

Article

# Faunal Remains from Torre Velha 12 (Serpa, Beja, Southwest of Portugal): Relationship between Animals and Bronze Age Communities

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**Abstract:** Torre Velha 12 is located in Serpa (Beja) and was excavated and directed by two of the authors (LB and SG), during an emergency intervention within the *Alqueva Project*. This site is characterized by negative structures filled with pottery sherds and other materials dating to the 3rd and 2nd millennia BCE. The aim of this paper is to publish the study of the faunal remains dated from Bronze Age (2nd millennium BCE). The faunal assemblage is small and comes from non-funerary pits and from funerary *hypogea*. Other than a bone artefact and an undetermined shell fragment, all of the remains integrated in the pits were classified as mammals. Sheep/goat is was frequently found while other species such as cattle and swines had lower frequencies. Fragments of cattle limbs are the only faunal remains associated with human burials and reveal a clear taxonomical and anatomical pattern that may be an indicator of a careful and structured anthropogenic behavior. The aim of this paper is to understand the social relationship between animals and the Bronze Age communities.

**Keywords:** Bronze Age; mammals; relationship between animals and prehistoric communities; mammals; society

## 1. Introduction

Torre Velha 12 is located in the municipality of Serpa, Beja district, in southern Portugal, in the Southwest of the Iberian Peninsula (Figure 1). The site is established in a small hill in an extensive flat area with gentle undulations, typical of the Alentejo territory and of the lower Guadiana River Basin [1].

Field work was carried out by the company Arqueologia e Património Lda. under the coordination of two of the authors (LB and SG). The main goal was the safeguarding of the archaeological heritage of Serpa's municipality due to the construction impacts of the Brinches-Enxoé irrigation channels of Alqueva's dam infrastructures.

The site is composed by 71 negative structures dug out in the substrata that were dated from the 3rd to the 2nd millennium BCE. Most archaeological contexts were excavated, except for nine structures that were preserved because they were not directly affected by construction works. Most of these structures were distributed, in a higher concentration, at the top of the hill. The remaining

structures were located on the upper slopes of the hill. It should be noted that the area affected by the constructions conditioned the distribution of these structures (Figure 2).

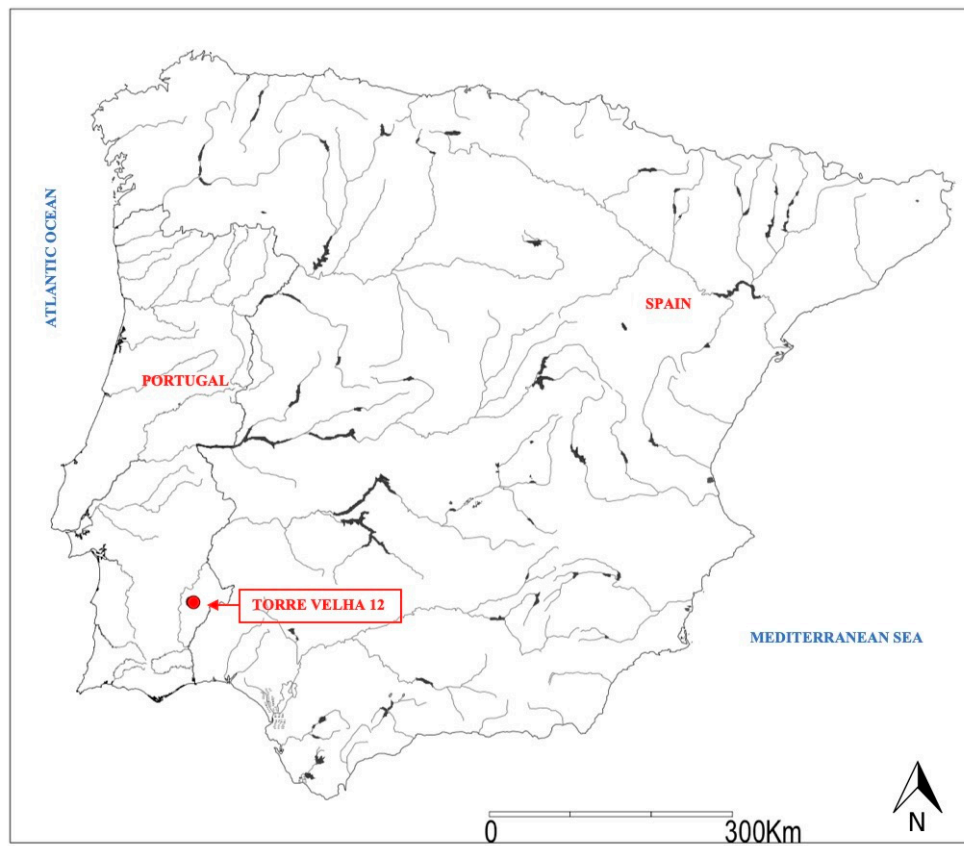
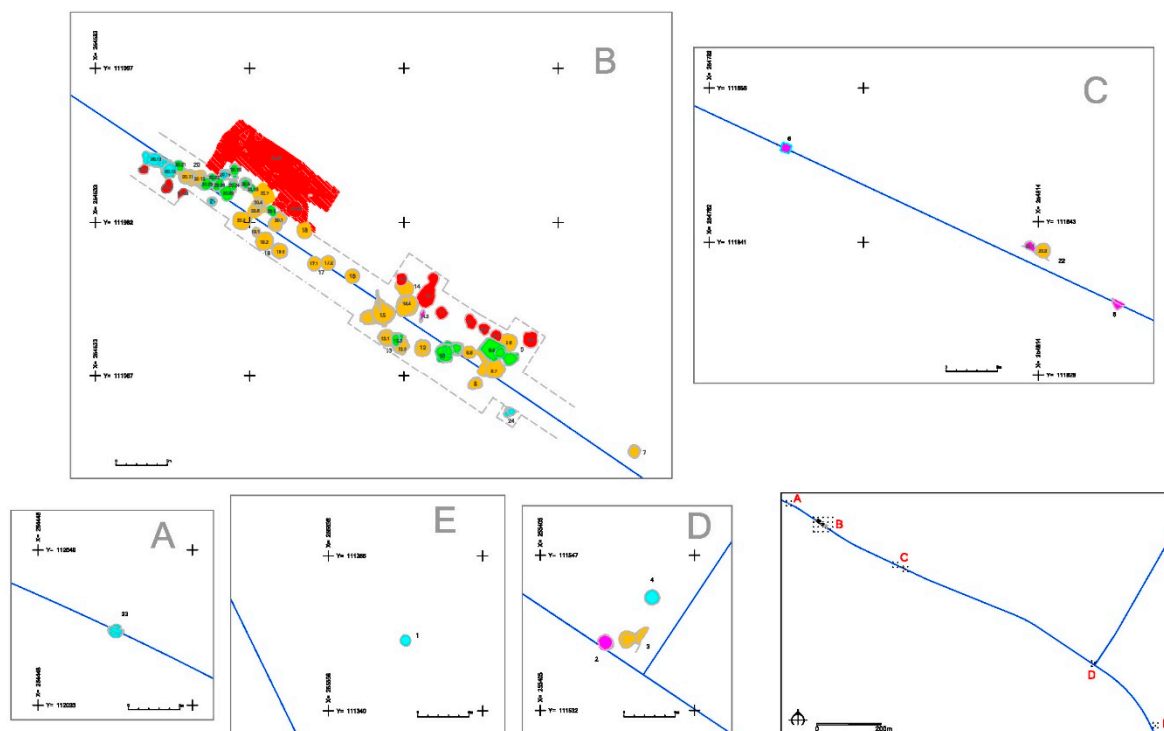


Figure 1. Location of Torre Velha 12 site in the Iberian Peninsula map.



**Figure 2.** Location of the structures on the top of the hill (B and C) and on the upper slopes of the hill (A, E and D).

Dating back to 2nd millennium BCE, two types of negative structures were identified: 16 pits with funerary ( $n = 4$ ) and non-funerary ( $n = 12$ ) use, with sub-circular plan and sub-rectangular forms, and two funerary *hypogea*. These structures were filled with sediments containing pottery sherds, one of the most frequent items, lithics and faunal remains.

*Hypogea* are subterranean chambers with an antechamber excavated in the geological substratum. Human burials (primary depositions) were placed in the subterranean chamber, along with metallic artefacts, ceramic containers and faunal remains.

Archaeological sites composed almost exclusively of negative structures are very common in the margins of Portuguese Guadiana River. Their chronological range is wide, spanning the Neolithic to Iron Age or even historical periods. With regard to sites dated from the Bronze Age, many of them are characterized by the co-existence of funerary and non-funerary contexts, mainly with primary human depositions [2,3]. These contexts, exclusively composed of negative structures that were destroyed by the construction works, are difficult to value architecturally. However, results of the research undertaken, may elucidate about another type of collective heritage: the knowledge about the daily life of the human communities in the past.

In general, funerary contexts have had more publications than non-funerary contexts. This is the case of Outeiro Alto 2 [4] and Torre Velha 3 [5–7] where the funerary contexts, including the votive fauna and the human remains, were already published. Non-funerary contexts, on the contrary, arouse less interest of the researchers and are still unpublished. With this paper, authors aim to counteract this trend by publishing the study of the faunal remains collected in the site, with a focus on Bronze Age contexts, bearing in mind the following questions: a) what kind of species were consumed and what were their frequencies; b) in what ways faunal remains were integrated in pits and what was their function; c) the kind and percentage of domestic species in non-funerary deposits versus funerary deposits; d) the social and cultural manipulation and inclusion of faunal remains, among others. To achieve this, we have inter-related zooarchaeological methodologies with archaeological aspects

and applied comparative analyses with other similar contextual realities [8–14], to provide a complete database to be used and compared in future studies.

## 2. Materials and Methods

Faunal remains were analyzed following the standard procedures of a zooarchaeological study. Therefore, aspects such as taxonomical and anatomical identification, the frequency of species, representation of the anatomical parts, age at death and bone surface modifications were considered [15,16].

Mammal faunal remains were identified using the osteological collection of Cultural Heritage Institute—Archaeosciences Laboratory (DGPC), in Lisbon (Portugal) [17] and consulting several mammal osteological atlases, such as Schmid [18], Barone [19] and Hillson [20]. Some faunal remains did not have the morphological characteristics to determine what species they belong to. Therefore, swines were identified as genus (*Sus* sp.) and sheep and goat weren't distinguished and were classified as *Ovis/Capra*. Other fragments were identified by size categories: large mammals (cattle and deer size), medium mammal (sheep/goat and pig sizes) and small mammal (hares and rabbits). In the case of the remains that were highly fragmented, we have classified them as undetermined.

Mammal age-at-death was estimated on the assessment of tooth replacement and on the state of long bones epiphyses fusion [21]. We also used quantification methods, such as NISP (Number of Identified Specimens) and MNI (Minimum Number of Individuals), to understand the incidence of the species in this collection [22].

Breakage was differentiated as recent break, green break and dry break. For burnt fragments, we have considered the alterations of the natural color of bones surfaces to understand the degrees of burning: light brown, dark brown or grey/blue [23,24].

The zooarchaeological data was also analyzed in interaction with the archaeological record by interrelating it with structures, stratigraphy, artefacts and other features.

## 3. Results

A total of 138 faunal remains were recovered from the negative structures of Torre Velha 12. Most of the remains were integrated in non-funerary contexts, inside of five *pits* ( $n = 128$ ). The faunal remains integrated in funerary contexts are scarce and were only present in two funerary *hypogea* ( $n = 10$ ).

### 3.1. Pits

Only 40 faunal remains were able to be identified at a taxonomical level (Table 1). This low rate of identification (31%) is the result of the high state of fragmentation of the faunal assemblage. Most remains are from mammals, with the exception of an undetermined shell fragment. One polished bone artefact was also recovered (Table 2).

**Table 1.** Number of Identified Specimens (NISP), Minimum Number of Individuals (MNI) and anatomical representation.

Species	NISP	%NISP	MNI	%MNI
<i>Ovis/Capra</i>	13	32.5	3	27.27
Teeth	4			
Mandible with teeth	1			
Humerus	1			
Radius	2			
Metatarsals	2			
Tarsals	2			
Calcaneum	1			
<i>Sus sp.</i>	2	5	2	18.18
Teeth	1			
Tibia	1			
<i>Bos taurus</i>	2	5	1	9.09
Mandible with teeth	1			
Metatarsal	1			
<i>Cervus elaphus</i>	1	2.5	1	9.09
Antler	1			
<i>Canis sp.</i>	3	7.5	1	9.09
Humerus	1			
Femur	1			
Metatarsal	1			
<b>Leporidae</b>	2	5	1	9.09
Phalanges	1			
<i>Lepus sp.</i>	16	40	2	9.09
Scapula	2			
Humerus	2			
Ulnae	2			
Radius	2			
Metacarpals (I,II,III,IV)	4			
Pelvis	2			
Metatarsals	2			
<i>Oryctolagus cuniculus</i>	1	2.5	1	9.09
Pelvis	1			
<b>Total</b>	<b>40</b>	<b>100</b>	<b>11</b>	<b>100</b>

Sheep/goat (*Ovis/Capra*) are the best represented *taxon* on the assemblage (n = 13) and are present in a larger number of deposits. This *taxon* is mostly represented by cranial elements (teeth and mandible fragments). Elements of the fore-limb, such as humerus, radius and metacarpals, come from one single deposit of pit P20.9.

Hares (*Lepus sp.*) are also predominant (n = 16). However, most of the remains belong to an individual collected in a single deposit of Pit P20.9 (Table 2). This individual is characterized by elements of the fore-limbs (scapula, radius and metacarpals) and by elements of the hind-limbs (pelvis and metatarsals) and suggests that the elements were originally articulated. Beside this, two other fragments of hares (a pelvis and a tibia) were collected in other pits. A single pelvis fragment was identified to rabbit (*Oryctolagus cuniculus*). However, other two Leporidae complete phalanges were also collected (Table 1).

**Table 2.** Total number of remains in each pit.

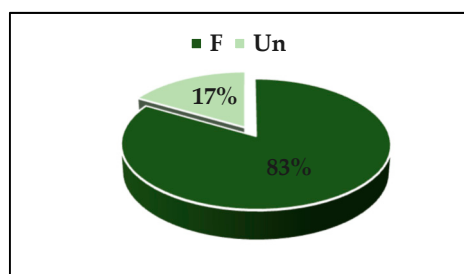
Species	P20.9	P20.15	P20.23	P20.26	P20.27
<b>Identified mammals</b>	<b>24</b>	<b>12</b>		<b>2</b>	<b>1</b>
<i>Bos taurus</i>		1			1
<i>Ovis/Capra</i>	4	6		2	
<i>Sus</i> sp.		2			
<i>Cervus elaphus</i>		1			
Lagomorpha	2				
<i>Lepus</i> sp.	15	2			
<i>Oryctolagus cuniculus</i>	1				
<i>Canis</i> sp.	3				
<b>Non-identified mammals</b>	<b>10</b>	<b>13</b>	<b>4</b>		
Lm (Large mammal)		4	1		
Mm (Medium mammal)	2	15	3		
Sm (Small mammal)	8	3			
<b>Non-identified shell fragment</b>					<b>1</b>
<b>Indeterminate</b>	<b>33</b>	<b>13</b>			
<b>Total</b>	<b>67</b>	<b>38</b>	<b>4</b>	<b>2</b>	<b>2</b>

The evidence of swines (*Sus* sp.) and cattle (*Bos taurus*) is scarce (Table 1). Swines (*Sus* sp.) were identified by an incisive teeth and a tibia fragment, both collected from pit P20.15. Cattle (*Bos taurus*) are represented through a mandible fragment and a metatarsal, both collected in two different pits (Table 2).

The presence of canids (*Canis* sp.) was exclusive to pit P20.25 (Table 2). It was represented by fragments of humerus, femurs and metatarsals. However, the poor preservation of the remains did not provide enough morphological features to identify them as belonging to dog or wolf.

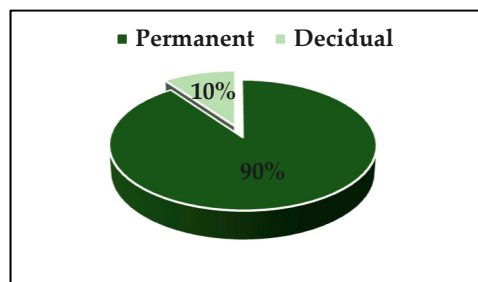
Red deer (*Cervus elaphus*) was identified in one pit (P20.15) through an antler fragment (Table 2). This antler fragment was associated with one almost complete pot and with other faunal remains (i.e., a mandible fragment from a juvenile ovicaprid and a fragment of pelvis from rabbit).

Age-at-death was possible to estimate on some faunal remains from cattle, swines and sheep/goat. In general, permanent dentition and fused bones are clearly superior (83% and 90%) (Figures 3 and 4), which indicates a general tendency to slaughter young adults (between 24 to 42 months of age). However, the slaughter of young individuals (between 6 to 22 months of age) seems to be frequent.

**Figure 3.** Percentage of fused (F) and unfused (Un) long bones from the pits of Torre Velha 12.

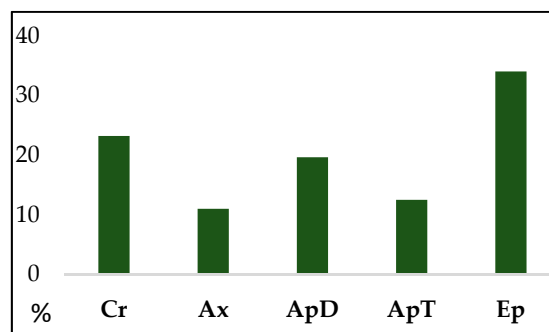
Sheep/goat (*Ovis/Capra*) are represented by juveniles (slaughtered before 24 months) and young adult individuals (slaughtered after 24 months and before 48 months) due to the presence of unfused and fused long bones and by the presence of decidual and permanent teeth. Cattle (*Bos taurus*) are also represented by a younger individual, due to the presence of an unfused metatarsal, and of a young adult, represented by a permanent teeth. As for swines (*Sus* sp.), only an unfused diaphyses of

tibia allowed us to estimate the age-at-death, which corresponds to the death of a juvenile individual (younger than 24 months).

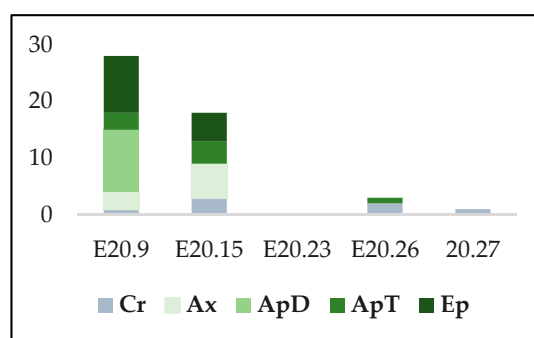


**Figure 4.** Percentage of permanent and deciduous dentition from the pits of Torre Velha 12.

Anatomical representation between pits is quite similar. Cranial elements (mostly teeth) and hind-limb elements (mostly pelvis, metatarsals and tarsals) are predominant in most of the pits (Figure 5). Tough, front-limbs elements (mostly humerus and radius) also have a high representation but only occur, exclusively, in a deposit of pit P20.9 (Figure 6).



**Figure 5.** Percentage of anatomical parts in pits (Cr—cranial elements; Ax—axial elements; ApD—front limb elements; ApT—hind limb elements; Ep—other limb elements).



**Figure 6.** Anatomical representation, in each pit (Cr—cranial elements; Ax- axial elements; ApD—front limb elements; ApT—hind limb elements; Ep—other limb elements).

These anatomical frequencies can be due to: a) better resistance of teeth and metapodials and tarsals to attritions in archaeological deposits, or b) discard of these elements which have low meat value. Nevertheless, we have to point out that the presence of a high volume of parts of front-limbs, exclusively integrated in one deposit, may be due to a specific human behavior related to the valuation of a particular part of the animal's body.

Burning was detected in 18 faunal fragments with evidence of long exposure to fire. There is a higher incidence in colors corresponding to temperatures between 250° to 550° (dark brown surfaces) (n = 16) while the presence of colors that correspond to temperatures above 600°–700° is lower (grey and blueish surfaces) (n = 2) (Table 3). Burning evidence is mostly incident in long bones but most of the remains were not able to be identified at a taxonomic level. The exception is the case of three metapodials and one teeth, identified to sheep/goat, and a tibia from a swine (*Sus sp.*), all of them collected from pit P20.15 (Table 3).

Burnt remains typically appear alongside with a high volume of non-burnt faunal remains. However, inside one single deposit from pit P20.15, burnt remains seem to be included in a primary context by being associated with other burnt materials such as a cork fragment and a crucible with green ore.

**Table 3.** Total of burning remains, in each pit, from Torre Velha 12.

Pits	Burning	<i>Ovis/Capra</i>	<i>Sus sp.</i>	Lm	Mm	Indeterminate	Total
P20.9	250°–550°					1	1
P20.15	250°–550°	4	1	1	4	2	12
P20.23	250°–550°				2	1	3
P20.26	600°–700°	1				1	2

Lm: large mammal; Mm: medium mammal.

### 3.2. Hypogea

Both *hypogea* from Torre Velha 12 (H9.4 and H10) have provided faunal remains (n = 10). Nevertheless, only a set of four remains was in association with human burials. A mandible fragment identified as *Sus sp.*, a *Lepus sp.* tibia fragment and three long bones fragments from large mammal were recovered from the filling sediments of the *hypogea* H9.4 (Table 4) and weren't associated with the funerary ritual.

**Table 4.** Number of remains and anatomical representation in *hypogea* H9.4.

Species	H9.4		H10	
	UE912	UE925	UE928	UE1016
<i>Sus sp.</i> Mandible fragment	1			
<i>Bos taurus</i> Radius + ulnae			1	
Carpal				1
<i>Lepus sp.</i> Tibia		1		
<b>Lm</b> Fragment of long bone	1			
Carpal				3
<b>Mm</b> Fragment of long bone	2			
<b>Number of remains</b>	4	1	1	4

Funerary context is highlighted in green.

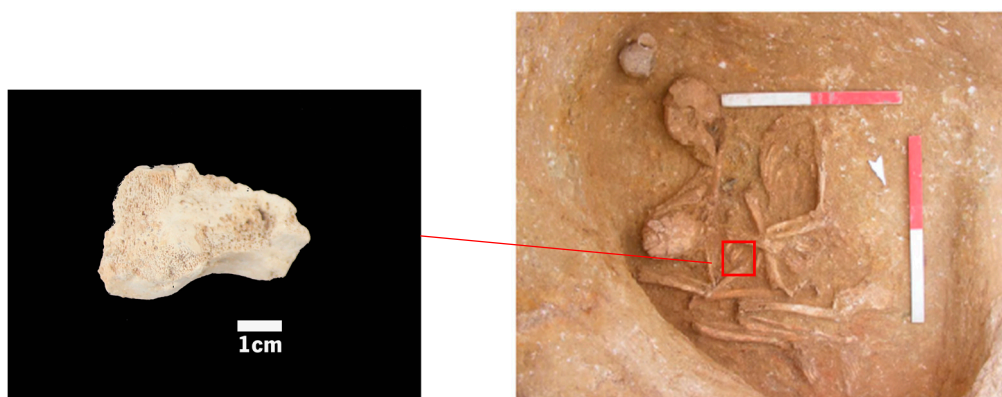


In the funerary chamber of *hypogeum* H9.4 a *Bos taurus* fused left radius and ulna (Table 4) were associated to a female adult skeleton of advanced age. The human skeleton was placed in left lateral decubitus. The faunal offer was placed near the human cranium, alongside a copper dagger and near the hands of a ceramic pot (Figure 7).

In *Hypogeum* H10 there were one adult male primary deposition placed in right lateral decubitus and an ossuary of a single juvenile burial (Figure 8). The votive fauna was directly associated to the burial and referred to a *Bos taurus* right carpal and to a set of three other highly eroded and fragmented right carpals identified as belonging to a large animal (probably belonging to the same cattle individual) (Table 4). Along with votive fauna was a pot, a copper dagger with three rivets and a copper ring (Figure 8).



**Figure 7.** Funerary context of *hypogeum* H9.4, with cattle's radius + ulnae.



**Figure 8.** Funerary context of *hypogeum* H10, with cattle's carpal.

Cut marks are visible in the cattle radius and ulnae joints collected in *hypogeum* H9.4. These marks indicate an intentional disarticulation of this segment of the limb before its introduction as part of the funerary rite.

There are interesting connections between faunal and human remains that might further explain the integration of cattle limbs into the funerary practices of Bronze Age communities. First, a left limb is associated with a human female (H9.4) and right side with a male (H10). Secondly, right carpals are

associated to human right lateral decubitus (H10) and left radius and ulna are associated to human left decubitus (H9.4).

## 4. Discussion

### 4.1. Faunal Accumulations and Their Meanings

Faunal remains in Bronze Age pits from Torre Velha 12 are integrated within the archaeological deposits in different manners: (a) with a variety of *taxa* associations; (b) through different anatomical representation, frequencies and associations; (c) mainly scattered but, also, with a few reported articulations; (d) funerary and non-funerary depositions. These features seem to reflect the multiple functionalities and values that animals must have had in this period.

Most faunal remains appear scattered, fragmented and combined with pottery sherds. This seems to reveal that most of these faunal accumulations are integrated as part of the fillings of the pits as waste discard after carcass dismemberment, since it is composed mainly by anatomical parts with no meat value (such as isolated teeth, metapodials and phalanx). Therefore, the parts of the animals that would be consumed may have been deposited in another place.

Other faunal materials are secondary accumulations removed from their primary use context. This is the case of certain burnt remains that are mixed with unburnt materials in an unburnt context or the ones incorporated in the sediments that filled the top of *hypogea*. However, there are other burnt remains that occur in their primary context in pit P20.15, alongside with charcoal, ashes, burnt cork and a crucible with green ore. This is a particular case where faunal remains may have been reused as a fuel with metallurgic combustion.

The inclusion of hare and canid limb elements in one deposit of pit P20.9, sealed by a level of stones, strongly suggests the intentional deposition of hind limbs of these two *taxa*. This context is hard to interpret. But, as Ingold [25] purposes, these depositions of limb elements can work as symbols of the social status of certain animals or can function as *totems* for the community.

Moreover, the faunal remains associated with the funerary rituals in Torre Velha 12 and other sites of the southwestern Iberia [26] are no more than segments of limbs. This reveals a highly structured anthropogenic behavior materializing the cultural and symbolic values of the front limbs, in one hand, and of the animal itself.

Inclusion of faunal remains in *hypogea* from Torre Velha 12 also seems to follow “norms” with the human skeletons, in terms of the laterality of the bovine limbs with the decubitus and gender of the inhumated humans. These aspects can also work as an evidence of the careful integration of these animals’ parts into the ritual practices of this Bronze Age community.

### 4.2. Animal Use and Economic Value

Sheep/goat and cattle husbandry played an important role in the daily life of this community by allowing them to take advantage of the various resources that domestic animals could provide. In a primary perspective, young animals, such as sheep/goat, cattle and swines would have been consumed for their meat, and, in the case of older sheep/goat and cattle, for the use of their secondary products, such as wool, milk, animal traction and dung and root consumers in the agricultural fields, in the specific case of cattle.

Faunal frequencies demonstrate a clear preference for the consumption of sheep/goat and cattle. Cattle were slaughtered in more mature age allowing the formation of more profound social bonds between the community and the animal fortifying its status. Therefore, cattle are the only animal that participates in the funerary rituals, which increased its economic value.

The inclusion of this animal into the funerary practices of Torre Velha 12, also suggests that animal status lasts after death, showing that there is no separation between daily life and “death” for the Bronze Age communities. This is reinforced through the presence, at the same place, of funerary and non-funerary structures.

The status of swines (*Sus* sp.) and canids (*Canis* sp.), whether they were wild or domestic, is hard to understand by having a low representation on this site. Swines may have been consumed, but perhaps at a lower scale. Canids (*Canis* sp) could also have been exploited for consumption, given its anatomical representation (scattered hind-limb bones). However, appearing in one single context, and only through limb elements, its consumption may have been sporadic and specific to social anthropogenic behavior.

Hunting was a marginal activity and exclusively for rabbits and hares. Red deer (*Cervus elaphus*) doesn't have evidence of being hunted by this community since its presence is exclusive to an antler fragment that could have been collected after red deer annual shedding or from the carcass of a dead animal. No cut marks were identified in the antler fragment, so it can only be inferred that these anatomical elements would have been collected and used as raw material.

#### 4.3. Torre Velha 12 in the Regional Context

Regarding the faunal information on non-funerary assemblages for Bronze Age of Alentejo, the volume of faunal studies available is quite scarce. Besides Torre Velha 12, only faunal assemblages from Montinhos 6 [9] and Alto de Brinches 3 [10] have been published.

The available data reveals a similar taxonomic list where domestic species are clearly dominant. In the case of Montinhos 6 and Torre Velha 12, sheep/goats (*Ovis/Capra*) are predominant while cattle and swines are more occasional (Table 5). The low frequency of cattle in non-funerary pits is quite interesting and may be related to its higher superiority in funerary contexts. Therefore, it's necessary to question whether this species was largely explored and consumed.

Low occurrence of swines (*Sus* sp.) is identified in Montinhos 6 and Torre Velha 12. In contrast, it is predominant in Alto de Brinches 3 (Table 5) due to the presence of four complete skeletons, deposited in a non-funerary pits. Furthermore, it's the only *taxa* buried, with complete skeleton in one funerary pit, in this chronological period, in Horta do Jacinto [13]. This aspect can also raises questions about the economic value of this *taxon* for Bronze Age communities of the Southwestern Iberian Peninsula.

**Table 5.** Faunal studies available in non-funerary pits and funerary *hypogea* of Bronze Age Southwestern Iberian Peninsula.

Bronze Age Archaeological Sites	Typology	<i>Cervus elaphus</i>	<i>Canis</i> sp.	<i>Sus</i> sp.	<i>Bos</i> sp.	<i>Ovis/Capra</i>	Lagomorpha	Ref.
Montinhos 6	Non-funerary pits	0.7%	10.9%	1.9%	3.1%	17.1%	27.6%	[9]
Montinhos 6	<i>Hypogea</i>				31%			[8]
Alto de Brinches 3	Non-funerary pits	2%		91%		3%		[10]
Torre Velha 12	Non-funerary pits	2.5%	7.5%	5%	5%	32.5%	47.5%	
Torre Velha 12	<i>Hypogea</i>			25%	50%		25%	
Outeiro Alto 2	<i>Hypogea</i>			75%	25%			[12]
Torre Velha 3	<i>Hypogea</i>				90%	10%		[5]
Belmeque	<i>Hypogea</i>				100%			[14]

The low frequency of canids (*Canis* sp.) is well documented in Bronze Age pits from Torre Velha 12 as well as in Montinhos 6 (Table 5). In both sites, canids are represented through scattered skeletal parts, which can support evidences of its occasional consumption. Though, a partially completed skeleton from dog (*Canis lupus familiaris*) was also identified in Montinhos 6, which supports its social status as an old intimate companion of humans since the Mesolithic era.

Red deer (*Cervus elaphus*) also integrates the assemblages from Montinhos 6 and Alto do Brinches with antler fragments. Its integration in the archaeological record reveals a particular behavior by collecting red deer antlers and associating it with complete pottery [9]. Some authors even identified cut marks on antlers fragments, which made them consider that these anatomical pieces would have been used as raw materials [3]. Therefore, consumption of red deer cannot be assumed in any of this Bronze Age sites and, as hypothesized in this study, could be the product of a specific recollection of its antlers.

Bronze age insertion of domestic animals in funerary contexts seems to be a common practice and is attested through the inclusion of cattle and sheep/goats segments of front limbs, in *hypogea* of southwestern Iberia [26] as documented in Torre Velha 3 [5–7], Outeiro Alto [4], Belmeque [14], Montinhos 6 [8] and Torre Velha 12, and, as well, through the inclusion of pigs, sheep/goats and cattle remains in funerary pits, as recorded in Horta do Jacinto [13] and Outeiro Alto 2 [12].

## 5. Conclusions

Torre Velha 12 shed light into the study of the relationship between animals and Bronze Age communities. First, the importance of husbandry as an economic practice seems undoubtable. Secondly, the importance of sheep/goat and cattle used for food consumption is clear. Hunting has been a secondary activity mainly related to the exploration of rabbits and hares.

Although the importance of the animals for consumption is clear, interaction between humans and these animals went further. Cattle limbs in funerary rituals or parts of hare and canid limbs in structured depositions (in pit P20.9), or even red deer antlers deposition, can also symbolize the intimate relationship that humans formed with the animals they explored. Therefore, “parts” of them could work as material and spiritual vehicles in daily life and between life and death, as also seen with the coexistence of non-funerary and funerary structures, placed in the same areas, during the Bronze Age in Southwestern Iberia.

However, more zooarchaeological and archaeological data are needed in order to understand which faunal associations should be considered as usual and recurrent in this chronological period for the Southwestern Iberia.

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