Animal remain in Chalcolithic funerary context in Portugal: the case of Perdigões (Reguengos de Monsaraz, Alentejo)

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ABSTRACT
Funerary sites in Late Neolithic/Chalcolithic Portugal are generally classified as natural or artificial caves, dolmens and tholoi. Regardless of their architectural expression, they are almost exclusively collective and mostly secondary in nature. The presence of animal remains, commingled with human skeletal fragments is common. Although they have not been systematically identified nor quantified, faunal bones are fairly constant in megalithic tombs and caves, when used as burials. Assemblages analyzed from a zooarchaeological perspective have revealed little human-produced changes, suggesting their purposeful funerary usage. In the case of Perdigões, a Chalcolithic site located in Reguengos de Monsaraz, a series of animal remains have been recovered. Their relationship with animal/human interaction is addressed, in light of available paleodemographic data.

KEY WORDS
Chalcolithic; funerary contexts; zooarchaeology

RESUMO
Os sítios funerários do Neolítico Final/Calcolítico em Portugal são classificados na sua generalidade como grutas naturais ou artificiais, aitas e tholoi. Independentemente da solução arquitectónica encontrada para cada caso, estes túmulos são quase exclusivamente colectivos e de natureza predominantemente secundária. A presença de restos de animais, misturados com porções de esqueletos é comum. Mesmo que não tenham sido sistematicamente identificados nem quantificados, os restos faunísticos são consideravelmente frequentes nos túmulos megalíticos e nas grutas utilizadas como sepulturas. Destes conjuntos, aqueles que têm sido analisados do ponto de vista zooarqueológico revelaram poucas alterações antrópicas, consentâneas com uma utilização alimentar (ou como matéria-prima). No caso dos Perdigões, um sítio calcolítico localizado perto de Reguengos de Monsaraz, foram recuperados vários restos de fauna nos dois túmulos já escavados. Este artigo descreve os restos de fauna encontrados no sepulcro I dos Perdigões e debruça-se sobre o seu possível significado neste contexto funerário e a sua relação com interacções homem/animal nessa época.

PALAVRAS CHAVE
Calcolítico; contextos funerários; zooarqueologia

1. CONTEXT OF LATE NEOLITHIC (CHALCOLITHIC) BURIALS

In South Portugal, every funerary context from Late Neolithic/Chalcolithic time frame can be included in one of four general categories: natural caves, artificial caves, dolmens and tholoi. To date, all the tombs identified for this time period are collective (Gonçalves, 2004: 472) even if with a variable number of occupants. Their history is diverse: some of these spaces were abandoned during the Chalcolithic, others at the end of that period, others were still occupied during Bronze Age and some had successive occupations, even though they might have been intertwined with periods of apparent abandonment. In the case of Perdigões, its occupation appears to have been limited to the Late Neolithic/Chalcolithic (Valera et al., 2000). It is a settlement site with impressive preser-
vation conditions, apparently occupying a circular area, delimited by a series of concentric ditches, clearly visible in aerial photograph (see Figure 1). The area within the widest circle totals 16 hectares.

The history of its discovery is closely related to the investment of wine industry in the area, namely by FINAGRA S.A. Settlement foundation and abandonment are surely linked to strategies already known for the Chalcolithic (vide Valera, 2003 for discussion of abandonment in this time period).

The most appealing characteristic of this site is the fact that it contains all the components for a habitation environment of first agriculturalist/pastoralist communities, organized in spatially structured settlements: it has a central area, clearly delimited by a nuclear circle (or founding core), areas that are apparently peripheral but contained within circles concentric to the core, and a semi-peripheral mortuary area. The latter defines a visible “bubble”, external to the habitation area. Apart from these components, as a final touch for perfection, the site faces a series of megalithic elements (menhirs), standing by the Ribeira do Alamo, East of the settlement, lined up with the Monsaraz mountain. Within the funerary restricted area, a series of eight tombs have been identified, on the basis of small flagstones and human remains visible on the surface.

Radiometric dating of Perdigões has not yet been possible, given that the human bone samples from Tomb I and II, tested for collagen content by the Instituto de Tecnologia Nuclear in Sacavém, Portugal, have not yielded sufficient nitrogen levels. The artefact assemblages recovered from the site, however, point towards an occupation located between the 4th and 3rd millennia B.C.

2. THE FUNERARY ASSEMBLAGE

From the eight tombs identified to date at Perdigões (see Figure 2) only three have been excavated: the two first ones (here designated as Tomb I and II) were investigated in the context of a research project developed by the authors, focusing on mortuary practises within Perdigões. The third one was only partially excavated at the surface, in order to clarify some questions regarding its architecture.

In both tombs excavated so far, it became clear that the architecture of the two buildings is distinct, in spite of the fact that they both follow similar structural concepts; even though the two aesthetical solutions are different, their foundation plans are similar: both possess a double hemisphere base, connected by a narrower passage – a structure shared by many funerary buildings from this time period, especially those excavated in the bedrock; there are classical examples of this type of structure at Grutas de Alapraia (Gonçalves, 2004), Carenque (Heleno, 1933). These two areas, roughly defining two hemispheres connected by a corridor, are commonly designated as atrium and chamber, often following relative size criteria (the one with the largest diameter is designated as chamber). In both cases excavated at Perdigões, human remains were deposited in both the atria and corridors, as well as in the chambers. The use of such terms for these portions of the funeral buildings – atrium, chamber, corridor – is as old as the interest for megalithic tombs across Europe; in reality, they do not correspond to any effective description of the mortuary usage of such buildings. If in Tomb I the area designated as atrium contained only a few human remains and abundant artefacts (grave goods?), in Tomb II, the same section held a considerable number of human bones, in clear mixture. In the latter, the only portion anatomically connected was a completely articulated foot, only lacking its distal ends (intermediate and distal phalanges). By contrast, the area designated as chamber (given its relatively larger size) held fewer human remains but these were apparently more organized and concentrating along the walls. The atypical corridor, sided by bulky standing blocks, also contained bone fragments between the large boulders.

Furnishing of Tomb II is radically different from that of Tomb I, in spite of the similarity in building plans. Tomb I is lined with thin slate flagstones all around its internal wall, while Tomb II lacks those architectural elements. If these diverse solutions are due to chronological differences is still unclear.

3. HUMAN REMAINS IN PERDIGÕES I AND II

Both Tomb I and II are exclusively secondary, i.e., their use as funerary chambers, testified by the presence of human remains in their interior, was restricted to the deposit of totally or partially defleshed human remains (Valera et al., 2000). These likely come from a different area within the settlement or cemetery or (in alternative) from surrounding villages of smaller dimension, whose inhabitants elected Perdigões cemetery for their final place of burial. One can only speculate about the “final” nature of these tombs. In fact, if it is clear that the depositions are all secondary (vide Roksandic, 2002 for definition of collective and secondary burials) we cannot ascertain whether this was the last resting place for the deceased. Such funerary practises, of continuous and repetitive nature, are extremely detrimental to the analysis of osteological data from human remains; osteobiographies are difficult to construct, the relationship between individuals and artefacts is impossible to establish, the construction of paleodemographic profiles becomes an endless task. Adding to these difficulties, the bone surface is severely damaged by post-depositional trampling and also by human transportation and manipulation, leading to crushing, cracking and erosion, which erase the periosteum and restrain
any paleopathological diagnosis. These surface changes, however, are indicative of past behaviours and they must be carefully read, in the light of taphonomical principals already established by zooarchaeology and physical anthropol­ogy (e.g. Lyman, 1994; Turner e Turner, 1999; White, 1992).

Tomb I and II of Perdigões are still under analysis, namely the human remains exhumed from both tombs. Given the commingled nature of the assemblage, we defined a strategy for analysing the human bones: after separating all the elements recovered from the field according to anatomical region, laboratory analysis proceeded for each bone individually. Preliminary results are available uniquely for Tomb I. The best indicators of Minimum Number of Individuals present at Tomb I are teeth. Hence, an estimate of the minimum number of human individuals that could have been buried at PDG I and could account for the present bone assemblage was estimated on the basis of individual identification of teeth and their quantification by side (see Figure 3).

To date, a total number of 2054 individual teeth were accounted for; among these, there are 60 mandibular and 40 maxillary fragments. There were 262 teeth excluded from analysis, given their high level of fragmentation. The tooth type with higher representation is the left mandibular first molar, indicating a minimum number of 101 individuals at Tomb I. The left maxillary first molar is coherent with this value, indicating an MNI of 99.

Evaluation of wear levels at the most abundant tooth (LM1) suggests that a significant number of individuals were dying young at Perdigões; from 181 lower first molars present at Tomb I, 45% exhibited no wear, suggesting that 45% of the individuals died around 6 years of age – age of eruption –, or even before (Table I).

The total number of teeth in PDG I is still unknown, because as cleaning and analysis progress, new specimens are frequently found inside cranial vaults, or in level bags of non-plotted bones. Total numbers will only be available once human osteology analysis is complete. Preliminary results, however, do point towards a high mortality in younger age sets. This might be a skewed image, due to the lower level of preservation of more heavily worn teeth; again, only total final results will clarify this issue.

For the Chalcolithic, high mortality at young age is not exclusive of Perdigões. In Monte Canelas I, Ana Maria Silva (Silva, 1997) identified a population with 147 individuals (50 subadults), in the oldest level of occupation of the site. Among the eldest, there was one primary deposition of a man older than 60 years of age. In the second level (more recent), there were 24 individuals (12 subadults). The relationship between subadults and adults is also surprising, with a significant number of children.

The same pattern is visible in Santa Margarida 3. The Minimum Number of Individuals (also estimated from teeth) was 28, 16 of which were subadults. Data obtained by Ana Maria Silva and Marta Miranda refute the hypothesis that first agriculturalists in Portugal had an abrasive diet, rich in carbohydrates. Only 8% of the teeth exhibited carious lesions, dental wear was insignificant and enamel hypoplasias were rare (Cunha et al., 2003). Similar results were obtained for Grutas Artificiales do Tojal de Vila Chã (Duarte, 1993).

It is difficult to assess life expectancy, given the lack of adequate tables for the Portuguese Neolithic/Chalcolithic populations. Difficulty arises precisely from the scattered, secondary nature of the funerary process adopted by these communities. Regardless of the exact paleodemographic profiles yet to construct, it seems that a significant number of individuals were dying young.

This pattern is not new in Portuguese Late Neolithic/Chalcolithic samples. It has been long emphasized and questioned by Mary Jackes (e.g., Jackes & Lubell, 1996).

Human communities were dying young, even when reaching adulthood. Deficient nutrition, however, does not appear to be the cause of death. There are no indicators of nutritional stress on the skeletal remains. Enamel hypoplasia, seemingly the best indicator for nutritional deficiencies during growth (Goodman & Arme­lagos, 1980; Hillson, 1996: 165-166; Hutchinson & Larsen, 1990; Niven et al., 2004), is practically null for this time period in Portuguese samples; Perdigões is no exception. Even though final results will only be available when all the human remains are quantified, the pattern is a rare presence of enamel defects during tooth development (i.e., during early childhood). It is therefore possible that higher mortality coincides with later phases of childhood, when exposure to pathogenic factors might be enhanced. Even though this hypothesis needs more consistent data support, it is plausible that these factors might account for the high mortality rates among younger individuals. The same hypothesis was formulated by Bocquet-Appel and Ibañez to explain the higher mortality rates during the fully established Neolithic system (Bocquet-Appel & Ibañez, 2002). Contact with pathogenic agents might be enhanced by cohabitation with cattle; the relationship between Neolithic and Tuberculosis, for example, has been discussed in the literature (vide Campillo, 2001: 243) and some emphasize that this contact must not be held responsible for the spread of infectious diseases (see Roberts, 2002 for discussion). More likely, the higher concentration of human individuals within an enclosed area could have increased the number of infectious diseases in a population yet to develop immune responses to such aggressions (Manchester, 1992).

Even though these statements can be taken as working hypotheses, one must not forget that any given mortuary assemblage is never clearly representative of the total population (see Milner et al., 2000 for review of discussion). Paleodemographic profiles, therefore, must be constructed.
with extreme caution, especially when applied to Prehistoric times, as it is the present case.

The values estimated for Perdigões I, however, are coherent with the results obtained by Bocquet-Appel and Ibañez (2002), when testing the wave of advance versus the cultural diffusion model through means of paleodemographic profile reconstruction. Their conclusions point to a two-phase model of population growth. In a first moment, there was an increase in birth rates; after the establishment of the Neolithic production system, then there was a stabilization of population growth, through the increase of mortality rates (Bocquet-Appel & Ibañez, 2002).

4. FAUNAL REMAINS WITHIN HUMAN TOMBS IN PERDIGÕES

In both tombs analyzed to date in Perdigões faunal remains were present. Bones exhumed from Tomb I between 1997 and 1999 (two first field seasons) have been analyzed from a zooarchaeological perspective by one of the authors (MJV). All the remains were observed macroscopically, in order to classify them down to the species level and identify the anatomical portion under scrutiny. The presence of juvenile and/or adult remains was summarily defined, as the teeth are scarce. Final quantification included total number of remains (NTR), the number of identifiable specimens for each species (NRD = NISP), number of non-identifiable remains (NR) and the minimum number of individuals (NMI = MNI) (vide Valente, 1997 for discussion of terminology).

A total of 498 (= NTR) faunal elements were quantified but only 167 (= NRD) were analyzed for species taxonomy and portion identification. The list of species represented at PDG I is heterogeneous: suids (wild boar or pig), red deer, domestic cattle, ovicaprids (sheep and/or goat), fox and rabbit (see Figure 4). The majority of the remains come from fox (99 NTR, corresponding to 59% of the sample) and the second species represented is rabbit (45 NTR, corresponding to 27% of sample). Apart from the fox and rabbit, and the wild boar/pig represented (14 NTR, 8%), the remaining species are only vestigial. Some micro-mammal bones were observed. In addition, fox remains are represented by partially anatomically connected skeletal portions.

Contrasting with the majority of the faunal remains, rabbit and fox bones are very well preserved and exhibit a low level of fragmentation; these characteristics suggest these species might be intrusive into the funerary environment. Fox bones, however, are represented by partially anatomically connected skeletal portions.

Red deer bones testify for the adoption of an economic strategy relying partially on hunting. Knowledge of domestication is demonstrated by the presence of ovicaprid and domestic bovid bones (rabbits and suid remains cannot be demonstrative of that knowledge). The total number of burnt specimens is reduced (n = 6), and there is no evidence of cut marks in any of the bones analyzed.

Faunal remains from Tomb II have not yet been studied, since excavation is not complete. A large deer antler, however, was a significant component of the chamber bone arrangement. Apart from the faunal remains themselves, a few zoomorphic figurines have been recovered from both tombs: a small bone bovid, three bone figurines representing birds, and one rabbit. A series of decorated bovid phalanges add up to this group of animal figurines.

Faunal remains in funerary context are not exclusive of Perdigões. Santa Margarida 3 also yielded rabbit, sheep, pig and the remnants of one dog, the latter clearly associated with the partial skeleton of a woman. Even though the only portion present inside the burial was the hind limb of the dog, the remains exhibit calcified precipitates denouncing its long permanence in the tomb (Moreno-García, 2003). No other dog bones have been reported for funerary environments in Portuguese Chalcolithic but other sites in the Iberian Peninsula have provided dog remains (Altuna, 1994) and more recent examples have been identified in Portugal (Cardoso & Gomes, 1997). Bovid and ovicaprid bones are more frequent. Their presence reflects the widespread domestication practices and cohabitation with domestic animals, presently well established through the analysis of faunal remains for the Portuguese Chalcolithic, namely in sites such as Mercador (Valera, 2001), Moinho de Valadares (Valera, 2000a), Monte do Tosco I (Valera, 2000b).

5. DISCUSSION AND CONCLUSION

The presence of animal bones in funerary context is not exclusive to the Chalcolithic (vide O’Day et al., for overview). Faunal remains exhumed from Chalcolithic burials in Portugal, however, have revealed similar species in their bone assemblages. These species coincide with those identified in the habitation sites. The fact is not surprising but it demonstrates that, at least at the symbolic level, the dead were seen as part of the living.

The same happens with the Neolithic, where human burials contain bones from species similar to those identified in the habitation sites. In Xerez de Baixo, species identified in kitchen structures are bovids, pigs, sheep, wild boar, deer, together with molluscs. Xerez de Baixo has been identified as Early to Late Neolithic (Gonçalves, 2003). In Santa Margarida 3, bones from rabbit and dog were identified. Ovicaprid remains were exclusively represented by a few loose teeth. Faunal assemblage was interpreted as the result of occasional intrusion, not as part of the funerary assemblage.
The only exception to this interpretation was the partially connected dog skeleton, represented by two hinds legs (Moreno García, 2003).

Interaction between humans and animal communities are evident in the funerary spaces during the Late Neolithic and Chalcolithic in Portugal. Quantification of human induced changes on the bone (cutmarks, fractures) is still scarce but the available data point towards an exclusively funerary use of the carcasses (or bones). The bone fragments analyzed to date do not exhibit any evidence for consumption. Further analysis is necessary to confirm this exclusive nature. Paleodemographic information, though, suggests a high mortality in early stages of life, which might be associated with the cohabitation of animals and humans, and their inability to resist new pathogenic agents. In Perdigões, patterns point towards a high mortality incidence on childhood, even though data might be biased, given the poor preservation of the bones. Commingled burials, with incomplete or defleshed individuals severely damage bone surface and renders a clear diagnosis almost impossible.

REFERENCES


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WHITE, T. D.  
TABLE 1. Wear level distribution by tooth type in Perdigões I (levels according to Smith, 1987).

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FIGURE 1. Aerial view from Povoado dos Perdigões. Photo ERA Arqueologia, Lda.

FIGURE 2. Location of the possible 8 tombs identified in Perdigões within the peripheral hemi-circle. Illustration by ERA Arqueologia, Lda.
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FIGURE 3. Minimum Number of Individuals represented in Tomb I, after tooth count.

FIGURE 4. Relative presence – % Number of Identified Specimens.