockshelter	6	0	0	1	0	1	8
Total		83	1	5	20	1	1	111

Table 92: Contingency table of the variables 'Body treatment at deposition' and 'Location' by site in 6500-4500 cal BC

Variables 'Body treatment at deposition' and 'Delimited / Mixed'

		BodyTreatment Complete	Cremation	Disarticulated bones	Isolated bone	Skull	Total
DelimitedMixed	Delimited	456	7	4	0	7	474
	Mixed	104	1	32	15	2	154
Total		560	8	36	15	9	628

Table 93: Contingency table of the variables 'Body treatment at deposition' and 'Delimited / Mixed' by individual in 6500-4500 cal BC

Variables ‘Body treatment at deposition’ and ‘Presence of funerary offerings’

		PresenceOfFuneraryOfferings No	PresenceOfFuneraryOfferings Yes	Total
BodyTreatment	Complete	7	4	11
	Disarticulated bones	6	10	16
	Ornament	3	0	3
	Skull	24	3	27
Total		40	17	57

		PresenceOfFuneraryOfferings No	PresenceOfFuneraryOfferings Yes	Total
BodyTreatment	Complete	7	16	23
	Cremation	1	6	7
	Disarticulated bones	22	26	48
	Ornament	3	0	3
	Skull	9	2	11
Total		42	50	92

		PresenceOfFuneraryOfferings No	PresenceOfFuneraryOfferings Yes	Total
BodyTreatment	Complete	46	14	60
	Cremation	2	5	7
	Disarticulated bones	15	17	32
	Isolated bone	1	0	1
	Skull	5	0	5
Total		69	36	105

		PresenceOfFuneraryOfferings No	PresenceOfFuneraryOfferings Yes	Total
BodyTreatment	Complete	285	269	554
	Cremation	2	6	8
	Disarticulated bones	59	12	71
	Isolated bone	10	0	10
	Skull	10	5	15
Total		366	292	658

Table 94: Contingency table of the variables ‘Body treatment at deposition’ and ‘Presence of funerary offerings’ by individual in 19000-10000 cal BC (top left), 10000-8000 cal BC (top right), 8000-6500 cal BC (bottom left) and 6500-4500 cal BC (bottom right)

Variables ‘Body treatment at deposition’ and ‘Location marker’

		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
LocationMarker	No	432	15	118	16	10	60	651
	Yes	25	1	0	0	0	0	26
Total		457	16	118	16	10	60	677

Table 95: Contingency table of the variables ‘Body treatment at deposition’ and ‘Location marker’ by individual in 48000-4500 cal BC

Secondary position

Skulls

Variables ‘Body treatment at deposition’ and ‘Grave’

		BodyTreatment Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
Grave	No	17	1	58	0	6	11	93
	Yes	729	14	60	15	0	23	841
Total		746	15	118	15	6	34	934

Table 96: Contingency table of the variables ‘Body treatment at deposition’ and ‘Grave’ by individual in 48000-4500 cal BC

Variables ‘Body treatment at deposition’ and ‘Sealed’

		BodyTreatment Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
Sealed	No	563	17	131	16	10	64	801
	Yes	47	0	0	0	0	3	50
Total		610	17	131	16	10	67	851

Table 97: Contingency table of the variables ‘Body treatment at deposition’ and ‘Sealed’ by individual in 48000-4500 cal BC

Variables 'Body treatment at deposition' and 'Furnishings'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
Furnishings	No	448	17	122	16	10	64	677
	Yes	72	0	7	0	0	3	82
Total		520	17	129	16	10	67	759

Table 98: Contingency table of the variables 'Body treatment at deposition' and 'Furnishings' by individual in 48000-4500 cal BC

Variables 'Body treatment at deposition' and 'Presence of funerary offerings'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
PresenceOfFuneraryOfferings	No	328	4	107	11	10	60	520
	Yes	296	12	39	0	0	11	358
Total		624	16	146	11	10	71	878

Table 99: Contingency table of the variables 'Body treatment at deposition' and 'Presence of funerary offerings' by individual in 48000-4500 cal BC

Disarticulated bones

Variables 'Body treatment at deposition' and 'Collective funerary space'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
CollectiveFunerarySpace	No	66	2	0	2	7	8	85
	Yes	761	17	168	15	4	68	1033
Total		827	19	168	17	11	76	1118

Table 100: Contingency table of the variables 'Body treatment at deposition' and 'Collective funerary space' by individual in 48000-4500 cal BC

Variables 'Body treatment at deposition' and 'Delimited / Mixed'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
DelimitedMixed	Delimited	468	7	14	0	0	10	499
	Mixed	127	5	58	15	15	10	230
Total		595	12	72	15	15	20	729

Table 101: Contingency table of the variables 'Body treatment at deposition' and 'Delimited / Mixed' by individual in 48000-4500 cal BC

Variables 'Body treatment at deposition' and 'Site Type'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
SiteType	Activity area	45	0	26	1	3	19	94
	Funerary cave	19	0	17	0	0	0	36
	Isolated burial	3	0	0	0	0	0	3
	Settlement	147	8	82	15	10	20	282
	Settlement cemetery	424	0	5	0	0	2	431
Total		638	8	130	16	13	41	846

		BodyTreatment					
		Complete	Cremation	Disarticulated bones	Ornament	Skull	Total
SiteType	Activity area	3	0	0	1	7	11
	Funerary cave	3	0	17	0	0	20
	Settlement	14	6	9	3	1	33
Total		20	6	26	4	8	64

Table 102: Contingency table of the variables 'Body treatment at deposition' and 'Site Type' by individual in the whole period (top) and 10000-8000 cal BC (bottom)

Variables 'Body treatment at deposition' and 'Presence of funerary offerings'

		PresenceOfFuneraryOfferings		
		No	Yes	Total
BodyTreatment	Complete	7	4	11
	Disarticulated bones	6	10	16
	Ornament	3	0	3
	Skull	24	3	27
Total		40	17	57

		PresenceOfFuneraryOfferings		
		No	Yes	Total
BodyTreatment	Complete	7	16	23
	Cremation	1	6	7
	Disarticulated bones	22	26	48
	Ornament	3	0	3
	Skull	9	2	11
Total		42	50	92

		PresenceOfFuneraryOfferings		
		No	Yes	Total
BodyTreatment	Complete	46	14	60
	Cremation	2	5	7
	Disarticulated bones	15	17	32
	Isolated bone	1	0	1
	Skull	5	0	5
Total		69	36	105

		PresenceOfFuneraryOfferings		
		No	Yes	Total
BodyTreatment	Complete	285	269	554
	Cremation	2	6	8
	Disarticulated bones	59	12	71
	Isolated bone	10	0	10
	Skull	10	5	15
Total		366	292	658

Table 103: Contingency table of the variables 'Body treatment at deposition' and 'Presence of funerary offerings' by individual in 19000-10000 cal BC (top left), 10000-8000 cal BC (top right), 8000-6500 cal BC (bottom left) and 6500-4500 cal BC (bottom right)

Post-decomposition bone removal and isolated bones

Variables 'Post-decomposition bone removal' and 'Grave'

		BonesRemoval No	BonesRemoval Yes	Total
Grave	No	39	0	39
	Yes	99	13	112
Total		138	13	151

		BonesRemoval No	BonesRemoval Yes	Total
Grave	No	61	7	68
	Yes	685	24	709
Total		746	31	777

Table 104: Contingency table of the variables 'Post-decomposition bone removal' and 'Grave' by individual in 10000-6500 cal BC (left), 6500-4500 cal BC (right)

Variables 'Post-decomposition bone removal' and 'Collective funerary space'

		BonesRemoval No	BonesRemoval Yes	Total
CollectiveFunerarySpace	No	112	0	112
	Yes	1093	43	1136
Total		1205	43	1248

Table 105: Contingency table of the variables 'Post-decomposition bone removal' and 'Collective funerary space' by individual in 48000-4500 cal BC

Variables 'Post-decomposition bone removal' and 'Primary / Secondary position'

		BonesRemoval No	BonesRemoval Yes	Total
PrimarySecondary	Primary position	712	24	736
	Secondary position	233	18	251
Total		945	42	987

Table 106: Contingency table of the variables 'Post-decomposition bone removal' and 'Primary / Secondary position' by individual in 48000-4500 cal BC

Variables 'Post-decomposition bone removal' and 'Primary / Secondary position'

		BonesRemoval No	BonesRemoval Yes	Total
PrimarySecondary	Primary position	704	24	728
	Secondary position	233	18	251
Total		937	42	979

Table 107: Contingency table of the variables 'Post-decomposition bone removal' and 'Primary / Secondary position' by individual in 48000-4500 cal BC

Variables 'Post-decomposition bone removal' and 'Body treatment at deposition'

		BonesRemoval No	BonesRemoval Yes	Total
BodyTreatment	Complete	726	25	751
	Cremation	19	0	19
	Disarticulated bones	131	16	147
	Isolated bone	16	0	16
	Ornament	15	0	15
	Skull	58	1	59
Total		965	42	1007

Table 108: Contingency table of the variables 'Post-decomposition bone removal' and 'Body treatment at deposition' by individual in 48000-4500 cal BC

Variables 'Post-decomposition bone removal' and 'Presence of funerary offerings'

		BonesRemoval No	BonesRemoval Yes	Total
PresenceOfFuneraryOfferings	No	611	9	620
	Yes	305	34	339
Total		916	43	959

Table 109: Contingency table of the variables 'Post-decomposition bone removal' and 'Presence of funerary offerings' by individual in 48000-4500 cal BC

Variables 'Body treatment at deposition' and 'Grave'

		BodyTreatment Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
Grave	No	17	1	58	0	6	11	93
	Yes	729	14	60	15	0	23	841
Total		746	15	118	15	6	34	934

Table 110: Contingency table of the variables 'Body treatment at deposition' and 'Grave' by individual in 48000-4500 cal BC

Variables 'Body treatment at deposition' and 'Presence of funerary offerings'

		BodyTreatment Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
PresenceOfFuneraryOfferings	No	328	4	107	11	10	60	520
	Yes	296	12	39	0	0	11	358
Total		624	16	146	11	10	71	878

Table 111: Contingency table of the variables 'Body treatment at deposition' and 'Presence of funerary offerings' by individual in 48000-4500 cal BC

Variables 'Body treatment at deposition' and 'Delimited / Mixed'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
DelimitedMixed	Delimited	468	7	14	0	0	10	499
	Mixed	127	5	58	15	15	10	230
Total		595	12	72	15	15	20	729

Table 112: Contingency table of the variables 'Body treatment at deposition' and 'Delimited / Mixed' by individual in 48000-4500 cal BC

Ornaments

Variables 'Body treatment at deposition' and 'Location'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
Location	Cave	140	0	109	1	12	46	308
	Open air	662	15	36	16	0	18	747
	Rockshelter	34	4	20	0	3	15	76
Total		836	19	165	17	15	79	1131

Table 113: Contingency table of the variables 'Body treatment at deposition' and 'Location' by individual in 48000-4500 cal BC

Variables 'Body treatment at deposition' and 'Collective funerary space'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
CollectiveFunerarySpace	No	66	2	0	2	7	8	85
	Yes	761	17	168	15	4	68	1033
Total		827	19	168	17	11	76	1118

Table 114: Contingency table of the variables 'Body treatment at deposition' and 'Collective funerary space' by individual in 48000-4500 cal BC

Variables 'Body treatment at deposition' and 'Delimited / Mixed'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
DelimitedMixed	Delimited	468	7	14	0	0	10	499
	Mixed	127	5	58	15	15	10	230
Total		595	12	72	15	15	20	729

Table 115: Contingency table of the variables 'Body treatment at deposition' and 'Delimited / Mixed' by individual in 48000-4500 cal BC

Variables 'Body treatment at deposition' and 'Grave'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
Grave	No	17	1	58	0	6	11	93
	Yes	729	14	60	15	0	23	841
Total		746	15	118	15	6	34	934

Table 116: Contingency table of the variables 'Body treatment at deposition' and 'Grave' by individual in 48000-4500 cal BC

Cremations

Variables 'Fire affected body' and 'Post-decomposition bone removal'

		FireAffectedBody		
		No	Yes	Total
BonesRemoval	No	552	12	564
	Yes	15	16	31
Total		567	28	595

Table 117: Contingency table of the variables 'Fire affected body' and 'Post-decomposition bone removal' by individual in 6500-4500 cal BC

Variables 'Fire affected body' and 'Location'

		FireAffectedBody		
		No	Yes	Total
Location	Cave	149	20	169
	Open air	532	7	539
	Rockshelter	15	0	15
Total		696	27	723

Table 118: Contingency table of the variables 'Fire affected body' and 'Location' by individual in 6500-4500 cal BC

Variables 'Fire affected body' and 'Sealed'

		FireAffectedBody		
		No	Yes	Total
Sealed	No	658	8	666
	Yes	14	19	33
Total		672	27	699

Table 119: Contingency table of the variables 'Fire affected body' and 'Sealed' by individual in 6500-4500 cal BC

Variables 'Fire affected body' and 'Presence of funerary offerings'

		FireAffectedBody		
		No	Yes	Total
PresenceOfFuneraryOfferings	No	346	2	348
	Yes	260	25	285
Total		606	27	633

Table 120: Contingency table of the variables 'Fire affected body' and 'Presence of funerary offerings' by individual in 6500-4500 cal BC

Variables 'Body treatment at deposition' and 'Presence of funerary offerings'

		PresenceOfFuneraryOfferings		
		No	Yes	Total
BodyTreatment	Complete	285	269	554
	Cremation	2	6	8
	Disarticulated bones	59	12	71
	Isolated bone	10	0	10
	Skull	10	5	15
Total		366	292	658

Table 121: Contingency table of the variables 'Body treatment at deposition' and 'Presence of funerary offerings' by individual in 6500-4500 cal BC

Variables 'Body treatment at deposition' and 'Grave'

		BodyTreatment						
		Complete	Cremation	Disarticulated bones	Isolated bone	Ornament	Skull	Total
Grave	No	17	1	58	0	6	11	93
	Yes	729	14	60	15	0	23	841
Total		746	15	118	15	6	34	934

Table 122: Contingency table of the variables 'Body treatment at deposition' and 'Grave' by individual in 48000-4500 cal BC

Mineral colourant applied to the body

Variables 'Mineral colourant on body' and 'Location'

		MineralColourantOnBody		
		No	Yes	Total
Location	Cave	167	7	174
	Open air	1	0	1
	Rockshelter	45	15	60
Total		213	22	235

		MineralColourantOnBody		
		No	Yes	Total
Location	Cave	92	30	122
	Open air	39	0	39
	Rockshelter	58	2	60
Total		189	32	221

		MineralColourantOnBody		
		No	Yes	Total
Location	Cave	222	10	232
	Open air	433	89	522
	Rockshelter	16	0	16
Total		671	99	770

Table 123: Contingency table of the variables 'Mineral colourant on body' and 'Location' by individual in 33000-11000 cal BC (top left), 11000-6500 cal BC (top right) and 6500-4500 cal BC (bottom)

Variables 'Mineral colourant on body' and 'Site type'

		MineralColourantOnBody No	MineralColourantOnBody Yes	Total
SiteType	Activity area	47	0	47
	Funerary cave	22	14	36
	Settlement	39	7	46
	Settlement cemetery	39	0	39
Total		147	21	168

		MineralColourantOnBody No	MineralColourantOnBody Yes	Total
SiteType	Activity area	33	0	33
	Funerary cave	9	1	10
	Isolated burial	0	3	3
	Settlement	199	22	221
	Settlement cemetery	231	44	275
Total		472	70	542

Table 124: Contingency table of the variables 'Mineral colourant on body' and 'Site type' by individual in 11000-6500 cal BC (left) and 6500-4500 cal BC (right)

Variables 'Mineral colourant on body' and 'Presence of funerary offerings'

		MineralColourantOnBody No	MineralColourantOnBody Yes	Total
PresenceOfFuneraryOfferings	No	625	26	651
	Yes	235	108	343
Total		860	134	994

Table 125: Contingency table of the variables 'Mineral colourant on body' and 'Presence of funerary offerings' by individual in 48000-4500 cal BC

Variables 'Mineral colourant on body' and 'Primary / Secondary position'

		MineralColourantOnBody No	MineralColourantOnBody Yes	Total
PrimarySecondary	Primary position	64	5	69
	Secondary position	74	18	92
Total		138	23	161

		MineralColourantOnBody No	MineralColourantOnBody Yes	Total
PrimarySecondary	Primary position	414	87	501
	Secondary position	82	2	84
Total		496	89	585

Table 126: Contingency table of the variables 'Mineral colourant on body' and 'Primary / Secondary position' by individual in 11000-6500 cal BC (left) and 6500-4500 cal BC (right)

Variables 'Mineral colourant on body' and 'Body treatment at deposition'

		MineralColourantOnBody No	MineralColourantOnBody Yes	Total
BodyTreatment	Complete	64	5	69
	Cremation	4	0	4
	Disarticulated bones	44	27	71
	Isolated bone	1	0	1
	Ornament	2	0	2
	Skull	16	0	16
Total		131	32	163

		MineralColourantOnBody No	MineralColourantOnBody Yes	Total
BodyTreatment	Complete	422	89	511
	Cremation	9	0	9
	Disarticulated bones	59	2	61
	Isolated bone	10	2	12
	Skull	11	1	12
Total		511	94	605

Table 127: Contingency table of the variables 'Mineral colourant on body' and 'Body treatment at deposition' in 11000-6500 cal BC (left) and 6500-4500 cal BC (right)

Individual and multiple deposits

Variables 'Individual / Multiple deposition' and 'Location'

		IndividualMultiple		
		Individual	Multiple	Total
Location	Cave	171	195	366
	Open air	483	195	678
	Rockshelter	49	46	95
Total		703	436	1139

Table 128: Contingency table of the variables 'Individual / Multiple deposition' and 'Location' by individual in 48000-4500 cal BC

Variables 'Individual / Multiple deposition' and 'Shell midden'

		IndividualMultiple		
		Individual	Multiple	Total
ShellMidden	No	490	355	845
	Yes	213	67	280
Total		703	422	1125

Table 129: Contingency table of the variables 'Individual / Multiple deposition' and 'Shell midden' by individual in 48000-4500 cal BC

Variables 'Individual / Multiple deposition' and 'Site type'

		IndividualMultiple		
		Individual	Multiple	Total
SiteType	Activity area	24	12	36
	Funerary cave	6	28	34
	Settlement	18	22	40
	Settlement cemetery	12	1	13
Total		60	63	123

		IndividualMultiple		
		Individual	Multiple	Total
SiteType	Activity area	22	21	43
	Funerary cave	6	12	18
	Isolated burial	3	0	3
	Settlement	117	106	223
	Settlement cemetery	305	93	398
Total		453	232	685

Table 130: Contingency table of the variables 'Individual / Multiple deposition' and 'Site type' by individual in 10000-7000 cal BC (left) and 7000-4500 cal BC (right)

Variables 'Individual / Multiple deposition' and 'Delimited / Mixed'

		IndividualMultiple		
		Individual	Multiple	Total
DelimitedMixed	Delimited	336	97	433
	Mixed	98	85	183
Total		434	182	616

Table 131: Contingency table of the variables 'Individual / Multiple deposition' and 'Delimited / Mixed' by individual in 7000-4500 cal BC

Variables ‘Individual / Multiple deposition’ and ‘Grave’

		IndividualMultiple Individual	Multiple	Total
Grave	No	25	38	63
	Yes	495	198	693
Total		520	236	756

Table 132: Contingency table of the variables ‘Individual / Multiple deposition’ and ‘Grave’ by individual in 7000-4500 cal BC

Variables ‘Individual / multiple deposition’ and ‘Post-decomposition bone removal’

		IndividualMultiple Individual	Multiple	Total
BonesRemoval	No	581	330	911
	Yes	4	38	42
Total		585	368	953

		IndividualMultiple Individual	Multiple	Total
BonesRemoval	No	490	190	680
	Yes	3	27	30
Total		493	217	710

Table 133: Contingency table of the variables ‘Individual / multiple deposition’ and ‘Post-decomposition bone removal’ by individual in the whole period (left) and 7000-4500 cal BC (right)

Variables ‘Individual / multiple deposition’ and ‘Fire affected body’

		IndividualMultiple Individual	Multiple	Total
FireAffectedBody	No	550	361	911
	Yes	10	31	41
Total		560	392	952

		IndividualMultiple Individual	Multiple	Total
FireAffectedBody	No	421	202	623
	Yes	7	25	32
Total		428	227	655

Table 134: Contingency table of the variables ‘Individual / multiple deposition’ and ‘Fire affected body’ by individual in the whole period (left) and 7000-4500 cal BC (right)

Variables ‘Individual / multiple deposition’ and ‘Primary / Secondary position’

		IndividualMultiple Individual	Multiple	Total
PrimarySecondary	Primary position	516	155	671
	Secondary position	57	220	277
Total		573	375	948

Table 135: Contingency table of the variables ‘Individual / multiple deposition’ and ‘Primary / Secondary position’ by individual in 48000-4500 cal BC

Variables 'Individual / multiple deposition' and 'Body treatment at deposition'

		IndividualMultiple		
		Individual	Multiple	Total
BodyTreatment	Complete	512	158	670
	Cremation	10	8	18
	Disarticulated bones	10	122	132
	Isolated bone	3	8	11
	Ornament	3	0	3
	Skull	30	44	74
Total		568	340	908

Table 136: Contingency table of the variables 'Individual / multiple deposition' and 'Body treatment at deposition' by individual in 48000-4500 cal BC

Variables 'Individual / multiple deposition' and 'Mineral colourant within context'

		IndividualMultiple		
		Individual	Multiple	Total
MineralColorantWithinContext	No	358	210	568
	Yes	45	11	56
Total		403	221	624

Table 137: Contingency table of the variables 'Individual / multiple deposition' and 'Mineral colourant within context' by individual in 7000-4500 cal BC

Variables 'Individual / multiple deposition' and 'Mineral colourant on body'

		IndividualMultiple		
		Individual	Multiple	Total
MineralColourantOnBody	No	81	70	151
	Yes	4	27	31
Total		85	97	182

		IndividualMultiple		
		Individual	Multiple	Total
MineralColourantOnBody	No	362	214	576
	Yes	51	22	73
Total		413	236	649

Table 138: Contingency table of the variables 'Individual / multiple deposition' and 'Mineral colourant on body' by individual in 13000-7000 cal BC (left) and 7000-4500 cal BC (right)

Variables 'Individual / multiple deposition' and 'Presence of funerary offerings'

		IndividualMultiple		
		Individual	Multiple	Total
PresenceOfFuneraryOfferings	No	131	128	259
	Yes	26	56	82
Total		157	184	341

		IndividualMultiple		
		Individual	Multiple	Total
PresenceOfFuneraryOfferings	No	281	128	409
	Yes	189	103	292
Total		470	231	701

Table 139: Contingency table of the variables 'Individual / multiple deposition' and 'Presence of funerary offerings' by individual in 48000-7000 cal BC (left) and 7000-4500 cal BC (right)

Variables 'Individual / multiple deposition' and Type of funerary offering'

		IndividualMultiple		
		Individual	Multiple	Total
TypeOfFuneraryOffering	-	4	0	4
	Ochre nodules	3	1	4
	Ornaments	5	11	16
	Tools and equipment	26	8	34
	Unmodified faunal remains / shells	12	5	17
Total		50	25	75

		IndividualMultiple		
		Individual	Multiple	Total
TypeOfFuneraryOffering	-	15	7	22
	Ochre nodules	11	0	11
	Ornaments	138	75	213
	Plants and derivatives	1	1	2
	Portable art	4	4	8
	Tools and equipment	227	65	292
	Unmodified faunal remains / shells	67	62	129
Total		463	214	677

Table 140: Contingency table of the variables 'Individual / multiple deposition' and 'Type of funerary offering' by funerary offering in 10000-7000 cal BC (left) and 7000-4500 cal BC (right)

Chapter 8: Death and the social role of the deceased

Sex

Variables 'Sex' and 'Site type' by site in 48000-4500 cal BC

		Sex			
		Both	Female	Male	Total
SiteType	Activity area	10	6	15	31
	Funerary cave	0	4	5	9
	Settlement	22	15	16	53
	Settlement cemetery	11	1	0	12
Total		43	26	36	105

Table 141: Contingency table of the variables 'Sex' and 'Site type' by site in 48000-4500 cal BC

Variables 'Sex' and 'Location marker'

		Sex		
		Female	Male	Total
LocationMarker	No	16	14	30
	Yes	0	6	6
Total		16	20	36

Table 142: Contingency table of the variables 'Sex' and 'Location marker' by individual in 8000-6500 cal BC

Variables 'Sex' and 'Presence of funerary offerings'

		Sex		
		Female	Male	Total
PresenceOfFuneraryOfferings	No	110	111	221
	Yes	59	100	159
Total		169	211	380

		Sex		
		Female	Male	Total
PresenceOfFuneraryOfferings	No	15	8	23
	Yes	3	12	15
Total		18	20	38

Table 143: Contingency table of the variables 'Sex' and 'Presence of funerary offerings' by individual in 48000-4500 cal BC (left) and 10000-8000 cal BC (right)

Variables 'Sex' and 'Type of funerary offering'

		Sex: Female	Sex: Male	Total
TypeOfFuneraryOffering	-	1	1	2
	Ornaments	9	2	11
	Tools and equipment	5	3	8
	Unmodified faunal remains / shells	2	13	15
Total		17	19	36

		Sex: Male	Total
TypeOfFuneraryOffering	-	1	1
	Tools and equipment	9	9
	Unmodified faunal remains / shells	4	4
Total		14	14

		Sex: Female	Sex: Male	Total
TypeOfFuneraryOffering	-	0	3	3
	Ochre nodules	1	2	3
	Ornaments	1	0	1
	Tools and equipment	0	25	25
	Unmodified faunal remains / shells	0	6	6
Total		2	36	38

		Sex: Female	Sex: Male	Total
TypeOfFuneraryOffering	-	0	8	8
	Ochre nodules	3	4	7
	Ornaments	61	57	118
	Portable art	1	2	3
	Tools and equipment	43	89	132
	Unmodified faunal remains / shells	14	30	44
Total		122	190	312

Table 144: Contingency table of the variables 'Sex' and 'Type of funerary offering' by funerary offering in 48000-10000 cal BC (top left) and 10000-8000 cal BC (top right), 8000-6500 cal BC (bottom left) and 6500-4500 cal BC (bottom right)

Variables 'Sex' and 'General Object Type' for unmodified faunal remains

		Sex: Female	Sex: Male	Total
GeneralObjectType	Faunal remains	13	15	28
	Shell	1	14	15
Total		14	29	43

Table 145: Contingency table of the variables 'Sex' and 'General object type' for unmodified faunal remains by funerary offering in 6500-4500 cal BC

Age

Adults and subadults

Variables 'Adult / Subadult' and 'Shell midden'

		AdultSubadult: Adult	AdultSubadult: Subadult	Total
ShellMidden	No	123	62	185
	Yes	37	8	45
Total		160	70	230

		AdultSubadult: Adult	AdultSubadult: Subadult	Total
ShellMidden	No	322	169	491
	Yes	270	104	374
Total		592	273	865

Table 146: Contingency table of the variables 'Adult / Subadult' and 'Shell midden' by individual in 10000-6500 cal BC (left) and 6500-4500 cal BC (right)

Variables 'Adult / Subadult' and 'Site type'

		AdultSubadult			
		Adult	Both	Subadult	Total
SiteType	Activity area	28	21	8	57
	Funerary cave	8	5	2	15
	Isolated burial	1	0	0	1
	Settlement	31	48	16	95
	Settlement cemetery	0	15	0	15
Total		68	89	26	183

Table 147: Contingency table of the variables 'Adult / Subadult' and 'Site type' by site in 48000-4500 cal BC

Variables 'Adult / Subadult' and 'Delimited / Mixed'

		AdultSubadult		
		Adult	Subadult	Total
DelimitedMixed	Delimited	362	144	506
	Mixed	100	67	167
Total		462	211	673

Table 148: Contingency table of the variables 'Adult / Subadult' and 'Delimited / Mixed' by individual in 6500-4500 cal BC

Variables 'Adult / Subadult' and 'Location marker'

		AdultSubadult		
		Adult	Subadult	Total
LocationMarker	No	433	267	700
	Yes	22	2	24
Total		455	269	724

		AdultSubadult		
		Adult	Subadult	Total
LocationMarker	No	245	145	390
	Yes	17	2	19
Total		262	147	409

Table 149: Contingency table of the variables 'Adult / Subadult' and 'Location marker' by individual in 48000-4500 cal BC (left) and 6500-4500 cal BC (right)

Variables 'Adult / Subadult' and 'Primary / Secondary position'

		AdultSubadult		
		Adult	Subadult	Total
PrimarySecondary	Primary position	61	15	76
	Secondary position	51	30	81
Total		112	45	157

		AdultSubadult		
		Adult	Subadult	Total
PrimarySecondary	Primary position	396	158	554
	Secondary position	50	35	85
Total		446	193	639

Table 150: Contingency table of the variables 'Adult / Subadult' and 'Primary / Secondary position' by individual in 10000-6500 cal BC (left) and 6500-4500 cal BC (right)

Variables 'Adult / Subadult' and 'Individual / Multiple deposition'

		AdultSubadult Adult	Subadult	Total
IndividualMultiple	Individual	74	16	90
	Multiple	64	42	106
Total		138	58	196

		AdultSubadult Adult	Subadult	Total
IndividualMultiple	Individual	293	107	400
	Multiple	137	88	225
Total		430	195	625

Table 151: Contingency table of the variables 'Adult / Subadult' and 'Individual / Multiple deposition' by individual in 10000-6500 cal BC (left) and 6500-4500 cal BC (right)

Variables 'Adult / Subadult' and 'Type of funerary offering'

		AdultSubadult Adult	Subadult	Total
TypeOfFuneraryOffering	-	4	0	4
	Ochre nodules	4	0	4
	Ornaments	1	3	4
	Tools and equipment	31	0	31
	Unmodified faunal remains / shells	10	4	14
Total		50	7	57

		AdultSubadult Adult	Subadult	Total
TypeOfFuneraryOffering	-	11	6	17
	Ochre nodules	7	0	7
	Ornaments	127	46	173
	Plants and derivatives	1	0	1
	Portable art	4	5	9
	Tools and equipment	195	40	235
	Unmodified faunal remains / shells	64	31	95
Total		409	128	537

Table 152: Contingency table of the variables 'Adult / Subadult' and 'Type of funerary offering' by funerary offering in 10000-6500 cal BC (left) and 6500-4500 cal BC (right)

Variables 'Adult / Subadult' and 'Material category' for ornaments

		AdultSubadult Adult	Subadult	Total
MaterialCategory	Bone	14	6	20
	Lithic	5	2	7
	Shell	98	24	122
	Teeth	3	6	9
Total		120	38	158

Table 153: Contingency table of the variables 'Adult / Subadult' and 'Material category' for ornaments by funerary offering in 6500-4500 cal BC

Variables 'Adult / Subadult' and 'Ornament composition'

		AdultSubadult Adult	Subadult	Total
OrnamentComposition	Bead	10	3	13
	Perforated shell	79	18	97
	Perforated tooth	2	6	8
Total		91	27	118

Table 154: Contingency table of the variables 'Adult / Subadult' and 'Ornament composition' by funerary offering in 6500-4500 cal BC

Variables 'Adult / Subadult' and 'General object type' for unmodified faunal remains shells

		AdultSubadult		
		Adult	Subadult	Total
GeneralObjectType	Faunal remains	33	23	56
	Shell	29	6	35
Total		62	29	91

Table 155: Contingency table of the variables 'Adult / Subadult' and 'General object type' for unmodified faunal remains and shells by funerary offering in 6500-4500 cal BC

Adults

Variables 'Age group' for adults and 'Location'

		AgeGroup				
		Mature adult	Old middle adult	Young adult	Young middle adult	Total
Location	Cave	28	8	15	9	60
	Open air	23	48	60	25	156
	Rockshelter	2	2	2	3	9
Total		53	58	77	37	225

Table 156: Contingency table of the variables 'Age group' for adults and 'Location' by individual in 6500-4500 cal BC

Variables 'Age group' for adults and 'Shell midden'

		AgeGroup				
		Mature adult	Old middle adult	Young adult	Young middle adult	Total
ShellMidden	No	49	32	50	22	153
	Yes	4	26	27	15	72
Total		53	58	77	37	225

Table 157: Contingency table of the variables 'Age group' for adults and 'Shell midden' by individual in 6500-4500 cal BC

Variables 'Age group' for adults and 'Site type'

		AgeGroup				
		Mature adult	Old middle adult	Young adult	Young middle adult	Total
SiteType	Activity area	2	6	1	6	15
	Funerary cave	2	1	1	1	5
	Settlement	27	14	20	9	70
	Settlement cemetery	13	36	45	20	114
Total		44	57	67	36	204

Table 158: Contingency table of the variables 'Age group' for adults and 'Site type' by individual in 6500-4500 cal BC

Variables 'Age group' for adults and 'Type of funerary offering'

		AgeGroup				
		Mature adult	Old middle adult	Young adult	Young middle adult	Total
TypeOfFuneraryOffering	-	0	1	2	1	4
	Ochre nodules	1	0	0	0	1
	Ornaments	5	32	26	22	85
	Portable art	0	1	1	0	2
	Tools and equipment	22	37	27	22	108
	Unmodified faunal remains / shells	8	22	4	14	48
Total		36	93	60	59	248

Table 159: Contingency table of the variables 'Age group' for adults and 'Type of funerary offering' by funerary offering in 6500-4500 cal BC

Variables 'Age group' for adults and 'Material category' for ornaments

		AgeGroup				
		Mature adult	Old middle adult	Young adult	Young middle adult	Total
MaterialCategory	Bone	0	4	3	4	11
	Lithic	2	0	0	1	3
	Shell	0	26	22	16	64
	Teeth	1	1	0	0	2
Total		3	31	25	21	80

Table 160: Contingency table of the variables 'Age group' for adults and 'Material category' for ornaments by funerary offering in 6500-4500 cal BC

Variables 'Age group' for adults and 'General object type' for unmodified faunal remains / shells

		AgeGroup				
		Mature adult	Old middle adult	Young adult	Young middle adult	Total
GeneralObjectType	Faunal remains	7	12	4	4	27
	Shell	1	9	0	10	20
Total		8	21	4	14	47

Table 161: Contingency table of the variables 'Age group' for adults and 'General object type' for unmodified faunal remains / shells by funerary offering in 6500-4500 cal BC

Variables 'Age group' for adults and 'Sex'

		AgeGroup				
		Mature adult	Old middle adult	Young adult	Young middle adult	Total
Sex	Female	17	21	26	21	85
	Male	29	34	28	10	101
Total		46	55	54	31	186

Table 162: Contingency table of the variables 'Age group' for adults and 'Sex' by individual in 6500-4500 cal BC

Subadults

Variables 'Age group' for subadults and 'Shell midden'

		AgeGroup					
		Adolescent	Foetus	Infant	Juvenile	Neonate	Total
ShellMidden	No	30	1	6	127	5	169
	Yes	12	1	13	72	2	100
Total		42	2	19	199	7	269

Table 163: Contingency table of the variables 'Age group' for subadults and 'Shell midden' by individual in 6500-4500 cal BC

Variables 'Age group' for subadults and 'Mineral colourant on body'

		AgeGroup					
		Adolescent	Foetus	Infant	Juvenile	Neonate	Total
MineralColorantOnBody	No	21	2	8	126	5	162
	Yes	4	0	6	8	1	19
Total		25	2	14	134	6	181

Table 164: Contingency table of the variables 'Age group' for subadults and 'Mineral colourant on body' by individual in 6500-4500 cal BC

Variables 'Age group' for subadults and 'Presence of funerary offerings'

		AgeGroup					
		Adolescent	Foetus	Infant	Juvenile	Neonate	Total
PresenceOfFuneraryOfferings	No	16	2	4	89	3	114
	Yes	12	0	11	48	3	74
Total		28	2	15	137	6	188

Table 165: Contingency table of the variables 'Age group' for subadults and 'Mineral colorant on body' by individual in 6500-4500 cal BC

Appendix VII:
Code and queries

This appendix contains information about the code used in R to generate the Monte Carlo simulations, as well as about the queries used to filter the information for the χ^2 tests on SPSS and to generate the maps on ArcGIS. For understanding the code and queries it is important to know that 'Start' and 'End' are the names given to 'Date cal BC (from)' and 'Date cal BC (to)' in the csv versions of the data tables. It is also relevant that, in the csv version of the data tables, there is an extra variable called 'Weight' which value is always 1. This is required for each piece of data (sites, individuals and funerary offering) being given equal importance in the Monte Carlo simulations.

R code

Before plotting the Monte Carlo graphs, data was cleaned as follows.

```
# Force Start and End to be numeric
burials[, Start := as.numeric(Start)]
burials[, End := as.numeric(End)]
burials[, QuantityOfFuneraryOfferings := as.numeric(QuantityOfFuneraryOfferings)]
burials[, QuantityOfTools := as.numeric(QuantityOfTools)]
burials[, QuantityOfOrnaments := as.numeric(QuantityOfOrnaments)]
burials[, "QuantityOfFaunalRemains/Shells" := as.numeric("QuantityOfFaunalRemains/Shells")]
burials[, QuantityOfPlants := as.numeric(QuantityOfPlants)]
burials[, QuantityOfArt := as.numeric(QuantityOfArt)]


# Fix any cases where start and end are reversed
burials[End > Start, temp := End]
burials[End > Start, End := Start]
burials[End > Start, Start := temp]
burials[, temp := NULL]

# Convert to years, assuming that the current numbers or millennia BC
# (or BP - doesn't matter for this purpose)
```

```
burials[, Start := (Start * -1)]
burials[, End := (End * -1)]

## Filter out missing data
burialsToRun <- burials[!is.na(Start) & !is.na(End)]
```

Then, the simulations and plots were done using variations of this code.

```
burialsToRun[, sim := {x <- runif(nrow(burialsToRun)); (x * (End - Start)) +
Start}]
check <- burialsToRun[, list(Start, End, sim)]

bw = 1000 # in the case of simulations and plots by site
bw = 500 # in the case of simulations and plots by individual and offering
```

Code using for generating a simulation and plot for the whole sample:

```
y <- density(check$sim, bw = bw, n=512, kernel = "rectangular", weights =
burialsToRun$Weight)
ymax <- max(c(y[[2]])) * 1.10

par(mar=c(4.1,2.1,2.1,6.1))
plot(y, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col
= rgb(0,0,0,0.05), axes = FALSE, ylab = " ", xlab = " ")
axis(1, at=seq(-48000, -4500, by = 1000), las = 1)
axis(4, at=seq(0, ymax, by = 0.1), las = 1)
mtext(text="Density", side=4, line=3, las=3)
mtext(text="Calibrated date (cal. BC)", side=1, line=2.5, las=1)
box()

for(i in 1:3000) {
  burialsToRun[, sim := {x <- runif(nrow(burialsToRun)); (x * (End - Start))
+ Start}]
  check <- burialsToRun[, list(Start, End, sim)]
  y <- density(check$sim, bw = bw, n=512, kernel = "rectangular", weights =
burialsToRun$Weight)
  lines(y, col= rgb(0,0,0,0.05))
}
```

Example of code used for generating a simulation and plot for multiple values. In this case cave, rockshelter and open air sites:

```
Cave <- with(burialsToRun[Location == "Cave"], density(sim, bw = bw, n =
512, kernel = "rectangular", weights = Weight) )
```

```
OpenAir <- with(burialsToRun[Location == "Open air"], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
Rockshelter <- with(burialsToRun[Location == "Rockshelter"], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )

ymax <- max(c(Cave[[2]], OpenAir[[2]], Rockshelter[[2]])) * 1.20

par(mar=c(4.1,2.1,2.1,6.1))
plot(Cave, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0,0,0,0.05), axes = FALSE, ylab = " ", xlab = " ")
lines(Rockshelter, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0,1,0,0.05))
lines(OpenAir, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0,0,1,0.05))

axis(1, at=seq(-48000, -4500, by = 1000), las = 1)
axis(4, at=seq(0, ymax, by = 0.1), las = 1)
mtext(text="Density", side=4, line=3, las=3)
mtext(text="Calibrated date (cal. BC)", side=1, line=2.5, las=1)
box()

for(i in 1:3000) {
  burialsToRun[, sim := {x <- runif(nrow(burialsToRun)); (x * (End - Start)) + Start}]
  Cave <- with(burialsToRun[Location == "Cave"], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
  OpenAir <- with(burialsToRun[Location == "Open air"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight ) )
  Rockshelter <- with(burialsToRun[Location == "Rockshelter"], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
  lines(Cave, col= rgb(0,0,0,0.05))
  lines(Rockshelter, col= rgb(0.5,0,0.5,0.05))
  lines(OpenAir, col= rgb(1,1,0,0.05))
}

legend("topleft", legend = c("Cave", "Rockshelter", "Open air"), col = c("black", "purple", "yellow"), lwd = 2, bty = "n")
```

Most simulations and plots follow this model. There are only a few ones that were more complex to make. These were the one for the types of sites containing funerary remains, the one for funerary offerings' materials, the one for the complete bodies in primary position and the one for individual and multiple deposits.

The one for the types of sites containing funerary remains used the following code:

```
Settlement <- with(burialsToRun[SiteType == "Settlement" | SiteType == "Settlement cemetery"| SiteType== "Seasonal settlement"| SiteType== "Seasonal settlement cemetery"], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
ActivityArea <- with(burialsToRun[SiteType == "Activity area" | SiteType == "Seasonal activity area"], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
SettlementRelatedRemains <- with(burialsToRun[SiteType == "Settlement-related burial" | SiteType== "Settlement-related cemetery" | SiteType == "Settlement-associated burial"], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
IsolatedRemains <- with(burialsToRun[SiteType == "Funerary cave" | SiteType == "Isolated burial"], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
Megalith <- with(burialsToRun[SiteType == "Megalith"], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )


ymax <- max(c(Settlement[[2]])) * 1.10
par(mar=c(4.1,2.1,2.1,6.1))
plot(Settlement, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(1,0.5,0,0.05), axes = FALSE, ylab = " ", xlab = " ")
lines(ActivityArea, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0.5,0,0.5,0.05))
lines(IsolatedRemains, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0,0,0,0.05))
lines(SettlementRelatedRemains, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0.75,0,0,0.05))
lines(Megalith, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0.5,0.5,0.5,0.05))

axis(1, at=seq(-48000, -4500, by = 1000), las = 1)
axis(4, at=seq(0, ymax, by = 0.1), las = 1)
mtext(text="Density", side=4, line=3, las=3)
mtext(text="Calibrated date (cal. BC)", side=1, line=2.5, las=1)
box()

for(i in 1:3000) {
  burialsToRun[, sim := {x <- runif(nrow(burialsToRun)); (x * (End - Start)) + Start}]
  Settlement <- with(burialsToRun[SiteType == "Settlement" | SiteType == "Settlement cemetery"| SiteType== "Seasonal settlement"| SiteType ==
```

```
"Seasonal settlement cemetery"], density(sim, bw = bw, n =  512, kernel =
"rectangular", weights = Weight) )
  ActivityArea <- with(burialsToRun[SiteType == "Activity area" | SiteType
== "Seasonal activity area"], density(sim, bw = bw, n = 512, kernel =
"rectangular", weights = Weight ) )
  IsolatedRemains <- with(burialsToRun[SiteType == "Funerary cave" |
SiteType == "Isolated burial"], density(sim, bw = bw, n =  512, kernel =
"rectangular", weights = Weight) )
  SettlementRelatedRemains <- with(burialsToRun[SiteType == "Settlement-
related burial" | SiteType == "Settlement-related cemetery" | SiteType ==
"Settlement-associated burial"], density(sim, bw = bw, n =  512, kernel =
"rectangular", weights = Weight) )
  Megalith <- with(burialsToRun[SiteType == "Megalith"], density(sim, bw =
bw, n =  512, kernel = "rectangular", weights = Weight) )
  lines(Settlement, col= rgb(1,0.5,0,0.05))
  lines(ActivityArea, col= rgb(0.5,0,0.5,0.05))
  lines(IsolatedRemains, col= rgb(0,0,0,0.05))
  lines(SettlementRelatedRemains, col= rgb(0.75,0,0,0.05))
  lines(Megalith, col= rgb(0.5,0.5,0.5,0.05))
}

legend("topleft", legend = c("Settlement", "Activity area", "Settlement-related
remains", "Isolated remains", "Megalith"), col = c("orange", "purple", "red3",
"black", "gray"), lwd = 2, bty = "n")
```

The plots and simulations for the funerary offerings' materials used the following code:

For tools:

```
ToolsBone <- with(burialsToRun[TypeOfFuneraryOffering == "Tools and
equipment" & (MaterialCategory == "Antler" | MaterialCategory == 'Bone' |
MaterialCategory== 'Teeth')], density(sim, bw = bw, n =  512, kernel =
"rectangular", weights = Weight) )
ToolsLithic <- with(burialsToRun[TypeOfFuneraryOffering == "Tools and
equipment" & MaterialCategory == "Lithic"], density(sim, bw = bw, n =  512,
kernel = "rectangular", weights = Weight) )
ToolsPottery <- with(burialsToRun[TypeOfFuneraryOffering == "Tools and
equipment" & MaterialCategory == "Pottery"], density(sim, bw = bw, n =
512, kernel = "rectangular", weights = Weight) )

ymax <- max(c(ToolsLithic[[2]])) * 1.10

par(mar=c(4.1,2.1,2.1,6.1))
```

```
plot(ToolsBone, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(1,1,0,0.05), axes = FALSE, ylab = " ", xlab = " ")
lines(ToolsLithic, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0.5,0.5,0.5,0.05))
lines(ToolsPottery, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0.75,0,0,0.05))

axis(1, at=seq(-48000, -4500, by = 1000), las = 1)
axis(4, at=seq(0, ymax, by = 0.01), las = 1)
mtext(text="Density", side=4, line=3, las=3)
mtext(text="Calibrated date (cal. BC)", side=1, line=2.5, las=1)
box()

for(i in 1:3000) {
  burialsToRun[, sim := {x <- runif(nrow(burialsToRun)); (x * (End - Start)) + Start}]
  ToolsBone <- with(burialsToRun[TypeOfFuneraryOffering == "Tools and equipment" & (MaterialCategory == "Antler" | MaterialCategory == 'Bone' | MaterialCategory == 'Teeth')], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
  ToolsLithic <- with(burialsToRun[TypeOfFuneraryOffering == "Tools and equipment" & MaterialCategory == "Lithic"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight ) )
  ToolsPottery <- with(burialsToRun[TypeOfFuneraryOffering == "Tools and equipment" & MaterialCategory == "Pottery"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight ) )
  lines(ToolsBone, col= rgb(1,1,0,0.05))
  lines(ToolsLithic, col= rgb(0.5,0.5,0.5,0.05))
  lines(ToolsPottery, col= rgb(0.75,0,0,0.05))
}

legend("topleft", legend = c("Bone", "Lithic", "Pottery"), col = c("yellow", "dimgray", "red3"), lwd = 2, bty = "n")
```

For ornaments:

```
OrnamentsBone <- with(burialsToRun[TypeOfFuneraryOffering == "Ornaments" & (MaterialCategory  == "Antler" | MaterialCategory == "Bone")], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
OrnamentsTeeth <- with(burialsToRun[TypeOfFuneraryOffering == "Ornaments" & MaterialCategory == "Teeth"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight) )
```

```
OrnamentsLithic <- with(burialsToRun[TypeOfFuneraryOffering == "Ornaments" & MaterialCategory == "Lithic"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight) )
OrnamentsShell <- with(burialsToRun[TypeOfFuneraryOffering == "Ornaments" & MaterialCategory == "Shell"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight) )

ymax <- max(c(OrnamentsShell[[2]])) * 1.10

par(mar=c(4.1,2.1,2.1,6.1)) # define márgenes abajo, izquierda, arriba, derecha
plot(OrnamentsBone, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(1,1,0,0.05), axes = FALSE, ylab = " ", xlab = " ")
lines(OrnamentsTeeth, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0.75,0,0,0.05))
lines(OrnamentsLithic, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0.5,0.5,0.5,0.05))
lines(OrnamentsShell, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0.5,0,0.5,0.05))

axis(1, at=seq(-48000, -4500, by = 1000), las = 1)
axis(4, at=seq(0, ymax, by = 0.01), las = 1)
mtext(text="Density", side=4, line=3, las=3)
mtext(text="Calibrated date (cal. BC)", side=1, line=2.5, las=1)
box()

for(i in 1:3000) {
 burialsToRun[, sim := {x <- runif(nrow(burialsToRun)); (x * (End - Start)) + Start}]
 OrnamentsBone <- with(burialsToRun[TypeOfFuneraryOffering == "Ornaments" & (MaterialCategory == "Antler" | MaterialCategory == "Bone")], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight) )
 OrnamentsTeeth <- with(burialsToRun[TypeOfFuneraryOffering == "Ornaments" & MaterialCategory == "Teeth"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight) )
 OrnamentsLithic <- with(burialsToRun[TypeOfFuneraryOffering == "Ornaments" & MaterialCategory == "Lithic"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight ) )
 OrnamentsShell <- with(burialsToRun[TypeOfFuneraryOffering == "Ornaments" & MaterialCategory == "Shell"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight ) )
 lines(OrnamentsBone, col= rgb(1,1,0,0.05))
 lines(OrnamentsTeeth, col= rgb(0.75,0,0,0.05))
```

```
  lines(OrnamentsLithic, col= rgb(0.5,0.5,0.5,0.05))
  lines(OrnamentsShell, col= rgb(0.5,0,0.5,0.05))
}

legend("topleft", legend = c("Bone", "Teeth", "Lithic", "Shell"), col = c("yellow", "red3", "dimgray", "purple"), lwd = 2, bty = "n")
```

For faunal remains and shells:

```
UnmodifiedFauna <- with(burialsToRun[TypeOfFuneraryOffering == "Unmodified faunal remains / shells" & (GeneralObjectType == "Faunal remains" | GeneralObjectType == "Complete animal")], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
UnmodifiedShells <- with(burialsToRun[TypeOfFuneraryOffering == "Unmodified faunal remains / shells" & GeneralObjectType == "Shell"], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )

ymax <- max(c(UnmodifiedFauna[[2]])) * 1.10

par(mar=c(4.1,2.1,2.1,6.1))
plot(UnmodifiedFauna, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(1,1,0,0.05), axes = FALSE, ylab = " ", xlab = " ")
lines(UnmodifiedShells, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0.75,0.58,0.89,0.05))

axis(1, at=seq(-48000, -4500, by = 1000), las = 1)
axis(4, at=seq(0, ymax, by = 0.01), las = 1)
mtext(text="Density", side=4, line=3, las=3)
mtext(text="Calibrated date (cal. BC)", side=1, line=2.5, las=1)
box()

for(i in 1:3000) {
  burialsToRun[, sim := {x <- runif(nrow(burialsToRun)); (x * (End - Start)) + Start}]
  UnmodifiedFauna <- with(burialsToRun[TypeOfFuneraryOffering == "Unmodified faunal remains / shells" & (GeneralObjectType == "Faunal remains" | GeneralObjectType == "Complete animal")], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
  UnmodifiedShells <- with(burialsToRun[TypeOfFuneraryOffering == "Unmodified faunal remains / shells" & GeneralObjectType == "Shell"], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
  lines(UnmodifiedFauna, col= rgb(1,1,0,0.05))
  lines(UnmodifiedShells, col= rgb(0.75,0.58,0.89,0.05))
```

```
}

legend("topleft", legend = c("Faunal remains", "Shells"), col = c("yellow", "plum3"), lwd = 2, bty = "n")
```

The plots and simulations for the complete bodies in primary position used the following code:

```
SNADComplete <- with(burialsToRun[((BodyTreatment == "Complete" & "Abandoned/Non-abandoned" == "Non-abandoned" & "Delimited/Mixed" == "Delimited") | (SiteType == "Settlement cemetery")) | (("Primary/Secondary" == "Both" & "Abandoned/Non-abandoned" == "Non-abandoned" & "Delimited/Mixed" == "Delimited") | (SiteType == "Settlement cemetery"))], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
SNAMComplete <- with(burialsToRun[((BodyTreatment == "Complete" & "Abandoned/Non-abandoned" == "Non-abandoned" & "Delimited/Mixed" == "Mixed") & (SiteType != "Settlement cemetery")) | (("Primary/Secondary" == "Both" & "Abandoned/Non-abandoned" == "Non-abandoned" & "Delimited/Mixed" == "Mixed") & (SiteType != "Settlement cemetery"))], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
SAComplete <- with(burialsToRun[((BodyTreatment == "Complete" & "Abandoned/Non-abandoned" == "Abandoned") & (SiteType != "Funerary cave")) | (("Primary/Secondary" == "Both" & "Abandoned/Non-abandoned" == "Abandoned") & (SiteType != "Funerary cave"))], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
SFuneraryCaves <- with(burialsToRun[(BodyTreatment == "Complete" & SiteType == "Funerary cave") | ("Primary/Secondary" == "Complete" & SiteType == "Funerary cave")], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )

ymax <- max(c(SNADComplete[[2]])) * 1.10

par(mar=c(4.1,2.1,2.1,6.1))
plot(SNADComplete, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0,0.90,0.90,0.05), axes = FALSE, ylab = " ", xlab = " ")
lines(SNAMComplete, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0,0,0,0.05))
lines(SAComplete, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(1,1,0,0.05))
lines(SFuneraryCaves, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0.5,0,0.5,0.05))
```

```
axis(1, at=seq(-48000, -4500, by = 1000), las = 1)
axis(4, at=seq(0, ymax, by = 0.001), las = 1)
mtext(text="Density", side=4, line=4, las=3)
mtext(text="Calibrated date (cal. BC)", side=1, line=2.5, las=1)
box()

for(i in 1:3000) {
  burialsToRun[, sim := {x <- runif(nrow(burialsToRun)); (x * (End - Start)) + Start}]
  SNADComplete <- with(burialsToRun[((BodyTreatment == "Complete" & "Abandoned/Non-abandoned" == "Non-abandoned" & "Delimited/Mixed" == "Delimited") | (SiteType == "Settlement cemetery")) | (("Primary/Secondary" == "Both" & "Abandoned/Non-abandoned" == "Non-abandoned" & "Delimited/Mixed" == "Delimited") | (SiteType == "Settlement cemetery"))], density(sim, bw = bw, n =  512, kernel = "rectangular", weights = Weight) )
  SNAMComplete <- with(burialsToRun[((BodyTreatment == "Complete" & Abandonment == "Non-abandoned" & "Delimited/Mixed" == "Mixed") & (SiteType != "Settlement cemetery")) | (("Primary/Secondary" == "Both" & "Abandoned/Non-abandoned" == "Non-abandoned" & "Delimited/Mixed" == "Mixed") & (SiteType != "Settlement cemetery"))], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight ) )
  SAComplete <- with(burialsToRun[((BodyTreatment == "Complete" & "Abandoned/Non-abandoned" == "Abandoned") & (SiteType != "Funerary cave")) | (("Primary/Secondary" == "Both" & "Abandoned/Non-abandoned" == "Abandoned") & (SiteType != "Funerary cave"))], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight ) )
  SFuneraryCaves <- with(burialsToRun[(BodyTreatment == "Complete" & SiteType == "Funerary cave") | ("Primary/Secondary" == "Complete" & SiteType == "Funerary cave")], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight ) )
  lines(SNADComplete, col= rgb(0,0.90,0.90,0.05))
  lines(SNAMComplete, col= rgb(0,0,0,0.05))
  lines(SAComplete, col= rgb(1,1,0,0.05))
  lines(SFuneraryCaves, col= rgb(0.5,0,0.5,0.05))
}

legend("topleft", legend = c("Complete bodies in non-abandoned delimited funerary spaces and cemeteries", "Complete bodies in non-abandoned mixed funerary spaces", "Complete bodies in abandoned funerary spaces", "Complete bodies in caves of exclusive funerary use"), col = c("cyan", "black", "yellow", "purple"), lwd = 2, bty = "n")
```

Lastly, the plots and simulations for the complete bodies in primary position used the following code:

```
IndividualIndividual <- with(burialsToRun[`Individual/Multiple` == "Individual" & CollectiveFunerarySpace == "No"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight) )
IndividualCollective <- with(burialsToRun[`Individual/Multiple` == "Individual" & CollectiveFunerarySpace == "Yes"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight) )
Multiple <- with(burialsToRun[`Individual/Multiple` == "Multiple"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight) )
Individualandmultiple <- with(burialsToRun[`Individual/Multiple` == "Both"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight) )

ymax <- max(c(IndividualIndividual[[2]], IndividualCollective[[2]])) * 1.10

par(mar=c(4.1,2.1,2.1,6.1)) # define márgenes abajo, izquierda, arriba, derecha
plot(IndividualIndividual, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0,0.90,0.90,0.05), axes = FALSE, ylab = " ", xlab = " ")
lines(IndividualCollective, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(1,1,0,0.05))
lines(Multiple, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0.5,0,0.5,0.05))
lines(Individualandmultiple, xlim = c(-48000, -4500), xaxs = "i", ylim = c(0, ymax), main="", col = rgb(0,0,0,0.05))

axis(1, at=seq(-48000, -4500, by = 1000), las = 1)
axis(4, at=seq(0, ymax, by = 0.01), las = 1)
mtext(text="Density", side=4, line=4, las=3)
mtext(text="Calibrated date (cal. BC)", side=1, line=2.5, las=1)
box()

for(i in 1:3000) {
 burialsToRun[, sim := {x <- runif(nrow(burialsToRun)); (x * (End - Start)) + Start}]
 IndividualIndividual <- with(burialsToRun[`Individual/Multiple` == "Individual" & CollectiveFunerarySpace == "No"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight) )
 IndividualCollective <- with(burialsToRun[`Individual/Multiple` == "Individual" & CollectiveFunerarySpace == "Yes"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight) )
```

```
 Multiple <- with(burialsToRun[`Individual/Multiple` == "Multiple"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight ) )
 Individualandmultiple <- with(burialsToRun[`Individual/Multiple` == "Both"], density(sim, bw = bw, n = 512, kernel = "rectangular", weights = Weight ) )
 lines(IndividualIndividual, col= rgb(0,0.90,0.90,0.05))
 lines(IndividualCollective, col= rgb(1,1,0,0.05))
 lines(Multiple, col= rgb(0.5,0,0.5,0.05))
 lines(Individualandmultiple, col= rgb(0,0,0,0.05))
}

legend("topleft", legend = c("Individual (sites with one individual)", "Individual (sites with more than one individual)", "Multiple", "Individual and multiple"), col = c("cyan", "yellow", "purple", "black"), lwd = 2, bty = "n")
```

SPSS queries

Queries were used on SPSS to select the time intervals to analyse and to leave the unsure cases (those marked with a question mark, *e.g.*, Male?, Female?) out of the $\chi 2$ analyses.

Most queries are variations of this one:

```
((Start <= 48000 AND Start >= 4500) OR (End <= 48000 AND End >= 4500)) AND (Location = 'Cave' OR Location = 'Rockshelter' OR Location = 'Open air') AND (Shellmidden = 'Yes' OR Shellmidden = 'No')
```

However, the filters used for the data table by funerary offering are more complex. These are the filters used for the variables related to the funerary offerings:

The quantity of funerary offerings was filtered using the following query:

```
QuantityOfFuneraryOfferings  >= 1
```

The types of funerary offerings were filtered as follows:

```
Filter used (TypeOfFuneraryOffering NE 'Tools and equipment?' AND TypeOfFuneraryOffering NE 'Ornaments?' AND TypeOfFuneraryOffering NE 'Unmodified faunal remains / shells?' AND TypeOfFuneraryOffering NE 'Portable art?' AND TypeOfFuneraryOffering NE 'Ochre nodules?') AND (GeneralObjectType NE '-')
```

This is how the materials were filtered:

(TypeOfFuneraryOffering = 'Tools and equipment') AND (MaterialCategory = 'Bone' OR MaterialCategory = 'Lithic' OR MaterialCategory = 'Pottery')

(TypeOfFuneraryOffering = 'Ornaments') AND (MaterialCategory= 'Shell' OR MaterialCategory= 'Lithic' OR MaterialCategory= 'Bone' OR MaterialCategory= 'Teeth')

The ornament composition was filtered as follows:

(TypeOfFuneraryOffering = 'Ornaments') AND (OrnamentComposition = 'Perforated shell' OR OrnamentComposition= 'Perforated tooth' OR OrnamentComposition= 'Bead')

Lastly, faunal remains and shells were filtered this way:

(TypeOfFuneraryOffering = 'Unmodified faunal remains / shells') AND (GeneralObjectType = 'Faunal remains' OR GeneralObjectType = 'Shell')

ArcGIS queries

Queries were used on ArcGIS to select time intervals. All the used queries were variations of this one:

("Start" <=48000 AND "Start" >=4500) OR ("End" <=48000 AND "End" >=4500)

Appendix VIII: Glossary of terms

Age:

- **Biological age:** The stage of development (subadults) and decay (adults) of the organism.
- **Chronological age:** The time the individual has been alive.
- **Social age:** The ideas society has about how people of differing ages should behave.

Cartesian dualism: A concept introduced in 1641 by Descartes: dualism between body and soul/mind.

Cemetery: In this thesis, cemeteries are funerary sites containing at least 10 non-buried or buried individuals that were not deposited simultaneously. Thus, sites with 10 or more individuals in a multiple grave or a shared space (if they were not buried) that cannot be shown to have been deposited at different times are not classed as cemeteries.

Cremation: Burning of a dead body.

- **Full cremation:** The whole body is cremated and turned into ashes.
- **Partial cremation:** Only a part of the body shows fire traces.

Ethnicity: Feelings of social belonging based on culturally constructed notions of a shared origin.

Funerary deposit: A grave or a differentiated space (*e.g.*, cave chamber, natural niche).

- **Individual deposit:** A grave or a differentiated space that only contains one individual.
- **Multiple deposit:** A grave or a differentiated space that contains more than one individual.

Funerary space: area in which the deceased are deposited. It can contain one or more funerary deposits.

- **Delimited funerary space:** Funerary space in which human remains are located in a delimited area – different from the one used for daily life activities.
- **Mixed funerary space:** Funerary space in which human remains are located within domestic areas.
- **Abandoned funerary space:** The funerary space was abandoned right after depositing the deceased.

- **Non-abandoned funerary space:** The funerary space was not abandoned right after depositing the deceased.
- **Collective funerary space:** There is more than one individual at the funerary site.
- **Individual funerary space:** There is only one individual at the funerary site.

Furnishings: objects intentionally placed in the funerary context that cannot be considered funerary offerings (*e.g.*, pillows, beds or wrappings).

Gender: The idea of being a man or a woman and how men and women should behave in society.

Identity: Broad concept that refers to the way people conceive themselves and the world around them, including the land and its inhabitants.

- **Individual identity:** According to Hernando (2002, 2012), the type of identity constructed through self-reflection.
- **Relational identity:** According to Hernando (2002, 2012), the type of identity constructed through relationships and performance.

Life-altering pathology: Injury that alters the life of the person who suffers it, for example, a broken leg. It can be temporary, if the injure is healed, or permanent (*e.g.*, an amputation).

Loss of autonomy: Individuals with a loss of autonomy are those who, because of a pathology, would need temporary or permanent assistance to survive or would see their capacity for survival reduced.

Persona: Public facet of identity that might vary depending on the context.

Personhood: Condition or state of being a person.

- **Dividuality:** Following Fowler (2004), mode of personhood in which persons are understood as divisible entities.
- **Individuality:** Following Fowler (2004), Western mode of personhood in which persons are understood as indivisible entities.

Selfownership: A concept developed by John Locke in 1764: the body as property of the subject.

Sex: Biological feature defined by X and Y chromosomes (genetic sex), the balance of estrogens and androgens (hormonal sex), the presence of testicles or ovaries (gonadal sex), the morphology of the internal reproductive organs and the morphology of the external reproductive organs.

Strategies of inhibition: Following Criado (1991, 1993, 1995, 2012), lack of interest in hiding or exhibiting the social action. When applied to death, it means that human remains where not intentionally hidden or exhibited.

Strategies of hiding: Following Criado (1991, 1993, 1995, 2012), intentional hiding of the results of the social action. In the case of strategies of hiding death, human remains are intentionally hidden.

Strategies of exhibition: Following Criado (1991, 1993, 1995, 2012), intentional exhibition of the results of the social action. In the case of death, human remains are intentionally exhibited.

Strategies of monumentality: Following Criado (1991, 1993, 1995, 2012), a kind of exhibition strategy that attempts to exhibit the results of the social action both in space and time. An example of this would be Megalithism.

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