

Orlando Ribeiro's work on transhumant pastoralism in north-central Portugal: Guidelines for a research project on ethno-history and archaeology

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KEYWORDS: Orlando Ribeiro, transhumance, Estrela Mountain, archaeology.

JEL CODES: N00, Z1.

With very few exceptions, ethnographic data is hardly ever used as a framework for archaeological research in Portugal. However, the systematic work of Orlando Ribeiro (1911–1997) on the traditional forms of transhumant pastoralism in the north-central mountains of Portugal provides a unique ethno-historical framework for studying those practices in earlier times. Combining the abundant field observations and documentary analysis published by this geographer with ongoing archaeological and zooarchaeological research could shed great light on the long history of livestock management in the area. Some of the transhumance variables studied – ranges, itineraries, settlement locations, herd size, duration, community social organization and specific herding practices – serve as research guidelines for future projects. Due to unfavourable taphonomic conditions, zooarchaeological assemblages are scarce and poorly preserved in most of the territory, thus preventing any comprehensive reconstitution of past livestock compositions. This further enhances the importance of Ribeiro's work.

A investigação de Orlando Ribeiro sobre o pastoreio transumante no centro-norte de Portugal: Orientações para um projeto de investigação em etno-história e arqueologia

PALAVRAS-CHAVE: Orlando Ribeiro, transumância, Serra da Estrela, arqueologia.

CÓDIGOS JEL: N00, Z1.

O uso de dados etnográficos para o enquadramento da investigação arqueológica tem sido, com poucas exceções, largamente ignorado em Portugal. No entanto, a investigação sistemática levada a cabo sobre as formas tradicionais de pastoreio transumante nas montanhas do Centro e Norte de Portugal por Orlando Ribeiro (1911-1997) constitui-se como um quadro etnográfico e histórico essencial para o estudo daquelas práticas em períodos mais antigos. As abundantes observações de campo e análises documentais publicadas por este geógrafo, cruzadas com a investigação arqueológica e zooarqueológica atual, pode lançar luz sobre a gestão de gados na região no tempo longo. Algumas das variáveis estudadas que podem servir como linhas de investigação em futuros projetos são a extensão e os itinerários da transumância, as localizações, tamanho e duração dos povoados, a organização social das comunidades e as práticas particulares de pastoreio. Devido a condições tafonómicas desfavoráveis, os conjuntos zooarqueológicos são no entanto escassos e encontram-se mal conservados na maior parte do território, impedindo assim a reconstituição rigorosa da composição dos gados no passado –um facto que ainda mais salienta a importância do trabalho de O. Ribeiro.

Received: 2021-01-05 • Revised: 2022-01-17 • Accepted: 2022-02-21

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1. INTRODUCTION

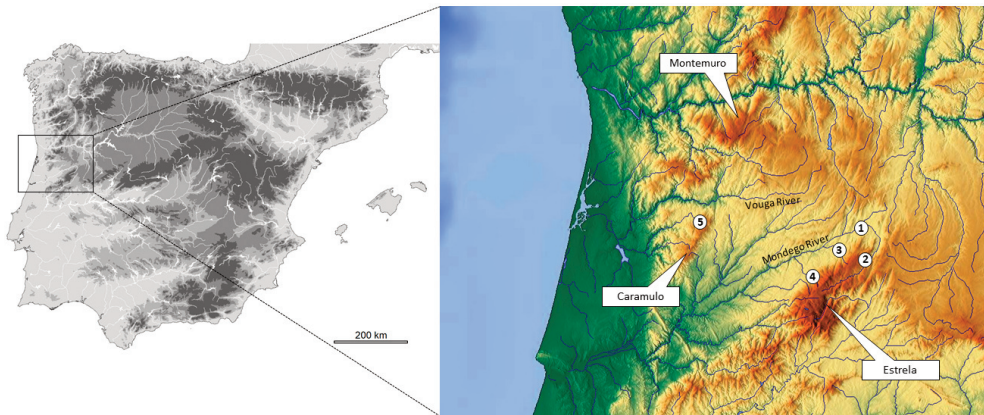
Until recent times, one of the most remarkable practices in animal husbandry strategies in Portugal was transhumance, which was carried out mostly by sheep and goat herders in the northerly mountain ranges of the country. Archaeological and historical research in those territories often proposes that similar practices would have taken place in the past (Cardoso, Senna-Martinez & Valera, 1995-96; Carvalho, 2007; Fernández-Mier & Tente, 2018; Senna-Martinez & Ventura, 2008). However, such proposals are based on uncritical transposition of recent practices to the past, use rather indirect evidence (pollen studies, parallels from elsewhere), and are devoid of zooarchaeological data. Furthermore, there has never been an ethno-historical or ethno-archaeological research effort in Portugal aimed at addressing this issue, in contrast to what has been seen in several other European countries, especially since the 1990s. This research limitation is today an insurmountable impediment to the reconstitution of past animal exploitation strategies, settlement systems or socio-economic organization aspects in a diachronic perspective. Current knowledge on past transhumant pastoralism in Portugal –especially in the mountains of the central-northern part of the country, where these practices lasted until recently– is deeply fragmented and incomplete, preventing any reliable attempt of synthesis.

However, the “pastoral mountains” (*sensu* Ribeiro & Santos, 1951) in central-northern Portugal comprise a series of common features that allow them to be approached comprehensively. These are summits and plateaux over 700 m above sea level (hereafter, a. s. l.), with average annual precipitation above 2000 mm and substrates formed mostly by granites and schists. These conditions result in relatively fertile soils in mid-slope platforms and thin, poor soils in granitic and schistose mountains, respectively. These are important limitations for farming. Traditional crops were also altitude-dependent (olives, wheat, grapes, rye) and some were introduced in the last hundreds of years only (maize, potato). Pastoralism, rather than agriculture, is thus favoured in higher altitudes. As a consequence, human settlement in these montane territories is usually structured in villages located in the foothills and adjacent river valleys and hamlets scattered across the landscape. Traditional lifeways were communal in many aspects, such as in the management of agricultural plots (*e. g.*, commons, *baldios* in Portuguese) and herds. These communal social structures in mountainous regions have not gone unnoticed in the last century of ethnographic (*e. g.*, Dias, 1948, 1981) and geographical (*e. g.*, Girão, 1941; Medeiros, 1987; Brito, 1994; Daveau, 2000) research in Portugal.

All this was thoroughly recorded and analysed by the Portuguese geographer, Orlando Ribeiro (1911-97), in the 1930-50's when traditional lifeways and practices started to be

abandoned due to a series of factors (modernization of agriculture, privatization of commons, emigration, etc.) that fall outside the scope of the present text. This author witnessed such changes and was able to make very valuable records and accounts of traditional practices. These refer in particular to the cattle transhumance between *brandas* (summer mountain settlements) and *inverneiras* (winter villages in valleys) in the Castro Laboreiro area of Peneda-Gerês National Park in the Minho province (Ribeiro, 1939), the traditional transhumant practices in the Estrela (Ribeiro, 1941) and Montemuro (Ribeiro, 1948) mountain ranges in Beira Alta, and the interpretative mapping of Portuguese “pastoral mountains” (Ribeiro & Santos, 1951). On the whole, these constitute in-depth and comprehensive analyses of the traditional forms of pastoralism that survived in the mountains of the central-northern regions of the country until the mid-20th century, therefore providing a sound ethno-historical framework for archaeological and zooarchaeological research in the area.

FIGURE 1
Geographical location of central-northern Portugal in the Iberian Peninsula
with major mountain ranges and river valleys



Sites mentioned in text: 1. São Gens (Celorico da Beira); 2. Soida (Celorico da Beira); 3. Penedo dos Mouros (Gouveia); 4. Buraco da Moura de São Romão (Seia); 5. Lameiros Tapados (Vouzela).

Source: <https://maps-for-free.com>

Thus, this article’s objective is to stress the lack of empirical data and, more importantly, the absence of systematic interdisciplinary research and projects specifically designed to approach past transhumant pastoralism in the above regions. Given the mentioned limitations, we cannot provide an overview¹ nor to produce novel theoretical

1. See CARVALHO *et al.* (2017) and FERNÁNDEZ-MIER & TENTE (2018) for first explicit approaches to the topic in prehistoric and historical times, respectively.

reflections on the application of recent ethnological data to interpret the archaeological record (*e. g.*, David & Kramer, 2001; González-Ruibal, 2003; Hodder, 2012; Wylie, 1985), even in what regards livestock mobility (*e. g.*, Sellet, Greaves & Yu, 2006). Instead, we will make a selection of the observations published by Ribeiro and frame them under an archaeological perspective aiming at the designing of an interdisciplinary research project on the topics of pastoralism in central-northern Portugal and its major manifestations in long-term human geography and montane archaeology, from the Neolithic to the Middle Ages –that is, between the onset of animal domestication and the appearance of the first written documents in the area. By central-northern Portugal we refer here to the traditional provinces of Beira Alta, Beira Litoral and Beira Baixa, which broadly correspond to the vast drainage basins of the Estrela mountain range, the region's backbone (Fig. 1). We have selected a number of research topics from Ribeiro's work that, in our view, may shed light on current debates on the ethno-archaeology of pastoralism and guide future research within those time periods.

2. A STARTING POINT: RECENT (ZOO)ARCHAEOLOGICAL RESEARCH IN THE ESTRELA MOUNTAIN RANGE AND ADJACENT LOWLANDS

Despite specific research in other mountain ranges in central-northern Portugal, in particular in Peneda-Gerês (Ribeiro, 1939) and Montemuro (Girão, 1940; Dias, 1949), the Estrela mountain range (Serra da Estrela, in its Portuguese designation) has long attracted the attention of researchers for two reasons: this is the highest mountain in continental Portugal, reaching 1993 m a. s. l.; and until recently systematic transhumance practices were centred here and are relatively well documented (Ribeiro, 1941). Indeed, the first scientific exploration in modern terms of the Estrela natural environment and human occupation took place as soon as 1881, when the Sociedade de Geografia de Lisboa undertook a “scientific expedition” aiming at a full survey of this territory (Sarmiento, 1883). The same cannot be said for the Caramulo since systematic research has been carried out here only very recently, with some still on-going (see section 3 below).

The oldest historical sources available with references to pastoralism at Estrela, and transhumance in particular, date to the Middle Ages but these are scarce, provide very vague accounts, and date mostly to the 13-14th centuries. Historical data from later centuries are more abundant (Ribeiro, 1941), though disparate in nature and therefore providing indirect pieces of information. An interesting example is the reference made by Gil Vicente (*c.* 1465-1536), a Portuguese Renaissance playwright, in his play entitled *Tragicomedia Pastoril da Serra da Estrela*, to milk, cheese, wool, cattle and sheep exported from the montane villages of Seia, Gouveia, Manteigas and Covilhã, which suggests that the

traditional herding economy that survived until the 20th century was already well established five hundred years before². However, a comprehensive historical analysis of Medieval and post-Medieval pastoralism in the region is still to be made. Historic overviews focus more on socio-economic or political issues, namely on the impact of the Spanish Mesta in Portugal, rather than on specific herding strategies and practices (Magalhães, 1993). This research bias prevents the use of historical data as a comparative framework for older periods.

TABLE 1
Zooarchaeology (mammals only) of the Estrela mountain range and adjacent territories. See Fig. 1 for location of sites.

Species	Penedo dos Mouros		Buraco da Moura de São Romão (Early Bronze Age) (b)		Penedo dos Mouros		São Gens	
	(Neolithic) (a)		(Medieval) (c)		(Medieval) (d)			
	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI
<i>Equus</i> sp. (horse, donkey)	—	—	—	—	—	—	3%	1
<i>Bos taurus</i> (cattle)	—	—	27	—	—	—	17%	6
<i>Ovis / Capra</i> (sheep/goat)	3	1	32	—	6	1	10%	3
<i>Sus</i> sp. (pig/wild boar)	2	1	—	—	4	1	—	—
<i>Sus scrofa</i> (wild boar)	—	—	16	—	—	—	2%	1
<i>Sus domesticus</i> (pig)	—	—	—	—	—	—	4%	2
<i>Cervus elaphus</i> (red deer)	—	—	4	—	—	—	46%	10
<i>Capreolus capreolus</i> (roe deer)	—	—	—	—	—	—	4%	2
<i>Lepus</i> sp. (hare)	3	1	—	—	—	—	—	—
<i>Oryctolagus cuniculus</i> (rabbit)	7	1	1	—	—	—	12%	4
<i>Canis familiaris</i> (dog)	—	—	—	—	34	1	—	—
<i>Lynx pardinus</i> (Iberian lynx)	1	1	—	—	—	—	—	—
<i>Felis sylvestris</i> (wildcat)	—	—	4	—	—	—	—	—
Total	16	5	93	—	44	3	630	29

(a) Carvalho et al. (2017).

(b) Cardoso et al. (1995/96); MNI not estimated.

(c) Tente et al. (2018a).

(d) Tente et al. (2018b); only percentages of NISP published.

Similarly, direct evidence (*i. e.*, zooarchaeological and archaeological) for Medieval and older pastoralism in the Estrela mountain range and adjacent lowlands is also scarce and very fragmented. The main reason is a preservation issue. Indeed, with the exception of singular, well-preserved contexts, the acidic nature of the soils prevents the preservation

2. For further data and references, see TENTE (2010).

of osteological remains. As can be seen in Table 1, only four archaeological contexts in the region revealed faunal assemblages: the Neolithic and Medieval occupations at Penedo dos Mouros (Gouveia), the Bronze Age site of Buraco da Moura de São Romão (Seia), and the medieval settlement of São Gens (Celorico da Beira). Chalcolithic, Iron Age and Roman faunal assemblages are completely lacking. For example, despite robust data gathered in other sectors of Roman Lusitania (Valenzuela & Detry, 2017), the most recent synthesis on the eastern foothills of Estrela explicitly states the complete absence of faunal remains, thus leaving inferences to be based solely on site structures and their spatial distribution. With these limitations in mind, Carvalho proposes for the Roman period the keeping of livestock in domestic contexts along with

[...] cyclic “transhumant movements” of short or medium distance (a few tens of kilometres) to the upper platforms of Estrela or even to the lowlands of Idanha, carried out in the framework of an economic system partly based on the production of wool and milk (and respective secondary products) aiming at supplying local and regional trade circuits. However, we do not envisage, as a recurrent fact, the gathering and displacement of large herds or their traveling across great distances since the economic context of most of these rural populations would not exceed a subsistence regime (Carvalho, 2007: 503, Portuguese original).

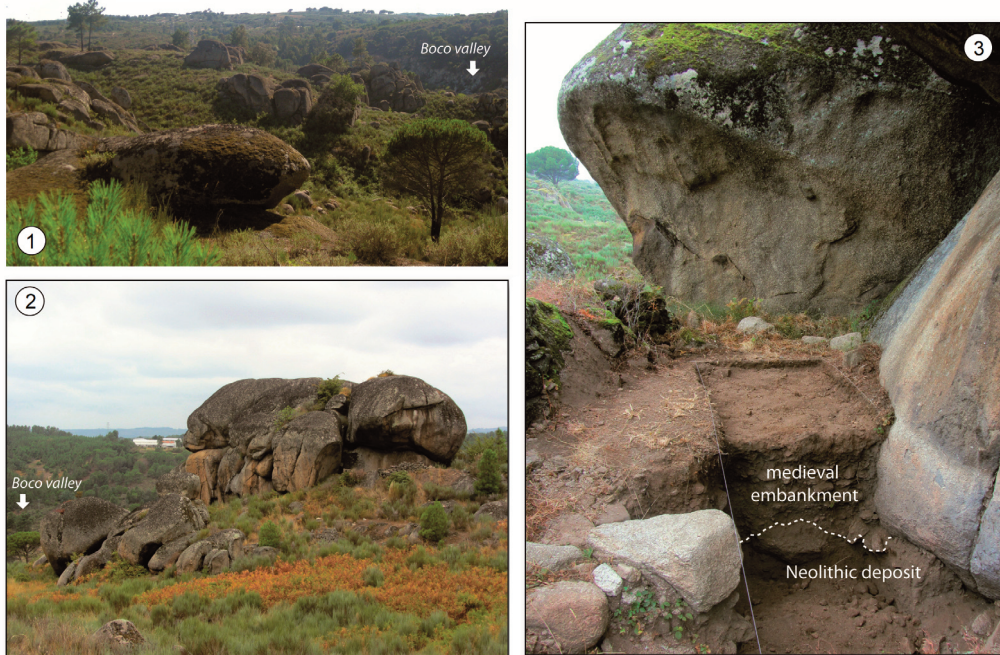
Despite its shortcomings, recent zoo- and archaeological research has been able to provide hard evidence for past herding strategies in the region (Table 1; Fig. 1), some of which are totally unexpected. In this section we present two case studies, one zooarchaeological and the other strictly archaeological, whose conclusions should be investigated further in the future, and which clearly illustrate the interest and potential of the region in such endeavour.

2.1. Case study 1: Penedo dos Mouros (Gouveia) and the issue of Neolithic transhumance

The resumption of the excavations in 2008, 2009 and 2011 at the enclosed medieval settlement of Penedo dos Mouros brought to light Neolithic occupations in a small rock-shelter located in the south-east sector of the site, at 435 m a. s. l. (Fig. 2). These were attributed to the 5-4th millennia BC transition (*i. e.*, between the end of the early Neolithic and the beginning of local megalithism) based on pottery typology. Despite the limited excavated area and the poor preservation of the faunal remains, these are exceptional finds if the overall adverse features of the local geology are considered. A total

number of 38 bone fragments, with 16 identified mammal specimens, were exhumed (Table 1), including the positive identification of sheep (*Ovis aries*). These are the oldest faunal remains known in the Estrela mountain region (Carvalho *et al.*, 2017).

FIGURE 2
Penedo dos Mouros (Gouveia)



Note: 1. View towards the south-west over the Boco valley; 2. View of the rock-shelter from the south-east; 3. Inside the rock-shelter and view of the archaeological test inside showing the medieval embankment and the Neolithic deposit.

Source: photos by the authors.

Despite the small numbers of faunal remains, that prevent in-depth analyses of animal exploitation strategies, geoarchaeological analyses were able to conclude for the absence of microscopic components indicative of animal stabling (lack of phytoliths or burnt herbivore dung and associated silica spherulites) or features like planar porosity or micro bedding derived from compaction (Simões, Carvalho & Tente, 2020), observations that lead to the exclusion of stabling as a past use of the rock-shelter, a conclusion that was already anticipated by its limited area. The same geoarchaeological study also concluded for vegetation clearance outside, in the area immediately adjacent to the rock-shelter. Focusing on the local topographic features and the relatively poor soils on the slope where the site is located, such clearance would possibly be intended for the creation of grazing land

in the immediate vicinities of the site. This evidence agrees with the artefactual assemblage that was recovered (Carvalho *et al.*, 2017): rare small sized pottery vessels, expedient knapping procedures of local raw materials (quartz), and curated strategies on the management of non-local knapping stones (flint) associated with short term occupations.

Previous works on Neolithic pastoralism in the area have been explicitly proposing transhumant practices as having started here as early as the beginning of the period (*e. g.*, Cardoso, Senna-Martinez & Valera, 1995-96; Senna-Martinez & Ventura, 2008). Such claims derive from deforestation events detected in pollen diagrams obtained in the Estrela mountain lakes (Knaap & Leeuwen, 1995, 1997). However, site distribution patterns, pastoralism economics and, to some extent, ethno-historic evidence provide in the current state of our knowledge a sounder approach to test the likelihood of these practices in such an early date. These topics are instead strongly suggestive of local, though may be itinerant, pastoralism rather than transhumance, thus fitting the above observations retrieved from the Penedo dos Mouros record.

Indeed, the spatial distribution of megaliths and habitation sites in the region do not surpass the 500 m a. s. l. contour line (*i. e.*, below the upper limit of wheat and barley cultivation [Table 2], the cereal crops available in Neolithic times) and prefer the sandy plateaux crossed by the Mondego's main tributaries (Senna-Martinez & Ventura, 2008). This distribution is more compatible with a mixed farming regime encompassing herding and agriculture. Thus, if Neolithic transhumant herding is hypothesised in the upper sectors of the mountain, it raises two issues: the corresponding archaeological sites are still to be found; and the question of what its triggering causes might have been requires proper explanation.

TABLE 2

Altitudinal compartment of modern crops in the Estrela mountain range (a)

Metres a.s.l.	Crops
< 700	Olive (<i>Olea europaea</i>)
< 800–850	Wheat (<i>Triticum</i> sp.) (b), vine (<i>Vitis vinifera</i>) and fruit trees
< 1000–1100	Maize (<i>Zea mays</i>)
< 1200–1300	Potato (<i>Solanum tuberosum</i>)
< 1500	Barley (<i>Hordeum</i> sp.) (c)
< 1600	Rye (<i>Secale cereale</i>)

(a) After Ribeiro and Santos (1949).

(b) It should be noted that the cereal crops available in the Neolithic could have been exploited in higher altitudes than those of more recent times, as is clearly indicated for example by the hulled wheat assemblages from Early Neolithic sites in the uplands of the Spanish Meseta (Peña-Chocarro *et al.*, 2018).

(c) Not referred to by the cited authors; adapted from Buxó (1997).

Regarding the latter issue, demographic pressure, bioclimatic forcing or economic intensification are the most commonly argued causes to explain the emergence of transhumant pastoralism in small-scale societies. As proposed by Carvalho *et al.* (2017: 34-6), if the first can be ruled out given the relatively low demographic density of early Neolithic farmers in Iberia (*e. g.*, Balsera *et al.*, 2015), under normal conditions the second cause must be also excluded from reasoning in the southern regions of temperate Europe. As stated by Greenfield,

[...] in strong contrast to arid and alpine conditions, temperature extremes in the lowlands are not sufficiently extreme during the summer to drive livestock into the mountains in search of pastures. Sufficient water and grazing are available year-round in most low and mid-altitude pastures in temperate climatic zones. Ecologically, there are fewer incentives for pastoralists from low and mid-altitude settlements in temperate regions to practice transhumance. Stock may be safely herded throughout the year in the lowlands, especially where a host of micro-environments are juxtaposed (*e. g.* marshes, streams, plains, hills, etc.) [...] (Greenfield, 1999: 16).

This applies well to the Estrela region. On the other hand, most authors also agree that there is no evidence pointing to relevant economic intensification processes taking place during the earliest stages of the local Neolithic; quite the contrary, rather mobile populations with itinerant farming regimes producing small surpluses have been the most commonly acknowledged lifeways in the period (Valera, 2005; Senna-Martinez & Ventura, 2008).

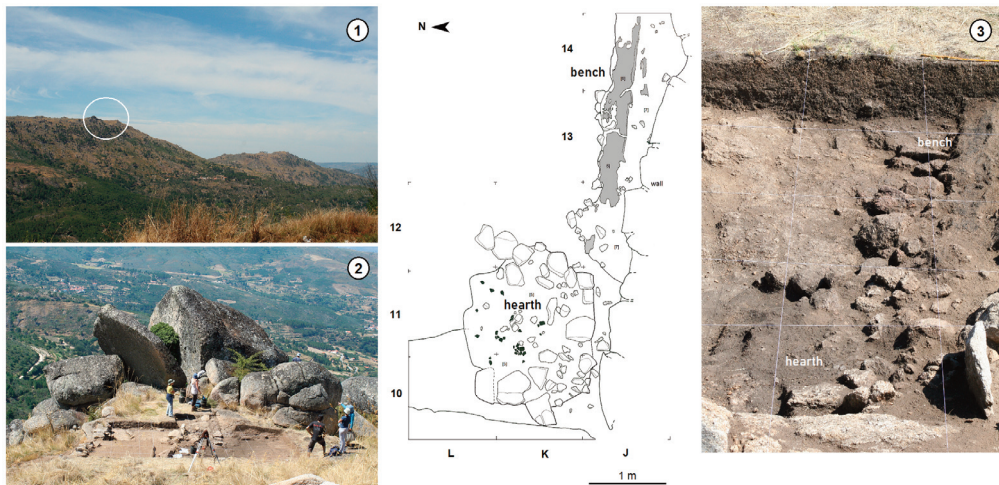
In sum, all available direct and indirect data from the Estrela mountain range is strongly suggestive of an absence of transhumant practices during the local Neolithic. However, it is currently well-established that this type of pastoralism started in other Iberian regions as soon as this period, even in high-altitude montane environments. This is the case, most notably, of the Pyrenees (*e. g.*, Antolín *et al.*, 2018; Gassiot *et al.*, 2020, 2021; Rojo *et al.*, 2013). This contrast in the micro-territorial dynamics and trajectories of Neolithic communities emphasises the possible existence of marked differences from area to area within the same general process.

2.2. Case study 2: Soida (Celorico da Beira), a testimony of bipolar transhumance in the Early Middle Ages?

Soida, a place name of Arabic origin, is a walled settlement found on top of an elongated promontory in the north-western sector of the Estrela mountain range, at 1000 m a.

s. 1. (Fig. 3). Excavated in 2007 and 2008, it revealed the remnants of huts built with perishable materials whose specific location inside the settlement was strongly conditioned by the local topography. As result of the abrupt slopes, huts had to be confined to narrow platforms next to the settlement's walls and their recognition was only possible due to the presence of stone-structured hearths and potsherds. Thus, most of the area was devoid of habitation structures, allowing the keeping of livestock (likely to have been sheep/goats) while cultivation must have been severely limited due to orography, granitic outcrops and thin, eroded soils. Sediment acidity also prevented the preservation of faunal remains. A radiocarbon determination on a sample of rowan (*Sorbus aucuparia*), a short-lived species, collected in a hearth, indicated the 10th century AD, which is consistent with the recovered material culture³.

FIGURE 3
Soida (Celorico da Beira)



Note: 1. View from the south-east of the mountain ridge where Soida is located (white circle); 2. Excavation of one of the 10th century habitation structures inside the settlement; 3. Plan and photo of the habitation structures above: hearth and wooden bench next to the settlement's wall; the superstructure was probably a hut built with perishable materials.

Source: photos and drawing by the authors.

A first interpretation emphasised the site's defensive character given the presence of a wall and palisade. However, three observations also suggested its seasonal occupation in the framework of pastoral activities (Fernández-Mier & Tente, 2018): a) productive activities (storage, metallurgy, grinding, weaving) are completely missing at Soida but are common

3. For a synthesis and regional integration, see TENTE (2012).

in coeval settlements located in the mountain's foothills and neighbouring valleys; b) as pointed out above, despite being a walled site, most of its area is devoid of human occupation and was probably used as an open-air sheepfold –in this regard, the wall and palisade would not only protect people and goods but also livestock; and c) its particular location allowed direct access to summer pastures in the mid-altitude plateaux of the mountain.

If this is confirmed by future research, we may be dealing here with a type of vertical, bipolar short-distance transhumance –of sheep and goats?– in which segments of a large community accompanied their livestock on summer displacements to the highlands. It is partly similar to the Peneda-Gerês seasonal *brandas* and *inverneiras* settlements (Ribeiro, 1939). Here, it was the whole community –not segments– that moved across the landscape, agriculture was carried out in both types of settlements (rye and potatoes, along with maize and beans in the *inverneiras*), and livestock mainly consisted of cattle. This practice, or a variant of it, is not historically recorded in Estrela. It may have been restricted to the Early Middle Ages, a period that counts with scarce written sources. Under this hypothesis, Soida was a 10th century *branda* and the *inverneiras* may have been sites such as Penedo dos Mouros (Tente, Carvalho & Pereira, 2018a), where there is direct evidence for sheep/goat herding (Table 1) along with agriculture (wheat and broad bean). The same cannot be said for São Gens, also located in the lowlands, because this site seems to have been specialized in the processing of game (mostly cervids; see Table 1), more than on pastoralism (Tente *et al.*, 2018b).

3. ORLANDO RIBEIRO'S RESEARCH: CONTRIBUTION TO A PROGRAM ON ETHNO-ARCHAEOLOGY FOR CENTRAL-NORTHERN PORTUGAL

The questions posed in the previous sections may find relevant research guidelines in the work carried out by Ribeiro (see references above). Among several possible research topics, we have chosen three, from livestock composition to transhumant routes and human geography, that can be usefully used as framework for an ethno-archaeological research program on pastoralism in the mountains and highlands of central-northern Portugal.

3.1. Research topic 1: Livestock composition in montane (> 700 m) territories

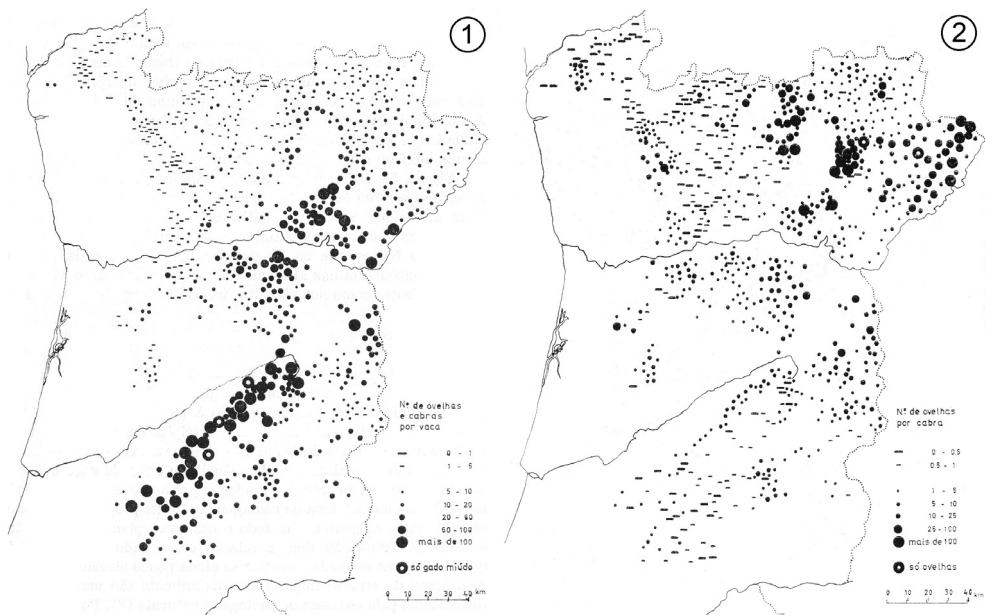
According to Ribeiro and Santos (1951), a relation between *gado miúdo* and *gado grosso* (*i. e.*, medium [sheep and goat] and large-sized [cattle] livestock, respectively) is crucial

for an in-depth analysis of herding in this region. Based on the 1940 inventory of livestock in parishes located above 700 m a. s. l., which allowed sheep/goat/cattle ratios to be calculated, the authors reached two main conclusions:

- a) regarding medium and large-sized livestock (Fig. 4, Map 1), sheep/goats predominate largely in all montane territories whereas, with exception of Arada; cattle is more important from the north-western mountains down to the Caramulo;
- b) in the sheep/goat ratio (Fig. 4, Map 2), the latter species predominate at higher altitudes (the north-western mountains, western Trás-os-Montes and at Estrela) whereas the former predominate in the lowlands and in the mountains' flanks and foothills.

FIGURE 4

Mid-20th century distribution of livestock in central-northern Portugal



Note: 1. Ratio medium (sheep, goat)/large livestock (cattle); 2. Ratio sheep/goat.

Source: Ribeiro and Santos (1951).

At least in the Estrela mountain range, where Ribeiro (1941: 243-44) discusses the sheep/goat ratio issue in more detail, the author claims that there is, besides altitude, a geological and orographic determinism, since goats predominate over sheep in areas characterized by more hilly, poorer schistose soils, in this case, in the more southerly sectors of the Estrela massif.

Indeed, despite lacunae due to taphonomic limitations, the available zooarchaeological data (Table 1) is not incompatible with Ribeiro's model. If leporids and carnivores are removed from the equation, sheep/goats are present in all assemblages, with positive identification of sheep occurring at Neolithic Penedo dos Mouros and at Bronze Age Buraco da Moura de São Romão. Cattle are usually less frequent but may reach considerable percentages in overall faunal assemblages in some sites. If their presence in valley sites, as at São Gens, is not surprising, at the former site, located at 890 m a. s. l. in the hilly western flanks of Estrela, it evokes the possibility of some short-distance cattle transhumance as recorded by Ribeiro (1941) at Loriga and Alvoco da Serra, coincidentally in this very same sector of the mountain. Swine specimens are also found in all contexts. However, the determination of its domestic or wild status, which is crucial in animal exploitation strategies, is usually problematic and therefore heavily dependent on methodological options. Clearly, more abundant faunal data, including sites with other chronologies and environments, are necessary for sounder insights.

3.2. Research topic 2: Transhumant ranges and itineraries

The work by Ribeiro deals greatly with transhumant itineraries and their seasonality. Some changes documented in historical times and practices, that took place in specific times and places, were also briefly surveyed. With the exception of the Peneda-Gerês (Ribeiro, 1939) and Montemuro (Ribeiro, 1948) cases, most transhumant itineraries in Portuguese territory still operating in the 20th century, as described by the author (Ribeiro, 1941; see also Martinho, 1978), were centred in the Estrela mountain range. Here, flocks were kept in highland pastures during the summer and spent the winter months (from November to March, the so-called *invernada*) in the immediate surrounding plains (a middle-distance transhumance of a few tens of kilometres) or travelled further away (a long-distance transhumance). These latter itineraries aimed at southerly territories (Fig. 5, itineraries 3 and 6), such as the fields around Idanha (70 km), or the lower Mondego valley between Coimbra and Figueira da Foz (100 km). To the North (Fig. 5, itineraries 1 and 2), the transhumant flocks from Estrela could reach the Marão massif (110 km) and the central and eastern parts of the Trás-os-Montes province (100 km).

An interesting issue regarding these itineraries was the role that was thought to be played by Montemuro. In works previous to those of Ribeiro (1941, 1948), Girão (1922: 146, Portuguese original; see also Girão, 1940) mentioned the “[...] great number of flocks that inhabit it [in July and August], coming from Estrela, when at that season pastures are scarce [...]”, passing around the town of Viseu. The same seemed to have happened also at Caramulo between August and the autumn months (see below). However, this was questioned by the first author since such practice would be a rare example of transhumance from mountain to mountain. Furthermore, Ribeiro’s fieldwork allowed him to conclude that no one at Estrela knew about this: “All the mountain shepherds I questioned –and there were not a few!– told me they knew of no flocks moving to the Montemuro” (1941: 259, Portuguese original). And indeed, it was not until the fieldwork carried out by Dias (1949), when this ethnographer accompanied transhumant flocks in the 1940’s across the Beira Alta, that a definitive answer could be obtained: the Montemuro’s popular designation of *Estrela flocks*, that misled Girão in his conclusions, came from the Nelas area in the Estrela foothills, not its highlands. This case is a good illustration of the type of conundrums that may arise from research circumscribed to single mountain ranges without attention paid to middle- or long-distance itineraries. This has to be borne in mind in ethno-archaeological research design on transhumance.

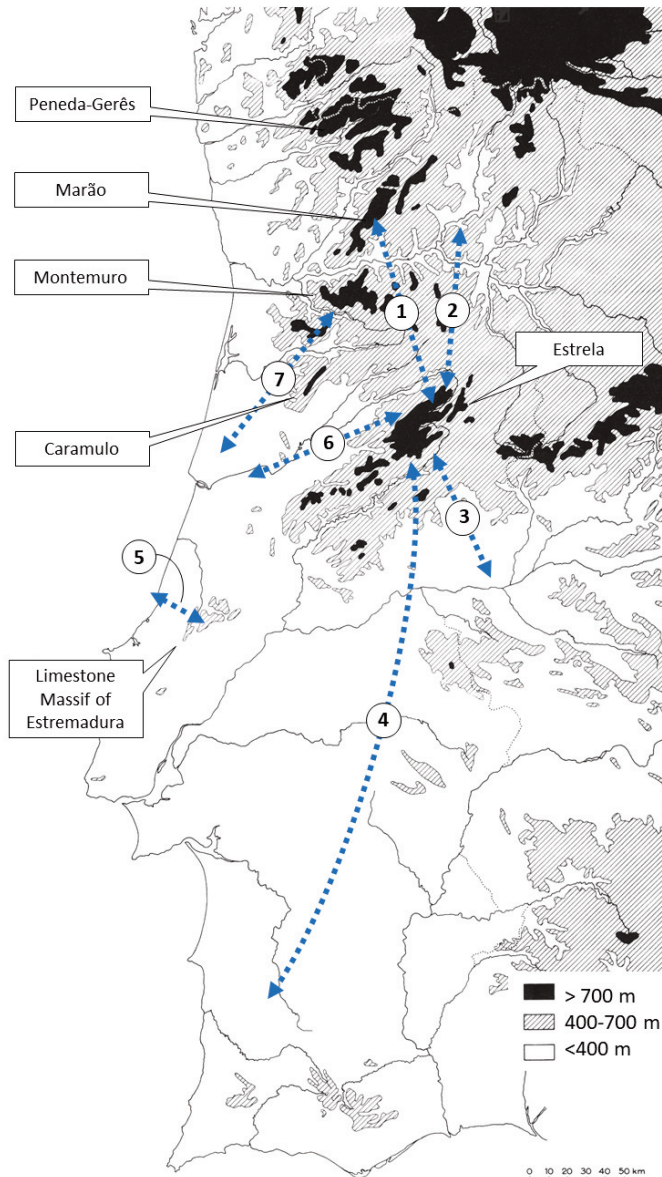
Ribeiro (1941) also compiled a few examples of extinct transhumant cases obtained from 15-17th century written sources. One of the best known cases is the *invernada* from Estrela to the Ourique plains (Fig. 5, itinerary 4), in the southern Alentejo (>400 km to the South), which is documented in some of the *foral* charts of the Beira Baixa and Alentejo provinces along with other coeval documents (Ribeiro, 1941: 282-89). The incorporation of the Spanish Mesta in the Portuguese transhumant routes, which is beyond the scope of the present paper, took place in this context.

Another extinct type of transhumance that should be noted is the sheep/goat transhumance from the limestone massif of Estremadura to the Atlantic coast (30-40 km) during the summer, thus contrasting with the northerly habits, which is due here to the dry, karst geology of the massif (Fig. 5, itinerary 5). In the words of Martins,

the singularity of the Massif reveals itself in the fact that, unlike other mountains, this is a centre of rejection of animals in the summer; flocks come down to the confines of the lower lands in this season, searching for water and grass. It must be said that, at present, this short-course transhumance—they sometimes reach Nazaré—is tending to end (1949: 54, Portuguese original).

FIGURE 5

Transhumant itineraries in Portugal as recorded in historical and ethnographic data



Note: 1. From Estrela to Marão; 2. From Estrela to the Trás-os-Montes province; 3. From Estrela to the fields of Idanha; 4. From Estrela to the southern Alentejo province around Ourique; 5. Summer transhumance from the Limestone Massif of Estremadura to the coast near Nazaré; 6. From Estrela to the lower Mondego River near Coimbra; 7. From Montemuro to the coast near Mira.

Source: base map after Ribeiro, Lautensach and Daveau (1991, fig. 23, adapted). For further descriptions, see text.

One particular case of cattle (not sheep/goat) middle-distance transhumance between Montemuro and the coastal plain of the Beira Litoral province is recorded in 16th century documents, according to which herds were kept in the mountain from May to September and then in the plains between October and April (Fig. 5, itinerary 7). To our knowledge, this phenomenon and its extinction was not studied but Ribeiro (1948) pointed out a working hypothesis: that the introduction of maize agriculture in the 1530's triggered an expansion of irrigated plots and an increase in surpluses; rain-fed fields were then reserved for pastures and fodder, allowing the keeping of cattle in pens during the cold months while stimulating sheep transhumance (rather than the grazing of goats given its incompatibility with cultivated fields). According to the cited author, all this implied significant economic and social changes in these rural communities favouring private property and the decline of agriculture in commons.

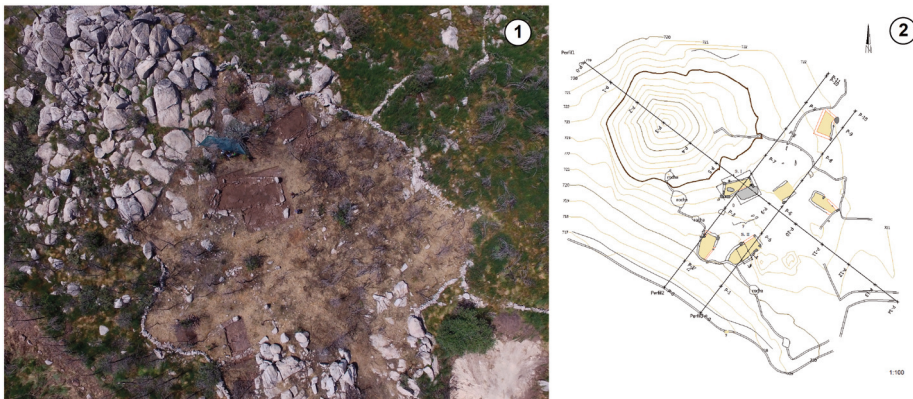
Independently of the likelihood of Ribeiro's thesis, the important ethno-historical conclusion from the introduction of maize is the impact of novel resources, either arable or pastoral, over pre-existing herding systems and their mobility habits. Important research topics related to transhumant ranges and itineraries would be the identification of probable pastoral routes in the past. The systematic mapping of natural and cultural traits in the landscape (such as megalith distribution patterns, Roman roads, natural passages and micro-toponymy, analysed under GIS methodologies) would provide a general frame of reference on the more recurrent, long-lasting pathways and itineraries. Indeed, besides orographic determinism, there is also a "cultural determinism" imposed by tradition at several levels, from the transhumant key-dates (that coincide with Christian holy days) to the used pathways. In several instances, Ribeiro (1941) and Dias (1949) make explicit note of this. Thus, a project on itineraries would have to rely heavily on field surveying.

Systematic field surveying is being carried out in the Caramulo mountain range since 2016 in the framework of a research project on local history and archaeology that is making a first diachronic approach (from the Neolithic to the Middle Ages) to the topic of ranges and itineraries of mobile pastoralism⁴. Although obtained recently and still limited, preliminary results seem to indicate that around the 10-11th centuries vertical mobility encompassed lowland and mid-altitude mountain (700-800 m a. s. l.) seasonal sites. The site of Lameiros Tapados (Vouzela) is one of these examples (Tente *et al.*, 2021). It is located next to a spring, in a very discrete spot in the landscape. A first season of excavations, that took place in the summer of 2019, permitted to identify a site with six to

4. For preliminary results, see REAL, CARVALHO and TENTE (2017), and CARVALHO, CARVALHO and ANASTÁCIO (2021).

seven individual structures that may have been houses and other facilities (Fig. 6). These domestic structures were built in stone and wood, which is an architectonic feature different from the other 10th century houses known in lowland areas of Beira Alta, with one of the main differences being the use of stone for the layout of the structures. In most of the known cases in the region, domestic structures of the same chronological span were entirely built with perishable materials (Tente, 2011), which is also documented ethnographically. This use of stone in the lower portions of the houses' walls may be an indirect indicator of their seasonality since this building material would allow the structures to stand still from one year to the next. Only the upper portions of the structures would need repair every year at the time of return. As can be seen in Figure 6, the structures present a rectangular plan, and are distributed in a small mountain platform protected by a granitic *tor*. The location and the distribution of the houses also suggests that this could have been a seasonal settlement used in the exploitation of mountain pastures in the summer, a possibility that is presently under specific investigation.

FIGURE 6
Lameiros Tapados (Vouzela)



Note: 1. Aerial view after the 2019 excavation season; 2. Topographic plan with indication of buildings.

Source: drone photo by Roberto Dias and topographic survey by José António Tomás.

Indeed, archaeological survey at the Caramulo mountain range also permitted to identify other sites apparently with the same characteristics as Lameiros Tapados and thus probably with similar roles in the mountain's settlement system at the time. Further excavations are however necessary for a better characterization of this new reality, which is very poorly documented in the area even ethnographically. Although it is interesting that the oral record indicates the coming of flocks from the Estrela mountain range in the summer, the mobility of flocks between highlands doesn't seem logic and evokes the exactly the same problem as recorded in the Montemuro mountain (see above). Clearly, the so-

lution of this problem requires systematic ethnographic queries and review of existing written sources since the full characterization of the archaeological record at Caramulo seems to be crucial to understand short-to-medium range transhumance systems in area and its vicinities in late Prehistory and historical times.

On the other hand, despite the acknowledged scarcity of faunal remains, these do exist and could be used for multi-isotopic approaches aiming at the determination of mobility ($^{87}\text{Sr}/^{86}\text{Sr}$ and $\delta^{18}\text{O}$) and grazing ($\delta^{15}\text{N}$, $\delta^{13}\text{C}$, $\delta^{18}\text{O}$) strategies, given its fruitful results obtained elsewhere in Iberia (*e. g.*, Valenzuela, 2020)⁵.

3.3. Research topic 3: Human settlement and social organization

Clearly, this is the most elusive topic under a comprehensive approach because economic, social and political organizational features have changed dramatically since Neolithic times. A research project on ethno-history and archaeology must be designed according to specific time slices, *i. e.*, settlement patterns and social organization features must be pieced together and reconstituted in their own historical and cultural context. This is the research topic for which only very broad aspects of ethnographic data are transposable to Prehistoric and Protohistoric times (*e. g.*, ecological and geographical constraints, seasonality of pastoral activities, natural routes of circulation), thus being more relevant for Medieval and Modern contexts or, at most and with the necessary cautions, for the Roman period.

But perhaps it is more important to acknowledge the fact that, even within the same temporal horizon, traditional socio-economic organization systems may differ from area to area. For example, Ribeiro (1939, 1941) emphasises the striking differences between Peneda-Gerês and Estrela regarding the traditional forms of transhumance in each territory, and its correlation with settlement patterns and social organization that can be summarized as follows:

- a) In the former area there are seasonal settlements (the summer *brandas* and the winter *inverneiras*, located respectively in the mountain and in valleys) whereas the Estrela villages, which are larger, are for the most part concentrated in the foothills. Only very rudimentary housing structures are built in the highland's summer pastures.

5. For a recent overview on similar research that is being carried out in the late Prehistory of the southern regions of Portugal, see VALENTE and CARVALHO (2019) and references therein.

- b) To both settlement systems also correspond different forms of social and political organization. The short-distance cattle transhumance at Peneda-Gerês is accompanied by the whole community whereas the sheep/goat transhumance at Estrela is carried out by shepherds only, *i. e.*, individuals specialized in the herding tasks (at Estrela, Ribeiro's estimate was of 2-3 shepherds per 1000-1500 livestock).
- c) These two forms of transhumance are combined with different forms of land ownership and division of labour, ranging from collective/communal to private/individual. An apparent common trait seems to have been the existence of local councils (formed by family men and elders) that plan all the community agro-pastoral activities.

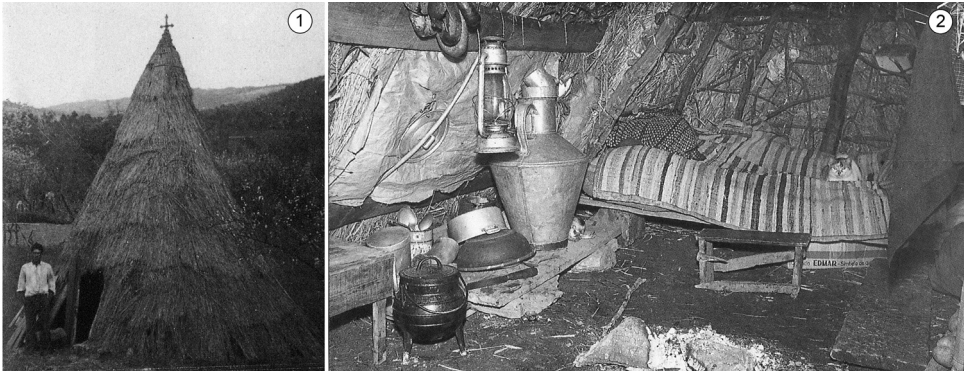
Possible archaeological research topics are the study of regional settlement systems with a particular focus on site functions and seasonality. Estrela's case-study 2 (the Soida walled settlement interpreted similarly as a *branda*) (Fernández-Mier & Tente, 2018; see above) is a good example of an archaeological site that may gain a broader scale of interpretation if framed in the available ethno-historic evidence and explicitly approached under this perspective.

In addition to this, traditional architectures (Oliveira & Galhano, 1992; Oliveira, Galhano & Pereira, 1969) can also be used as an analogue for archaeological evidence. Again, Soida is an important case-study in this regard. The excavation of its 10th century layers revealed what seem to be the remnants of huts built with perishable materials directly on the ground (*i. e.*, with no postholes), leaving very few archaeological traces of their presence (Fig. 3). However, this is a type of conic structure that can still be found today in the Beira Alta region, where it is known as *choupana* ("cabin" or "hovel"), similar to the Beira Baixa *socha*, and has been subjected to ethnographic recording by the mentioned authors (Fig. 7).

But there is a type of site that is missing in Ribeiro's ethnographic descriptions: cemeteries. This is probably because these are found aggregated to modern-day villages. However, these are acknowledged archaeologically-rich contexts that provide far-reaching insights on settlement and social organization of past societies. But, more importantly, the distribution of funerary sites, from Neolithic megaliths to medieval rock-cut tombs, may also be correlated with pastoralism. In particular, the distribution of megaliths has been successfully used to detect possible prehistoric pastoralist routes in other regions of Iberia (*e. g.*, Murrieta-Flores, 2014), partially confirming long-lasting ideas about megalith builders as shepherds. A similar methodology can be ap-

plied in central-northern Portugal, where several hundreds of monuments of the kind are known.

FIGURE 7
Traditional shepherd huts built with perishable materials
from central-northern Portugal



Note: 1. View of a *choupana* (Viseu, Beira Alta); 2. Inside view of a *socha* (Idanha-a-Nova, Beira Baixa); note a plank in right of the photo serving as bench, as recorded at the medieval settlement of Soida.

Source: after Oliveira, Galhano and Pereira (1969, figs. 113 and 86, respectively); adapted.

4. CONCLUSION

The research topics outlined above, which result from an examination of Ribeiro's ethno-historical observations along with on-going archaeological and zooarchaeological research, are strongly suggestive of future directions for a comprehensive, cross-cultural investigation of pastoralism from the Neolithic to historical times in the mountain ranges of central-northern Portugal. It will forcibly imply a detailed (re)analysis of written sources and ethnographic data to put in context new archaeological records obtained from selected sites to allow those historical processes and their impact on the territory and landscape to be pieced together. Aiming in a first stage of research at the identification of singular herding practices at the local scale (like those already observed at Estrela and Caramulo in Medieval times), it may result in the reconstruction of broader strategies at the regional or supra-regional scales (namely through the recovery of medium-to-long transhumant itineraries) while also recognizing the role played by these mountain ranges in socio-economic organizations in the *longue durée*.

These general objectives are presently being put together in a research project aiming at the comparison between the Estrela and the Caramulo mountain ranges whose structure relies on articulated archaeological, ethnographic and historical analyses following

methodological proposals and projects currently taking place elsewhere in the Iberian Peninsula, namely in the Pyrenees but not restricted to them (*e. g.*, Catalán *et al.*, 2019; García-Ruiz *et al.*, 2020; Gassiot *et al.*, 2020; Valenzuela, 2020). In this project, the excavation of selected sites within known and presumable transhumance territories and routes will provide the necessary empirical support for inferences on the socio-economic and political organization features in each temporal horizon within the Neolithic-Middle Ages time frame. If favourable geological/taphonomic conditions are met –previous research has already shown that these can occur in specific contexts despite the adverse conditions provided by the granitic substrata of the region (*e. g.*, Simões, Carvalho & Tente, 2020)–, the recovery of faunal and botanic remains will be crucial for direct analyses on livestock exploitation strategies and the exploitation of natural resources and thus to characterise the evolution of past mountain landscapes and settlement systems (including farming/herding practices and corresponding impacts). Within the former material in particular, the retrieval of strontium and oxygen isotopic data from animal teeth may provide direct evidence for animal mobility. Organic material is also important for systematic radiocarbon dating of archaeological contexts; this may seem a rather redundant topic, but it is particularly important in these montane contexts since some specific temporal horizons (*e. g.*, the Bronze-Iron Age transition or the early Middle Ages) are still devoid of type-fossils or sound typologies of material culture items allowing detailed chrono-cultural integrations.

In sum, the recording and salvage of these traditional, nearly extinct pastoralist lifestyles –that in some areas persist only in the memory of the elderly– may produce a dramatic societal impact on local communities, increasing self-awareness of their past and cultural identity, while creating tourism opportunities for municipalities and the region as a whole.

ACKNOWLEDGMENTS

We would like to thank three anonymous reviewers and the journal’s editors for their useful comments on a first version of the manuscript. However, any errors or omissions are our own.

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