

Neolithic and Bronze Age Studies in Europe

From material culture to territories

edited by

Marie Besse and François Giligny



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(4-9 June 2018, Paris, France)
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Session I-4

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Foreword to the XVIII UISPP Congress Proceedings

UISPP has a long history, originating in 1865 in the International Congress of Prehistoric Anthropology and Archaeology (CIAAP). This organisation ran until 1931 when UISPP was founded in Bern. In 1955, UISPP became a member of the International Council of Philosophy and Human Sciences, a non-governmental organisation within UNESCO.

UISPP has a structure of more than thirty scientific commissions which form a very representative network of worldwide specialists in prehistory and protohistory. The commissions cover all archaeological specialisms: historiography; archaeological methods and theory; material culture by period (Palaeolithic, Neolithic, Bronze Age, Iron Age) and by continents (Europe, Asia, Africa, Pacific, America); palaeoenvironment and palaeoclimatology; archaeology in specific environments (mountain, desert, steppe, tropical); archaeometry; art and culture; technology and economy; biological anthropology; funerary archaeology; archaeology and society.

The UISPP XVIII World Congress of 2018 was hosted in Paris by the University Paris 1 Panthéon-Sorbonne with the strong support of all French institutions related to archaeology. It featured 122 sessions, and over 1800 papers were delivered by scientists from almost 60 countries and from all continents.

The proceedings published in this series, but also in issues of specialised scientific journals, will remain as the most important legacy of the congress.

L'UISPP a une longue histoire, à partir de 1865, avec le Congrès International d'Anthropologie et d'Archéologie Préhistorique (C.I.A.A.P.), jusqu'en 1931, date de la Fondation à Berne de l'UISPP. En 1955, l'UISPP est devenu membre du Conseil International de philosophie et de Sciences humaines, associée à l'UNESCO. L'UISPP repose sur plus de trente commissions scientifiques qui représentent un réseau représentatif des spécialistes mondiaux de la préhistoire et de la protohistoire, couvrant toutes les spécialités de l'archéologie : historiographie, théorie et méthodes de l'archéologie ; Culture matérielle par période (Paléolithique, néolithique, âge du bronze, âge du fer) et par continents (Europe, Asie, Afrique, Pacifique, Amérique), paléoenvironnement et paléoclimatologie ; Archéologie dans des environnements spécifiques (montagne, désert, steppes, zone tropicale), archéométrie ; Art et culture ; Technologie et économie ; anthropologie biologique ; archéologie funéraire ; archéologie et sociétés.

Le XVIII^e Congrès mondial de l'UISPP en 2018, accueilli à Paris en France par l'université Paris 1 Panthéon-Sorbonne et avec le soutien de toutes les institutions françaises liées à l'archéologie, comportait 122 sessions, plus de 1800 communications de scientifiques venus de près de 60 pays et de tous les continents.

Les actes du congrès, édités par l'UISPP comme dans des numéros spéciaux de revues scientifiques spécialisées, constitueront un des résultats les plus importants du Congrès.

Marta Azarello
Secretary-General /
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Introduction to Neolithic and Bronze Age studies in Europe: from material culture to territories

Marie Besse, François Giligny

A large amount of papers have been proposed during the 18th UISPP Congress. It has become tradition to propose that some of them be presented in general sessions for each period, and one of these sessions was dedicated to the Neolithic and the Bronze age. Here we present eight papers related to this session, the majority concerning the Neolithic and one the Bronze age period.

Neolithic studies are promoted on behalf of the UISPP Commission 'Neolithic Civilizations of the Mediterranean and Europe' during the 18th Congress, and a large amount of communications have been proposed in many sessions.

In the first contribution, Alfonso Alday and his co-authors, 'Deconstructing the Neolithic: reflections from the Iberian Peninsula' discuss the Neolithization process of Iberia. It's an opportunity to come back to one of the most important debates of the Neolithic: the process of economic, social and symbolic changes involved with this period. The neolithization process is key to some of the most extraordinary changes in the relationship between man and his environment to the extent that it is now considered by some as an ecological disaster and the beginning of the Anthropocene. The intention of the authors is to deconstruct some concepts and to build another perception of the Neolithic in the Iberian peninsula. Two questions are discussed, animal domestication and village settling. The domestication itself is not always easy to demonstrate at its beginnings, when wild animal species equivalent are living in the same biotopes, as is the case for example for the Suidae or bovines, and where hybridization is possible. Some of them are present in Mesolithic contexts. Some technologies admitted as markers of the Neolithic are invented sometimes before the Neolithic, such as pottery vessels or polished axes. One of the points developed here is to consider the complexity of the phenomenon, which cannot be expressed with a single unique model, and to take into account the contribution of Mesolithic communities to the neolithization with regards to the colonization process.

The paper proposed by Chiara Messina and co-authors concerns 'Faunal exploitation in an Early Neolithic site: the assemblage from Casa Gazza (Travo, Piacenza, Northern Italy)', a site attributed to the Vhò culture. In this area, the neolithization is quite old and the process goes back to the 7th millennium BC. Excavated in the 1980's, the site, situated on a bank of the river Trebbia, has delivered an assemblage of more than 7000 bone fragments and allowed for the determination of 1417 of them. The site shows an agricultural and livestock breeding economy. Domestic species are dominant (73%), and Ovis or Capra is the most popular domestic animal. Wild species are dominated by Cervidae and adult red deer hunting was frequent. Other species, such as pond tortoise, were also consumed as food. The site is part of an economy of meat resources similar to that of known sites in the region, with a majority domestic share supplemented by the consumption of deer.

Also illustrating the contribution of archaeozoological analyses, the paper by Svenja Höltkemeier and Susanne Friederich discuss the role of the animal in Neolithic symbolic manifestations in the Elbe-Saale area between 5500 and 2200 BC. These events are visible in causewayed enclosures, in the form of deposits of artifacts or animal and human funeral remains recorded. The enclosure of Salzmünde-Schiepzig (Saxony-Anhalt) played a major role for communities in the second half of the 4th millennium BC at the regional level. The economy of the meat resources is based mainly on cattle, the bone assemblage found in the enclosure ditches and the other structures is mostly

detritus with a significant amount of burned bone. Animal parts were also deposited in burials, as is observed in the Elbe-Saale region, with also practices of depositing bucrania, 'cattle burials', or skulls in graves showing the symbolic importance of domestic animals.

Antonietta Del Bove and her co-authors present data regarding Copper age human remains in central Italy, from the Spinosa Cave in Tuscany. The recent excavations have provided a sample of human remains for two occupation periods, Neolithic and Eneolithic, and are in secondary position and unfortunately in a poor state of preservation. The bioanthropological analysis of 45 individuals gives information about age and sex, and attest to the presence of both males and females.

The decomposition of the bodies without fire and with ancient fractures supports the hypothesis of a 'decaying' area in the cave, with remains taken outside and the mixing of bodies, as in a collective burial.

Spatula-idols are one symbolic manifestation found in funerary remains from the Neolithic in Northern Spain. The contribution of Javier Fernández-Eraso and José Antonio Mujika-Alustiza describes those forms in the Western Pyrenees and its archaeological context. Those idols are made from bones, ovicaprids tibia bone, exceptionally a human radius. The bones are decorated with geometric patterns and the morphology is modified to give an anthropomorphic resemblance. The idols are always found inside dolmens and are part of the grave goods. Radiocarbon dating of three idols from two different sites is many centuries older than those of the human bones and that must be explained, perhaps through the reuse of older funerary structures.

Another paper about figurines is presented by Elena Garrido Fernández and co-authors, concerning their rare occurrences in the Late Neolithic and Chalcolithic of the Iberian Peninsula. One zoomorphic clay figurine has been found in a natural monument at Cueva del Agua but is incomplete. It represents the back or rear part of a quadruped animal, and is conserved as a fragment over eight centimetres in length. As such, the complete piece must have been quite big. In other contexts, bovines, suids, or hybrid animals are often found.

The role of symbolic territories is a question treated by the paper by Pilar Zapatero et al. In the Amblés valley, in central Iberia (province of Ávila), new sites with schematic art have been discovered. This art is engraved or painted on granite rocks in many different locations and represents geometric, zoomorphic or anthropomorphic figures. Their chronological attribution is uncertain, but excavations nearby have provided pottery dated from the end of the 5th/beginning and first half of the 4th millennium BC. The geographic localization of this representations is interpreted as marking landmarks of resources and symbolic appropriation, perhaps for itinerant pastoral communities.

Hélène Blitte's paper deals with Bronze age hoards in Europe. Starting from an inventory of hoards in five selected areas, more than 4000 hoards have been analyzed. The different deposition practices and hoard compositions are testimonies of the ritual and social structure of Bronze age societies. Similar characteristics refers to a common universe, like burying those into the ground at a low latitude and the frequency of axes, weapons and ornaments. Their complexity also appears to increase with time and late Bronze age hoards are the most complex ones. Regional specificities also do appear.

Deconstructing the Neolithic: reflections from the Iberian Peninsula

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Abstract

Many research projects focused in the Iberian Neolithic have offered during the last years a significant archaeological documentation. Researchers' efforts to compile those data and to give them a historic sense are not enough if, at the same time, we do not think about the concepts associated to the neolithization process. Usually, reconstructions confront a certain image of the farming lifestyle that starts in the Neolithic versus another one that derives from the hunting-gathering way of life. Nevertheless, those idealized scenarios are far from the prehistoric realities and, consequently, far from the archaeological record reality. Concerning this, in this paper we reflect on the limits and problems associated with the Neolithic archaeological record and we test a deconstruction of some traits considered Neolithic. Specifically, we address: a) problems of the animal domestication, and b) the founders of the villages.

Keywords: Neolithic, Iberian peninsula, animal domestication, leap-frog colonization

Résumé

De nombreux projets de recherche axés sur le néolithique ibérique ont offert au cours des dernières années une documentation archéologique importante. Les efforts des chercheurs pour compiler ces données et leur donner un sens historique ne sont pas suffisants si, en même temps, nous ne pensons pas aux concepts associés au processus de néolithisation. Habituellement, les reconstructions confrontent une certaine image du mode de vie agricole, qui commence au Néolithique, contre une autre qui dérive du mode de vie de chasse-cueillette. Néanmoins, ces scénarios idéalisés sont loin des réalités préhistoriques et, par conséquent, loin de la réalité archéologique. A ce propos, dans cet article nous réfléchissons sur les limites et les problèmes associés au dossier archéologique néolithique et nous testons une déconstruction de certains traits considérés comme néolithiques. Plus précisément, nous nous penchons sur : a) les problèmes de la domestication animale, et b) les fondateurs des villages.

Mots-clés : Néolithique, péninsule Ibérique, domestication des animaux, colonisation de proche-en-proche

Introduction

We, as archaeologists, could easily arrange a museum showcase displaying what the Neolithic is, from a cultural and archaeological point of view. We would choose some ceramics after their shapes and/or decorations, lithic tools designed for mowing cereals, polished tools for chopping wood or farming, as well as seeds and bones from domestic species. An adequate selection of maps

and chronograms could explain the geographic and temporal flows. If we compare this precise showcase with other containing the technological capabilities and the way of life of the last hunting-gathering societies we will realize the cultural leap that the neolithization implied.

But the former experience is only a hierarchized construction made by archaeologists: there never was a *Neolithic plan*. Similarly, there is no unique way of understanding it. Prehistoric societies did not think a lot about it: the process was the result of a series of facts, some of them induced, some others accidental, occasionally coordinated, other times not, that took place in different territories and times.

There is a double consequence:

- a) archaeological, because the ensemble of elements in our showcase only coexisted in the final moment of the Neolithic construction, but not during the previous centuries when the process had already begun;
- b) cultural, because the process implied successive transitions when the limits between the different ways of life were blurred.

If we consider the fossil record, the incapacity of fixing the transitions has been pointed out (Signor *et al.* 1982). Those diffuse limits appeared not only where the Neolithic began, but also in the regions that received a consolidated version of the phenomenon: the Neolithic record offers too many variants to ignore its complex expansion from the native region. There was never a Neolithic plan, nor was there an *expansion* or *conquer* plan of other territories or societies. Plainly, no one realized that it was happening: chance facts, induced elements and uncoordinated situations coincided in its expansion, as well as diverse types of interaction with the native communities from the new lands.

Thus, it is necessary a reflection on the *items* that the archaeological community accepts as referents for the Neolithic, proposing its *deconstruction* in order to evaluate the cultural codes behind the archaeological reality. Due to the length limit of this text, only two main topics will be addressed: a) problems of the animal domestication; b) the founders of the villages.

The Iberian Peninsula can be seen as a melting pot of influences that ultimately produced different versions of the Neolithic culture: influences from the Mediterranean, from the North of Africa, from the continental Europe. Those forces affected the dynamic and interconnected Mesolithic societies: hunter-gatherers were used to *giving* and *receiving*, thanks to their dense exchange networks. The arrival of the new Neolithic codes should have been seen with curiosity and spontaneity, ignoring its social and economic implications. A surprising fact concerning the Iberian neolithization is its fast expansion: in every region with enough evidences the process was initiated by ca. 5600 cal BC: in less well-known areas the new data tend to approach to that date. But, in fact, the Neolithic is not completely consolidated until ca. 5300 cal BC. For several centuries there was a back and forth learning process (Alday 2009; Montes & Alday 2012): from the Neolithic groups to the Mesolithic ones and vice versa.

1. The problems with husbandry

Concerning husbandry we will focus on two factors: the criteria defining animal domestication and the visualization of the economy of production.

1a. Domestic and wild species: a long-term relationship

There are several criteria that allow determining a faunal remain or ensemble as domestic: a) findings in regions lacking of wild precedents, assuming human intervention; b) osseous morphometric changes (internal geometry and size); c) genomic identifications; d) sacrifice ages.

Their archaeological observation is a complex one, be it by the volume and conservation state of the collections, or by the lack of clarity of the theoretical patterns: the size change may be related to domestication but also to climate, regional adaptations or a higher hunting-related human pressure (Rowley-Conwy *et al.* 2012).

One of the oldest dates of the Iberian Neolithic context has been obtained from a *Ovis aries* metapode found at Peña Larga (Beta-242783, 6720±40) (Murelaga *et al.* 2009). Some authors question its domestic status (Martins *et al.* 2015), others simply refuse the date arguing that the Neolithic was not established in the region yet (Manen 2014); some of us accept it considering its relationship with other Neolithic evidences (Alday 2009).

Domestic sheep lacks of a wild agriotype in the Iberian Peninsula: its presence is related to human intervention. The distinction between *Ovis* and *Capra* and their status is difficult; the similar sizes between adults (*Rupicapra rupicapra*) and youngsters (*Capra pyrenaica*) add more confusion. The experiments carried out by Zeder (Zeder & Pilaar 2010; Zeder & Lapham 2010; Zeder 2012) show remarkable mistakes; recently, new criteria have been proposed to overcome difficulties (Balasse *et al.* 2016; Koutsoglannouli *et al.* 2010). Martins and collaborators (2015) point out discrepancies in the status definition if we employ morphodimensional criteria or protein biomarkers (peptide footprint): some sheep identified by their anatomy were in fact, after spectrometry analysis, goats.

In the stratigraphic sequence of Peña de Marañón the *Suidae* bones are the most abundant and their domestic or wild status is problematic: in the Mesolithic levels seven fragments have been identified as wild boars and thirty-three would fit, after their sizes, the domestic parameters (Castaños 1992).

To the methodological difficulties we must add those caused by prehistoric introgressions, whether *natural* or *driven by humans* (Rowley-Conwy and Zeder 2014). The finding in pre-Neolithic ensembles of *Suidae* that combine wild and domestic skeletal features (Evin *et al.* 2014; Blasco & Castaños 2014; Balasse *et al.* 2016; Koutsoglannouli *et al.* 2010) is a serious warning concerning the identification of their domestication. Some authors (Krause-Kyora *et al.* 2012) set back half a millennium their domestication in Northern Europe, in Ertebølle culture sites: *Suidae* genetically related to Near East pigs, that phenotypically and pathologically are in concordance with them, have the size of European wild boars. There is no internal contradiction, given the dependence between the size of the individuals and their environments, but this issue questions, as for other species, the viability of the exclusive employment of metrical markers to catalogue the individuals.

Keeping in mind the insufficiencies of the biometric characterization, there are some hypothesis that could explain the presence of *Suidae* with some domestication features in Mesolithic contexts: feral pigs crossbred with boars, Mesolithic groups hunting Neolithic pigs, proto-domestic individuals, exchanges between groups, introgressions... According to our response, the perspective we offer of the neolithization will be different. The Ertebølle panorama cannot be compared with the Iberian one that we analyse here (due to its late chronology and to its frontier situation during the expansion of the North European Neolithic). Nevertheless, the phenomenon could well have taken place in other times and areas.

The differentiation between aurochs and bulls according to their size is also complex (Kysely 2016; Wrigth & Viner-Daniels 2015): metric analysis do not give the expected bimodal distribution between wild and domestic populations, because their dimensional thresholds are diffuse. Some factors can be quoted: environmental determinations; human attitudes towards feeding and sexual management of cattle, and introgressions (Göthström *et al.* 2005; Lira 2010; Park *et al.* 2015). Thus, the theoretical fundamentals envisaged by archaeozoologists differ when considering the status of *Bos taurus*: its domestication was far from being a simplistic scenario (Orlando 2015).

Three *Bos taurus* samples were selected to date level IC2 from the cave of Arenaza (Arias & Altuna 1999): two results fits with the cultural characterization (Ancient Neolithic) of the industrial assemblage. But OxA-7158 (10860±120 BP) doesn't: its husbandry status should be rejected, no matter its domestic-like skeletal features, accepting some stratigraphic disturbance.

At Mendandia, morphotypometry of the Neolithic bovines (except for some remains from level I) is in accordance with aurochs features (Castaños 2006), but genetics outlines the presence of a haplotype (T3) linked to domestic cattle in one element (Alday *et al.* 2012). Morphometric analysis of the genetically determined phalanx fits the average dimensions of the Iberian *Bos primigenius* (Lira *et al.* 2014).

In order to ascertain those contradictory data we have to bear in mind the problems derived of metric records: a) West-East and North/South cline of the aurochs size, meaning that we compare Mendandia with a reference collection whose members were bigger than the Iberian individuals (Arbuckle *et al.* 2016; Wright & Viner-Daniels 2015); b) progressive decrease of the size of the domestic cattle until the Middle Ages (Altuna 1980; Kysely 2016); c) breeding between domestic and wild individuals since Prehistoric times, even in the case of the last Polish aurochs of the 17th century (Arbuckle *et al.* 2016; Kyselý & Hájek 2012; Orlando 2015), confirmed by DNA analysis. The consequence are bones with intermediate internal geometry and sizes or, if preferred, superposition/fusion of metric data. We can question whether the hybridization took place, but the coexistence of wild and domestic individuals, and their possible mixing in our collections, cannot be denied. Besides, the different criteria employed by archaeozoologists insist in the feeble analysis and the high degree of interpretation assumed (Arbuckle *et al.* 2016): according to the chosen criterion, the phalanx from Mendandia belongs to one or another status.

1b. The visibility of the economy of production

The deficient conservation of vegetal remains prevents archaeologist to establish their real participation in the diet of prehistoric societies. The problem becomes frustrating when we study the beginnings of agriculture: in La Revilla village, 1,603 litres of earth from silos had to be processed to recover 7 cereal grains; in La Lámpara 3,868 litres were filtered to obtain 45 grains (Rojo-Guerra *et al.* 2008). But we do not know how many of them belong to Neolithic. The weight and mechanics of the diffusion of cereal pollen worsen the problem (López *et al.* 2003).

Also, the analysis of husbandry faces visualization problems. In table 1 we include sites from the Bajo Aragón, with faunal data from their Mesolithic (GM) and Neolithic levels (NEO): except the *Cervidae* from Valmayor XI, identified bones are scarce (in Secans there were no osseous remains at all). The table displays the reality of those collections: poverty and lack of resolution to diagnose their economy. It is wrong to state that we face no husbandry groups: data are simply too scarce. The situation is similar on sites like Forcas II in the aragonese Pre-Pyrenees (Blasco & Castaños 2014), inside ensembles from the Cantabrian coast (Altuna 1980) or in Portugal (Dean & Carvalho 2011). The application of paleontological criteria for the determination of the status of the individuals and of the economic structure in such fragmented and poor faunal remains is complicated.

Besides, the functionality of every site may produce important biases in the identification of husbandry. Unless we accept a unique pattern of sites in the Neolithic, the archaeological reality resembles an assorted scenery. The Vicentine coast (South Portugal) is a good example: it includes necropolises (Ibn Amar), lithic workshops (Vale Santo), shell middens (Rocha das Gaivotas, Castelejo, Ribeira de Alcantarilha, Alcalar), temporal habitats (Padrão, Cabranosa, Vale Boi, Caramujeira, Areias das Almas) and villages (Castelo Belinho) (Carvalho 2010). Only if we envisage the complete frame, we will apprehend a realistic vision of the Neolithic. Hunting was indeed a strategic economic activity in sites like Peña Larga and Chaves (Castaños 1997, 2004), La Draga (Palomo *et al.* 2005), Toll and Font Major (Cebrià *et al.* 2014), Cova Frare (Martins *et al.* 2015),

Site culture level	Pontet		Secans		Botiquería		Costalena		Valmayor Xi	
	GM e	NEO cinf+csup	GM IIb	NEO IIa	GM 2+4	NEO 6+8	GM c3	NEO c2+c1	NEO* 2	NEO 3
<i>Equus caballus</i>					2		1			
<i>Bos primigenius</i>										1
<i>Capra pyr/sp.</i>								5		1
<i>Rupicapra rupic.</i>					1					
<i>Cervus elaphus</i>	1	5			3	2	6	3	33	65
<i>Capreolus cap..</i>						1				
<i>Sus scropha</i>					1	2			3	2
<i>Oryctolagus c.</i>	1	87			9	6	6	7	557	527
<i>Lepus c.</i>										
<i>Lynx sp</i>						1				19
Others					birds		19	2	202/58/1	278/61/2
Total TAXA	2	94	0	0	163	149	39	17	854	956

Table 1. Faunal taxa identified in *Bajo Aragón* archaeological sites with Geometric Mesolithic (GM) and Neolithic (NEO) records. We consider *Valmayor XI phase 2 as Neolithic due to its material remains, despite its researchers describe it as ‘Mesolithic with ceramic’. Table shows the total taxa per level, and detailed the number of remains per species (NISP), except in Botiquería, where the publication shows only the minimum number of individuals (MNI) (here in italics). Other: in Costalena has been identified as cervidae / herbivore; in Valmayor XI, the original study includes important batches of macro-mammals and mesomamifers, reflected here together with 2 birds and 1 reptile (Rodanés *et al.* 1996; Barandiarán 1978; Barandiarán & Cava 1989; Rojo *et al.* 2015) (Pontet data: unpublished analysis by M.F. Blasco).

Cendres (Iborra & Martínez 2009), Or and Sarsa (Pérez Ripoll 1987). Strikingly, La Vaquera IA has been described as a stable but a 20% of the recognised assemblage is wild fauna (Estremera 2003). The livestock management followed a progressive pattern that included hunting: at Los Husos I the domestic livestock augmented from 60% in Neolithic times to 80% in the Chalcolithic and 98% in the Bronze Age (Altuna 1986).

The lack or poverty of domestic fauna may respond to taphonomic and / or functional problems. Both questions affect the debate of the interpretation of archaeological contexts: while some of the sites from Table 1 have been defined as ‘Mesolithics with pottery’ (why?), other without faunal data (Cova Bonica, Can Filuà, Molino de Arriba, Plano del Pulido, Paternanbidea...) are considered as Neolithic (García-Martínez de Lagrán 2018). We cannot understand this logic, except if a priority was applied: the difference between them is the pre-existence, sometimes, of Mesolithic levels (some of them several centuries older), but not a dissimilar material assemblage. If we accept this vision, husbandry could not be recognised in some areas until Iron Age, which is historically absurd.

The exclusion from the Neolithic world of those contexts, with Neolithic pottery and lithic industry, but lacking evidences of domestication (side-stepping the taphonomic problems), means that we separate from the historic program of the neolithization some ensembles that demonstrate the versatility of human communities.

1c. Reflections

The animal domestication process was complex (in every region) and long (the species went through different phases). The opposition between wild and domestic is biologically false: there

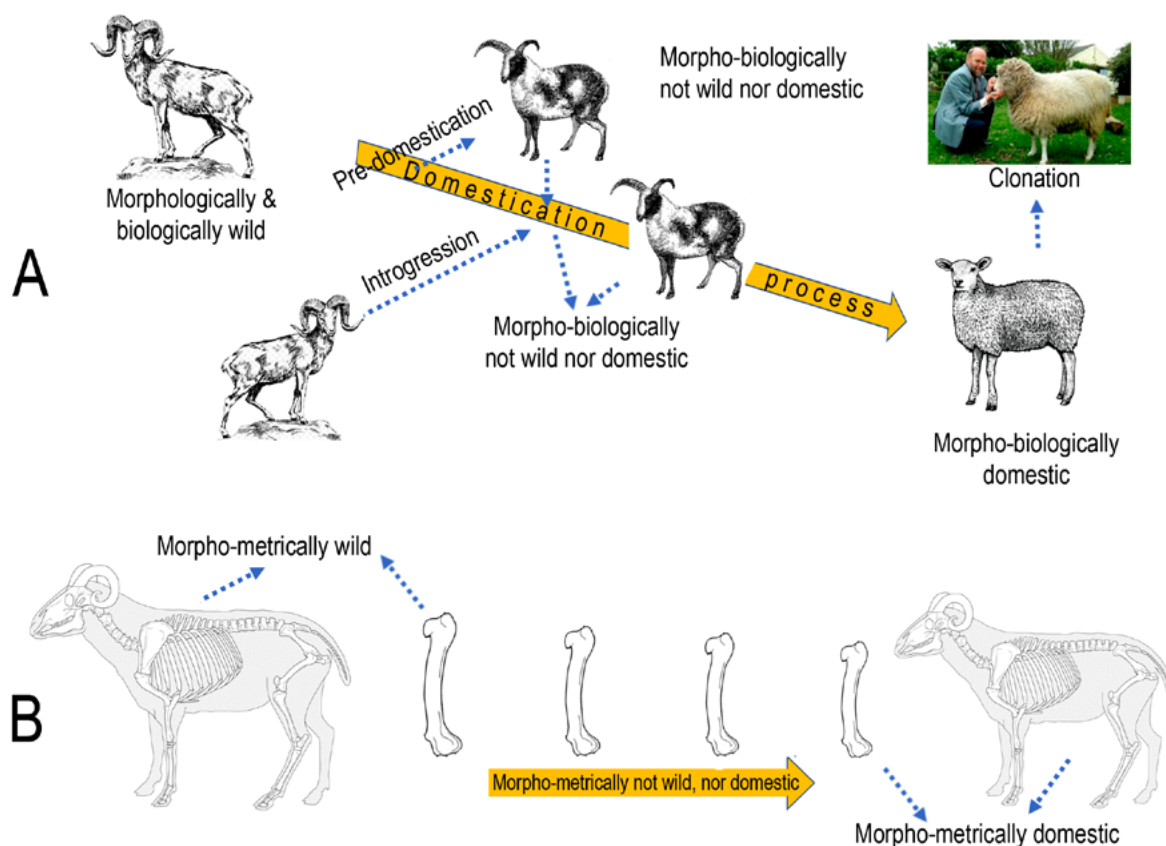


Figure 1. (Up) Theoretical framework for the domestication process of sheep: between *Ovis amon* and domestic form *Ovis aries*, individuals would present forms and sizes not conform to start and end patterns. (Down) Archaeologically, the process results in a non-regressive evolution of the size of the bones we found and analyzed in the sites.

were in between assorted situations derived from fluxes sustained in time and space (Marshall *et al.* 2011) (Figure 1). Concerning this, at Sillourokambos (Cyprus) the domestication of the four basic animal species is not accompanied by skeletal changes. The *re-domestication* (Hristov *et al.* 2015; Larson *et al.* 2007; Lari *et al.* 2011), the introgressions and the environmental changes difficult the linear *reconstruction* of the domestication and an unequivocal lecture of the archaeological evidences.

In Table 2 we point some the problems involving the distinction wild/domestic among animals: a bimodal compartmentalization is contrary to the biological point of view, and the parameters employed to *build* the economic Neolithic are not always evident. Genetic analysis, biomarkers and metric calculations may contradict one another. The presence of domestic elements in contexts described as Mesolithic challenges their true consideration, pointing out that the limits of the hunter-gatherers and farmers showcases are blurred. Moreover, it is not for sure that the mere presence of domestic elements may be considered as a more evident proof of neolithization than pottery or the renewal of lithic industry. The true key is the management of plants and animals. If humans do not drive this management, then there is no real productive economy: animals, as other items, could be as well exchange products. Strictly speaking, production economy consolidated ca. 5300 with the first folds and a high percentage of domestic fauna (at least in some sites): previously, there are isolated news concerning domestic-like individuals, whose management is poorly known, although we know that the process had already started.

It is important accepting/questioning the domestic status of some animals, but it is even more important to reflect on what these and other peninsular evidences imply/contribute to the design of the neolithization and help to solve our doubts: is the ovicaprid from Peña Larga chronologically

	Identification problems	Consequences
A	Poorness and fragmentation of the faunal records	Scarce possibilities of defining economical practices
B	Chance or induced introgressions	Distortion of the metric evolution scale of individuals
	Dependency between animals size and environment	Ignorance of the metric trends of species
C	Mobility, ages and sex management	Distortion of the metric evolution of individuals and herds
	Combination of hunt and husbandry by a group	Different archaeological scenarios in an economic system
D	Identification mistakes concerning species	Caution on the results
	Identification mistakes concerning status	Caution on the results
	Contradictions: morphology vs. morphometry vs. biology	Different archaeological interpretations

Table 2. The difficult visualization of the animal domestication in archaeological records: problems of identification and its consequences in the arqueozoological interpretation.

Types of problems: A) Of archaeological nature; B) Of ecological nature;

C) Of prehistoric cultural management; D) Concerning study methods.

representative of all the level where it was found? A human-driven management of bovines at Mendandia explains the forest thinning? At Peña, can the pigs be considered as such in a Mesolithic context or are they small boars evidencing a metric overlapping between them? Is the lack of domestics at the Bajo Aragón real or only apparent, given the poorness of the conserved records? Why a sheep, a goat or a cow make a place more Neolithic than the related pottery or lithic industry? The remains of domestic vegetables may show similar doubtful scenarios: paradoxically, the agricultural management can be seen in sickle elements glosses, even if we cannot find cereal grains.

2. New villages and new dwellers?

The acceptance of the productive economy is such a deep change that makes reconsider the population strategies (namely, the establishment of villages). Or, from the archaeologist point of view, the changes in the spatial distribution of the record are interpreted as evidences of deep cultural innovations.

Los Cascajos is a village from the Ancient Neolithic (García Gazólaz *et al.* 2011b) with negative structures that held posts to build huts and with amortized silos that served as graves. Some archaeologists see its foundation as the evidence of the arrival of foreign populations that were following a leap-frog displacement model (García-Martínez de Lagrán *et al.* 2018). The mechanics are simple: a Neolithic community is in need of new lands, so it moves and settles in new territories, disregarding of the already-living human groups. Concerning the *deconstruction* of the Neolithic, this topic is worth a detailed analysis.

Figure 2 shows the distribution of the known occupation sites dating 5500-4000 cal BC from the Geometric Mesolithic and the first Neolithic of the Iberian Peninsula. Spatially, the occupied areas and the gaps are the same along both periods, although Neolithic occupation seems to cover more territories. It is important to remark that, even if some points from both maps represent the same site, there is no real continuity: on the contrary, hiatus are observed, be it by temporary abandonments, be it by selection of the dated items. The phenomenon occurs between levels from the Mesolithic, from the Neolithic and in their interfaces.

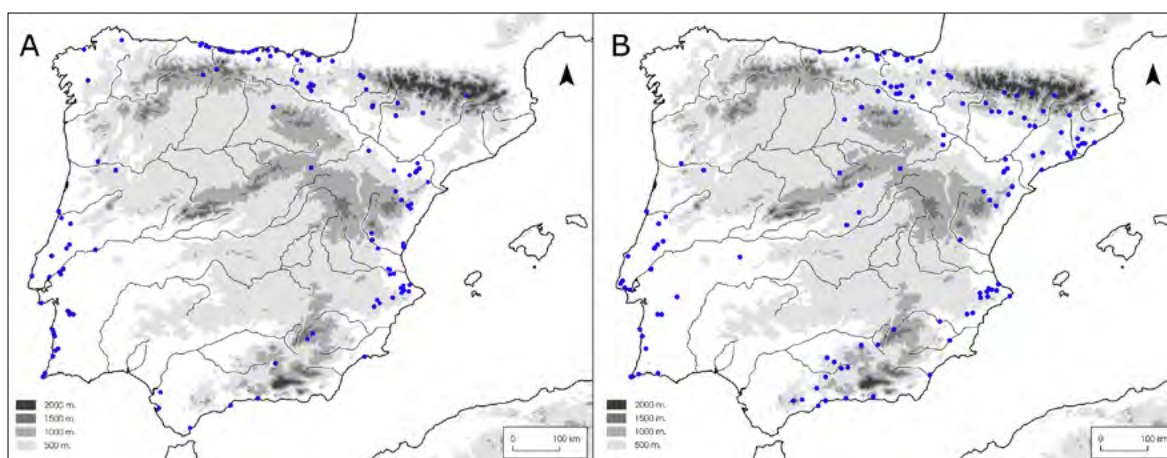


Figure 2. (A) Iberian Geometric Mesolithic contexts dated between 7500-6700 cal BC. (B) Early Neolithic contexts between 6700-6000 cal BC. Both cases without funerary samples, always difficult to define culturally.

In an exercise of presentism, we have distributed Neolithic sites on a current climate map of Iberia (Figure 3A). There are no clear relationships between climates and territorial distribution: early neolithization appears both in mountain climates and in the arid Mediterranean zones. Interestingly, this situation should move us to rethink the idea that Neolithic groups looked for particular ecological areas. A microgeographical analysis should be needed, but we cannot include it here. It has been assumed that Neolithic migrants preferred humid areas, lakes, endorreic basins or inundation plains, choosing locations that controlled communication ways. This vision only offers a partial view of the first Neolithic places, disregarding their functional diversity. Besides, this ensemble of ecological features is in general shared by the rockshelters and open-air sites where the last Mesolithic groups lived: next to water resources and interfluves, marshes, territorial control... (Alday *et al.* 2018; Montes & Alday 2012).

If we reproduce the precedent test but on a lithological map the result is more revealing: almost two thirds of the sites are located in cavities of the calcareous regions or in clayous areas that also include rock shelters (Figure 3B). The dependence of the distribution of the archaeological record and the geological basis is evident. Caves to shelter the livestock become compulsory (Trocs, Coro Trasito, Peña Larga, El Portalón, El Mirador, La Vaquera...) and this situation eases the localisation of some sites (Alday 2018). At Andalusia this pattern becomes paradigmatic: the calcareous terrains

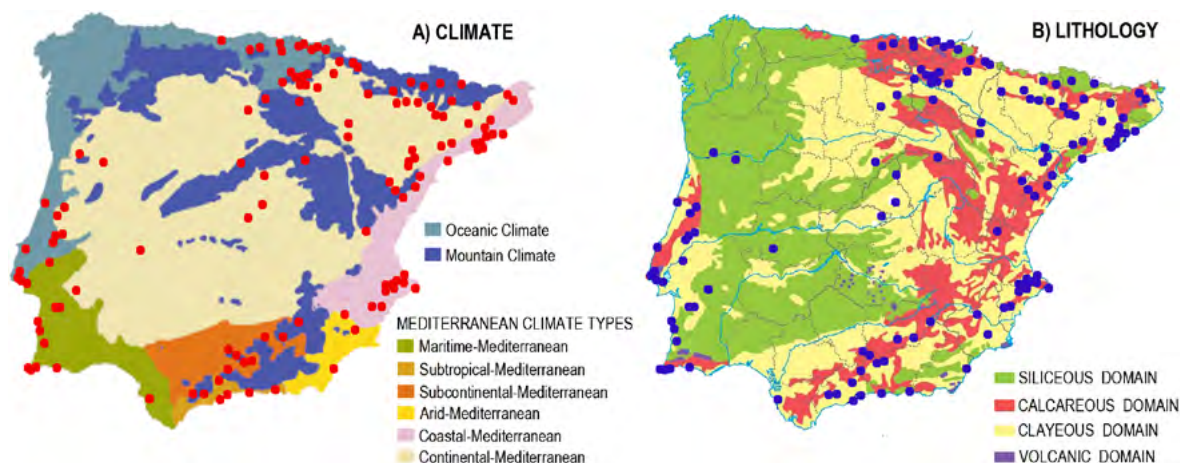


Figure 3. Distribution of the Iberian Early Neolithic sites (fig. 3) represented on (A) different types of climatic environments (after García Couto 2001) and (B) lithological domains. There is no special relationship with climate, but with limestone and clayey with rock shelters lithologies.

occupy less surface than the siliceous and clayous areas, but the former ones concentrate most of the Neolithic sites. But it is illogical that the Neolithic settlements remain concentrated only in cavities typical of ‘mountain’ areas: where are the sites located in the cultivation-apt plains?

When we focus our attention in the precise type of open-air settlement, the village, a new conceptual bias related to the Neolithic *construction* process appears: the opposition temporary campsite vs. stable village. The few known Mesolithic open air sites are aprioristically qualified as a campsite instead of as a village, a term which is left for Neolithic and later periods: as an example, we can compare the reconstructions proposed for the Mesolithic site of Cabezo de la Cruz (Rodanés and Picazo 2013) and for an undetermined Neolithic village (Rojo *et al.* 2008).

Ultimately, the visibility of the sites, their preservation (worse in the open-air cases) and the research bias (Alday *et al.* 2018) introduce other preconception in the population image, and consequently in the *construction of the Neolithic*. The interpretation of the geographical gaps and their consideration in the explicative models of the Neolithization process is mandatory.

In order to deal with the question of who founded a site we can profit the available genetic information. The current view is that the remarkable Upper Palaeolithic ancestry among modern-day Europeans is derived from complex prehistoric and historic processes (Semino *et al.* 2000; Sykes 2001; Achilli *et al.* 2004; (Soares *et al.*, 2010; Fu *et al.* 2016; Deguilloux *et al.* 2012; Fernández *et al.* 2010; Soares *et al.* 2010). But this broad view should be refined: detailing regional and temporary situations; filling the documentary gaps (Hoffman 2015; Pinhasi *et al.* 2012); discussing the role of haplogroups (for mtADN H cf. Soares *et al.* 2010 vs Brotherton *et al.* 2013 or Fu *et al.* 2012); establishing the genetic structure of Mesolithic populations (increasingly complex: Brandt *et al.* 2013; Villalba-Mouco *et al.* 2019); assessing the contribution from the Neolithic and later, which is becoming more and more important (Lee *et al.* 2012; Ricaut *et al.* 2012; Olalde *et al.* 2019)... It is no longer easy to fit into different *showcases* the haplotypes of the hunter-gatherers and of the farmers, given the presence of lineages associated to Neolithic groups in Mesolithic contexts from Greece, Hungary, the Balkans, Sweden or Luxembourg (Fernández & Reynolds 2017; Gamba *et al.* 2014).

Besides, the relationship of an individual with a region established by his genetic ancestry does not mean a straight cultural dependence: ancestry can be related to previous generations as a result of population and/or cultural fluxes, unconnected from the actuality of that particular person.

At Los Cascajos the identified haplotypes are mt H (12), J (2), K (3), T (1), U (7), U5 (1), y X (1) (Hevella *et al.* 2012). If H, U and U5 are considered as markers of Mesolithic populations, the 87%



Figure 4. Mesolithic camp-site (left, after Rodanés & Picazo 2013) and Neolithic village (right, after Rojo-Guerra *et al.* 2008). The same archaeological footprint (because the same type of hut), but different denomination. Conceptual apriorisms oppose the terms camp vs. village, then, nomad vs. sedentary lifestyle.

of the individuals show that ancestry. The most parsimonious hypothesis is that the village was founded by a local community that included some individuals from other lineages (bearing in mind the previous comments). Nevertheless, other solution has been proposed (García *et al.* 2017): the founders were Neolithic migrants who practised a leap-frog displacement, and the genetic mixture could have been previous to the foundations. Two comments arise when we face this issue: a) the maternal line is the only genetic information we have; b) genetic data should be contextualized into the archaeological record. Technological traditions of lithic projectiles or ceramic style from Los Cascajos are similar to the ones identified in neighbouring Neolithic sites with a Mesolithic background.

3. The leap-frog model: theory and application to the Iberian Neolithic

The leap-frog model implies that from Neolithic centres with problems related to production, demography or social issues, a group set off a journey in quest of suitable lands for agriculture, far from the original area. Initially, the model was not proposed for the Neolithic (Anthony 1990; Bandelt *et al.* 2003; Kruk 1980; Lefferts 1977; Van Andel & Runnels 1995). According to our perception of the Neolithic complexity, it could be a valid model for some situations, but not for others. Its mechanics include three phases: departure, displacement, and arrival.

Departure

The first question to solve involves the reasons impelling the foundation of a new village, with three basic possibilities:

- Soil exhaustion. How long / how many generations pass until the farmlands become exhausted? The answer depends of particular issues: group size, possibilities of the territory, management. The *leap-frog* denotes that Neolithic groups chose the most suitable territories. Given the limited intensity and extension of their agricultural labours, the fertility loss should not have been immediate. Otherwise, the community could have made a bad decision or an incorrect management.
- Demographic growth: How long / how many generations pass until the equilibrium population/resources is broken? A demographic imbalance does not imply an exponential population growth (Hofman 2015) and may not derive in a village enlargement, or in an augmentation of activities, becoming thus invisible in the archaeological record. Some members of the group could be expelled, but the village would continue and the region would be neolithized.
- Social instability: be it by internal dynamics (systemic crisis), be it by external factors, (environmental crisis, competition...), its archaeological contrast is difficult. Given the size of the villages and the scarce social hierarchy, a social collapse does not seem a suitable scenario for us.

Leap-frog model theory: start			
Posible causes	Casuistry & questions	Effects on neolithics	Effects on archaeol. Record
Soil exhaustion	How long?	Village abandonment	Archaeological silence
Population growth	How many generations?	Village Continuity	Difficulty finding significant evidence
Social instability	Reasons?		

Tabla 3. Leap-frogmodel: analytical synthesis of the start.

The displacement of the group: territory and mobility

The analysis of the movement of the group should address several factors:

- Incertitudes and risks: the group would not know the itinerary and if the destination met the requirements. We have to consider that the travellers would face deep valleys, high mountains and impetuous rivers, with possible dangers and critical situations along the journey. A previous exploration by members of the community (a *Daniel Boone*-style scouting) would ease the travel, but could not eliminate completely the risks (implicating besides contacts with local populations).
- Transport: likely, the expedition should take place no later than two months after recollection: a stock of food and seeds, and assorted tools, would be required. After Broodbank and Strasser (1991), forty settlers should need no less than 5/10 couples of each animal species and 250 kg of grains: the logistic problems are evident.
- Speed: it would depend of the size and structure of the group, of the geographic difficulties, and of the weight and volume of the baggage. Speed and distance are unknown vectors, but define an expansion rate whose estimate varies among authors (Ackland *et al.* 2007; Ammerman & Cavalli-Sforza 1984; Bocquet *et al.* 2009; Edmonson 1961; Lemmen *et al.* 2011; Velichko *et al.* 2009).

Leap-frog model theory: displacement	
Problems	Implicaciones
Uncertainties and risks	Critical situations
Transport Logistics	Need to get surpluses for seed and food during the trip and first months. Carry enough tools / equipment
Velocity	Depends on group size, weight of the equipment and territory
Recognition and negotiation	Resources of the region / Relationship with other groups

Table 4. Leap-frog model: analytical synthesis of displacement.

Arrival and installation

Once chosen the destination, there remain still several factors before achieving reproductive success:

- Learning: the group must identify the land quality, natural risks (inundations...), seasonal climate features, resources (water, hunting and gathering possibilities, raw materials...). The critical moments before the first harvest(s) should be get over. Significantly, the early Neolithic settlements in the Ebro Basin know and exploit the same lithic resources than in the Late Mesolithic: how did they find those precise outcrops?
- Domestication: the territory has to be transformed from a Mesolithic cultural landscape to a Neolithic cultural landscape: deforesting, sanitizing lands, arranging the village, preparing infrastructures (silos, pens)...
- Economic rearrangement: economy should be adjusted to the resources and conditions of the environment, which may have affected health patterns (Ash *et al.* 2016).
- Isolation: entering a territory implies risks for the demographic survival of the group (Hofmann 2015), making indispensable exogamic politics with other groups, whether Mesolithic or Neolithic. In order to establish that, exchange networks, new or preexistent, should be needed.

The leap-frog mechanism would be a hazardous challenge that should be successful and capable of generating future leaps. Is this possible in groups that abandoned their original dwelling area and that owed to renew the process? We have advanced some generic remarks: according to recent proposals by García-Martínez de Lagrán (2018) and García-Martínez de Lagrán *et al.* (2018), we will evaluate now the possibilities for some peninsular examples, that constitute the first known case of productive societies in their regions: they are the villages of Los Cascajos (García-Gazólaz *et al.*

Leap-frog model theory: arrival and settlement		
Adaptation factors	Objectives	Consequences
General recognition	Territory / Resources / climate cycles	Relearning Critical phases Countryside landscape
Domestication of the territory	Arable and pasture lands / habitat Infrastructures	
Economic readjustment	Balancing productive resources	Social reconditioning?
Demographic isolation	Avoid problems of future survival	Contacts with the village of origin? Contacts with the indigenous?

Table 5. Leap-frog model: analytical synthesis of arrival and settlement.

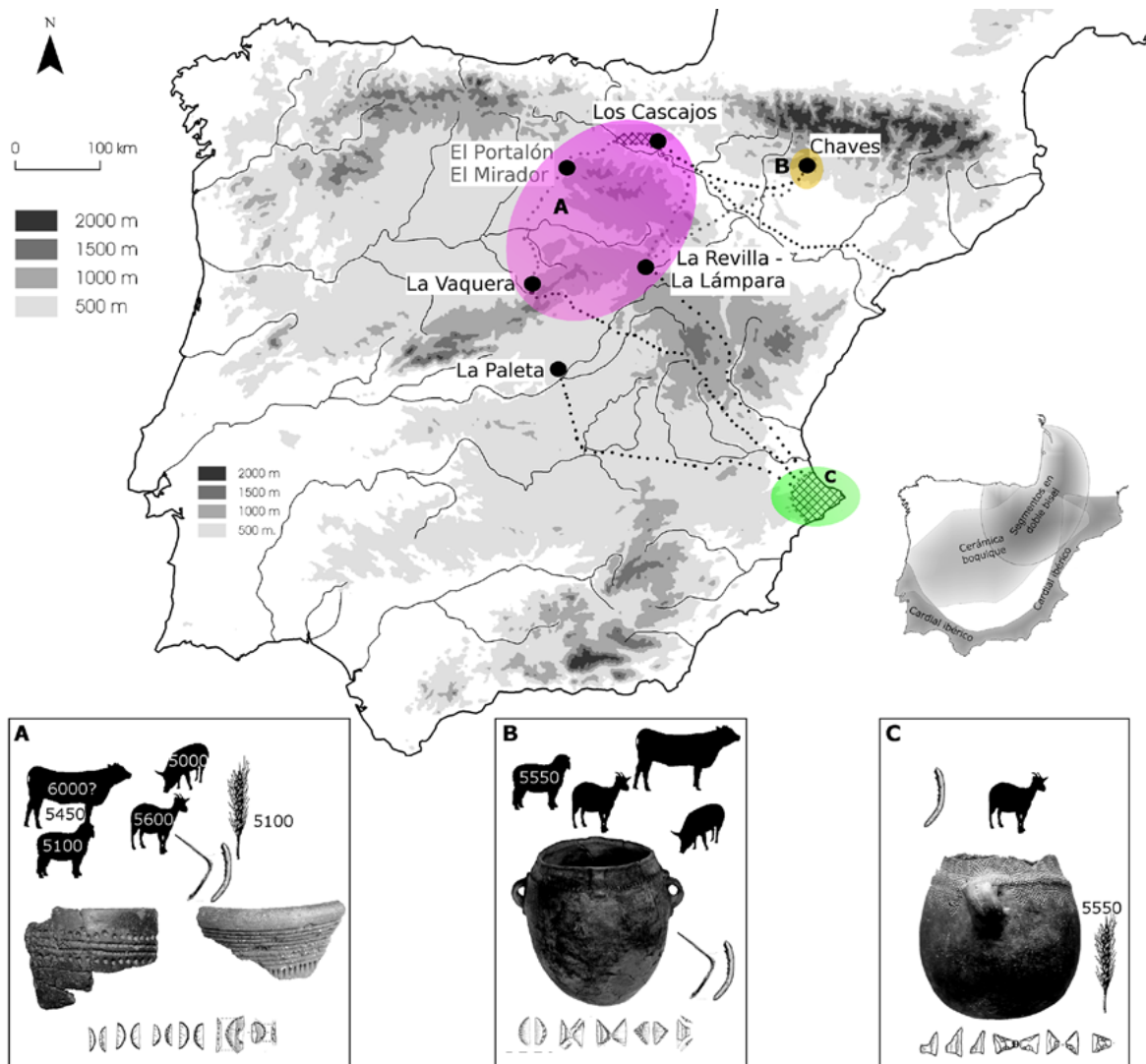


Figure 5. Evaluation of the inner Iberia leap-frog model: villages (Cascajos, Revilla, Lámpara, Paleta) and caves (Vaquera, Chaves) have been selected because the first known Neolithic installation in their regions. Note the possible travel routes and the excessive distances (>100 km maximum supported by the model) separating the sites from the coast. Three large Neolithic units are pointed on the map according to their material records: A) Alto-Ebro Region and Meseta; B) Chaves in the middle Ebro Basin; C) Mediterranean region (Alicante).

2011), La Revilla-La Lámpara (Rojo-Guerra *et al.* 2008) and La Paleta (Jiménez 2010), as well as the caves of La Vaquera (Estremera 2003) and Chaves, a village-like site inside a huge natural cavity (Utrilla and Laborda 2018: 265). We assume that the Neolithic arrives to the Eastern coasts of Iberia

and that afterwards it spreads to the interior territories. In Table 5 and Figure 6 those cases are synthetized, stating the distance between the sites and the coast and the possible journeys, their chronology and the basic features of the material assemblages. Given the distance from La Vaquera to the Mediterranean coast, and its industrial concordance with the High Ebro (*boquique* pottery, double-bevelled segments...) we also indicate the sites from the Atapuerca area with which it could conform an ensemble.

Three remarks arise after the exposed data:

1. Distance, seen as a risk factor, would be long, more than indicated in the original proposal of the model. Initially, it was conceived for movements along fluvial or marine natural ways, to which later was added the displacements on geologic units (loess). In the cases selected for Iberia mountain ranges and fluvial networks have to be traversed, across edaphological regions very disparate. We cannot neglect, as a reflection limit, the partial knowledge we have of the prehistoric reality, namely concerning open-air settlements. We should conceive the gaps as an unknown that should be cleared instead of employing them as an argument proof of an *ad-hoc* theoretical model. Moreover, the information from Los Cascajos suggests that it was not a genetic island (as expected in the original model, Zvelebil 2001); on the contrary, it is in agreement with the expected regional representation.
2. In Iberia the material culture shows patterns of regional unity, interregional differences and transferences that blur the frontiers (Alday 2018). The combination of armatures, sickles and

SITE	ALTITUDE (m asl)	ANNUAL RAINFALL (mm)	CLIMATE (Köppen)	km FROM MEDITERRANEAN SEA	CHRONOLOGY cal BC
LOS CASCAJOS	420	500-600	Cfb	360 170 (Chaves)	
LA REVILLA LA LÁMPARA	1100	400-500	Csb	300	
LA PALETA	540	300-400	BSK	350	
LA VAQUERA	950	500-600	Csb	450	
CHAVES	640	500-600	Cfb	200	
EL PORTALÓN					
EL MIRADOR					
LOS CASCAJOS REGION					
MEDITERRANEAN REGION					

Table 6. The leap-frogmodel in the inner Iberia (see Figure 5). Current physical data (altitude, rainfall average, climate) show no relationship between them and the selected location. Distance to the Mediterranean Sea is exposed to apply the mechanism of the leap-frog model from the supposed coastal origin. Dates cal BC (CalPal) point the chronological similarity of the sites. Lower part of the table includes other chronological values: those from the Mediterranean region, from the Cascajos zone, and from the Portalón and Mirador caves, whose location would explain the material connection between Cascajos and Vaquera.

ceramic styles shows several traditions: in the inner Iberia double-beveled segments, two models of sickles and *boquique*-type impressed pottery; in the Mediterranean area, abrupt-retouched triangles and trapezes (Chaves shows also double-beveled pieces) and impressed pottery with a majority of cardial models; in Portugal, abrupt segments and *boquique* and cardial pottery. Transferences eased the dissemination of elements in every direction.

3. Dates from the focus areas (discarding those from charcoals) are statistically identical, which contradicts the *tempo* foreseen in the leap-frog: distances and number of generations from the foundation of the village, as well as the necessity of creating a new one, are greater than the speediness required in the process. The situation becomes more complex if we accept the dates from Peña Larga and Mendandia (Alday 2011). In figure 5 we include the moment when domestic products appear (bearing in mind that information is incomplete, especially for agriculture).

There is not at this moment any archaeological evidence justifying the necessity of those long-distance displacements: they imply risky travels along important distances, learning of the new ecological scenarios, need for lithic resources (for harvesting and grinding)... If we consider the fast spread of the agriculture, the leap-frog system does not seem the most probable expansion model. The genetic information from Los Cascajos, as well as the similitudes of its archaeological record with neighboring sites that should conform the network needed by the Neolithic way of life, seem to suggest that it was founded by local populations that integrated foreign individuals.

Final remarks

This text considers how diffuse are the limits of the criteria defining the Neolithic. There are two superimposed situations acting on this: a) the complexity of Neolithic; b) the capabilities of the archaeological record. Thus, it is only logical that archaeologists engage in debates when transiting from the *archaeographic* Neolithic to the *cultural* Neolithic. Nevertheless, and despite the sinuosity of the Neolithic markers, we are convinced that some concepts concerning the neolithization of Iberia should be dismissed. For example, the idea of *Mesolithics with pottery*, a concept appeared decades ago to characterize very poor archaeological records (Beguiristain 1987), has no longer any sense, although it can still be found from time to time (Rojo-Guerra *et al.* 2015): there is not any exclusively Mesolithic elements in the Neolithic sites from Table 1. They are all purely Neolithic, even if they lack of some of the elements included in the Neolithic *package*. Why the presence of a domestic animal, or some cereal grains, make an ensemble more Neolithic than the presence of potteries or lithic instruments for harvesting or processing vegetal products? As aforementioned, what confirms the production is the domestic ensemble management, not the mere discovering of a domesticated element: if we cannot confirm the Neolithic management we will not be able to identify an economic Neolithic. As the situation has been established, we could take the risk of multiplying the casuistic by means of terminology: Neolithics, slightly less Neolithics, Mesolithics with pottery, Mesolithics with sheep...

This is precisely what we try to avoid in this essay of *deconstructing* the Neolithic. Concerning the fauna, its complexity is manifested in the impossibility of establishing a biological barrier in the animal status. The options are very meager when we observe the quantity and quality of the available information.

The information being so ambivalent, we do not want to influence the interpretation of any of the archaeological contexts with our suggestions, because: a) this is contrary to our vision of the analyzed historical process (asymmetric, complex, diffuse, without a plan...); b) the authors of this text have valued and discussed the diverse possibilities but have not arrived to a unique position. But we agree that the participation of the Mesolithic groups has to be adequately pondered:

at macro and micro spatial scales, they share the same geography than the first Neolithic. The recognition of this participation does not imply that we establish a particular neolithization model, as erroneously has been pointed out, but only tries to adjust archaeological data to the historic process. The biggest problem is to equilibrate that participation: it should have been less intense where the colonization was direct, and more intense when diffusion was the mechanism of propagation. In this last situation the open appreciation of the archaeological record, by contrast with the closed showcases, plays an essential role. Recently, genetics is assuming this role (Lipson *et al.* 2017), and the material record analysis does not contradict it.

It is worth remembering that during the Mesolithic there were similar processes of fast diffusion and adoption of technological novelties elsewhere (Marchand and Perrin 2017). The generalization of the trapeze industries in the Second Mesolithic is as problematic as the neolithization process, regarding mechanisms and speediness (barely 200 years) of diffusion. Data concerning population movements and/or replacements are very limited, mainly because the scarcity of Mesolithic graves prevents the accumulation of genetic information. In any case, the macro and micro spatial overlapping of both Mesolithic technological units (as was the case in the first Neolithic) and the deep contact/exchange networks are two major features of this period.

The neolithization process was a learning effort, independently of the explanation model we are more at ease with. In Iberia the first Neolithic evidences date to ca. 5600 cal BC -without discarding previous pioneering arrivals-, and becomes well consolidated by ca. 5300: a period of three centuries seems enough for a mutual learning by the populations that forged the Neolithic (Table 7). This is interesting when we reaffirm the formative complexity of the new culture, at the same time that we explain the complexity of the archaeological record. Social and economic processes involved the varied human communities that, with different rhythms, reached the Neolithic way of life, are contrary to the elaboration of a sole consistent model of neolithization. There is no a unique rule to delimit precisely the transition from the Mesolithic to the Neolithic: this is why we are obliged to refine our perspectives of the process to avoid being normative. If we deprive the archaeological record of our apriorities, that is, if we *deconstruct* it, the resultant image should be precisely that.

	Learning and needs		Mechanisme	Problematic issues
Itinerant settler	Territory suitability	Ecological and climatic possibilities	Displacements and / or contacts	Adaptability of resources Critical phases in the early stages Restriction and/or competition with natives Adaptation of the livestock Remodeling Landscape
	Raw materials	Flint, sandstone, clay ...	Contacts and experiences	
	Livestock corrals	Shelters Pastures	Displacements and / or contacts	
Natives	Agriculture	Species, techniques and cycles	Contacts, integration or diffusion	Relocation of habitat or workspaces Remodeling Landscape Initial low productivity
	Animal husbandry	Agryotypes	Contacts and experiences	
	Pottery	Manufacturing (<i>Chaîne Opératoire</i>)	Contact or imitation	

Table 7. The neolithization learning process for natives and settlers (regardless of the degree of participation, unequal in each case). The settlers know the techniques, but not the new environment. The natives know their milieu, but they ignore the new practices. In the Iberian Peninsula between the first manifestations of Neolithic and the development of a productive economy there is a lapse of about 3 or 4 centuries, enough time for mutual learning.

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Faunal exploitation in an Early Neolithic site: the assemblage from Casa Gazza (Travo, Piacenza, Northern Italy)

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Abstract

The faunal assemblage of Casa Gazza, providing new data to lighten the economic model of the Early Neolithic communities in northern Italy, represents a significative evidence in the Po Plain. The settlement, a half-buried pit, is located on a large terrace on the left bank of the Trebbia River (150 m a.s.l.), in the area of Travo (Piacenza, northern Italy). The results of zooarchaeological, taphonomic and paleoecological analyses are here discussed.

The faunal assemblage consists of 7,354 remains of which 1,417 were identified (NISp). Faunal composition shows a prevalence of domestic animals on the wild ones. Butchery marks are well documented and several modifications are related to hard animal material manufacturing.

Comparisons with Neolithic sites of the Po Plain, show that the economy at Casa Gazza was characterized by a fully-developed sedentary breeding.

Keywords: Early Neolithic, Po Plain, north-east Italy, zooarchaeology, taphonomy

Résumé

La contribution fournie par Casa Gazza à la connaissance et à la reconstruction du modèle économique des premières communautés du Néolithique du nord de l'Italie représente un important témoignage dans la plaine du Pô. Le site, qui se caractérise par une fosse à demi enterrée, est situé sur une grande terrasse sur la rive gauche de la rivière Trebbia (150 m a.s.l.), dans la région de Travo (Piacenza, Italie du Nord). Les résultats des analyses archéozoologiques, taphonomiques et paléoécologiques sont présentés ici.

L'assemblage faunique est composé de 7.354 restes, dont 1.417 ont été identifiés au niveau spécifique. La composition de la faune montre une prévalence d'animaux domestiques par rapport aux animaux sauvages. Les stries de découpe de boucherie sont bien documentées et plusieurs modifications sont liées à la fabrication d'artefacts en matière dure animale.

Les comparaisons avec les sites néolithiques de la plaine du Pô montrent comment l'économie de Casa Gazza était caractérisée par un élevage sédentaire pleinement développé.

Mots-clés : Néolithique ancien, plaine du Pô, Italie du Nord-Est, archéozoologie, taphonomie

1. Introduction

The first neolithic communities appeared in the central Po Plain at the end of the 7th millennium BP. Two cultural *facies* are attested in northern Italy: the Vhò Group that spread in southern Piedmont, south-eastern Lombardy and western Emilia and the Fiorano Culture, attested in Veneto and Emilia-Romagna (Biagi, Starnini, Voytek 1993).

Zooarchaeological analyses carried out on Early Neolithic sites of the Po Plain highlighted faunal assemblages characterized by small quantity of remains and a high fragmentation index. Among these sites, Vhò-Campo Ceresole (Barker 1976, 1977 and 1983) and Ostiano-Dugali Alti (Barker 1983; Biagi 1995) in the Cremona Area, allowed, between the '70s and '80s of the last century, to define a preliminary model of the subsistence strategies adopted in the Po Plain during the Early Neolithic. This model shows an economy still tied to hunting against breeding that seems to constitute a secondary practice. In fact, the faunal assemblages of the two sites highlight a predominance of wild species over domestic ones. Fishing is also attested and integrated the diet of the community.

Further evidence on the final phase of the Early Neolithic comes from Casalmoro site (Mantua; Clark 1984) and from the pit of Isorella (Brescia; Bon, Zampieri, Starnini 2003). These sites represent a transitional phase from a mixed economy (hunting and breeding) to a full neolithization phase. Whereas the Casalecchio di Reno site, close to Bologna and belonging to the final phase of the Fiorano culture, shows a faunal assemblage characterized by the prevalence of the main domestic taxa and with scarce remains of wild species (Thun Hohenstein *et al.* 2012). The Ponte Ghiara site (Mantovani 2012), a few miles away from Casa Gazza, and the Rivarolo Mantovano (Catalani 1984) pits have yielded data on subsistence activities during the Middle Neolithic. Finally, the two sites of Belforte di Gazzuolo (Catalani 1985) and Tosina di Monzambano (Bona 2015), both in Mantua area and the Botteghino site (Parma) (Berto, Bon, Zampieri 2012) provided the economic framework during the Late Neolithic in the Po Plain.

This paper aims at illustrating the archaeozoological data recovered at Casa Gazza, in order to reconstruct the natural environment of the Po Plain during the Early Neolithic, the economic choices and finally, to add new interesting informations about animal hard materials manufacturing of the Vhò cultural *facies*.

2. The site

The Casa Gazza site is located in the middle of the Trebbia Valley (northern Apennines) on a large terrace on the left bank of the River Trebbia (150 m a.s.l.), near the town of Travo (Piacenza; Figure 1A). During the excavations in 1984-85, carried out by the Archaeological Superintendence of Emilia-Romagna, a bilobed half-buried pit of about one meter deep, 10 m long and 6 m wide was excavated (Figure 1B). Its functional interpretation is unclear and the radiocarbon dates made on charcoal have returned two dates: 6130±160 BP; 5830±210 BP (labo). The filling was uniform and consisted of a clay soil, very dark and extremely rich in lithic, ceramic and faunal material (Bernabò Brea 2004; Bernabò Brea, Dal Santo, Mazzieri 2017). Once its primary use was finished, the sunken structure was reused as a waste disposal area that preserved a great deal of materials (Bernabò Brea 1991).

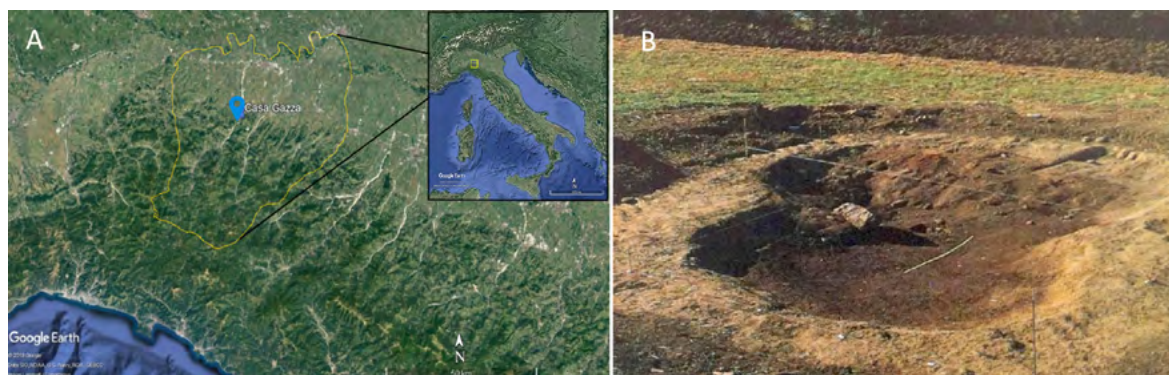


Figure 1. (A) Localization of the Trebbia Valley and the Casa Gazza site (modified from Google Earth); (B) bilobed pit (from Bernabò Brea 1991).

Pottery from Casa Gazza belongs to the *Vhò facies* and there are also ceramic remains probably imported from the area of the Fiorano Modenese *facies* or imitating Ligurian materials.

The lithic industry is mainly made of pre-alpine flint (Monte Baldo and Monti Lessini), of higher quality than the Apennines ones (Bernabò Brea 1991; Bernabò Brea *et al.* 2017).

3. Material and methods

The specimens were identified and quantified (NISp, MNI), using the reference collections of the Laboratories of Zooarchaeology and Taphonomy and of Large Mammals and Birds at the Department of Humanistic Studies of the University of Ferrara. The osteological manuals edited by Pales & Lambert (1971), Schmid (1972), Barone (1976) and Wilkens (2003) were also consulted. The distinction between goat and sheep was made according to the criteria elaborated by Zeder & Pilar (2010) for teeth and by Boessneck (1969) and Zeder & Lapham (2010) regarding the post-cranial skeleton. The discrimination between wild boar and pig was made according to the dimensions of the anatomical elements and the osteological reference collections. The minimum number of individuals (MNI) was estimated taking into account the largest anatomical element for each *taxon* combining age classes and laterality, and the data obtained by the teeth analyses. The estimation of age at death was based on the epiphyseal fusion of long bones according to the methodologies proposed by Barone (1976) and on the observation of tooth eruption and wear stage following Grant (1982) and Silver (1969). The taphonomic analysis was performed using a Leica S6D stereomicroscope (0.63x-4.0x magnification) equipped with an EC3 digital camera.

4. Composition of the faunal assemblage

The faunal assemblage is composed of 7,354 bone remains, of which 1,417 (19.27%) were identified (Table 1). The composition of specimens shows a clear prevalence of domestic animals on the wild ones. Besides mammals, among the wild species there are also some remains of eel, pond tortoise and unidentified birds.

Tab. 1 – NISp and MNI and relative percentages of the Casa Gazza faunal assemblage.

The community of Casa Gazza was devoted to agriculture and livestock breeding. The economy was mainly based on goat breeding. The high number of remains is confirmed by 21 estimated individuals. The variability in the composition of this herd suggests a mixed breeding, aimed at the exploitation of meat, testified by the presence of juvenile and sub-adult individuals, and probably the production of secondary products (Figure 2). Teeth are the most represented anatomical element. The appendicular skeleton is particularly attested, with a high number of long bones. These ones include tibia (NISp 41), radius (NISp 40) and metapodials; among which 32 remains belong to metacarpal, 24 to metatarsal and 10 to a metapodials. Pigs are the second most represented *taxon*. All age classes are represented with a prevalence of juvenile individuals (Figure 2), testifying an exploitation of the pigs aimed at consuming the meat and fat. The most frequent anatomical elements are teeth (NISp 94), phalanges (NISp 35), scapula (NISp 19), ulna (NISp 14) and humerus (NISp 11). Cattle is present with 6 individuals, mainly young, highlighting the exploitation of its meat (Figure 2). The presence of at least one individual over 42 months old, could indicate its use as labour force, production of secondary products and reproductive purposes. Teeth are the most represented anatomical element (NISp 34), followed by phalanges (NISp 13). 26 remains are metapodials, among which 14 were determined as metacarpals and 10 as metatarsals. Fore limb and hind limb bones are quite equally present, also confirmed by 10 remains of coxal and 10 of scapula. Finally, the domestic fauna of Casa Gazza is completed by the presence of dog, with at least 4 individuals identified, two of which are very young. The lack of anthropic marks on dogs' bones suggest that it was bred for his social role.

FAUNAL EXPLOITATION IN AN EARLY NEOLITHIC SITE

Table 1. Composition of the Casa Gazza faunal assemblage (NISp and MNI and relative percentages).

TAXON	NISp	%NISp	MNI	%MNI
<i>Lepus europaeus</i>	6	0.42	1	1.23
<i>Erinaceus europaeus</i>	2	0.14	1	1.23
<i>Martes foina</i>	5	0.35	2	2.47
<i>Lutra lutra</i>	1	0.07	1	1.23
Mustelidae	1	0.07	–	–
<i>Canis lupus</i>	1	0.07	1	1.23
<i>Vulpes vulpes</i>	3	0.21	2	2.47
<i>Sus scrofa</i>	48	3.39	7	8.65
<i>Cervus elaphus</i>	250	17.65	7	8.65
<i>Capreolus capreolus</i>	32	2.26	2	2.47
cfr. <i>Rupicapra</i> sp.	1	0.07	1	1.23
Total wild mammals	350	24.70	25	30.86
<i>Canis familiaris</i>	10	0.71	4	4.94
<i>Sus</i> sp.	242	17.08	9	11.12
<i>Sus domesticus</i>	57	4.02	4	4.94
<i>Bos</i> sp.	7	0.49	–	–Bos
–Bos	175	12.35	6	7.41
^{taurus} <i>Capra hircus</i>	15	1.06	4	4.94
<i>Ovis aries</i>	36	2.54	5	6.17
<i>Ovis vel Capra</i>	503	35.50	21	25.93
Total domestic mammals	1045	73.75	53	65.45
Total mammals	1395	98.45	78	96.31
<i>Anguilla anguilla</i>	1	0.07	1	1.23
Aves indet.	19	1.34	1	1.23
<i>Emys orbicularis</i>	2	0.14	1	1.23
Total others taxa	22	1.55	3	3.69
Total NISp	1417	100	81	100

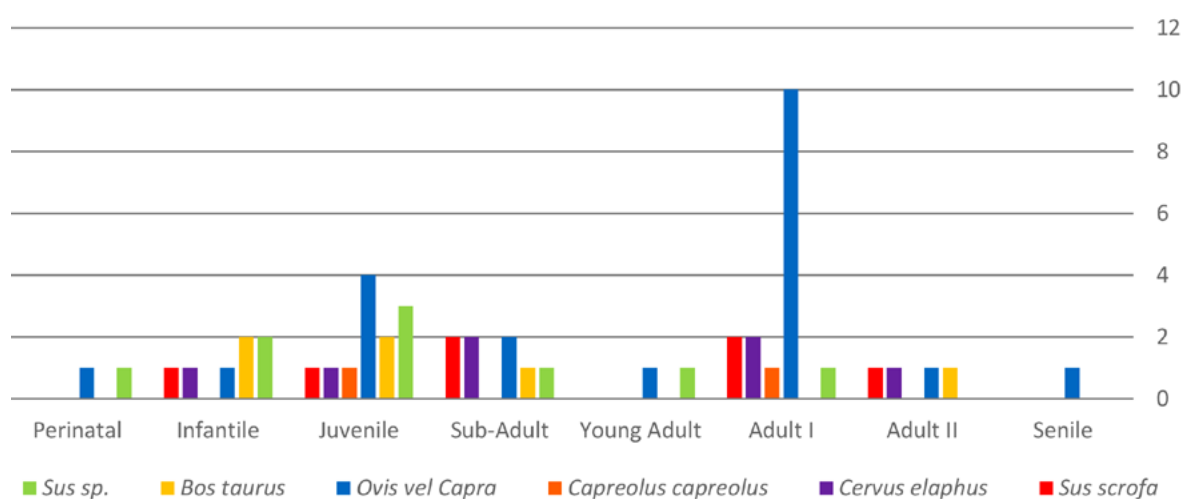


Figure 2. Casa Gazza: Age classes of the main taxa.

Hunting, mainly directed to large and medium size ungulates, was a marginal activity. Red deer is the most abundant *taxon* among wild mammals. It is represented by at least 7 individuals, with a predominance of adults and sub-adults (Figure 2); hunting therefore was focused to mature game which would have ensured a greater quantity of meat, and to young-adult males, that are an easy target when they abandon their original herd. The appendicular skeleton is well represented, with an abundant quantity of phalanges and long bones; some remains show butchery marks (Figure 3A), technological traces that indicate that hard animal tissues were used to manufacturing objects and tools (Figure 3B). The small quantity of remains of roe deer (Figure 2) compared to the red deer ones shows that this species was sporadically hunted. Despite the lower frequency of remains, wild boar is present with the same number of individuals (NMI 7; Figure 2). They are mainly adults and sub-adults, demonstrating that this species was occasionally hunted.

The remaining wild species, such as hare, hedgehog, beech marten, otter and fox, are represented by few remains. Their introduction into the site was probably for natural causes, due to the lack of anthropic marks that could testify their exploitation. Butchery marks are instead present on some wolf remain, a distal epiphysis of left ulna, and probably connected to the recovery of the fur. However, the consumption of its meat is not to be excluded.

Eel is evidenced by the discovery of a vertebra which, along with the finding of a probable hook made on a wild boar canine, shows how fishing could occasionally integrate the daily feeding into the Casa Gazza settlement that is located near the river Trebbia. The presence of pond tortoise is evidenced by two fragments of plastron, belonging to the same individual, which preserve butchery marks and manufacturing traces.

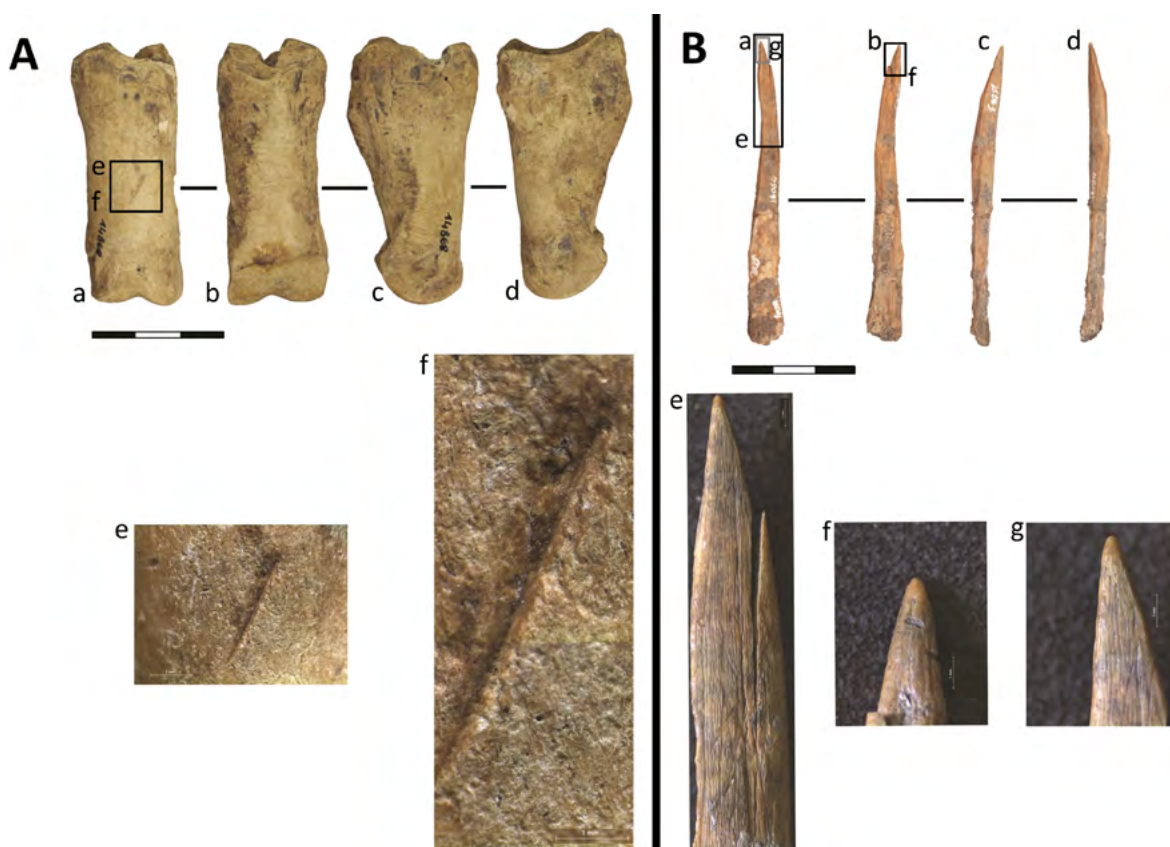


Figure 3. Casa Gazza: (A) First phalanx of *Cervus elaphus*. There is a disarticulation mark on the dorsal surface (e: 2 mm bar scale; f: 1 mm bar scale); (B) Awl on long bone of a medium-sized mammal. Scraping marks and use wear traces on the tip are visible (e, f, g: 1 mm bar scale).

The high fragmentation of bird remains, whose presence seems in any case to be connected to contributions of natural origin, did not make it possible to carry out an identification at the level of species or genus.

Through the analysis of wild species, it has been possible to obtain valuable paleo-environmental information. The presence of wooden areas near the settlement is evidenced by red deer, roe deer and wild boar remains. Tortoise, otter and eel indicate the presence of watercourses, wetlands and marshes, particularly suitable for pigs. Fox, marten, hedgehog and hare can be associated with both the forest context and open fields. The site of Casa Gazza was therefore placed in an environment that had to see the presence of cultivated fields and pastures alternate with forests and swamps, the latter derived from the proximity of the River Trebbia.

5. Discussion and conclusions

Zooarchaeological data obtained by this study show the adoption of sedentary breeding, aimed above all at exploiting goats and secondly pigs and cattle. The caprine sex-ratio suggests a mixed breeding, focused on exploiting meat and secondary products. Pigs and cattle were mainly bred for meat consumption. In addition, hunting was occasionally practiced as highlighted the presence of some wild species, such as deer, roe deer and wild boar. Fishing was probably practiced.

Comparing the faunal assemblages with other sites, it is clear that Casa Gazza site gives an important and unique contribution to the study of the economy of the *Vhò facies* sites (Figure 4).

The sites of Vhò-Campo Ceresole and Ostiano-Dugali Alti present an economy still linked to the exploitation of wild fauna and breeding seems to be a secondary practice (Barker 1976, 1977 and 1983, Biagi 1995). On the other hand, the Isorella and Casalmoro sites have an economy based on the exploitation of domestic taxa (Bon, Zampieri, Starnini 2003, Clark 1984). All the analyzed sites are located near rivers, on marshy lands and with abundant forests of mixed oak woods nearby. Therefore, the different economic base of the sites does not depend on different environmental conditions, but rather on chronological aspects. Indeed, the last three sites are located at the end of Early Neolithic, when breeding allowed to meet the food needs of a community (Figure 4).

For which is concerning animal size, the *taxa* at Casa Gazza are consistent with those of the analyzed *Vhò facies* sites. Unfortunately, withers-height of any animal was not possible to be estimated, due to the lack of complete bones. However, several measurements have been recorded, which allowed some comparisons with the same sites seen above. The only differences concern the size of pigs with respect to Vhò-Campo Ceresole ones, compared through the GLI measurement of the astragalus. *Sus sp.* astragalus at Casa Gazza are in fact smaller, with a GLI measure of 45 and 41.4 mm. Suids present in Vhò (GLI 53.2 mm) are, however, larger in size compared to other sites

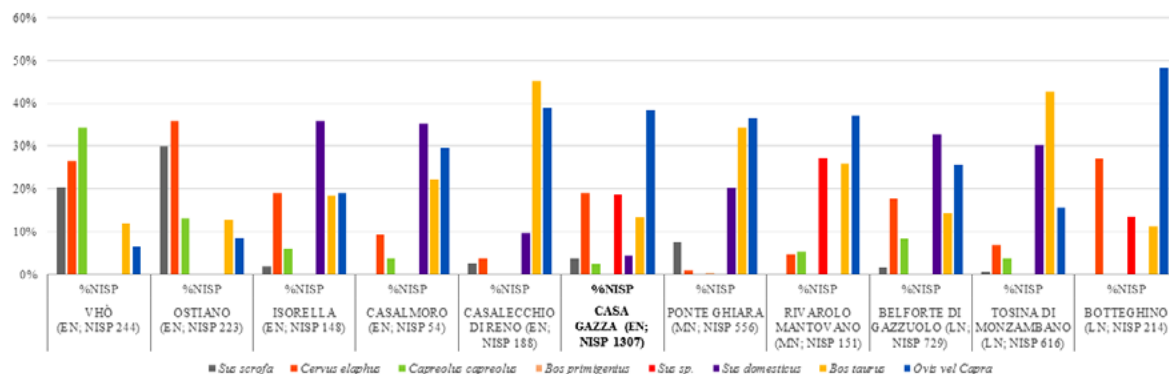


Figure 4. Casa Gazza: Comparison among the main taxa identified in the faunal assemblages recovered in the Po Plain sites during the Neolithic.

of the Ancient Neolithic, probably in relation to the luxuriant forest environment close to the site. Moreover, using the GLI measurement of astragalus we can also find a slightly larger size of cattle present at Casa Gazza (GLI 70 mm) than the one present at Casalmoro (GLI 64.4 mm).

The same economy of Casa Gazza can be seen in the two sites of Ponte Ghiara (Mantovani 2012) and Rivarolo Mantovano (Catalani 1984); both sites belong to the Square Mouthed Vases culture. The economy is based on the exploitation of domestic *taxa* and wild species played a scarce role (Figure 4).

The Late Neolithic sites of Belforte di Gazuolo (Catalani 1985) and Tosina di Monzambano (Bona 2015) and Botteghino (Berto, Bon, Zampieri 2012) document a breeding-centered society, in which, however, hunting, mainly directed to red deer, is still practiced (Figure 3A).

It is even more interesting to enlarge the spectrum to other Neolithic sites located in northern Italy. The sites of Friuli (Piancada, Nogaredo, Bannia, Palù di Livenza), where neolithization spreads earlier than in the Po Plain, present a faunal assemblage composed almost exclusively by the main domestic species (Petrucci *et al.* 2005).

Moving to Veneto, during the Late Neolithic, the Monselice and Maserà sites (Padua; Tecchiati 2015), and the Rocca di Rivoli site (Piper 2008) and Gazzo Veronese (Verona; Petrucci, De March, Thun Hohestein 2015) show fully agricultural and sedentary communities, where domestic species dominate the wild ones.

Therefore, comparisons with other Neolithic sites in northern Italy show how the economy of Casa Gazza was characterized by a fully developed sedentary breeding.

In conclusion, the faunal assemblage of Casa Gazza provides a fundamental contribution to the knowledge and reconstruction of the economic model in the Early Neolithic within northern Italy, and particularly in the Po Plain. The data obtained from this study are also important for the reconstruction of the natural environment of the Po Plain during the Early Neolithic. And finally, the Casa Gazza site has provided additional information regarding the animal hard materials manufacturing belonging to the Vhò cultural facies.

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The role of animals in the Salzmünde Society and beyond (Elbe-Saale region, Germany)

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Abstract

The Elbe-Saale region represents a privileged study area to understand the complexity between human-animal relations. Due to its diversity and its extensive documentation, archaeological research is carried out here for quite some time. Since the Early Neolithic, European settlers inhabited this territory, which became thereafter a crossroad for the encounter of various people. The present paper focuses on the regional evolution of the subsistence economy between 5500-2200 BC while considering its links of symbolic order. For this purpose, the monumental and multifunctional enclosure Salzmünde-Schiepzig (Saxony-Anhalt) is particularly suitable. This eponymous site was attended during the 4th millennium BC, as a central place for economic exchanges and symbolic activities. Archaeozoological data show that the boundaries between the economic and symbolic sphere are not always clear to draw, more specifically both are even in interaction.

Keywords: Neolithic, Salzmünde culture, society, archaeozoology, breeding, symbolism

Résumé

La Mittelelbe-Saale est une région privilégiée pour l'appréhension de la complexité des relations que les hommes néolithiques ont entretenues avec le monde animal. De par sa diversité et sa richesse en données, des recherches archéologiques y sont exercées depuis longtemps. Dès le Néolithique ancien, les hommes s'y sont sédentarisés, puis cette région est devenue un carrefour pour la rencontre de nombreux peuples. Le présent article se concentre sur l'évolution de l'économie de subsistance dans l'aire d'étude pour la période 5500-2200 BC, tout en considérant ses liens avec le domaine symbolique. L'enceinte monumentale et multifonctionnelle de Salzmünde-Schiepzig (Saxe-Anhalt) se prête particulièrement bien à ce sujet. Fréquenté au IV^e millénaire av. notre ère, ce site éponyme a été un lieu central pour des échanges économiques, ainsi que des manifestations symboliques. Les données archéozoologiques révèlent que la limite entre la sphère économique et symbolique n'est pas toujours évidente et que les deux sont même intimement liées.

Mots-clés : Néolithique, groupe culturel Salzmünde, société, archéozoologie, élevage, symbolisme

1. Introduction

During the Neolithic, between 5500 and 2200 BC, the Elbe-Saale region in central Germany was densely inhabited. Throughout this period, exogenous influences brought new knowledge and innovative productions to this crossroad area. From the Linear Pottery to the Beaker Culture, people settled in this fertile region with its loess and chernozem soils. Therefore it was, and still is, an environment conducive to agro-pastoral practices. The subcontinental climate, with hot summers, harsh winters and low annual precipitation, required husbandry adapted to these conditions. From the Late Neolithic on, various cultural groups lived here, some occupied the same

territory, others avoided each other. Some of them were groups of the large Funnel Beaker Culture -TRB – (Midgley 1992).

1.1 Geographic and environmental context

The Elbe-Saale region is an archaeological well documented area and it represents a special framework to understand social change and man-animal relationships. For example, concerning the period 4100 to 2800 BC, 1145 archaeological sites were documented (Müller 2001). About 40 ditched systems of the early TRB phase are known for this zone, and their number is increasing constantly (Friederich 2009).

With a size of 40,000 km², this region covers mostly the *Länder* Saxony-Anhalt, Saxony and Thuringia (Behrens 1973; Figure 1). The landscape is marked by the glacial period and several watercourses pass around it. These watercourses could have been used as transport and communication paths. On its northern and eastern margins, this territory is open (heathland *Colbitz-Letzlinger* and *Lausitzer Landrücken*), but it is protected by highlands to its southern and western limits (Erz Mountains, Thuringian Forest, *Harz*). Proximity between agriculture and animal husbandry has one great asset, the improvement of the products obtained by these activities, and the Neolithic people should not be ignorant to this fact. So, cattle strength could have been for example used for the clearing of forests (Bogucki 1988: 176). By the way, around 5000 BP, human activities generate the elm decline and the increase in beech (Bogucki 1988: 32-34). Taxa related to human activities (as wheat and barley) increased, too.

1.2 Chronocultural context

During the Early Neolithic (ca. 5500-5000 BC), this region was inhabited by the so called Linear Pottery Culture (Lüning 1996; Müller *et al.* 2012). People from the Stroked Pottery Culture, Rössen and Gatersleben appeared during the Middle Neolithic (ca. 5000-4400 BC). During the Younger Neolithic (ca. 4400-3500 BC) appeared the Jordansmühl Culture and at the end of this period a local group of the Michelsberg Culture emerged, the Hutberg, which was partly contemporaneous with the Baalberge. The different exogenous currents influenced the local cultural background. This is the case for the Michelsberg Culture, native to Northern France (Dubouloz 1988), leading together with eastern influences to the emergence of the Baalberge (Klassen 2004: 273-300). During the Late Neolithic (ca. 3500-2800 BC), various cultural groups cohabited in this region (Salzmünde, Walternienburg, Bernburg, Tiefstich and Globular Amphora Culture). Some of them were regional groups of the large Funnel Beaker Culture, as for example the Tiefstich, which is part of the western group (Midgley, 1992). The Final Neolithic (ca. 2800-2200 BC) is characterised by the Schönfeld, the Corded Ware and the Bell Beaker Cultures (Höltkemeier 2018b: Figure 2).

Enclosures were a common phenomenon since the regional Early Neolithic, but they were particularly abundant during the 4th millennium BC. A spatial proximity can exist between these sites and megaliths. Together, they can structure a territory, which was by the way noticed on a European scale (e.g. Renfrew 1976; Dubouloz *et al.* 1991; Andersen 2004). The function of enclosures varied according to location, size, shape and an interpretation on case-by-case basis is required.

1.3 Site of Salzmünde-Schiepzig

Implanted on the edge of a plateau, this site is localised at about 10 km north-east from Halle (Saalekreis, Saxony-Anhalt). The 30 m high plateau is flanked by the river Saale on the North, by its tributary, the Salza, on the West and two nowadays dried up valleys bordered it in the North and the South (Jarecki & Moser 2014b). Moreover, on a regional scale, this site was located roughly in the center of the Salzmünde area. From this place could be observed another contemporaneous

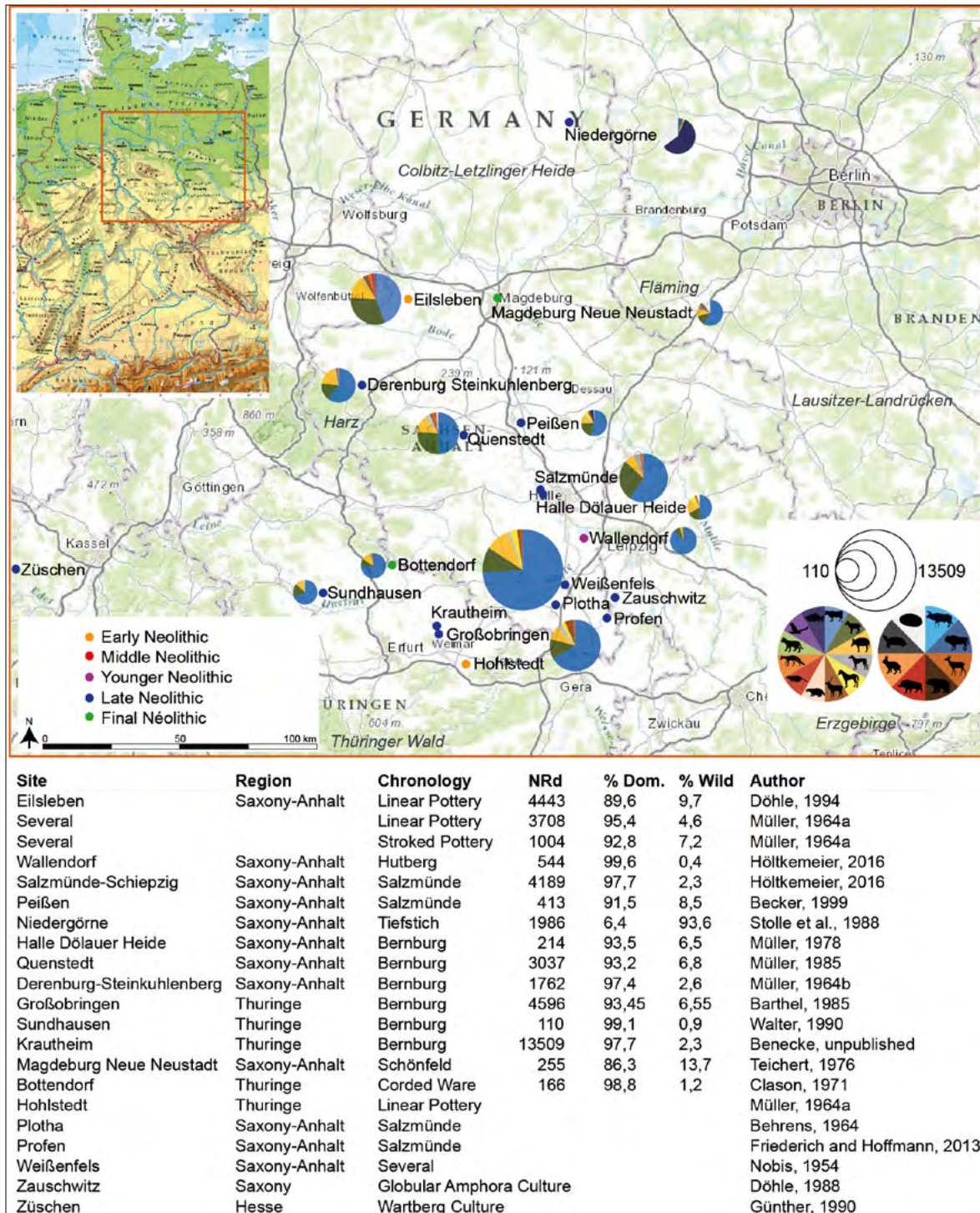


Figure 1. Mentioned sites localised in the Elbe-Saale region and proportions of their animal species (except animal burials). CAD © S. Höltkemeier, base map © geoviewer.bgr.de

enclosure, Halle Dölauer Heide, implanted at 5 km to the East, and it is in close proximity with the tumulus *Bierhügel* (Jarecki & Sommerfeld 2007).

The first archaeological discoveries on the eponymous site of the Salzmünde society were made in the 19th century and during the 20th century; several excavations were carried out by N. Niklasson, P. Grimm, W.A. Von Brunn, F. Schlette and E. Schröter (Friederich 2009). From the 1950s onwards, this site was exposed to heavy gravel extraction and more than half of the archaeological features have been destroyed. After the Wall came down, O. Braasch and R. Schwarz made air prospectations,

which revealed the double-ditch system. But the destruction continued with the laying of pipelines, only a few rescue excavations were undertaken by H. Schmidt and C. Froh. Finally, in the 21st century, between 2005 and 2008, major rescue excavations were carried out on a surface of 20 ha by the *Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt* (LDA-LSA) due to the construction of the highway A 143 (Jarecki & Sommerfeld 2007; Friederich 2009; Jarecki & Moser 2014a). They revealed that this plateau has been frequented from the Upper Paleolithic to the Middle Age. Due to its dominant position, this place continued for millennia, at times as settlement or as funeral place.

Radiocarbon dating and relative timing based on ceramics indicate that the Salzmünde site has been frequented for some time, at least between 3400 and 3000 BC (Jarecki & Sommerfeld 2007; Meller & Friederich 2014). The double-ditched system covered an internal surface of 37 ha and at least one entrance was fitted out in the South-West (Figure 2). The contemporaneous ditches, spaced between 10 and 18 m, had an estimated length of 4.3 km, a maximum depth of about 3 m and a maximum width ranging between 3 and 6 m. Therefore, the archaeologists call it a monumental earthwork (Jarecki & Moser 2014b). A ‘deposit layer’ was found in the ditches, showing a strong anthropological activity. Inside this imposing feature, there were several types of structures testifying to various profane and religious activities: at least three buildings, domestic pits, clay extraction pits, pits with dispersed human bones, regular and irregular graves (Meller & Friederich 2014).

2. Faunal analysis

Revealing in which way Neolithic animals were used in the Elbe-Saale region contributes *inter alia* to the debate about timing and diffusion of the so called ‘secondary products’ and their consequences. Highlighting new activities and characterizing the technical sub-system of animal resource exploitation are other subjects of this research.

2.1 Sample presentation

In order to apprehend from an archaeozoological point of view the links that may have existed between the economic and the symbolic sphere in and near the Saale valley, the data from 15 faunal analysis of Neolithic settlements are considered and almost 40,000 identified bones are used (Figure 1). These data are completed by some more specific cases like animal burials. It is therefore a synthesis for a period between 5500 and 2200 cal. BC which covers the whole regional Neolithic and follows other archaeozoological studies (Döhle 1997; Benecke 2006). The core of this research was been undertaken for a PhD dissertation at Paris 1 Panthéon-Sorbonne University (Höltkemeier 2016), enlarged (Höltkemeier 2018b) and completed in the present paper. In particular we will look at specifically practices of the Salzmünde society.

Disparities exist between data and also between chronological periods. Krautheim is the site where most of the bones were discovered and the Late Neolithic is actually the best documented period. In total, eight cultural groups are represented: Linear Pottery and Stroked Pottery Culture, Hutberg, Tiefstich, Salzmünde, Bernburg, Schönfeld and Corded Ware Culture.

2.2 Methodology

The analysis of the faunal material is carried out with a holistic approach and the detail of the applied methods can be consulted in a chapter dedicated to that very subject (Höltkemeier 2020). The sample comparison considers first of all the acquisition mode and spectral range species in order to know which main species were used and why. By examining the marks, the reconstruction of the bones history can be undertaken and these data can inform us about the activities which took place on the sites. A spatial analysis of faunal remains and particular animal deposits gives

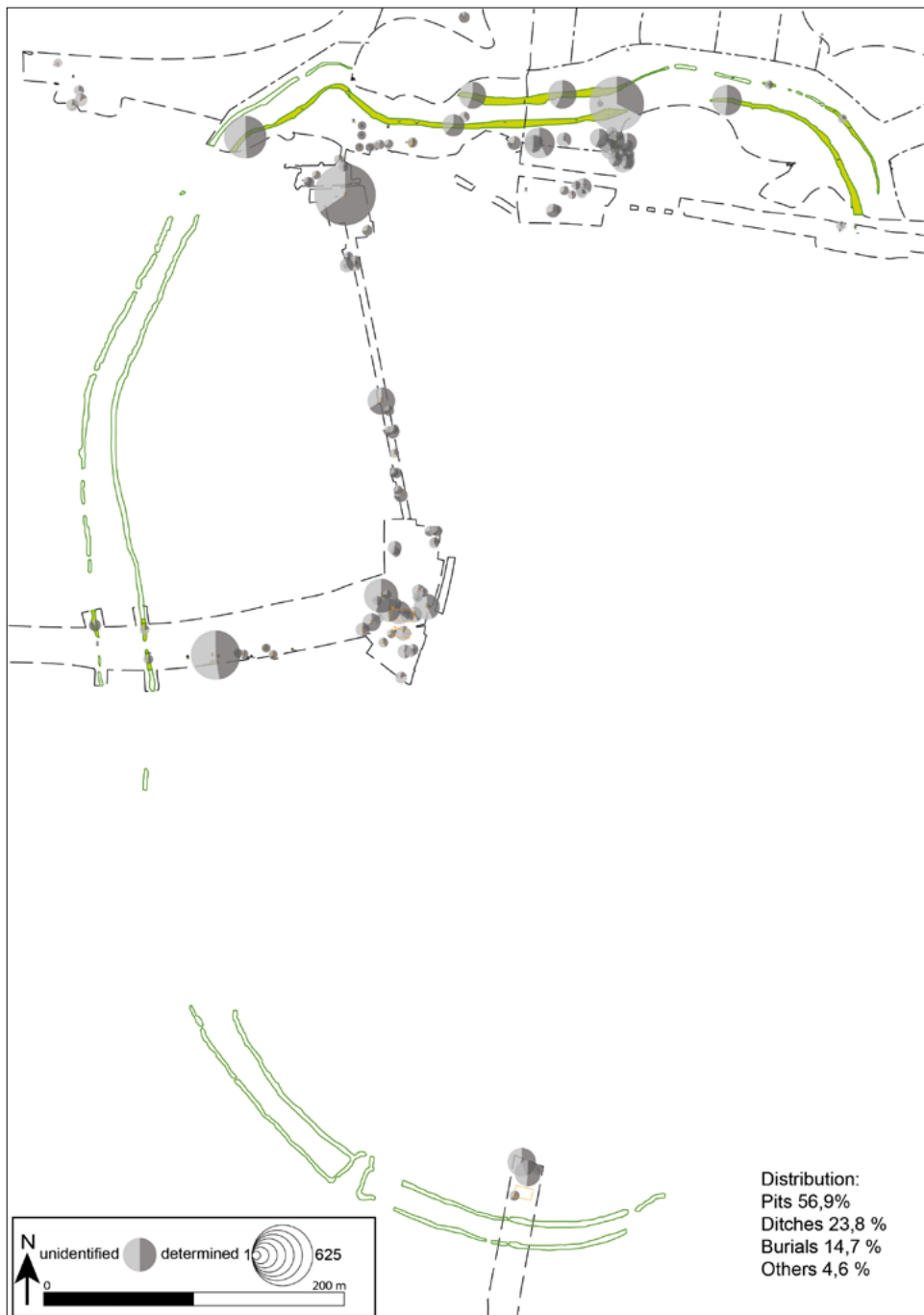


Figure 2. Plan with the distribution of faunal remains inside the Salzmünde enclosure.
CAD © LDA Saxony-Anhalt and S. Höltkemeier.

us information about the localization of different activities within a site. Sex-ratio and slaughter ages are ways of apprehending herd management within the subsistence economy. Considering all data, at the same time discharges and manifestations which go beyond the profane, gives us also information about symbolic practices. This is made in a perspective of historical anthropology in order to furnish concrete examples for human practices in the Elbe-Saale region, which is by the way also focused on change in territorial subsistence.

2.3 Evolution of the animal procurement

In this region, food economy was based since the Early Neolithic with almost 90 % on farming and cattle were the most represented species. Some exceptions exist, as for example

Niedergörne, where fishing and collecting bivalves were very important (Stolle *et al.* 1988). This could reflect a specialised station in these activities which served over a short time period or which was visited at several occasions. On most of the sites, cattle breeding furnished significantly animal products. Only at Eilsleben, Halle Dölauer Heide and Quenstedt, this species was below the threshold of 50%. For all sites, sheep rising was much more important than goat rising and this could be evidence of a particular exploitation. In general, pigs were less abundant than caprines. Derenburg Steinkuhlenberg and Bottendorf were exceptions, where pigs were a little more abundant than the small ruminants. Cattle breeding was very important during the Younger Neolithic. At the end of the Neolithic, caprines became less important, while the proportion of pigs remained relatively stable. Horses were mostly represented during the Late Neolithic and dogs during the Final Neolithic. Concerning wild game, red deer was often the most abundant species; roe deer and wild boar were also well represented. The composition of the wild game reflects the different biotopes visited by the agro-pastoral communities.

2.3.1 *Animal supply at Salzmünde-Schiepzig*

Due to its size and its variety, this sample is a reference for the Late Neolithic and it is the most important one for the Salzmünde society. The bones are very fragmented and the mean weight of the determined ones is 19.2 grams (Table 1). In total, 8141 animal remains came out of 120 structures. They were mainly excavated in pits, but also in burials, ditches or in another context (shaft, archaeological layer).

At Salzmünde-Schiepzig, the main characteristics previously dressed were noticed. Cattle were the prior food supplier, followed by caprines and pigs. In the burials, caprines were represented almost as much as cattle. At least seven dogs and three horses were represented. The first were aged less than 10 months (MNI=4) or were adults (MNI=3) and the second ones were aged less than a month (MNI=1) or were adults (MNI=2) including a mare (Döhle 2009). It is difficult to say if these data show a beginning of horse breeding at this site or if the imported mare was pregnant during travel and gave birth to a foal once arrived in the Saale valley. What is sure is that the horse, as the dog, was provided with a high social status and it remains possible that they were consumed. There were also only few, but a wide range of wild species. Thus, hunting and fishing were represented. Badger, beaver, skunk and probably wild cat could have been killed for their fur. Hunting some particular species, as big game and the less common wild cat, and fishing big fishes (catfish) could have been activities dedicated to a certain elite.

2.4 *From herd management to specialised sites*

By analysing the livestock composition and slaughter ages of domestic animals, varied exploitations could be revealed. Castration of cattle was possible since the Early Neolithic, as it was proposed by H.-H. Müller for the Hohlstedt settlement (Müller 1964: 16-17), and it was generalised at least during the Late Neolithic. This activity provided large supply of tender meat, such as in Quenstedt, and furnished docile animals, which could be used for their strength, such as in Salzmünde-Schiepzig. The livestock composition varied from one male for one female at Quenstedt to one male for 10 females at Krautheim (excluding the oxen, otherwise the sex-ratio would be well balanced). Sheep were raised for their fleece, at least during the Late Neolithic and the castration of rams was a common practice. The flock composition varied from three males for one female (Salzmünde-Schiepzig) to one male for five females (Großbringen) and these animals were raised for several proposals. Pig breeding supplied tender meat. For example, at Wallendorf and Quenstedt, the herd was considerably reduced before the sows became fertile. For the reproduction, some adults were also kept in an advanced age. The stock composition was nearly always well-balanced, indicating a strong selection of pigs.

THE ROLE OF ANIMALS IN THE SALZMÜNDE SOCIETY AND BEYOND

Species	NR	%	weight	%	MNI	%
Cattle (<i>Bos taurus</i>)	2491	59.5	68734.7	82.4	32	31.68
Sheep (<i>Ovis aries</i>)	235	5.6	2271.3	2.7	24	23.76
Goat (<i>Capra hircus</i>)	3	0.1	53	0.1	2	1.98
Caprines (<i>Ovis aries/Capra hircus</i>)	896	21.4	3133.3	3.8	1	0.99
Pig (<i>Sus domesticus</i>)	293	7	4443.7	5.3	14	13.86
Dog (<i>Canis familiaris</i>)	161	3.8	957.1	1.1	7	6.93
Domestic horse (<i>Equus caballus</i>)	14	0.3	546	0.7	3	2.97
Red deer (<i>Cervus elaphus</i>)	14	0.3	2099.5	2.5	2	1.98
Aurochs (<i>Bos primigenius</i>)	11	0.3	621	0.7	1	0.99
Wild boar (<i>Sus scrofa</i>)	5	0.1	267.5	0.3	1	0.99
Red fox (<i>Vulpes vulpes</i>)	37	0.9	241.9	0.3	1	0.99
Badger (<i>Meles meles</i>)	4	0.1	16.2	0.02	1	0.99
Beaver (<i>Castor fiber</i>)	2	0.04	11	0.01	1	0.99
Skunk (<i>Mustela putoris</i>)	1	0.02	0.5	0.001	1	0.99
Wild cat (<i>Felis silvestris</i>)	1	0.02	8	0.01	1	0.99
Goose (<i>Anser</i> sp.)	3	0.1	8.4	0.01	1	0.99
Anatidae (<i>Anas</i> sp.)	2	0.04	1.7	0.002	1	0.99
Strigidae (<i>Strigidae</i> sp.)	1	0.02	1	0.001	1	0.99
Birds (<i>Aves</i> sp.)	4	0.1	3.8	0.005	3	2.97
Roach (<i>Rutilus rutilus</i>)	1	0.02	0.1	0.0001	1	0.99
Siluridae (<i>Siluridae</i> sp.)	7	0.1	32.5	0.04	1	0.99
Cyprinidae (<i>Cyprinidae</i> sp.)	3	0.1	1.1	0.001	1	0.99
Determined	4189	51.44	83453.3	84.7	101	
Red deer antler	17	0.2	2511.5	2.5	2	
Roe deer antler	2	0.03	36.5	0.04	2	
unidentified	3933	48.31	12496.9	12.7		
Total	8141		98498.2			
Domestic animals	4093	97.7	80139.1	96	83	82.2
Wild game	96	2.3	3314.2	4	13	17.8

Table 1. Distribution of the animal remains from Salzmünde-Schiepzig.
NR=number of remains; MNI=minimum number of individuals.

This archaeozoological analysis exposed that cattle and sheep were raised for mixed exploitation: life-time products (milk, hair, strength) and final products (leather, meat, bones, grease, etc.). But it reveals also that there were some less specialised sites, as for example Wallendorf, and other more specialised sites, as Krautheim with its milk exploitation and Quenstedt with its strong demand in meat. This could reflect the independence of some sites with mixed exploitation, which had a higher degree of autonomy. In contrast, the more specialised sites were well integrated in exchange networks and a territorial hierarchy could have been existed between them. So, producer and consumer sites were opposing each other, even if they existed since the dawn of this period. They could be located quite close together, such as Großbringen and Krautheim. During the 4th millennium, consumer sites were more frequent.

Another point to consider is that the functionality of the sites varied: there were settlements (such as Eilsleben, Wallendorf, Halle Dölauer Heide, Krautheim, Magdeburg Neue Neustadt), funeral places (such as Plothä, Zauschwitz) and multifunctional places (such as Salzmünde-Schiepzig and Weißenfels).

2.5 Activities carried out in the enclosures

In Salzmünde-Schiepzig, 17% of the determined bones were entire, 3% had butchery marks and almost one third were fractured. 18% were burned bones and they were often exposed at a temperature over 550 °C. 3% of the bones had gnawing marks mainly made by carnivore, but also by rodents. Measurements of dog tooth and some gnawing marks were matching so that we can say, at least in one cases, dogs gnawed some bones. This was also noticed for human bones (Stecher *et al.* 2013). Furthermore, several weathering stages exist, indicating that animal bones were exposed a varying time to alterations. This information is noticed for all contexts, but most of the data came from pits. Nevertheless, bones found in pits were better preserved than bones from burials or the double ditch system. The data clearly supports carcass treatment and meat consumption carried out inside the enclosure. The pieces have been boiled or roasted and a special conservation treatment cannot be excluded (salting, smoking). Moreover, the ages at death of the animals show that this site has been in continuous use for some time. The weathering stages recorded on the bone surfaces are also heading in this direction. Therefore, and in combination with the types of features present at this site (buildings, ditches, pits, burials, etc.), it can be advanced that we are facing a multifunctional site, used both for domestic activities and ritual practices.

For the other sites, the treatment of carcasses and food practices were rarely reported. The main features relevant to this subject were noticed for the Wallendorf enclosure, even if there were a little less burned bones and more bones with butchery marks (Höltkemeier 2018a). For the Peißen enclosure, butcher carving was carried out in or near the excavated area, some pieces seemed to be boiled and bone marrow was recovered (Becker 1999: 114). At Halle Dölauer Heide, the animals were butchered *in situ* (Müller 1978: 215-217). In Großobringen, the meat pieces of domestic animals consumed in the enclosure were butchered somewhere else and deer were brought and debited in the enclosure (Barthel 1985: 64-66). These enclosures had different functions: for example, Wallendorf was a more versatile site while Quenstedt seems to be a probably seasonal visited site, where a lot of tender meat was consumed (*cf. supra*).

2.6 Signification and spatial distribution of the fauna

The animal bones found at Salzmünde-Schiepzig are mainly detrital discharges evacuated in reused structures, except some intentional deposits. They were distributed in variable quantity and several concentrations exist (Figure 2). Cattle remains were found in almost all features and this species was often associated to caprines. Bones gnawed by dogs came from 27 structures. Burned bones were identified in 73% of the structures and a lot of them came from burials. This observation, coupled to the results of the ceramic analysis (Schlenker & Stecher 2013), indicate that fire and destruction must have played a role in the funerary ritual. The domestic horse and red deer *calvaria* were excavated in the internal ditch segments. The rest of a cattle horncore was deposited in a vessel and they were found on top of a human skeleton in the internal ditch. It has to be noticed that deer antlers were only present in the double ditch system and this could reflect their use in a particular context.

During ancient excavations in the 20th century, a skeleton of a *Suinae* was found in the pit 58 (Behrens 1964: 41). During recent excavations conducted by the LDA, a woman was buried on a nest of shells and fragments of a dog skull were found nearby (burial 5529 – Stecher *et al.* 2013). In another burial, a man was interred with weaving material (burial 3691 – Von Rauchhaupt 2014).

Meat pieces of a *Caprinae* and rests of a catfish accompanied him in the afterlife. In a burial (5586) of a child were found phalanxes of a cattle foreleg and hind leg. One phalanx was slightly burned and had some cutting marks typical of skinning. So it is likely that the child was accompanied by two cattle paws perhaps in kind of a lucky charm.

2.7 Beyond the symbolic practices

In this region, cattle were by far the most represented species for symbolism (Behrens 1964). But dog, sheep, pig and some wild animals, like red deer, were also used (Höltkemeier 2016: 299-302). These deposits were often part of funeral practices. The animal could be in its entirety, or only a part of a *pars-pro-toto* which was deposited intentionally. This imaginary exists since the beginning of domestication (Helmer *et al.* 2004). Several cases exist where different animals were associated and the best examples are the so called ‘cattle burials’ (Döhle 1988; Döhle & Stahlofen 1985; Döhle & Schlenker 1998). They appeared in the studied region during the Salzmünde cultural group (in Profen – Friederich & Hoffmann 2013) and subsisted until the end of the here considered period. Most of them occurred during the Globular Amphora Culture (Pollex 1999; Jeunesse 2006; Koch 2009). The animals were placed site by site or face to face and they could be associated to human burials (Behrens 1964).

The earliest and most outstanding site in this region with symbolic practices was the Baalberger settlement and sepulchral place of Weißenfels ‘Eselsweg’. Deposits of animal skulls from cattle, dog, goat and pig were plentiful and deposits of skeletal parts existed, too (Behrens 1953). They can be associated or even dedicated to human, as for example in the burial pit 27, in which a man, a woman, two children, 19 cattle *calvaria* and 9 dog skeletons were excavated. In total, at least 24 cattle and 20 dogs were counted (Behrens 1953). The animal deposits were placed above the human skeletons and this might reflect a closing act of the funerary ritual.

Cognitive productions of live scenes were made in several occasions. They were made on vessels, like the ‘comb’ topped with ‘cattle horncores’ (Salzmünde-Schiepzig – Grimm 1938: fig. 16) which may correspond to the ploughing of a field. ‘Carved symbols’ were graved on slabs inside the chamber of the gallery grave at Züschen (Günther 1990) and one may ask if this were not ploughing or transport representations.

3. Outlook

The fact that cattle played a key role in the Neolithic feed supply is not only typical for the Elbe-Saale region. This dominance was noticed throughout the TRB period and over its entire area. In most cases, this species was followed by pigs and caprines, even if caprines were sometimes ahead the pigs, as in Bronocice (Poland). Only at Toftum and Troldebjerg (Denmark), pigs were more important than cattle (Midgley 1992: 371). This composition of the domestic fauna brings to mind that one observed for the Paris Basin for the Middle Neolithic and is most closely to the Michelsberg Culture (Hachem 2011). In this region, milk production was also evidenced (Tresset 1996) and the territory was hierarchized by many different feature types, including enclosures (Dubouloz *et al.* 1991). The provision in flint was made here on a regional scale, or even on a supra-regional scale (Manolakakis & Giligny 2011). In this context, the enclosure Bazoches-sur-Vesle ‘Le Bois de Muisemont’, dating to the early Michelsberg, clearly comes out with its dynamic of complex discharges (Dubouloz *et al.* 1997). There were three main gestures: a commonplace domestic consumption (eat, produce and use objects), some specific activities (break a lot and eat little) and a few punctual gestures (deposit entire objects; *idem*). In the ditches, deer antlers have been deposited (Hachem & Maigrot, in press). Concerning the animal deposits in general, it was noticed that cranial parts were mostly used for deposits (Höltkemeier & Hachem 2013). Using the animal as a symbol was also a widespread phenomenon. This is particularly obvious as soon as people were enough marked to illustrate for example a new activity, as animal traction. Thus, they

shaped wheeled carts, as in Bronocice (Milisauskas & Kruk 1982) or they engraved during the 30th century BC symbols on rocks in the Alps, as in the Val Camonica and at Mont Bego (Pétrequin *et al.* 2006).

A lot of other side events could be tackled in that respect, but the issue here is not to present all of them. In all cases, cattle should have a special role in the European Neolithic, due to its economic significance and to its use in the symbolic domain. Consequently, it is difficult to separate between what is profane and ritual, because both were closely linked. Indeed, Neolithic people illustrated economic activities with symbolism.

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Human skeletal remains from the Eneolithic of Spinosa Cave (Grosseto-Tuscany, Italy)

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Abstract

Spinosa Cave is located near the city of Massa Marittima in Tuscany (Central Italy). The site has been investigated through systematic excavations between the years 2001 to 2003. Osteological, archaeological and paleontological data obtained from this site confirm two different moments of occupation during the Neolithic and Eneolithic periods. In this study we show data obtained from Stratigraphic Units 4, 5 and 8 (US4, US5 and US8), all three belonging to the Copper Age. The human skeletal remains have been found in secondary depositions. The aims of this study lie in the analysis of bio-anthropological data on the sample, MNI, sex, age at death and pathological conditions. These results are conditioned by the poor state of preservation observed in these skeletal remains alongside multiple traumatic fractures observed. Through this, this accumulation suggests a very interesting hypothesis about the nature of this accumulation, considering the evidence suggested by old fractures.

Keywords: bioanthropology, Eneolithic, central Italy, burials, human remains

Résumé

La Cave de la Spinosa est située près de la ville de Massa Marittima en Italie centrale (région Toscane). Le site a été étudié avec des fouilles systématiques de 2001 à 2003. Les données ostéologiques, archéologiques et paléontologiques confirment deux moments différents de l'occupation du site de l'âge néolithique et énéolithique. Dans ce travail, on montre que les données proviennent de l'Unité Stratigraphique 4, 5 et 8 (US4, US5 et US8), les trois appartiennent aux *facies* énéolithiques (âge du Cuivre). Les restes de squelettes humains ont été trouvés dans les dépôts secondaires. L'objectif de ce travail est l'analyse des données bio-anthropologiques sur l'échantillon, le calcul du MNI, le sexe, l'âge à la mort et les conditions pathologiques. Les résultats ont été compromis parce que les restes des squelettes montrent un très mauvais état de conservation et de multiples fractures traumatiques. En revanche, cette hypothèse d'accumulation est très intéressante, parce qu'il y a plusieurs signes de fractures anciennes.

Mots-clés : bioanthropologie, Énéolithique, Italie centrale, sépultures, restes humains

1. Introduction

Spinosa Cave is located near the city of Massa Marittima in Tuscany (Central Italy). The site has been systematically excavated and investigated by the Tuscany Archaeology Superintendence under the supervision of Dr. Biancamaria Aranguren between the years 2001 to 2003, anthropologically studied under the supervision of Dr. Elsa Pacciani. Recent studies have confronted the systematic analysis and characterisation of materials (Aranguren 2009; Aranguren *et al.* 2014). The cave is composed of a single chamber (12 x 6 m). Inside said chamber, numerous and diversified materials have been

found including faunal remains, lithic and bone tools as well as abundant ceramic materials. All the items have been documented on a series of 1:20 scale maps while their spatial coordinates have also been recorded. The stratigraphic sequence of the site includes many levels referring to two different moments of occupation, the first in the Neolithic (US 10; US11; US12; US13, US14) and the second in the Copper Age (US4, US5 and US8), as observed through osteological, archaeological and paleontological data. The archaeological contexts indicate a correlation between the cultural horizon of Serra D'Alto's *facies* and the Eneolithic subsequence stage '*facies funeraria grossetana*' respectively (Aranguren *et al.* 2014). In this study we present the data obtained through the study of human remains from Stratigraphic Units 4, 5 and 8 (US4, US5 and US8), all three belonging to the Copper Age. The Eneolithic level is covered by a floor of travertine rocks intentionally placed in prehistory to seal these burials. The burials are not in primary deposition, and the excavation area was destroyed by illicit excavations affecting up to 60% of the total digging area. Despite this, the uncontaminated excavation area is 80 m², representing a very important opportunity to investigate for the first time a large Eneolithic deposition in Central Italy. In the Eneolithic level, lithic arrowheads, shell and bone pendants, metal daggers attributed to the Remedello *facies* variety B (Bianco Peroni, 1994; De Marinis 2006) and ceramics with characteristic handles of the Italian Copper Age have been discovered (Aranguren 2009; Del Bove *et al.* 2017). A dagger found associated with human remains has been radiocarbon dated to the latest Copper layer (US8.II): GS2: Beta-180236, 4640±110 B.P., cal. 1δ 3620-3340, cal. 2δ 3650-3300 B.C. (Aranguren, 2006; Dolfini 2010; Dolfini *et al.* 2011). This date fits perfectly with the known chronology of the early Chalcolithic period (Dolfini 2010; Dolfini *et al.* 2011).

The aim of this short communication is to present the analysis of bio-anthropological data obtained from this sample, MNI, sex, age at death and pathological conditions for US4, US5 and US8.

2. Materials and methods

Human skeletal remains presented in this study come from US4, US5 and US8, stored at the Tuscany Archaeology Superintendence. All materials present a very poor state of conservation with multiple fractures and common loss of epiphyses and important part of bones useful for the determination of elements. The majority of human remains were found in US4 (NR=148), US5 (NR=145) and US8 (NR=4876). Before analysing each piece, the materials were cleaned with water and restored using Paraloid B-72 where considered necessary. Estimations for the age of death were based on morphological traits and morphometric analysis, following the following criteria: dental wear (Brothwell 1989; Lovejoy *et al.* 1985), stages of dental development and eruption (Ubelaker 1978); closure of epiphyses (Canci and Minozzi, 2005; Iscan and Kennedy 1989; Suchey *et al.* 1984). Diagnosis of the individuals sex was based on Acsádi's & Nemeskéri's (1970), Phenice's (1969) and Rogers' & Sauders' (1994). At the end the minimum number of individuals was calculated through the use of the most represented element for each US. These consist in femora, radii and ulnae for US4, 5 and 8 respectively. For US4 and US5 the conservation status of each item was divided into 4 qualitative categories: poor, good, very good and excellent. The category 'Poor' is used for those fragments without epiphyses and subject to more taphonomic damage. The category 'Good' is used for those bones conserved with one of the two epiphyses or presenting any other taphonomic peculiarity. The category 'very good' is used when the fragments present a state of conservation that is able to provide the possibility of extracting biological information such as age and sex. The final group and the last group 'excellent' contained bones that are complete. Pathological analysis was based on morphological criteria. In the particular case of dental-alveolar diseases, which consequently turned out to be all adult teeth (NR=927) the sample was scrutinized to determinate the presence of dental diseases such as caries, hypoplasia and tartars (Gualtelli-Steinberg 2016). All data obtained from anthropological analyses were based on archaeological dig: photos, detailed layouts and publications of materials. A check based on all the different information was performed afterwards. Despite the fact that three different US are included, during this preliminary stage it was considered necessary to analyse biological

data separately. US8 presents a layer called 'BASE' which has been analysed separately during excavations and interpreted as a transitional stage. Considering how this level is discontinuous compared with the whole of US8, it was decided to include 'BASE' into the US8 data. In order to analyse and quantify the presence of sub-adults in a sample, the sample is divided into classes of age before introducing sub-adults into the study. This information is inferred through different stage of dental eruption (Ubelaker 1978).

3. Results and discussion

The results of the study are conditioned by the very poor state of preservation of osteological remains and multiple traumatic fractures observed. In order to classify the impact of conservation in the analysed sample, percentages of fractures were calculated only for US4 and US5 to evaluate the state of preservation (see Figure 1).

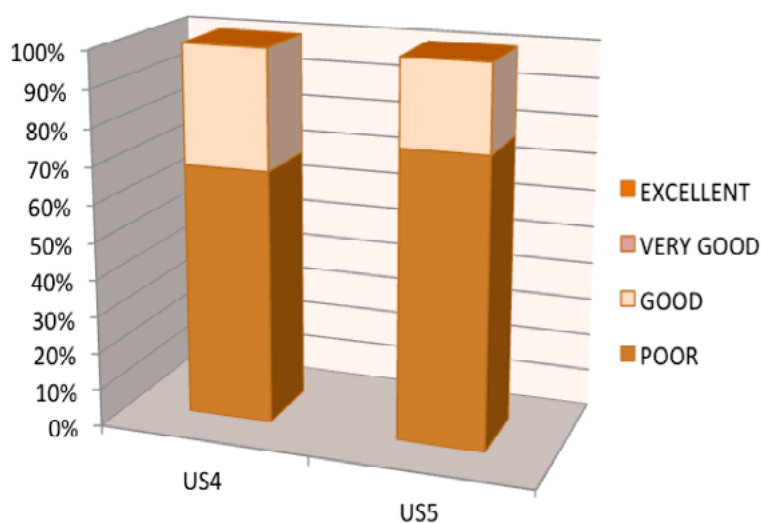


Figure 1. Presenting the percentage of conservation in US4 and US5.

The first objective of this communication is to quantify the presence of humans in Spinosa cave. The total MNI obtained was calculated with the sum of bones most represented in each US with a total of 45 individuals (see Table 1). The US8 is significantly richer than the other levels. The distribution of individuals for US4 is 3, while for US5 there are 7 individuals and for US8 there are 35 individuals.

N° of elements	US4	US5	US8
Fragments determined*	148	145	4876
Mandibles	6	13	66
Radii	3	21	136
Ulnae	5	10	150
Femora	7	15	105
Tibiae	5	8	109

Table 1. Number of elements in each US, divided by type of bone.

The hypotheses of the accumulation is very interesting considering the evidence of old fractures. The sample consists of both male and female individuals, as well as individuals of different ages (difference age classes are present for adults and sub-adults individuals). The presence of different age classes in sub-adults are reported in Table 1, while the ages are calculated with teeth using the Ubelaker method (Ubelaker 1978), producing more information in some cases than other dental analysis. The most represented age classes in the sample are that of 6-10 years of age, with the presence of 16 individuals.

The presence of male and female elements with designated sex and the presence of bones of different ages at time of death in the sample concludes the selection based on these categories (age and sex) in the burial mound. This is typical of contexts in the next stage of the Bronze Age in Central Italy.

Table 2. Presence of sub-adults divided by a range of ages.

	0-1 years	2-5 years	6-10 years	11-14 years	14-16 years
US8	3	4	11	2	1
US4	0	0	3	2	0
US5	0	0	2	0	0
Total	3	4	16	4	1

Macroscopic analysis show how fractures lines occurring in the whole sample are of two types: the first being product of recent mechanical action and the second as a product of an ancient origin. The first category is very simple to reconstruct and shows how the different parts of the same anatomical element came from an adjacent space. For the second category with older fractures, the reconstruction of site formation processes is not possible because in most cases the additional parts of bone are missing. Nevertheless, no cut marks were observed on bones through this macroscopic analysis.

In taphonomic studies of site formation processes, the accumulation does not indicate the presence of fire used to accelerate the decomposition of cadavers. This is concluded through the absence of burnt bones, with the exception of a single phalanx from US5. The analysis of osteological remains additionally concludes the presence of all anatomical elements throughout the sample, including *pourrisoir* elements.

The analysis of dental paleopathologies show an absence of dental diseases and vitamin deficiencies. Only 4% of remains present caries and 2% have hypoplasia. The remaining 94% are absent of dental diseases.

4. Conclusions

Spinosa cave forms part of a very heterogenous Eneolithic context in Central Italy (Piroso 2017), with the important present of 45 individuals. This site can be considered as heterogenous due to how the object of study in this period generally present varying typologies of funerary contexts such as large grave tombs (i.e. Remedello and Ortucchio), single tombs (i.e. Rinaldone) (Silvestrini *et al.* 2003) and large necropolis (i.e. Selvicciola) (Conti *et al.* 1997). Nevertheless, both Adriatic and Mediterranean peninsular areas of central Italy frequently present funerary caves containing mass graves (Alessandri and Rolfo 2015; Cazzella and Moscoloni 2012). The greatest limitation for a large scale comparison is product of inadequate data coming from sites that were not systematically excavated in the 50's as well as the presence of unauthorized excavations that have consequently destroyed a lot of the data and information about the localisation of archaeological materials. Although preliminary, the relevance of this Eneolithic site in central Italy is crucial. The taphonomic reconstruction and presence of bony elements such as the *pourrisoir*, concludes with a possible hypothesis that these inhumed remains were taken out of the cave during the process of decompositions. Taphonomic interpretations suggest a form of 'ritual' to have been performed in Spinosa cave, consisting in the mixing of bodies and their consequent displacement. This is most likely to be product of practical issues with available space. In general, the context analysed presents important data contributing to this particular funerary context in Eneolithic caves, which are normally in the form of individual burials with grave goods or mixed secondary burials, such as the case of Spinosa Cave. Another factor used to distinguish the typology of the accumulations from Spinosa cave as opposed to other successive periods (e.g. Bronze Age) would be the presences of an entire community in the graves, without discriminating between sex and age. Future studies will confront the in depth bio-anthropological study of the entire accumulation located at Spinosa Cave, with the possibility of answering key questions regarding the *post-mortem* rituals contributing to this particular accumulation of human remains. In order to confront this, however, a more systematic spatial of the assemblage is required.

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Chronologie et contextes des spatules-idoles dans les Pyrénées occidentales

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Abstract

The megalithism of the Western Pyrenees is characterized by discreet architecture and poor funerary goods. Its beginnings are around 5300-5200 BP, from radiocarbon dating of infra-tumular charcoals, and human remains whose dates are more recent: Los Llanos (5190 BP), La Chabola de La Hechicera (4980/4940±40 BP), San Martín (4800±40 BP), etc. The older funerary goods presents geometric lithic pieces with abrupt retouching or double bevel, and bone idol-spatulas. These are mostly made of Ovis/Capra tibia and are sometimes, profusely decorated with geometric patterns and feminine representations. The excavation of the San Martín Corridor Dolmen (Alava), in 1964, was the first deposit to make it possible to identify objectively the existence of this phase, and in it these singular objects. This association was later found in several dolmens in the northern half of the Peninsula (in the provinces of Burgos, La Rioja, Gipuzkoa, Valladolid, Palencia, Soria, Guadalajara and Toledo). Recently were directly dated by AMS several of the dolmens of San Martín and Kurtzebide (Alava). Dating is much older than dated individuals.

On the other hand, one will be interested in the complexity of decorative motifs, their wide geographical dispersion, and their parallelism with other (symbolic) representations on other anterior or contemporary supports.

Keywords: idol-spatula, western Pyrenees, neolithic, dolmen, funerary goods

Résumé

Le mégalithisme des Pyrénées occidentales est caractérisé par une architecture de dimensions discrètes et un mobilier funéraire pauvre. Ses débuts se situent autour de 5300-5200 BP, à partir de datations radiocarbones de charbons infra-tumulaires, et de restes humains dont les dates sont plus récentes: Los Llanos (5190 BP), La Chabola de La Hechicera (4980/4940±40 BP), San Martín (4800±40 BP), etc. Le mobilier funéraire plus ancien présente des pièces lithiques géométriques à retouche abrupte ou à double biseau, et des spatules-idoles en industrie osseuse. Celles-ci sont pour la plupart faites en tibia d'ovicapridés et sont parfois décorées avec profusion de motifs géométriques et de représentations féminines. La fouille du dolmen à couloir de San Martín (Alava), en 1964, a été le premier gisement qui a permis d'identifier objectivement l'existence de cette phase, et en cela ces objets singuliers. Ensuite, cette association a été retrouvée dans plusieurs dolmens de la moitié nord de la Péninsule (dans les provinces de Burgos, La Rioja, Gipuzkoa, Valladolid, Palencia, Soria, Guadalajara et Tolède). Récemment, ont été datés directement par AMS plusieurs des dolmens de San Martín et Kurtzebide (Alava). Les datations sont beaucoup plus anciennes que les individus datés.

D'autre part, on s'intéressera à la complexité des motifs décoratifs, leur large dispersion géographique, et leur parallélisme avec d'autres représentations (symboliques) sur d'autres supports antérieurs ou contemporains.

Mots-clés : spatule-idole, Pyrénées occidentales, Néolithique, dolmen, mobilier funéraire

Introduction

Dans cet article, nous souhaitons présenter une problématique sur certains objets particuliers recueillis à l'intérieur de certains dolmens en Espagne. Ce sont des objets en os d'ovicapridés qui ont été interprétés comme des offrandes funéraires, des inhalateurs, des épandeurs d'ocre, etc.



Figure 1. Manche de la spatule-idole de Gurrpide Norte.

Les dates fournies par trois échantillons obtenus directement sur des spatules-idoles indiquent que les datations radiocarbone sont beaucoup plus anciennes que celles fournies par les os humains.

1. La découverte

La première découverte de ce type d'objets a eu lieu sur le territoire d'Alava en 1962 à l'intérieur du dolmen de Gurrpide Norte (Kuartango) (Figure 1) et plus tard dans d'autres dolmens de La Rioja Alavesa: Chabola de la Hechicera (1964) et San Martin (1964). La découverte, dans ce dernier dolmen, clairement associée à une industrie lithique homogène constituée de géométriques à retouches abruptes, a permis de déduire l'ancienneté de sa chronologie d'une manière relative.

G. Eogan (1979) pensait avoir trouvé un objet similaire dans celui de Knowth (Irlande).

Les décennies suivantes produisent de nouvelles découvertes à Álava (Kurtzebeide 1974, Los Llanos 1987), mais le plus important est que la présence de ce type d'objets s'étende à d'autres territoires de la moitié nord de la Péninsule ibérique (La Rioja, Gipuzkoa, Meseta Nord -Burgos, Valladolid, Palencia, etc.- et au sud -Toledo).

2. Caractéristiques des Spatules-Idoles

Ce sont des instruments bien définis du point de vue techno-typologique. Ils sont fabriqués sur tibias d'ovicapridés (*Ovis/Capra*) et exceptionnellement sur le radius humain. Cependant, le degré d'élaboration de certains d'entre eux a empêché d'identifier la pièce anatomique utilisée dans sa fabrication. Environ le tiers distal du tibia est l'extrémité proximale de l'outil. Cette épiphyse est totalement polie jusqu'à éliminer sa caractéristique anatomique et s'arrondit de manière à simuler une tête humaine, de cette manière on forme le manche. Ensuite, presque toutes les spatules-idoles ont été décorées plus ou moins par des rainures profondes et larges (Figure 2).

Les deux tiers restants correspondent au reste de la diaphyse et à l'épiphyse proximale du tibia coupé des côtés opposés, en retenant l'une de ses moitiés. La partie mésiale a été conservée car l'élargissement régulier qui se produit vers l'épiphyse était idéale pour y disposer la palette. Cependant, en considérant au moins deux des objets d'El Miradero qui ont cette extrémité apparemment inachevée (sans amincir ni régularisé), on pourrait penser qu'il s'agit d'un extrême presque inactif.

La décoration qu'elles présentent est basée sur des rainures profondes, parfois complétée par l'abrasion profonde de la surface du tibia, soulignant ainsi les motifs souhaités. Les plus simples consistent en une ou plusieurs rainures parallèles, parfois transversales, d'autres hélicoïdales, en arc ou en zigzag. Moins fréquemment, une figure féminine est représentée, à San Martín, La Velilla, El Miradero et La Tarayuela (Delibes *et al.* 1986; Rojo *et al.* 2005; Zapatero, 2015; Fernández Eraso *et al.* 2015).

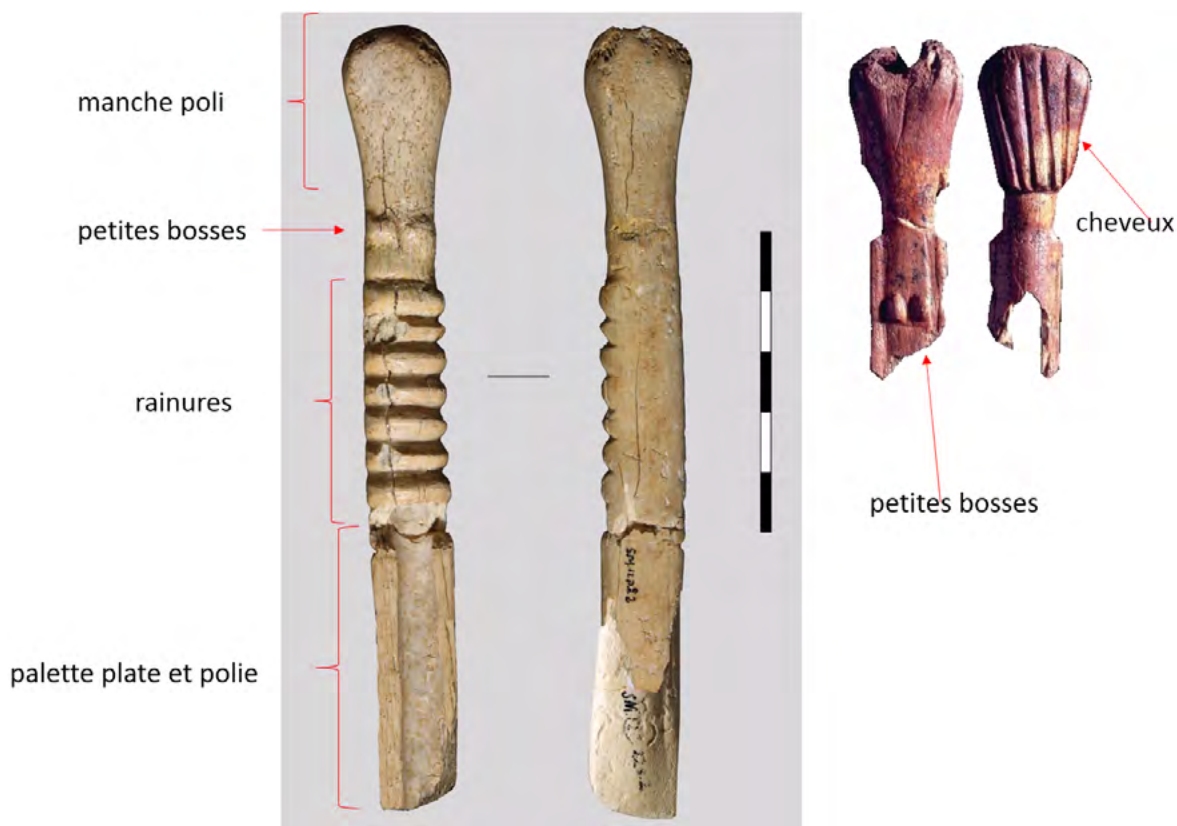


Figure 2. Parts des spatules-idoles.

3. La décoration

Ces spatules-idoles sont également caractérisées par la complexité de la décoration du support. Cela se fait par des rainures parallèles profondes et larges disposées perpendiculairement à l'axe longitudinal de la pièce, afin de créer de motifs de type géométrique (arc, zigzag, segmenté, etc.).

Dans d'autres cas, de manière complémentaire, la surface du tibia est grattée profondément, même jusqu'à ce que le tissu spongieux apparaisse sur l'épiphyse. Cette extrémité, compte tenu des détails anatomiques en relief (poitrines) de plusieurs représentations réalistes, correspond à la tête d'un individu féminin (San Martín, La Velilla, etc.) (Figure 2 et 3).

4. La répartition géographique

Les premières découvertes ont été faites en 1962 dans les dolmens de Gurpide Nord (Katadiano, Álava) et en 1964 dans ceux de San Martín (Laguardia) et Chabola de La Hechicera (Elvillar), et dans les années soixante-dix à Kurtzebide (Letona) et Los Llanos (Kripán). À partir des années 80, l'aire de distribution sera étendue à La Rioja (Peña Guerra II -Nalda-), à la Meseta Nord (El Miradero -Villanueva de los Caballeros-, Las Quintanillas -Pardilla de Duero -Valladolid-, La Velilla -Osorno, Palencia-, Tagarabuena -Toro, Zamora-, Fuentepeciña I -Sedano-, Valdemuriel -Tubilla del Agua- La Cabaña -Sargentos de La Lora-, Alto del Reinoso -Fresno, Monasterio de Rodilla, Burgos), La Peña de la Abuela et La Tarayuela -Ambrona-, La Sima I -Miño de Medinaceli-, le tumulus de la Mina -Alcubilla de las Peñas, Soria-, Praalata -Idiazabal, Gipuzkoa-, et finalement à El Castillejo -Huecas, Toledo- et à Portillo de Las Cortes -Aguilar de Anguita, Guadalajara- (Figure 4).

5. Le contexte

Ces objets proviennent presque toujours de l'intérieur des dolmens. Le fragment récupéré à Tagarabuena (Toro, Zamora) est exceptionnel car il n'a pas de contexte clair. Mais en général, le

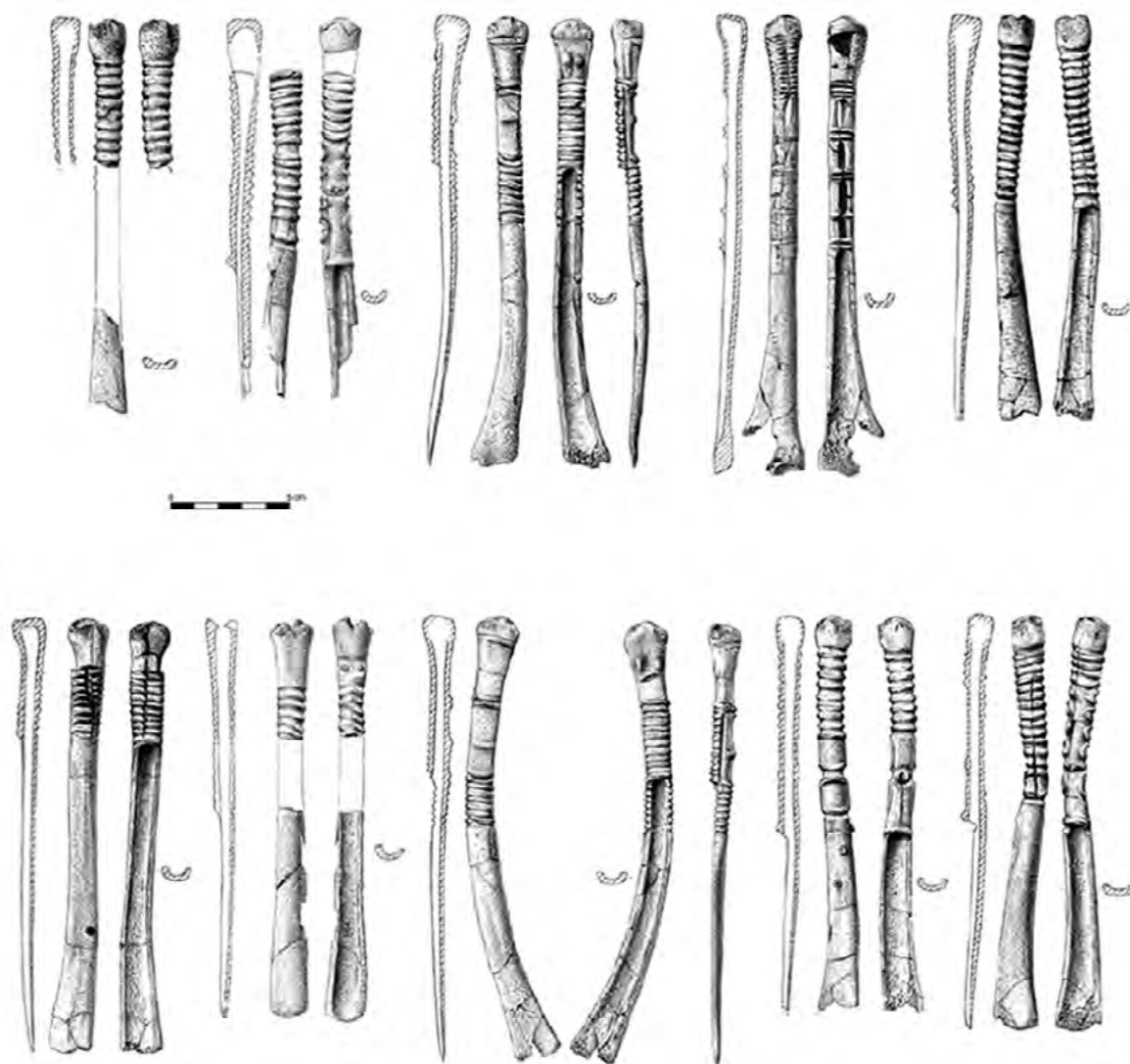


Figure 3. Quelques des spatules-idoles du mobilier funéraire de l'individu n° 7 du dolmen El Miradero (Villanueva de los Caballeros, Valladolid) (Desine de Ángel Rodríguez González): (Guerra Duce *et al.* 2009).

contexte est assez imprécis, car il s'agit de sépultures collectives et, du fait de la réutilisation du même espace funéraire et de la dégradation des vestiges, il est difficile de les associer aux autres instruments contemporains. Dans les fouilles plus modernes, dans les sites où les restes sont mieux conservés, cet aspect peut parfois être précisé.

Les spatules-idoles provenant du dolmen à couloir de San Martín ont été recueillies sous la grande dalle tombée à un niveau où, dans l'industrie lithique, il n'y avait que des objets géométriques. Il est très important de noter que deux des trois spatules-idoles étaient très proches (deux à 12D et un à 12E). On ne peut pas exclure qu'elles ont été déposées ensemble en même temps, et que c'est un dépôt contemporain.

L'ensemble le plus frappant est celui de l'individu masculin adulte (n° 7) d'El Miradero (Valladolid). En plus d'un ensemble lithique (plaques, géométriques et peut-être une herminette polie), était associées plus de 4.000 perles d'ardoise, 4 *Dentalium* et 11 spatules-idoles brûlées (Delibes *et al.* 2012).

Un autre petit fragment étonnant est celui qui se trouve dans le dolmen à couloir de La Chabola de La Hechicera (Álava), dont la chronologie pourrait être proche de sa construction et qui montre des



Figure 4. Carte de distribution des spatules-idoles de la Péninsule Ibérique.

signes évidents de contact avec le feu. Parmi les restes humains déposés, il n’y a aucun signe de feu (Figure 5).

6. Chronologie

Les contextes d’où proviennent ces objets sont encore très imprécis, en raison de la réutilisation des chambres dolméniques pendant de longues périodes. Cependant, le fait que dans la chambre de San Martín une grande dalle latérale soit tombée et recouvre un niveau d’inhumation accompagné d’un mobilier homogène (des géométriques à retouches abruptes et certaines à double biseau) nous a permis d’avancer qu’il s’agit de la plus ancienne phase du mégalithisme dans la région, mais jusqu’à aujourd’hui sans date radiocarbone qui permettait d’en préciser la chronologie.

Les fouilles récentes et les nouvelles découvertes ont permis de dater les restes humains mais ils ne sont pas, nécessairement, les premiers inhumés dans le monument, ni la date de construction du mégalithe.

Le tumulus de Rebolledo à Sedano (Delibes et Rojo 1997, 405-406) présente plusieurs inhumations que les chercheurs interprètent comme simultanées et qui ont été fermées par un feu daté de 3333±30 BC.



Figure 5. Spatule-idole du dolmen de La Chabola de la Hechicera (Elvillar, Álava).

Dolmen	Échantillon	Data BP	Cal BC	Laboratoire
La Sima I (Miño de Medinaceli, Soria)	Charbon	5048±27	3940-3850	Bln 5349
<i>Idem</i>	Charbon	5308±31	4230-4180	Bln 5362
<i>Idem</i>	Charbon	5082±31	3950-3910	Bln 5363
<i>Idem</i>	Charbon	5001±32	3900-3880	Bln 5376
<i>Idem</i>	Charbon	5303±34	4230-4190	Bln 5377
<i>Idem</i>	Charbon	5068±33	3950-3900	Bln 5378
El Miradero (Valladolid)	Charbon	5115±35	3978-3804	GrN-12100
<i>Idem</i>	Charbon	5155±35	4046-3937 3872-3807	GrN-12101
<i>Idem</i>	Charbon	5135±45	4044-4011 4000-3892 3883-3798	GrN-12102
<i>Idem</i>	Charbon	5120±25	3981-3915 3876-3804	GrN-12103
<i>Idem</i>	Bois	4940±40	3788-3649	GrN
Chabola de la Hechicera	Os humain	4940±30	3780-3650	Beta-307795
<i>Idem</i>	Charbon infra tumulaire	4980±30	3780-3880 3800-3700	Beta-307796
La Mina (Alcubilla de las Peñas, Soria)	Os humain	4970±30	3776-3706 3893- 3660	Beta 316132
Alto del Reinoso (Monasterio de Rodilla, Burgos)	Os humain	4911±25	3700-3657 3761-3643	MAMS-14325
<i>Idem</i>	Os humain	4854±26	3661-3636 3698-3539	MAMS-14326
<i>Idem</i>	Os humain	4933±27	3748-3658 3770-3653	MAMS-14327
La Velilla (Palencia)	Charbon	4810±200	4041-3024	GrN 16295
<i>Idem</i>	Radius humain	4720±40	3635-3374	PoZ 42092
El Castillejo (Huecas, Toledo)	Squelette n° 4	5710±150	4720-4365	Beta 132917
Rebolledo (Sedano, Burgos)	Charbon	5305±30	4236-4044	GrN-19569
Rebolledo (Sedano, Burgos)	Charbon	5075±40	3965-3782	GrN-19567

Tableau 1. Dates des dolmens où ont été trouvées des spatules-idoles.

7. Les nouvelles données

7.1. Kurtzebide

Il s'agit, probablement d'un dolmen simple qui a été complètement modifié. Les fouilles, sous la direction de J.I. Vegas, ont permis d'identifier diverses structures qui forment le tumulus: pierres poussées obliquement et orientées vers le centre et qui se chevauchant, pierres de bonne taille disposées horizontalement, etc. Sous le tertre funéraire, une série de trous ont été réalisés afin d'introduire les dalles de la chambre, apparemment réutilisées, qui définissaient un dolmen polygonal.

Au cours des fouilles, des restes anthropologiques très fragmentés appartenant à un minimum de 6 individus ont été découverts: 5 adultes (3 individus de plus de 30 ans et 2 de 20 à 30 ans) et un sixième enfant de 8 ou 9 ans.

Aussi, également, ont été recueillis des os d'animaux de *Bos taurus* et d'*Ovis/Capra*.

La révision des matériaux a permis d'étudier 7 pièces géométriques à retouches abruptes, dont 3 trapézoïdes et 4 triangles (2 sont de type tranchets), une tête de flèche cruciforme à silhouette asymétrique, etc. En outre, il convient de noter la présence de deux centaines de fragments de céramique mal conservés, certains ornés d'incisions ou d'impressions.

Pour ce qui concerne les spatules-idoles, nous pouvons citer deux exemples :

- TB1. Spatule-idole incomplète, qui a perdu une partie de la palette (Figure 6). Ses dimensions sont: 82,6 x 24,2 x 16,8 mm. L'épiphyse distale conserve les deux dépressions dans lesquelles le tarse est inséré, mais est profondément abrasée ou polie. Peut-être que ce détail est simplement dû à des causes banales (l'artisan le considérait comme sans importance à l'époque, c'est un os fin, un jeune animal, etc.). Le travail d'abrasion a été très intense également dans la diaphyse, qui a été très amincie. L'épiphyse et la partie de la diaphyse qui correspondrait au manche ont une longueur de 42,5 mm. La limite entre eux commence par un sillon transversal profond qui affecte l'une de ses faces (l'opposé est lisse) et parallèlement à celle-ci, une autre, d'environ 9 mm. Cela a été fait comme dans d'autres spécimens sciant la diaphyse de tibia des deux côtés (Mujika 1998). La longueur conservée est de 28 mm.
- TB1.25 le corps et TB1.10 la tête (Figure 7). Spatule-idole presque complète. Ses dimensions sont: 195 x 23,3 x 16 mm. L'épiphyse distale préserve les deux dépressions dans lesquelles le tarse est inséré, et il est profondément poli. Le travail d'abrasion a été très intense également dans la diaphyse le même que pour d'autres pièces de La Velilla, Gurpide, etc. L'épiphyse et la partie de la tige correspondant au manche ont une longueur de 44 mm. Sa limite commence par une rainure profonde et transversale qui affecte l'une de ses faces et,



Figure 6. Manche de la spatule-idole de Kurtzebide (Letona, Álava).



Figure 7. Spatule-idole de Kurtzebide (Letona, Álava).

parallèlement à celle-ci, un autre sillon, a 9 mm, qui forme une sorte de collerette. Ensuite, à 5 mm, commence la partie correspondant à la lame, qui a une longueur de 151 mm. Cela a été fait, comme pour d'autres spécimens, en sciant la diaphyse des deux côtés.

7.2. Dolmen à couloir de San Martín

C'est un des dolmens de la station mégalithique de Rioja Alavesa située entre les chaînes de montagnes de Codés, Cantabria-Toloño et le fleuve Èbre. Dans ce territoire il y a huit architectures funéraires (El Montecillo, Layaza, El Sotillo, El Alto de la Huesera, El Encinal, Los Llanos, La Chabola de la Hechicera et San Martín). Dans les trois derniers monuments se trouvent des spatules-idoles comme celle que nous traitons dans le travail présent.

Le sépulcre à couloir de San Martín a été découvert par D. Fernández Medrano en 1956 et mis au jour en 1964 avec J.M. Barandiaran (Barandiaran et Fernández Medrano 1959).

La fouille du couloir a fourni deux crânes humains et d'autres os, ainsi qu'une industrie lithique qui a des pièces géométriques de silex -deux triangles et deux trapèzes à retouches abruptes, un grattoir, un racloir, etc. Cependant, dans la chambre, il y avait deux niveaux séparés par un orthostate tombé à l'intérieur. Le supérieur correspondait à une phase de réutilisation du Bronze ancien et du Chalcolithique tardif et il y a des restes humains, trois pointes de flèches avec pédoncule et ailerons, une hache polie, 14 boutons hémisphériques perforés en 'V', un poignard en bronze et des céramiques campaniforme à imprimé incisé (type Ciempozuelos). Au niveau inférieur, sous l'orthostate tombé, 14 crânes ont été collectés, ainsi que d'autres os humains, des morceaux de céramique lisse et une orné de bandes, des pièces géométriques de silex (16 triangles, 16 trapèzes) et de spatules-idoles incomplètes (Barandiaran et Fernández Medrano 1964). Sur le côté ouest de la chambre on a remarqué la présence de trois stèles de grès.

Les spatules-idoles récupérées sont très incomplètes. Trois pourraient provenir d'un petit ensemble puisqu'ils se trouvaient dans les cadres 12D et 12E, et l'autre le plus éloigné de 5D, bien que ce dernier présente une grande similitude avec l'un des exemplaires du première lot (Figure 8).

- La spatule-idole n° 1 (Figure 9.1) se trouvait dans le cadre 12D. L'épiphyse est très abrasée, jusqu'à ce que le tissu spongieux apparaisse à un moment donné. L'intense repli de la zone de convergence de l'épiphyse avec la diaphyse délimite deux petits renflements circulaires parallèles excisés, interprétés comme la représentation de seins féminins. Ensuite, sur le côté dorsal de la diaphyse, on observe des rainures transversales larges et profondes, régulièrement espacées, formant 7 crêtes excisées.

Enfin, il existe un morceau de palette, qui peut correspondre à son extrémité distale ou à celle d'un autre spécimen daté de 5920±40 BP.

- Une deuxième spatule-idole, dont seule la partie correspondant à la diaphyse sciée en demi-ronde est conservée, provient du cadre 5D (Figure 9.3). Il présente sur sa face ventrale une décoration côtelée avec plusieurs rainures profondes et parallèles dans l'arcade, puis le même motif mais dans le sens opposé. Un échantillon de l'objet a fourni la date de 5380±40 BP.
- La troisième provient du cadre 12D et présente des caractéristiques similaires à celles du n° 1 mais plus incomplètes (Figure 9.2). L'épiphyse est profondément abrasée. Un second segment de la spatule-idole, de 13,1 cm, est décoré dans la partie la plus proche de l'épiphyse avec 3-4 sillons en zig-zag parallèles, disposées perpendiculairement à l'axe de l'objet et s'étendant dans tout son périmètre. Ils sont interrompus dans une des faces lorsqu'ils arrivent à la zone sciée. Sur le côté opposé, cependant, cela donne l'impression que le zigzag pourrait être inséré entre des motifs en arc, dont l'un est maintenu à une extrémité et quatre à l'autre. L'objet ne pouvait pas être daté par C-14.

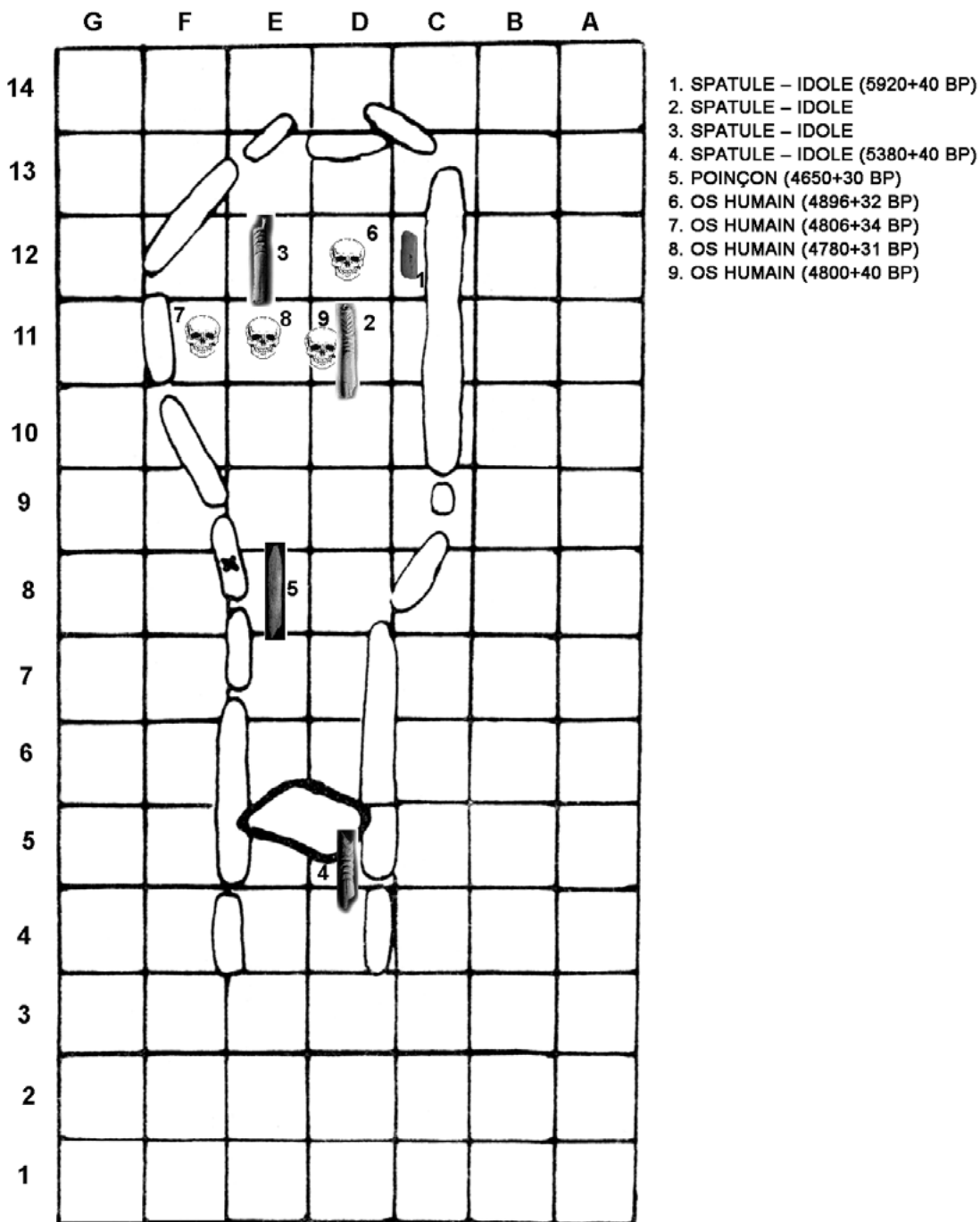


Figure 8. Situation des échantillons datés du dolmen de San Martín (Laguardia, Álava).

- La quatrième spatule-idole, similaire à la dernière décrite, provient du cadre 12E. Sur la face ventrale de la moitié proximale il présente une décoration à rainures profondes avec des motifs en arc à tendance concentrique (Figure 9.4). Sans datation C-14.

8. Datation des spatules-idoles

Afin de préciser la chronologie de ces objets, nous avons demandé les autorisations correspondantes pour dater les deux objets de Kurtzevide et quatre spatules-idoles et un poinçon de San Martín.

Les objets ont été datés au Laboratoire Beta Analytic (Miami, Florida, USA) et d'Oxford et toutes sont faites par AMS. Dans le tableau suivant (2) les dates des os humains et des spatules-idoles des deux mégalithes sont présentés.



Figure 9. Spatules-idoles du San Martín (Laguardia, Álava).

Dolmen	Échantillon	Data BP	Cal BC	Laboratoire
Kurtzebide	Spatule-idole	5340±40	4320-4290 4270-4040	Beta-339341
Kurtzebide	Os humain	4445±95	3365-2903	I.-10826
San Martín	Spatule-idole	5920±40	4900-4860 4850-4710	Beta-317865
San Martín	Spatule-idole	5380±40	4330-4220 4210-4160 4130-4060	Beta-339342
San Martín	Poinçon	4650±30	3520-3390 3390-3369	Beta-339342
San Martín	Os humain	4800±40	3658-3516 3398-3384	Beta-273269
San Martín	Os humain	4896±32	3761-3742 3731-3726 3715-3637	OxA-X-2627-24
San Martín	Os humain	4806±34	3654-3619 3610-3522	OxA-X-2627-25
San Martín	Os humain	4780±31	3643-3518	OxA-X-2626-36

Tableau 2. Dates obtenues pour les dolmens de Kurtzebide et de San Martín.

Les dates obtenues sont cohérentes avec les contextes mis au jour lors de la fouille. Les ossements humains appartiennent à la fin du Néolithique et au Chalcolithique. Le poinçon de San Martin a été trouvé sur la dalle tombée avec des objets typiques du Chalcolithique et la date obtenue confirme cette attribution culturelle.

Les spatules-idoles datées des deux dolmens sont toujours plus anciennes que les os humains, presque d'un millénaire. Ces dates appartiennent à une époque à laquelle il n'existait pas de dolmens classiques, mais il est possible qu'il profite ou modifie un type de structure funéraire antérieure ('coffre'), qui n'a pas pu être délimité lors de la fouille.

9. Conclusion

Les spatules-idoles ont été trouvées dans des mégalithes de différents types (dolmens simples et dolmens à couloir), mais pas dans d'autres contextes funéraires (grottes, abris).

Elles ont été fabriquées dans des os d'ovicapridés, à l'exception de l'un des Zumacales qui a été fabriqué à l'aide d'un radius humain.

En général, elles ont été considérées comme une partie du mobilier, du rituel funéraire, comme objets de prestige ou de pouvoir.

Les dates obtenues directement sur les spatules-idoles provenant de l'intérieur des dolmens, sont un millénaire plus ancien que les inhumations datées aujourd'hui.

Enfin, nous croyons que le résultat de la date la plus ancienne n'est pas un problème de laboratoire où de l'échantillon envoyé. Le problème est dans l'interprétation archéologique. Peut-être les dolmens ont-ils été construits en tirant parti des anciennes structures funéraires simples (coffres, tertres funéraires), en les modifiant et en s'appropriant leur symbolisme comme point de référence territorial.

Compléments

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Symbolism in prehistoric Extremadura: a small zoomorphic figure in the natural monument 'Cuevas de Fuentes de León' (Fuentes De León, Badajoz)

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Abstract

Hereby, we present the finding of a clay zoomorphic figure during the archeological excavations in Cueva del Agua, inside the Natural Monument 'Cuevas de Fuentes de León'. This article shows a preview about the archaeological and contextual scientific analysis of this piece datable in the Recent Prehistory of the southwest of the Iberian Peninsula.

Keywords: zoomorphic figurine, Récent Prehistory, Natural Monument Cuevas Fuentes de Leon, Extremadura, Iberian Peninsula

Résumé

Nous présentons la découverte d'une figure zoomorphe en argile située dans les fouilles archéologiques menées à Cueva del Agua, à l'intérieur du Monument Naturel 'Cuevas de Fuentes de León'. Cet article présente une avancée dans l'analyse scientifique du caractère archéologique et contextuel de cette pièce, qui date de la Préhistoire Récente du sud-ouest de la Péninsule Ibérique.

Mots-clés : figure zoomorphe, Préhistoire Recente, Monument Naturel Cuevas de Fuentes de Leon, Estrémadure, Péninsule Ibérique

1. Introduction

The zoomorphic figures of Late Neolithic and Chalcolithic of the Iberian Peninsula are very scarce, being very limited the scientific knowledge and the investigations carried out. The finding of a small figurine of cooked clay in the archaeological excavations carried out in Cueva del Agua in the 'Cuevas de Fuentes de León Natural Monument' (Fuentes de León, Badajoz) deserves an in-depth analysis at the level of species, style and archaeological context, as well as a comparative examination with analogous pieces located in the same geographical area that allow to translate interpretations about the prehistoric societies that create this type of material culture (Figure 1).

The Natural Monument 'Cuevas de Fuentes de León' is located in the municipality of Fuentes de León, to the south of the province of Badajoz (Extremadura) and bordering the northern area of

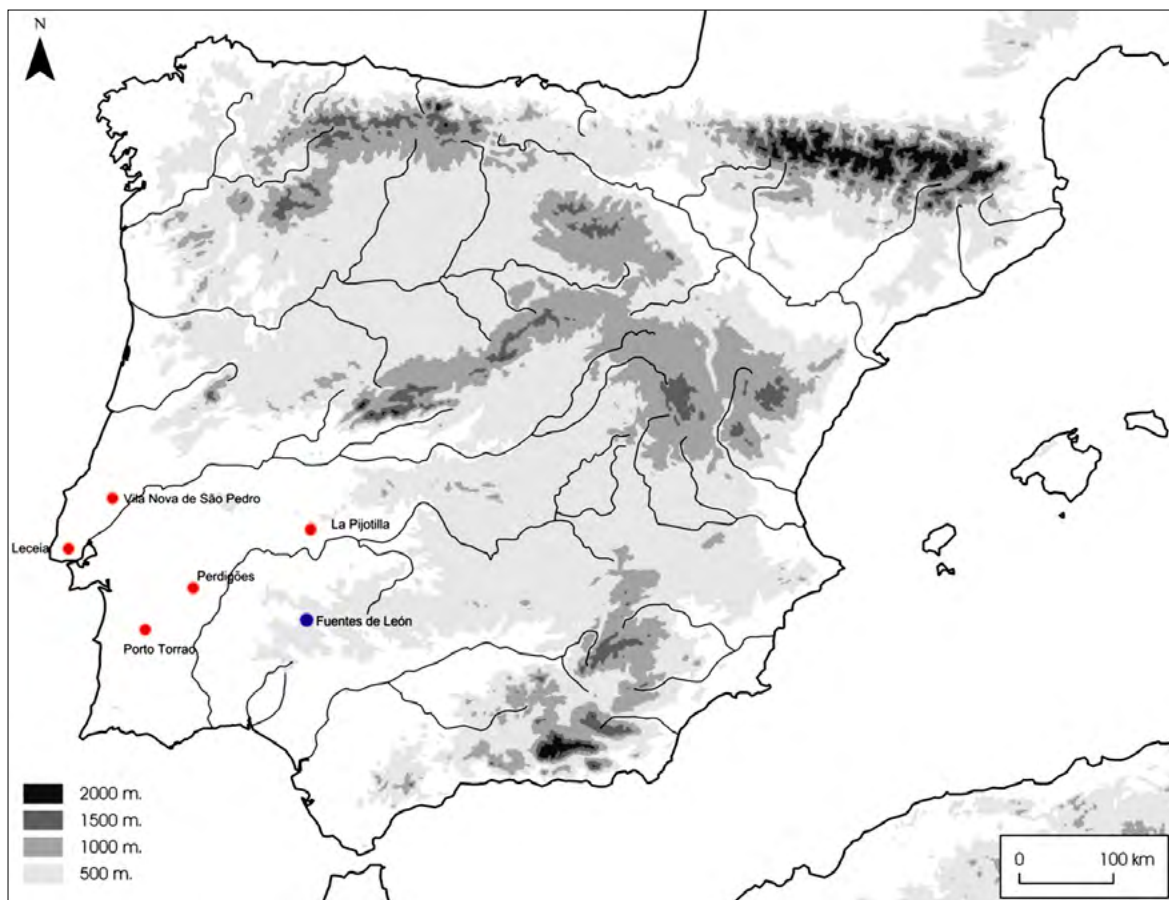


Figure 1. Location of archeological sites with zoomorphic figures in the Iberian Peninsula.

the province of Huelva (Andalusia). This privileged enclave is constituted by a multitude of cavities and formations developed in limestones of the Lower Cambrian belonging to the Ossa Morena Zone of the Hespérico Massif. The Monument is constituted by a set of five caves and several chasms: Cueva del Agua, Masero (or Bonita), Los Postes, El Caballo, Lamparilla and Sima Cochino I and II; recent explorations in the monument identify the presence of several caves and chasms that had not been previously documented, such as Lupercalia, Sima Miranda and La Rebuscá. The presence of these caves in the southwest of the province of Badajoz is exceptional because the main geological characteristic of Extremadura do not allow the existence of underground spaces, being a unique enclave in the entire southern strip of Extremadura.

The Natural Monument ‘Cuevas de Fuentes de León’ is a protected area for its outstanding geological, biological, archaeological and paleontological values from different periods in all cavities. For this reason, several caves of this group have been the subject of interventions and scientific studies since 2000 as a result of the research project ‘ORIGINS’, coordinated by the Directorate General of Libraries, Museums and Cultural Heritage of the Junta de Extremadura (Collado *et al.* 2015), whose objective is to characterize the different human occupations detected in the caves of the monument, as well as to analyze the continuity of use of these spaces throughout prehistory.

We can define as ‘zoomorphic’ any object that has an animal shape or structure in its morphological features. The prehistoric zoomorphic figures in the Iberian Peninsula stand out for their scarcity as well as their contexts being not much described or mentioned, which means that knowledge about this type of material in the peninsular territory is insufficient. It is specifically during the periods of the Late Neolithic and the Chalcolithic (second half of the IV and during the III millennium BC) when we see this new practice of modeling figures and containers or containers with zoomorphic

characteristics, in the case of singular pieces that mark an artifactual innovation. During this period, and ascribing ourselves to the southwestern peninsular area where we are immersed, we find zoomorphic elements in different raw materials (bone, ivory, minerals, rocks, clays) with different sizes and styles, being also several animal species represented.

2. Study and analysis of the piece

The piece in question is a zoomorphic figurine of cooked clay located in the called Cueva del Agua, an impressive aquifer originated from a partial detachment of the roof, thus creating a natural dam that retains the waters and give room to an underground lake; It has a total of six caverrooms, being occupied by said lake the first two. Inside it has been able to document archaeological remains as well as rock engravings. Since 2012 the cave suffers different valuation archaeological surveys began to be carried out outside the cavity, surveys that continued in successive archaeological interventions during the campaigns of 2015, 2016 and 2017 (Collado and Bello 2016). The verification of surface material culture in these surveys opened the possibility of the existence of some type of external settlement that could be correlated with the presence of materials inside the cavity.

This figurine was located during the archaeological excavation campaign carried out in 2016 in the intervention zone called Exterior Sounding 1, an archaeological sounding under the visor located on the outer wall of the cavity; the piece comes from the grid called C2 and from the stratigraphic unit or level 9, which provided traces of recent fauna, probably falling from the visor of the cavity, so that it cannot be considered as an intact level. This archaeological level has a maximum height of 99,451 cm, and a minimum of 99,281 cm. above sea level, with a clear geological dip with southeast direction tending to the interior of the visor area. The unit presents a sediment of brown coloration, sandy texture (0.06-2 mm) loaded with moisture and loose consistency. The stratigraphic unit presents inclusions of stones of endogenous character (rocks of karstic type, fragments coming from the fracture of the track and visor) of small, medium and large size together with remains of lithic material of exogenous origin to the cavity (river pebbles, coming from the nearby river), roots and some clay pellets.

This figure was elaborated from modeled clay and later subjected to cooking. The piece is incomplete, keeping only the back or rear part of a quadruped animal, whose extremities are broad and short, showing a possible tail between them. On its inner or lower face, an incised line of longitudinal demarcation is observed between the two extremities of the animal. It has the following measures: 82.36 mm maximum conserved length, 56.21 mm in its widest area and 36.48 mm in its narrowest area; the piece retains a maximum measure of 46.04 mm thick and 29.78 mm in its narrowest area. According to these dimensions and in comparison with other similar elements with which it is possible to draw up parallels, it is an element of considerable size with a total weight of 183 grams, resulting therefore of a movable object made to be placed and / or exposed.

Among its formal characteristics, it is possible to appreciate a clayey composition rich in mineral degreaser (possibly mica of iron oxide or pyrite, through a mineralogical analysis). It presents in its paste a type of very thick mineral degreaser (more than 2 mm thick), a cooking of oxidizing character and a reddish brown colour, being a thick structure of up to 46.04 mm. The treatment carried out on the surface is of the smoothed type although the most exposed areas show erosion and loss of part of it, being appreciated above all in the lower part of the fragment (Figure 2).

The archaeological material associated with this zoomorphic artifact consists of scarce bone industry (with a complete bone punch) and hand-made pottery, with a total of 61 fragments weighing 825 g for this grid and stratigraphic unit, which represent the 14.35% of the sample for the survey in the 2016 campaign. We distinguish non-decorated pottery, with 16 fragments of identifiable shapes, together with 43 atypical ones without decoration. The latter represent 70.49% of the total sample of pottery, with external and internal surfaces predominantly of Good

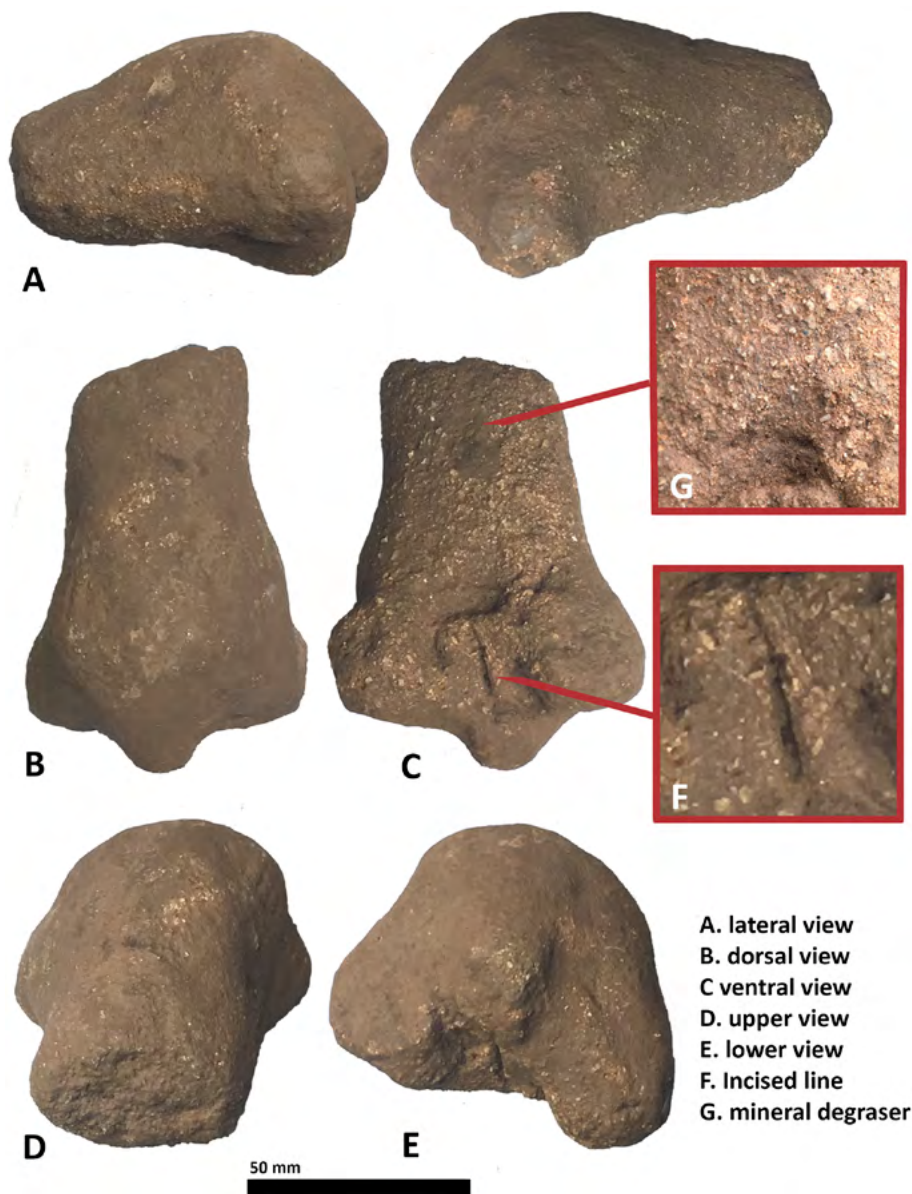


Figure 2. Views of Fuentes de León's zoomorphic figure.

Quality (53.48% and 41.86%, respectively), with fine smoothing and smoothing surfaces. The firings are represented by most of the reductive cooking (60.46%) compared to oxidants (23.25%) and mixed (16.97%). The degreasers are mostly coarse (81.39%) and the walls of these atypicals are thick (74.41%) and medium (25.58%). The fragments show a predominance of coloration of the range of browns on their external surfaces (93.02%) and internal surfaces (79.06%).

The pottery shapes not decorated in this unit include, as we have indicated, a total of 16 fragments, which are distributed among 9 edges, 1 ribbon handle with vertical orientation, 3 bases (flat and semi-flat), 2 necks screw and 1 shoulder. The edges represent 14.75% of the sample, with predominantly salient (5), incoming (3) and ignored (1) and pointed (4), rounded-pointed (3) and semi-flat (2) lips; the diameter of these edges ranges between 5-10 cm (2) and 10-15 cm (4), not having been possible to determine it in 3 specimens. These non-decorated pottery fragments are characterized by external and internal surfaces in which good quality predominates (9 and 7, respectively), with smoothed surfaces. Most of the fragments have reductive firings (7) and, to a lesser extent, oxidant (4) and mixed (5); among the degreasers, coarse (12) and medium (4) types prevail, with thick (10) and medium (6) thickness walls in the sample. Externally and internally, the fragments present surfaces of brown (13) and black (3) coloration.

Regarding decorated pottery (3.27%) the sample is scarce. We locate a fragment with a slight shoulder that shows surfaces with a good treatment (fine smoothing on both sides), oxidant firing, medium degreasing, thickness of the piece is middle and coloration of the range of browns on both surfaces. The decoration of this fragment consists of printed circles. In addition, a unique fragment of atypical decoration is conserved that presents in its external surface incised parallel lines with 'burr' product of its execution with the paste still wet; both surfaces are smoothed, the firing is reductive, the degreaser is medium, being a thick piece with coloration of the range of browns on both sides. This pottery decoration, although scarce, is usual in contexts belonging to the Neolithic in a broad sense, being more frequent in the full moments of the period. Although it is the most significant remains in terms of cultural ascription, taking into account that the object we are dealing with does not come from an intact level, we are not in a position to extend the proposed cultural award to all the ergology recovered in this sedimentary unit, especially taking into account the presence of elements similar to ours in other sites of later chronology located in the southwest.

The presence of human remains was not found throughout the survey, so it is possible that it is a habitat or domestic context, although, as we have indicated above, altered by recent removals.

3. Other similar zoomorphic figures in the southwest of the Iberian Peninsula

Clay figurines or round-shaped figures respond to a limited number of species. During the III millennium BC the range of species represented is mostly limited to quadrupeds, with bovine, suids and animals with hybrid characteristics. These vestiges are quite scarce and geographically are concentrated in the southwest of the Iberian Peninsula, especially in the portuguese area. The known collection of zoomorphic elements in the area of the Iberian Peninsula cannot be seen as a uniform set of objects, but it is convenient to include them within a comparative framework that allows us to know their cultural context and provide us with more information about their meaning, concentrating specifically on the study of clay figures. Geographically, chronologically and stylistically there are some pieces with characteristics like the zoomorphic of Fuentes de León with which it is possible to draw parallels.

Among the quadrupeds, whose species is not possible to determine, stand out the pieces found in the Portuguese sites of Vila Nova de Sao Pedro (five figures of possible quadrupeds recovered in housing contexts, Paço 1970) or Perdigões (four statuettes found in surface; Valera *et al.* 2007). As for the representations of bovids and hybrid animals (representations with a mixture of species), they usually appear fragmented and come from non-funerary areas; some of the hybrids have an ambiguous aspect, being more usual bovine-suids, that is to say, animals with heads of pigs (identifiable by the shape of their heads, ears and eyes) and bovine bodies or even representations of bovine with legs or tail of porcine character. Among the places with this type of vestiges, in the southern part of Portugal, the Leceia site (Valera *et al.* 2014) stands out, with three hybrid bovine statuettes in a domestic or habitat context and a chronology corresponding to the Late Neolithic; a hybrid figure of a possible bovid-pig found on the surface at the site of Porto Torrao, in Ferrerira do Alentejo (Portugal) (Arnaud 1993) or the clay figurine of a bovine, decontextualized, from the Extremadura site of La Pijotilla (Badajoz) (Hurtado 1990). All these pieces share characteristics with that found in Cueva del Agua, providing us with great information when carrying out the scientific analysis of our concrete figure based on analogies.

4. Conclusions

As we have mentioned throughout the present work, the finding of this type of figures is very scarce, with a very small number. The zoomorphic clay sculptures of Neolithic and Chalcolithic chronology from the south of the Iberian Peninsula in reference to species, contexts, spatial and

chronological distribution do not seem to follow a homogeneous pattern or category, which makes their interpretation difficult.

Fuentes de León zoomorph is a round bulge, its dimensions being considerable as it is a type of manifestation conceived possibly as a sitting deposit. The interpretation of the represented species is difficult to preserve few identifiable characteristics of the figure; it is possible to define it as a quadruped animal that, taking care of its rear part, conserves a possible tail, characteristic present in the representations of pigs and / or swine, being able to be an animal of this species. In the III millennium, bovines and pigs belong to the range of most common species among clay figures in similar contexts. In the specimen that occupies us, in its internal or inferior face, an incised line of longitudinal demarcation can be seen between the two extremities that allows to pose the possible sexual designation of the represented specimen, being able to be a female.

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Painting the Neolithic landscape of the Amblés Valley: Schematic Art, landmarks and symbolic territories of Central Iberia

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Abstract

The role that Rock Art might have played in the construction of the Iberian Neolithic landscape has long been explored in the Mediterranean regions of Spain. The paintings, either corresponding to the Levantine, Macroschematic or Schematic styles, have been considered the earliest cultural actions on the landscape, beginning in the Early Neolithic, and serving functional, economic and symbolic purposes. Unlike Levantine and Macroschematic paintings, the spatial distribution of Schematic Art covers the whole of the Iberian Peninsula. In inland Iberia, this style has traditionally been dated to the Metal Ages. It is only recently that its antiquity has been recognized, and similar theories about its function during the Neolithic have begun to be investigated. However, it has not been possible to perform this analysis in certain areas, such as in the province of Ávila, where there is a scarcity of sites with Schematic Art. Our research project, aimed at examining the neolithisation process in the Amblés valley, has led to the discovery of Schematic-style paintings in three prehistoric sites. The locations of these sites in the Amblés share a common feature, namely, their proximity to important resources, such as watercourses and summer pastures, which were crucial for the Neolithic herders. This seems to suggest that the earliest Neolithic groups might have used Schematic paintings to landmark the space, that is, to claim property rights over the most profitable resources, and, consequently, to construct symbolic territories which, thus consolidated, continued through Late Prehistory.

Keywords: neolithisation, Central Iberia, Schematic Art, landmarks, symbolic territories

Résumé

Le rôle que l'art rupestre pourrait avoir joué dans la construction du paysage néolithique ibérique a longtemps été exploré dans les régions méditerranéennes de l'Espagne. Les peintures, qu'elles correspondent aux styles levantin, macroschématique ou schématique, ont été considérées comme les premières actions culturelles sur le paysage, à partir du néolithique ancien, et à des fins fonctionnelles, économiques et symboliques. Contrairement aux peintures levantines et macroschématiques, la distribution spatiale de l'art schématique couvre l'ensemble de la péninsule ibérique. Dans l'intérieur de l'ibérie, ce style a été traditionnellement daté des âges des métaux. Ce n'est que récemment que son antiquité a été reconnue et des théories similaires sur sa fonction pendant le néolithique ont commencé à être prises en compte. Cependant, il n'a pas été possible d'effectuer cette analyse dans certaines régions, comme dans la province d'Avila, où il y a une pénurie de sites d'art schématique. Notre projet de recherches visant à examiner le processus de néolithisation dans la vallée d'Amblés, a conduit à la découverte de peintures de style schématique dans trois sites préhistoriques. Les emplacements de ces sites dans les Amblés partagent une caractéristique commune, à savoir leur proximité de ressources importantes, telles que les cours d'eau et les pâturages d'été, qui ont été cruciales pour les éleveurs néolithiques. Cela semble suggérer que les premiers groupes néolithiques pourraient avoir utilisé des peintures schématiques pour marquer l'espace, c'est-à-dire de revendiquer des droits de propriété sur les ressources les plus rentables, et, par conséquent, de construire des territoires symboliques qui, ainsi consolidés, ont continué par la Préhistoire tardive.

Mots-clés : néolithisation, Ibérie centrale, art schématique, points de repère, territoires symboliques

1. Introduction

Research into the role of certain rock paintings in the neolithisation process has a long history in specific regions of the Iberian Peninsula, and fundamentally the Mediterranean area, where three of the main post-Palaeolithic art forms -Levantine, Macroschematic, and Schematic styles- can be found (Cruz Berrocal 2005; Cruz Berrocal & Vicent 2007; Cruz Berrocal *et al.* 2014; Fairén 2004, 2006; García Puchol *et al.* 2004; Hernández Pérez & Martí 2000-2001; McClure *et al.* 2008; Utrilla 2005). However, also in the interior of the Peninsula several rock paintings and engravings have been attributed to the first farming groups (Bueno 2008; Bueno & Balbín 2000; Bueno *et al.* 2004). Such proposals have been the result of an analysis of Rock Art from the perspective of Landscape Archaeology (Ingold 1986), whereby among the land appropriation strategies of itinerant groups to establish control of certain critical resources, painted markers would have had a symbolic function.

As regards Schematic Art, reservations concerning the chronology due to the undeniable parallels of some motifs on rock with those of portable art of the Chalcolithic have disappeared (Hernández Pérez 2007). There is now no doubt that it can be ascribed -at least, that is, the initial phases of its representation cycle- to the Early Neolithic, around mid-6th millennium BC, in both the Mediterranean regions of the Peninsula (Acosta 1968; Carrasco *et al.* 2006; Hernández Pérez 2008; Marcos Pou 1981; Martínez García 2004, 2006; Miret *et al.* 2008; Torregrosa & Galiana 2001) and Inland Iberia (Collado & García Arranz 2009, 2013; Fernández Lozano *et al.* 2017; Jiménez Guijarro 2006; Lucas Pellicer *et al.* 1997; Martins 2014; Rubio 2006; Sanches *et al.* 2013). Consequently, two stages are usually distinguished nowadays: Early Schematic Art, which corresponds to the Neolithic, and Later Schematic Art, developing in the Age of Metals and continuing through to the Iron Age. The most widespread interpretation as to the purpose of schematic paintings and engravings is once again that of symbolic markers in land appropriation strategies. This notion is perfectly summarised in the most poetic way in the title of an article by I. Rubio (2006) 'on paintings from the Neolithic communities of the Central Mountain Range: *the colour red tames nature*'.

In the case of Ávila, this type of approach is not yet very common in research into prehistoric Rock Art. This is due on the one hand to the small number of locations, around ten, with documented Schematic Art, and on the other hand to the lack of information, at least in the majority of cases, regarding Neolithic occupations in the surrounding area. Nevertheless, in the Amblés valley there happen to be several sites with Schematic Art which, moreover, have occupations at the foot of the decorated panels, and in some cases these date back to the Neolithic. Two of these sites have been excavated by our research team, and therefore we have been prompted to reflect on the role of Schematic Art in the neolithisation process in this region.

2. Schematic rock art of the Amblés valley in its provincial context

It is only recently that Schematic-style rock paintings and engravings have begun to be discovered in the province of Ávila (Figure 1). Not until 1974 did we learn of the paintings that decorate an impressive granite outcrop located in the area of Ojos Albos, near to the Guadarrama mountain range (Álvaro Bobadilla 1974). With this finding, which has been given different names (such as Peña Mingubela or Mingovela, Cerro de la Cabra, Abrigo de las Cabras, and Abrigo del Corral Hondo), Ávila has been put well and truly on the map in terms of Iberian territories with prehistoric Rock Art. This is because of the complexity and great worth of the motifs distributed among some thirty collections, for which differing dates have been put forward; these range from the Bronze Age to medieval times (González-Tablas 1980). The existence on the top of the Cerro de la Cabra of a settlement ascribed to the Late Bronze Age would support the idea that the paintings may have originated then (Delibes 1995a: 103).

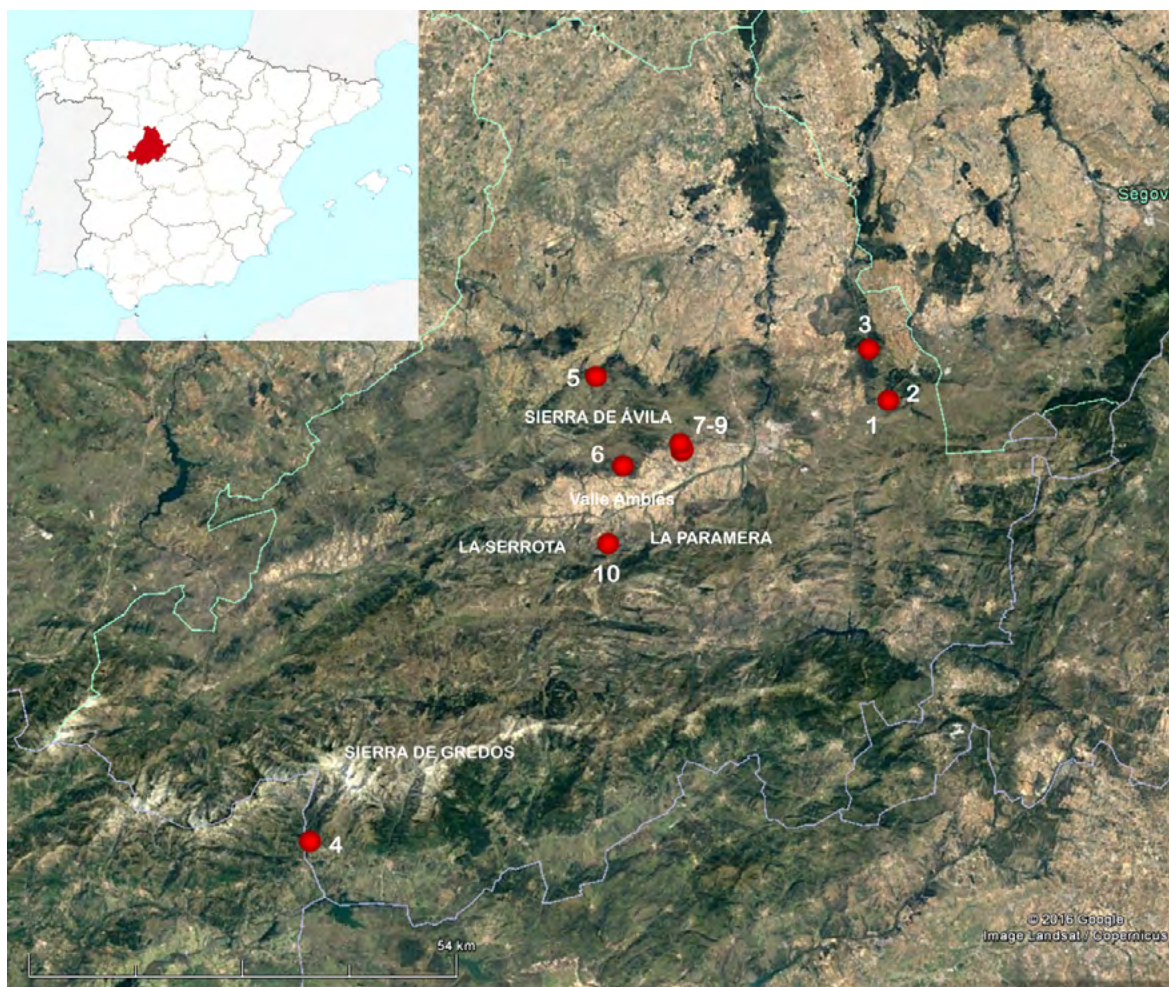


Figure 1. Sites with Schematic Rock Art in the province of Ávila: 1. Peña Mingubela (Ojos Albos); 2. Peña del Castrejón (Ojos Albos); 3. Dehesa de Tabladillo (Blascoeles, Santa María del Cubillo); 4. Peña Escrita (El Raso); 5. Castro de La Mesa de Miranda (Chamartín); 6. La Peña del Águila (Muñogalindo); 7. El Canto del Cuervo (Muñopepe); 8. La Atalaya (Muñopepe); 9. La Cueva del Gato (Muñopepe); 10. Umbría de Robledillo (Robledillo, Solosancho).

At least in terms of geographical proximity, a relationship should be established between the paintings of Peña Mingubela and those of Peña del Castrejón, also in Ojos Albos, and the paintings of Dehesa de Tabladillo, in Blascoeles (Santa María del Cubillo), recently discovered (Ripoll *et al.* 2014) and the object of current study.

Outside of this nucleus, in the south of the province and, more specifically, on the southern side of the Gredos Mountain Range, are the paintings of Peña Escrita o Risco de las Zorreras, not far from the (pre-Roman) Vetton *oppidum* of El Freíllo, in El Raso. These were made known to the scientific community by A. Beltrán in a talk given in Ávila Museum, in which he argued that the panels had been completed in three stages and that chronologically speaking they should be ascribed to between the Late Neolithic and the late Bronze Age (Terés 1987: 61).

Additionally, in another Vetton *oppidum*, that of La Mesa de Miranda, in Chamartín but in the centre of the province, a red schematic motif has been documented in a rock shelter to the south of the wall of the second enclosure yet externally, and which Fabián (2005: 63) associates with the settlement's occupation. With the exception of this case, where the decorated shelter is located actually inside a settlement, and, as we have seen, in Peña Mingubela, it is uncommon for sites containing Rock Art to be apparently related to occupations. However, in the Amblés valley there is a reversal of this tendency, which is why we shall pay closer attention to its decorated sites.

The Amblés is an intra-mountain tectonic basin which extends for 42 km along a NE-SW axis in the heart of the province of Ávila. It is delimited to the north by the Ávila mountain range and to the south by those of La Paramera and La Serrota; this encompasses an area of approximately 800 km² which revolves around the course of the river Adaja, a tributary of the Duero on its left side. It contains a wealth of pre- and proto-historic sites, with over a hundred listed to date (Blanco 2008); nevertheless, examples of rock art from these times are practically unheard of.

2.1. *La Peña del Águila (Muñogalindo)*

This is the name given to a granite promontory, at 1,173 m.a.s.l., which hangs above the slope marking the transition between the ridge ascending to the Ávila mountain range to the north and the bottom of the valley to the south. The surface of the site is slightly over 3 hectares, although most of the materials tend to be concentrated near to the rock after which it is named. In fact, it was on an adjacent plateau that excavations were carried out in the nineteen seventies, affecting a surface of 71 m²; such excavations confirmed the chronology of the occupations hinted at by the pieces recovered at surface level, ranging from the Neolithic to the Early Bronze Age (López Plaza 1974, 1975, 1976, 1979, 1980).

The schematic art forms, brought to light by López Plaza (1983), are embodied in a series of engravings on granite boulders, dispersed up to more than 1 km from the settlement; they include prehistoric motifs (one zoomorphic and one reticulated) together with other historic, possibly medieval, ones such as crosses (Figure 2).



Figure 2. Left, La Peña del Águila (Muñogalindo) (photo: E. Guerra Doce); right, some Schematic engravings of La Peña del Águila (López Plaza 1983).

2.2. *Sites with schematic art at Muñopepe*

On the same ridge which in the north delimits the Amblés valley and in the direction of the capital of the province, lies the municipality of Muñopepe, home to an absolute wealth of sites from Recent Prehistory (Fabián 2006). Surface materials, scattered over an area strewn with granite rocks, cover some 10 hectares, and are concentrated at diverse points; this may well be accounted for by the existence of numerous water sources. In at least three of these sites, also on the first slope ascending to the Ávila Range, mention is made of rock paintings which are always in reddish tones.

El Canto del Cuervo

Once again we are talking about an impressive granite crag which gives its name to the site, characterised by a couple of panels decorated with red motifs typical of the schematic tradition



Figure 3. Left, El Canto del Cuervo (Muñopepe) (photo: E. Guerra Doce); right, Schematic paintings at the site (Fabián 2006).

(Figure 3). We can discern masculine anthropomorphic forms accompanied by faint lines which may well represent more complex designs that nowadays have deteriorated due to inclement weather and the flaking of the support (Fabián 2006: 156-157). The materials that appear on the surface around the crag show considerable signs of erosion, as do those recovered in the three testing trenches carried out at the foot of the paintings and which affected a surface area of 36 m²; this seems to suggest that in the event of an occupation, this would not have been exactly underneath the Canto del Cuervo (Guerra *et al.* 2017: 17). As regards the chrono-cultural context, at least the pottery and stone remains provide most information here, with recipients largely from the local Chalcolithic, despite the recovery of a Ciempozuelos Beaker fragment and several carinated vessels possibly from the Early Bronze Age (Fabián 2006).

La Atalaya

Two hundred metres from the Canto del Cuervo towards the south-west is another of these prehistoric *loci* of Muñopepe, once again around a number of rocks among which one stands out, receiving the name of La Atalaya by the local residents. The schematic paintings are distributed on five panels ranging from this crag overlooking the Adaja valley to four more on another enormous boulder -known as Atalaya Chica- delimiting the site to the east. On the main panel, or panel 1, the motifs include some twenty anthropomorphs alongside circular figures, dots and the occasional straight line; the other panels, meanwhile, display lines in very poor condition as a result of conservation problems (Figure 4). The materials recovered at surface level (pottery, flint tools and several fragments of polished stone tools) in the vicinity of this rocky terrain would suggest a Late Neolithic-Chalcolithic occupation (Fabián 2006: 160-1). Yet as a result of several testing trenches between the clearings left by the blocks of granite, previous levels were detected corresponding to the Early Neolithic and dated to the end of the 6th millennium BC; these would be followed by chalcolithic occupation represented by pits breaking the Neolithic levels and in some cases reaching the geological substratum (Guerra *et al.* 2017). What is more, number 7 excavation area, at the foot of the Atalaya Chica, made it possible to document several cup marks of possible anthropogenic origin on a granite slab embedded in the ground (Aicara 2009: 56).

It is possible that the paintings were created over a long period of time and that the panels were undergoing completion throughout the different episodes of the site's occupation. To support this proposal is the fact that both at the Neolithic levels and in one of the chalcolithic pits, red pigments have been recovered; these have been identified by X-Ray Diffraction as slates and

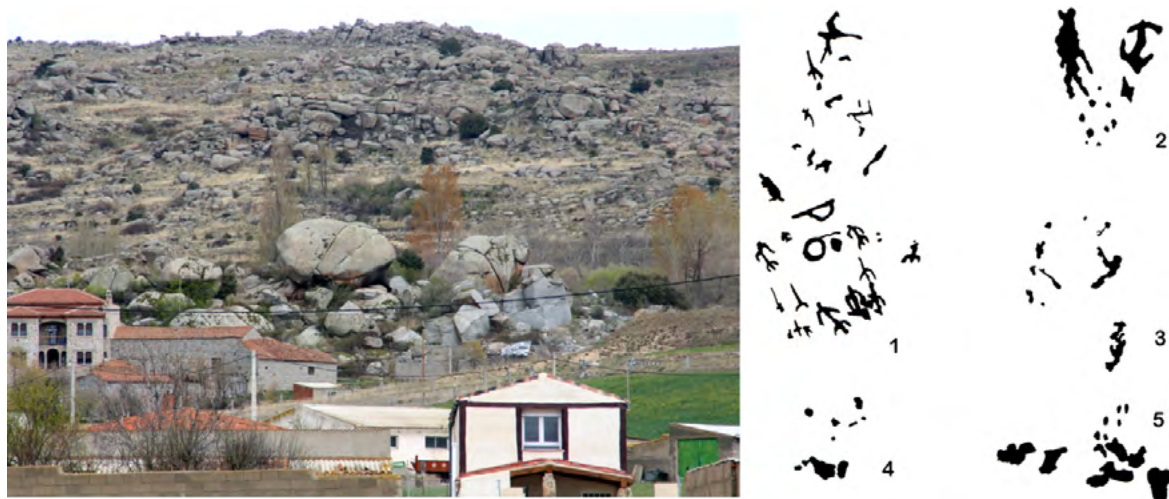


Figure 4. Left, La Atalaya (Muñopepe) (photo: E. Guerra Doce); right, Schematic paintings at the site (Fabián 2006).

ferruginised shales, goethite and oligistus.¹ If this idea is correct, the first painted motifs in La Atalaya would date back to the Early Neolithic, around the end of the 6th/beginning of the 5th millennium BC.

La Cueva del Gato or Casa del Gato

On a rocky promontory above La Atalaya there is a small cave, or rather a shelter, called after a large crag which is a feature of the landscape. Fabián (2006: 164) mentions the existence there of rock paintings that represent anthropomorphs inside the main granite promontory, but nowadays these have disappeared. In addition to a flat copper axe discovered on the surface (Delibes 1995b: 41) there are other materials (pottery, clay pedestals, flint tools) which due to their typology are no doubt from the Copper Age, when this cave could have been used as a meeting place.

2.3. Umbría de Robledillo

During the course of our field work we have come across new schematic paintings in the Amblés. For the moment this is the only documented case on the southern edge of the valley, an area full of rocks known as the Umbría de Robledillo on account of its situation on the northern side of the Paramera mountain range, and to the south of the village of Robledillo, which belongs to the municipality of Solosancho. The red painted motifs are displayed on a towering crag which dominates the landscape, or to be exact on several planes of the rock facing the bottom of the valley. The paintings are in very poor condition, although it is possible to distinguish anthropomorphs and a cruciform design together with other fainter ones such as circles and vague lines (Figure 5). At the foot of the panels we were able to recover a handful of prehistoric ceramics and some flint flakes, which seemed to suggest a new example of art and occupation. For this reason, we excavated two testing trenches, over a surface area of 4.5 m², which led to the recovery of a few materials, mainly pottery. Despite the scant chronological information obtained from most of this collection, the typology of two pottery sherds enabled to establish a Neolithic context: a circular section horizontal handle and sherd with a small knob, which Thermoluminescence dating established in the first half of the 4th millennium BC.

It is interesting to consider the visual connection between this and the Cueva de los Moros, a Neolithic site located a little over 200 metres to the south-west, and to add that in light of the

¹ The study of these pigments has been the responsibility of Dr. Gaspar Alonso Gavilán, of the Geology Department of Salamanca University, to whom we are grateful for his collaboration in this project.



Figure 5. Left, Umbría de Robledillo (Robledillo) (photo: E. Guerra Doce); right, some of the Schematic paintings at the site (DStretch-image enhancement)..

ceramics collected on the surface (flutings, impressions and plastic cordons decorated with fingertip impressions), it could be dated to the Early Neolithic, perhaps towards the end of the 5th/beginning of the 4th millennium BC (Fabián 2006: 56-57, 484).

3. Landmarking: the role of schematic art in the recent prehistory of the Amblés valley

When analysing the Rock Art of Trás-os-Montes, in Northern Portugal, Sanches *et al.* (1998: 97) already noted that it might usefully be studied in relation to natural resources, as Rock Art might have acted as a territorial system. The sites with Schematic Art on the northern edge of the Amblés and the only one reported so far on the southern edge share some spatial characteristics:

- They are not situated in the flat areas of the valley bottom but on the slopes of the mountain ranges, near to streams and smaller brooks.
- There is evidence of human activity, or even actual occupations, at the foot of the decorated panels, which dates back to the prehistoric times. These sites were particularly attractive for prehistoric communities, which explains the successive visits throughout Late Prehistory, dating back in certain cases to the Neolithic.
- Granite crags, strewn around the whole area, leave only tiny clearings which would be a problem for cultivation to take place. Notwithstanding, good grazing land would appear to suggest cattle farming as the main economy of these sites.
- The choice of supports for the motifs seems neither unintentional nor random: at all times these were impressive granite boulders which stood out on the landscape and were recognisable even at a distance of several kilometres, so much so that they were given their own name. In fact, this tends to be a common feature of the Neolithic sites in the Amblés valley, in a location with large crags which represent visual reference points in the area (Guerra *et al.* 2012).
- To a large extent the motifs tend to be displayed on canvasses looking out onto the bottom of the valley, which denotes an interest in visually controlling the area (perhaps the communication routes?).

All of this seems to underscore the symbolic nature of Schematic Art in the Amblés valley, as a way to transmit information about the landscape and make use of the most favourable enclaves as territorial markers. The need to depend on landmarks would have been appropriate, since visits to these sites were episodic and there is no association with stable structures, implying that the occupants were sedentary, at least until the 3rd millennium BC. As these, then, were itinerant communities, the necessity of establishing indicators of ownership over certain critical resources would have been vital.

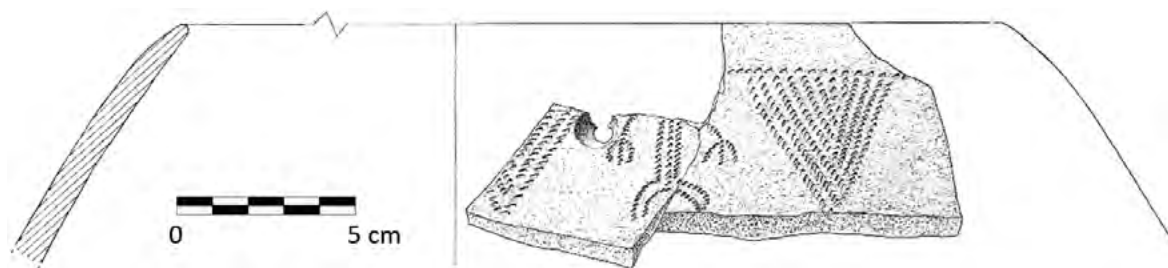


Figure 6. Pottery vessel from the Copper Age site of Cerro de la Cabeza, with an anthropomorphic motif depicted on the outer wall (drawing: Ángel Rodríguez González).

Identifying a Neolithic phase in some of these sites (La Peña del Águila, La Atalaya and Umbría de Robledillo) leads us consider the hypothesis that these artistic representations could have been the product of that particular time, a point which the reddish pigments recovered at the Neolithic levels of La Atalaya would also suggest. This would, on the one hand, corroborate the early chronological context of Schematic Art in the province of Ávila and, on the other, enhance the importance of the Neolithic; not only did the latter leave its mark on techno-economic aspects, but also on the realm of beliefs and ideological referents. A legacy that will endure and prosper throughout the Chalcolithic, incorporating new supports as canvasses for Schematic Art (Figure 6).

Acknowledgements

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Bronze Age hoards from the Carpathian Basin to the French Atlantic coast: European similarities and regional specificities

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Abstract

This paper presents the main results of a PhD thesis dealing with the European Bronze Age hoards (2200-800 BC). The high variability of these assemblages forms the starting point of this study, developed following two research axes, the first one focusing on the content of the hoards i.e. an intrinsic approach (statistical analysis) and the second one on their repartition in the landscape i.e. an extrinsic approach (spatial analysis). This study could highlight several common features between the five investigated areas as well as regional specificities. The signification of the hoards is also discussed in this paper, presenting the current accepted interpretations and adding some new hypothesis. A recap chart of the results allows to consider a diffusion of the practice from East to West.

Keywords: Hoards, Bronze Age, spatial analysis, statistical analysis

Résumé

Cet article présente les principaux résultats issus d'une thèse portant sur la pratique des dépôts non funéraires de l'âge du Bronze (2200-800 av. J.-C.) en Europe. La grande variabilité de ces ensembles constitue le point de départ de cette étude, développée selon deux approches, l'une intrinsèque c'est-à-dire ayant pour objet la composition de ces ensembles (analyse statistique) et l'autre extrinsèque, autrement dit s'appuyant sur leur implantation dans le paysage (analyse spatiale). Ce travail de thèse a permis de mettre en évidence un certain nombre de similitudes entre les cinq zones-échantillons mais également des préférences régionales. La signification de ces ensembles est également abordée dans cet article en rappelant les principales interprétations admises à l'heure actuelle et en proposant par ailleurs de nouvelles hypothèses. Un récapitulatif des résultats permet d'envisager enfin une diffusion de la pratique d'Est en Ouest.

Mots-clés : dépôts non funéraires, âge du Bronze, analyse spatiale, analyse statistique

1. Introduction

European Bronze Age hoards (2200-800 BC) show a high variability in space and time regarding their content as well as their frequency. In this paper I will present briefly the main results of my PhD thesis finished in 2015, based on an extrinsic and an intrinsic approach (Blitte 2015). Five areas have been analysed thanks to various statistical methods and the use of a GIS. Single finds and hoards from following areas have been inventoried (Figure 1): western Carpathians (eastern Hungary and Slovakia), Mittel- und Oberrhein-Gebiet (called 'MESG', central Germany), Denmark, Burgundy Doors (eastern France, Switzerland and south-western Germany) and an enlarged Armorican Massif (western France). The analyses went through a total of 4331 hoards and single finds and revealed similarities between the chosen areas as well as regional specificities. After giving a short definition of the hoard practice, the main similarities and specificities will be described. The interpretation of these hoards will be then approached, including common hypothesis and new propositions. To conclude, a diffusion of the practice from Eastern Europe to Western Europe will be suggested.

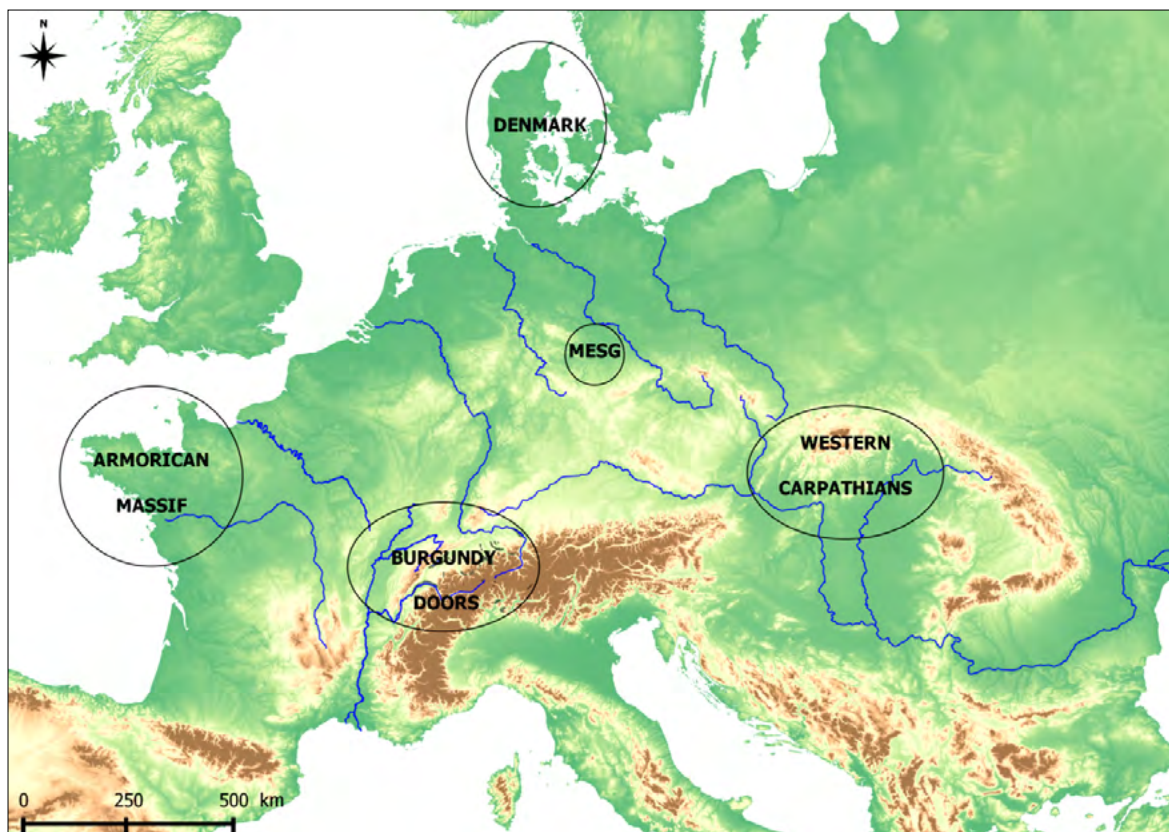


Figure 1. Areas investigated within the PhD thesis.

2. Definition

A hoard is composed of artefacts, mostly made of bronze, selected to be deliberately abandoned together. They were buried or immersed in different locations, rarely within an identifiable context such as a household sector for example. Often discovered by chance, these objects are in different conditions: whole or fragmented, new or well-worn. Some of them were even carefully deposited in a pot or/and under a stone. Several categories of objects can be identified in these sets: weapons, adornments, axes, tools, knives, pieces of harness, drinking vessels, ingots etc. The hoard practice covers two aspects: on one hand, hoards that contain at least two artefacts and up to many hundreds, and on the other hand, single finds i.e. a unique object (Jensen 1972; Brun *et al.* 1997; Bradley 2013). Hoards can be divided in different groups regarding their content. One-type hoards contain only one category of objects whereas multi-type hoards are composed of several categories. In the same manner, homogeneous hoards gather artefacts coming from a unique cultural world, whereas heterogeneous hoards reflect many cultural origins.

Understanding this social practice is difficult owing to its rhythm and to the great variability of content of these assemblages but is necessary to approach the Bronze Age societies, since it constitutes an important part of their ritual economy (Earle and Kristiansen 2010).

3. European similarities

The statistical approach as well as spatial analyses pointed out several similarities between the five investigated areas. The most relevant common features are presented below.

The first similarity concerns the discovering context of the hoards and single finds since most of them have been buried in the soil (41% of the all data) and at a low altitude, that is to say less than 300 meters high above sea level for the western Carpathians, the MESG and the Armorican

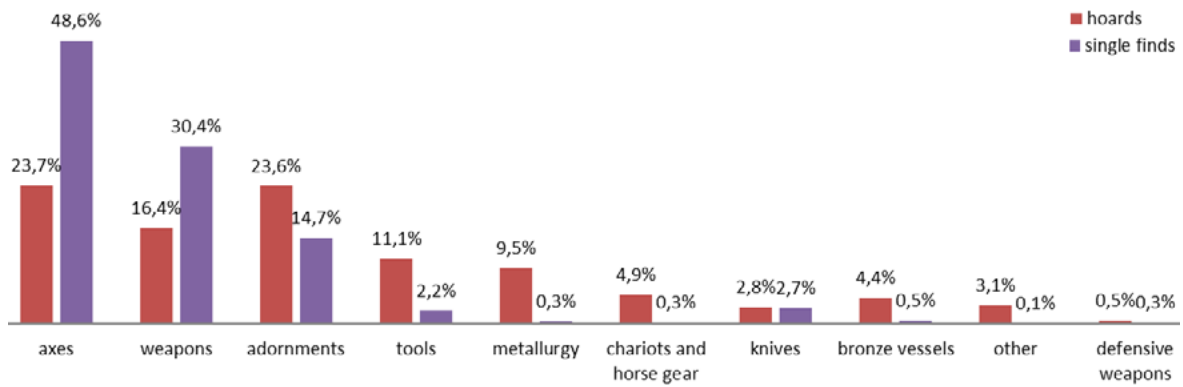


Figure 2. Functional categories of objects deposited within the hoard's practice during the Bronze Age.

Massif, and 500 meters high above sea level for the Burgundy Doors (80% to 90% of the studied data, i.e. without Denmark, which could not be investigated through spatial analyses). In each region, between 50% and 70% of the hoards have been found with certitude in a terrestrial context. The case of the single finds is more questionable and more difficult to analyse.

In all regions, axes, weapons and ornaments are the three categories of objects privileged to be deposited within the hoard practice (Figure 2). Only the order of preferences changes from a region to another, weapons and axes being more often deposited alone than in a set (single finds from the western Carpathian could not be analysed in this thesis). On the opposite, other objects such as bronze vessels, pieces of horse gear or metal scraps are barely abandoned as single finds.

The fragmentation of objects in the hoards is attested in all regions with different rhythm and different proportions. Nevertheless, in all cases the median of the fragmentation ratio is non-existent (Figure 3), which means that the phenomenon of fragmentation within hoards is actually marginal, despite an increase through time. Fragmented objects are indeed present in only half of the hoards in western Carpathian, the MESG and the Burgundy Doors and less in Denmark and the Armorican Massif. Very few of them are composed with more than 60% of fragmented objects or even exclusively with fragments.

Despite an increasing complexity of the multi-type hoards through time, especially during the Late Bronze Age, hoards composed of one, two or three categories of artefacts predominate the

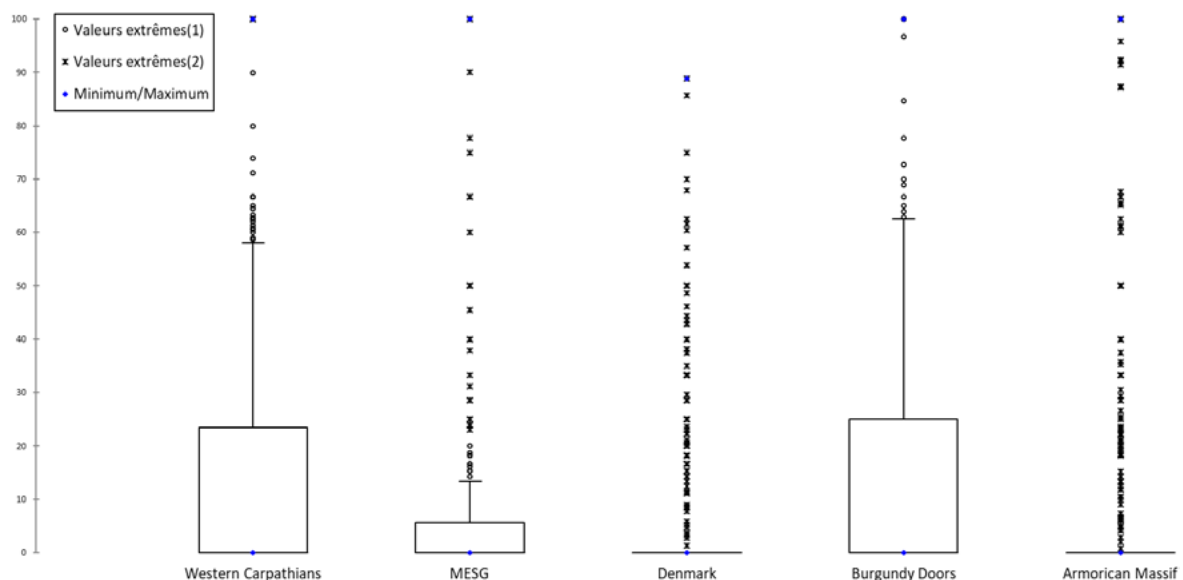


Figure 3. Box-Plot of the fragmentation ration of hoards in each region.

inventory in each area for the whole period. Very complex multi-type hoards can contain up to nine different types of artefacts but remain exceptional.

Finally, the beginning of the Late Bronze Age shows very high densities of hoards and artefacts in each studied area, revealing the importance of some zones of rivers confluences. For example, the confluence between the Tisza and the Bodrog in the western Carpathians or between the Loire and the Sèvre nantaise in the Armorican Massif.

4. Regional specificities

Although the hoard practice is a European phenomenon, as it was highlighted in the previous part of this paper, each region developed its own preferences. The main specificities of each area are listed below.

In the first place, the Armorican Massif constitutes a very singular region in two ways. It is the only area where one-type hoards are globally more numerous than multi-type ones (57% of the corpus) and also the unique region with mostly homogeneous sets (Figures 4 and 5). This means

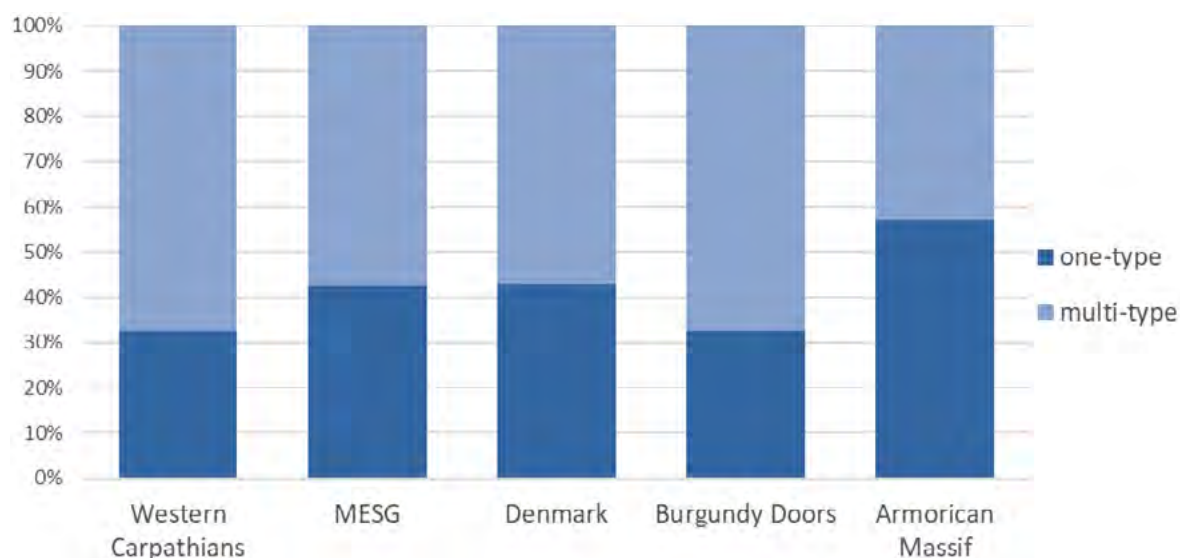


Figure 4. Functional composition of the hoards in each region.

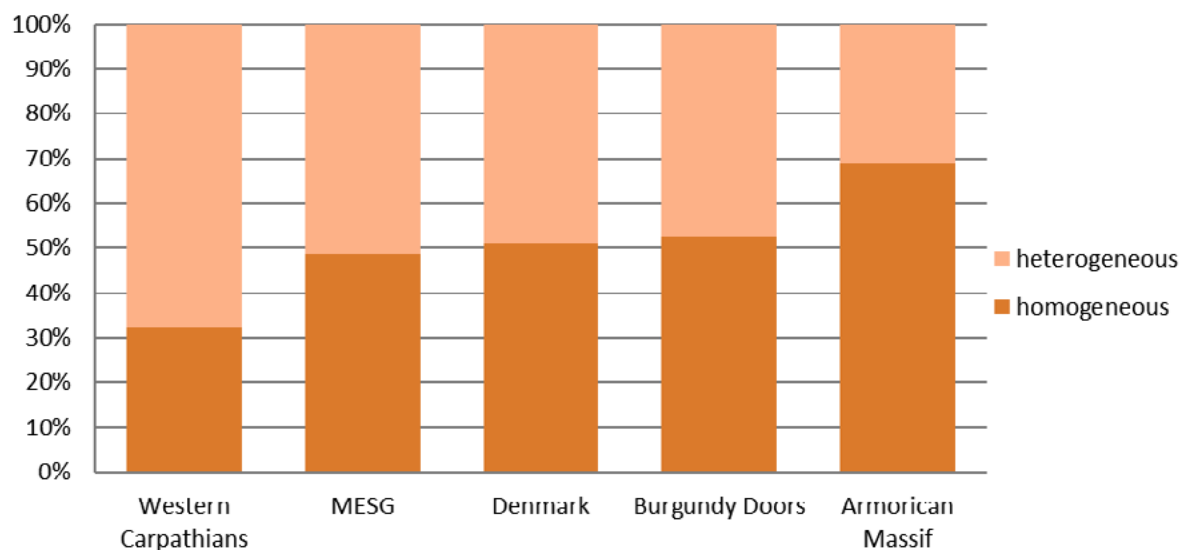


Figure 5. Cultural composition of the hoards in each region.

that almost 70% of the armorican hoards contain exclusively artefacts from Atlantic origin. This specificity is attested for the whole Bronze Age.

On the contrary, the western Carpathians delivered more imported objects than local ones since only 32% are homogeneous assemblages (Figure 5). The biggest and the most complex hoards were also discovered in this area, respectively Debrecen I with 1081 objects (BzD-HaA1) and Esztergom or Bodrogheresztúr with 9 categories of objects (BzD-HaA1).

In Denmark, no hoards were found in domestic context nor totally fragmented. Furthermore, it is the only region where the evolution of the hoard practice is exactly the reverse of the evolution of the single finds practice (Figure 6). In my opinion, a pure coincidence should be excluded.

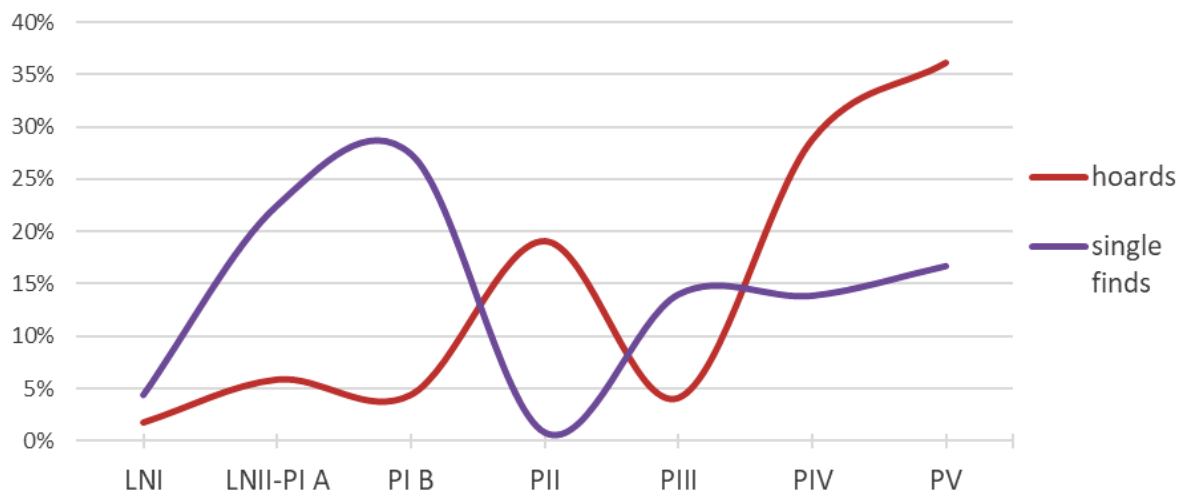


Figure 6. Evolution of the hoard's practice in Denmark during the Bronze Age.

The MESG has the highest spatial concentration ratio of hoards and single finds among all: up to 3.29 hoards/km² in some zones during Bronze A2/A3 (Figure 7), well above the other investigated areas which are never higher than around one hoard/single find per kilometre squared. The relative stability of the centre of gravity of the corpus in this area testifies also from a great constancy in the location of the hoards and single finds during the Bronze Age.

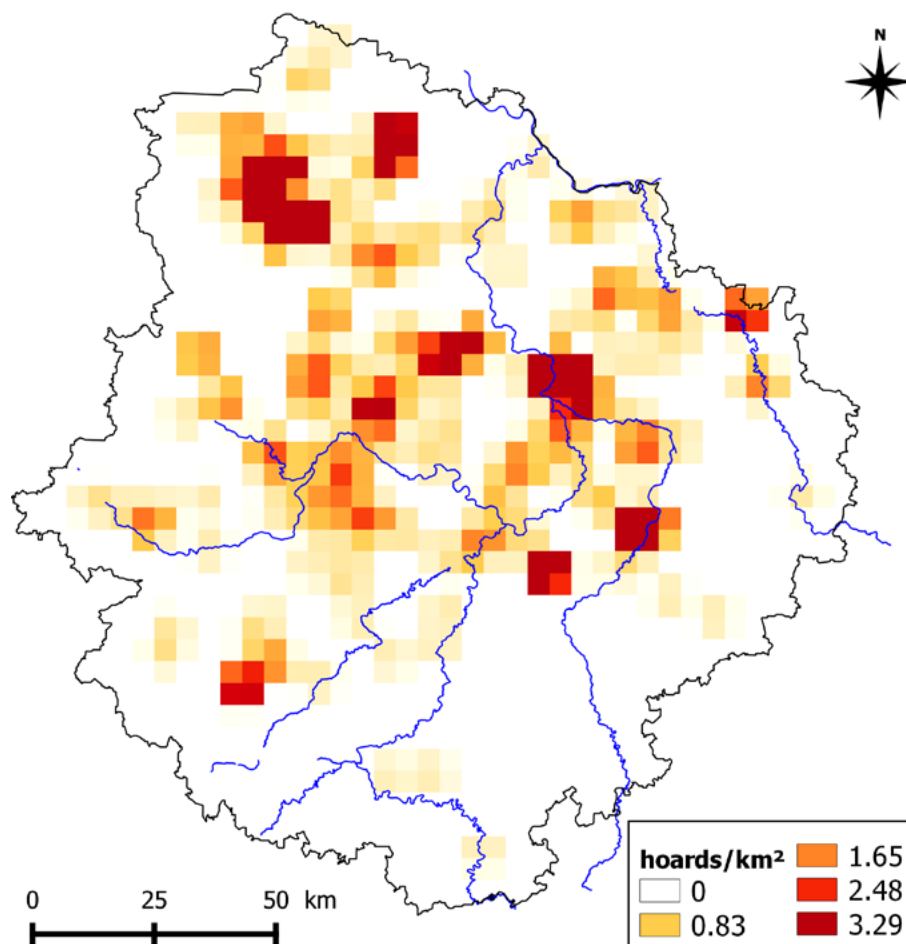
Last, in the Burgundy Doors, the orientation axis of the standard deviational ellipse is relatively stable through time, no opposite change of the axis was noticed unlike in the other regions. This axis follows globally the direction of the Sône and Doubs rivers.

5. Interpretations

Because of the huge amount of bronze objects that have been abandoned and never recovered, the hoard practice is nowadays still under discussion. Two main interpretations have been proposed by the scholars, namely understanding them as a stock of wealth/primitive money (Needham 1990; Sommerfeld 1994) or as votive offerings (Montelius 1885; Baudou 1960). This second hypothesis reflects different possibilities such as being a mean for the elite to legitimize its power (Kristiansen 1998) or simply offerings to ask the deities for protection or thank them for a good harvest for example (Helms 2009). They can also be the result of a transaction or an agreement between different persons (Needham 2007).

Regardless the high variability of content of these assemblages suggests that we are dealing with individual as well as collective initiatives. Indeed, a single find cannot be considered like a very complex multi-type hoard. While the first one could be deposited by anyone, the other requires

Figure 7. Map of the density of hoards in the MESH during Bronze A2/A3.



people with great wealth. Nevertheless, criteria such as the biography of the object or its material composition could change these assessments (Blitte 2017).

Another interpretation is to consider single finds deposited in fords and passes as an evidence for rites of materialized passage (Van Gennep 1909). Numerous examples are known in the ethnographic record such as the Obo/Lhapsa in Himalaya or the Kerkour in Morocco. By depositing offering to the deities or spirit, the travellers insure a safe journey through the mountain. In the same way, ceremonies could have taken place near fords to prepare the crossing of the river.

The motivation behind the very-big one-type hoards is still unclear. Ingot-rings and sickles in central Europe as well as axes in western Europe have been deposited in huge quantities and never been recovered. Their possible function as primitive money let diverse scholars interpret them as merchant's stock but with another point of view, we could understand them as rest of social payments. Indeed wealth is used in primitive societies to pay mainly social obligations (Testart, Govoroff and Lécivain 2002) such as for example the bride price or the blood price. Law or tradition fixes the nature and amount of goods required in each case of payment, leading to their storage until they could be used. Some unexpected events could explain that these hoards have never been recovered since it is commonly prohibited to have these goods available for other purposes.

The high variability of content could be also linked to the depositary and its motivation. The depositary probably invested a different amount of wealth regarding his social group. The content of the hoard could thus represent his signature such as weapon for warrior, feminine adornments for women or specific tools for bronze workers. The event might be the key element of the hoard practice (Figure 8). It could have determined the depositary, the kind of goods and its quantity but also the location of abandon of the objects.

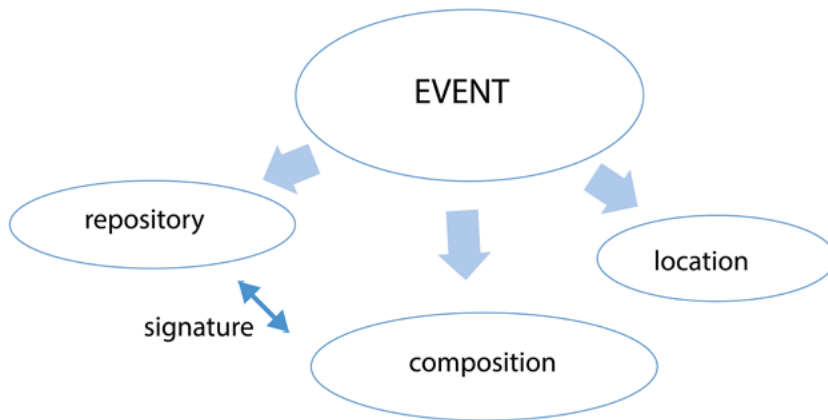


Figure 8. Diagram explaining the event as a key element for hoard's deposition.

The numerical composition is not random but probably fixed in advance by rules, like it is the case in the Hittite societies. Several types of events require to deposit offerings to the deities following three criteria: the location (outdoor or in the house), the time of the day (morning, midday, evening, night) and the precise number of offerings (Haas, Spuler and Altenmüller 1994). Depending from the event and the intention of the rite, the Hittites offered mostly 3, 7, 9, 12 or 30 artefacts. These numbers have different significations and can be related to religious elements such as deities' groups or refer to the calendar in use. A similar approach can be considered for the contemporary European societies of the Bronze Age. An analysis of the numerical composition of European Bronze Age hoards has been conducted by two scholars on the bronze vessels and defensive weapons (Warmenbol 2010) as well as on swords (Brandherm 2007). In the five regions studied during this PhD, it appears that bronze vessels or swords are often deposited by 3 or multiple of 3. Moreover, more than half of Danish hoards and from the MESHG have a pair of identical objects, while around 40% of the hoards of the western Carpathian and Burgundy Doors are concerned and only 22% present this characteristic in the Armorican Massif.

6. A diffusion from East to West?

When we sum up some results of this PhD thesis, it appears that some features appear earlier in the eastern part of Europe than in the western part (Table 1):

- The hoard practice ends earlier in the western Carpathians than in the other investigated areas. Denmark shows even a pronounced gap with hoards dated from Hallstatt C.
- The phenomenon of fragmentation of the artefacts is already attested during the Early Bronze Age in the western Carpathians, the MESHG and the Burgundy Doors, whereas it appears later in the Armorican Massif and Denmark.

Areas	Peak	End	Fragmentation	Complexity	Arrival of horse gear and bronze vessels
Carpathian Basin	BzD-HaA1	HaB2/3	from BzA2 100% BzD-HaA1	5 categories BzB Maximum 9	Bronze vessels BzB Horse gear BzC
MESHG	BzA2	HaC	from BzA1 100% BzA2	5 categories BzA2 Maximum 7	Bronze vessels BzD-HaA1 Horse gear HaA2-B1
Denmark	HaB2/3	HaD	from BzC Never 100%	5 categories BzC Maximum 9	BzD-HaA1
Burgundy Doors	BzD-HaA1	HaC	from BzA1 100% BzD-HaA1	5 categories BzB Maximum 9	BzD-HaA1
Armorican Massif	BzC	HaC	from BzB 100% BzD-HaA1	5 categories BzC Maximum 8	Bronze vessels BzD-HaA1 Horse gear HaA2-B1

Table 1. Recap chart of the main results of the study.

- The great complexity of the assemblages can be documented in the MESH for Bronze A2, then in the western Carpathians and the Burgundy Doors for Bronze B and is finally attested in Denmark and the Armorican Massif during Bronze C.
- New objects that show prestige, in particular bronze vessels and horse gear, appear very early in hoards from the Carpathian region during the Middle Bronze Age while they are present only from the beginning of the Late Bronze Age in the other areas. Horse gear appears last in the MESH and the Armorican Massif during HaA2-B1.

Moreover, some hoards have been deposited in domestic context during Bronze A2 in the western Carpathian and the MESH, but only during Bronze C in Normandy, during Bronze D-Hallstatt A1 in Switzerland, Hallstatt A2-B1 in the Saône valley and during Hallstatt B2/3 in Brittany.

The western Carpathians, precocious on several points, have with the MESH similarities and constitute thus the origin core of the hoard practice and its modalities. Kilometres away, Denmark and the Armorican Massif are late regarding some criteria. Denmark is also the last region to use the hoard practice. Thereby a light opposition between the Atlantic cultural sphere (Armorican Massif and Denmark) and the continental one (Burgundy Doors, MESH and western Carpathians) comes out.

The Bronze Age hoard practice seems therefore to be initiated in eastern Europe, where new modalities and new criteria of composition of the sets arise and then gradually spread to the north and to the west of Europe. This development explains the common features identified in all the investigated areas while regional specificities could be related to cultural preferences or local necessities.

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Neolithic and Bronze Age Studies in Europe: from material culture to territories present eight papers from the 2018 UISPP Congress. Topics include the neolithisation process in the Iberian Peninsula; faunal exploitation in early Neolithic Italy; the economic and symbolic role of animals in eastern Germany; Copper Age human remains in central Italy; animal figurines; spatula-idols; territories and schematic art in the Iberian Neolithic; and finally Bronze age hoards at a European scale. The diversity of the papers reflects contemporary approaches and questions in those periods.

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