

Social complexity in a long term perspective

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Social complexity in the third millennium cal BC in southern Portugal

JOAQUINA SOARES*

In other words, what aspects of the production and exchange systems of Copper and Bronze Age Europe opened up the opportunity for effective long-term exploitation by a ruling minority? (Antonio Gilman, 1981, p.4)

Abstract

The starting point of this paper is the extensive archaeological fieldwork developed at the Chalcolithic fortification of Porto das Carretas on the left bank of the Middle Guadiana River (Soares, 2013). The well-preserved stratigraphy and correlated radiocarbon dates of Porto das Carretas enabled a new and deep insight into the third millennium cal BC, displaying environmental, economic and social transformations from the first to the second half of the millennium. Furthermore, the integration of the local scale into the regional, and supra-regional levels of interaction have created a key framework for the construction of a dynamic model of increasing social complexity (Fig. 1).

Thus, a proposal of a complex tribal organization of stable communities, during the first half of the third millennium cal BC is presented. They shared a kinship structure inherited from the megalithic societies and an economy based on intensive agriculture (cart, plow). This model of social organization began to collapse in the third quarter of the same millennium, mostly as a probable result of the development of craft specialisation, mainly metallurgy (copper-arsenic alloys). The control of metallurgy integrated in the European exchange network of prestige goods (Bell Beaker package) gave the elites a new source to amass significant wealth for their own immediate benefit, and also coercive power to impose an unequal and very hierarchical social structure similar to chiefdom.

Keywords

Middle Guadiana River Basin; Porto das Carretas; Chalcolithic; complex tribal organization; copper-arsenic metallurgy; exchange networks of Bell Beaker prestige goods; chiefdom.

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Introduction. The theoretical framework

We use the concept of social complexity as a process of social differentiation, associated with increasing inequality (Brumfiel, 1995; Hayden, 1995; Manzanilla, 1997; Mcguire, 1983; Sarmiento, 1992; Soares 2013, p. 63-67). Our purpose is to document the growth of social complexity in the non-stratified societies of the third millennium cal BC, trying to explain the emergence of complex hierarchical societies from the Late Neolithic onwards. The third millennium has been a proficuous laboratory to study complex non-state societies; this is due to the interface character of this period (Soares and Tavares da Silva, 1998; 2000) between the peak of the development of megalithic societies, which reached

in some areas a very centralized social organization, possibly with a theocratic power structure (Bueno and Balbin, 1997; Gomes, 1997a-b; Soares, 2013; Soares and Tavares da Silva, 2010a) and the strongly hierarchical societies of the Southwest Middle Bronze Age (Soares and Tavares da Silva, 2016) or the stratified Southeast societies from El Argar onwards (Lull and Risch, 1995; Cámara and Molina, 2011).

In the southwest of Iberia, social stratification had been developed clearly in the Early Iron Age (Soares and Tavares da Silva, 2016), when the Late Bronze Age hereditary elites were integrated in the Mediterranean-Atlantic exchange system (Ruiz-Gálvez, 2009). This integration had been consolidated by the stable and long-distance Phoenician

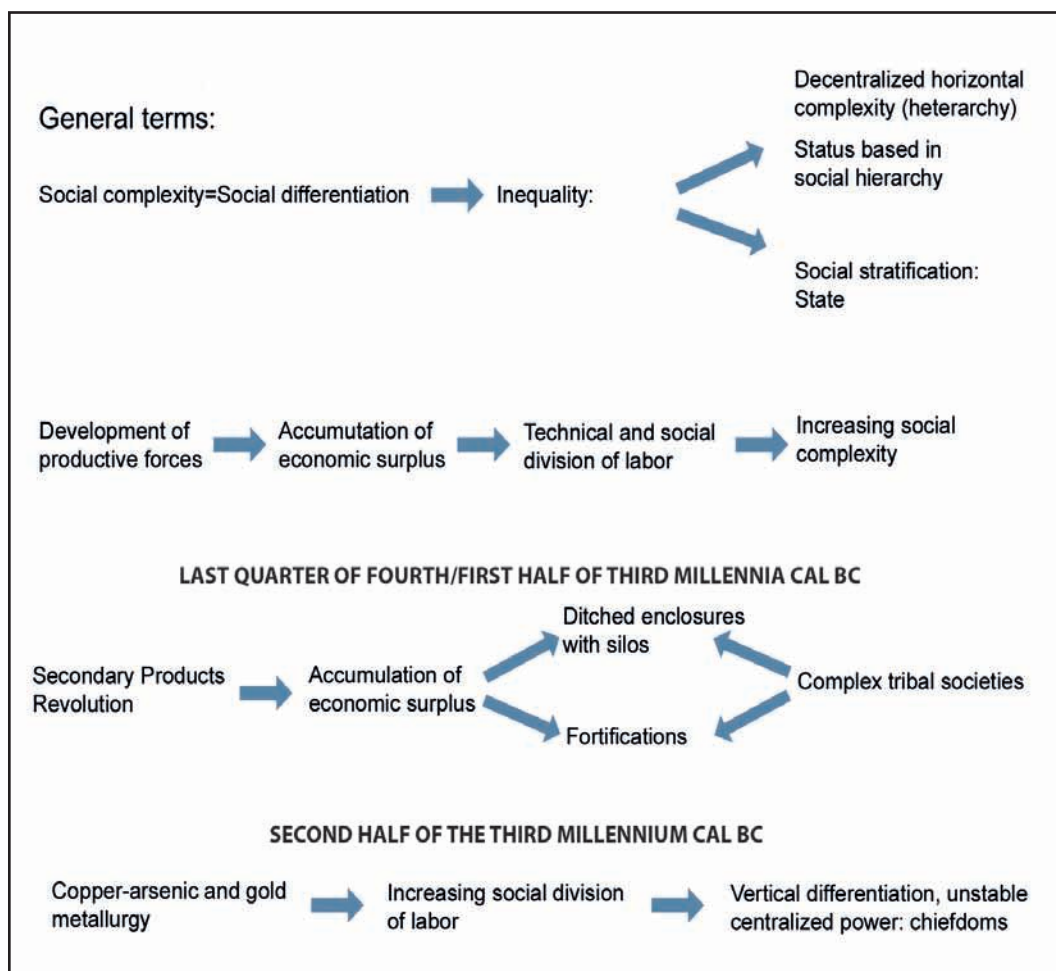


Fig. 1- A general framework of social complexity in the Late Prehistory of southern Portugal.

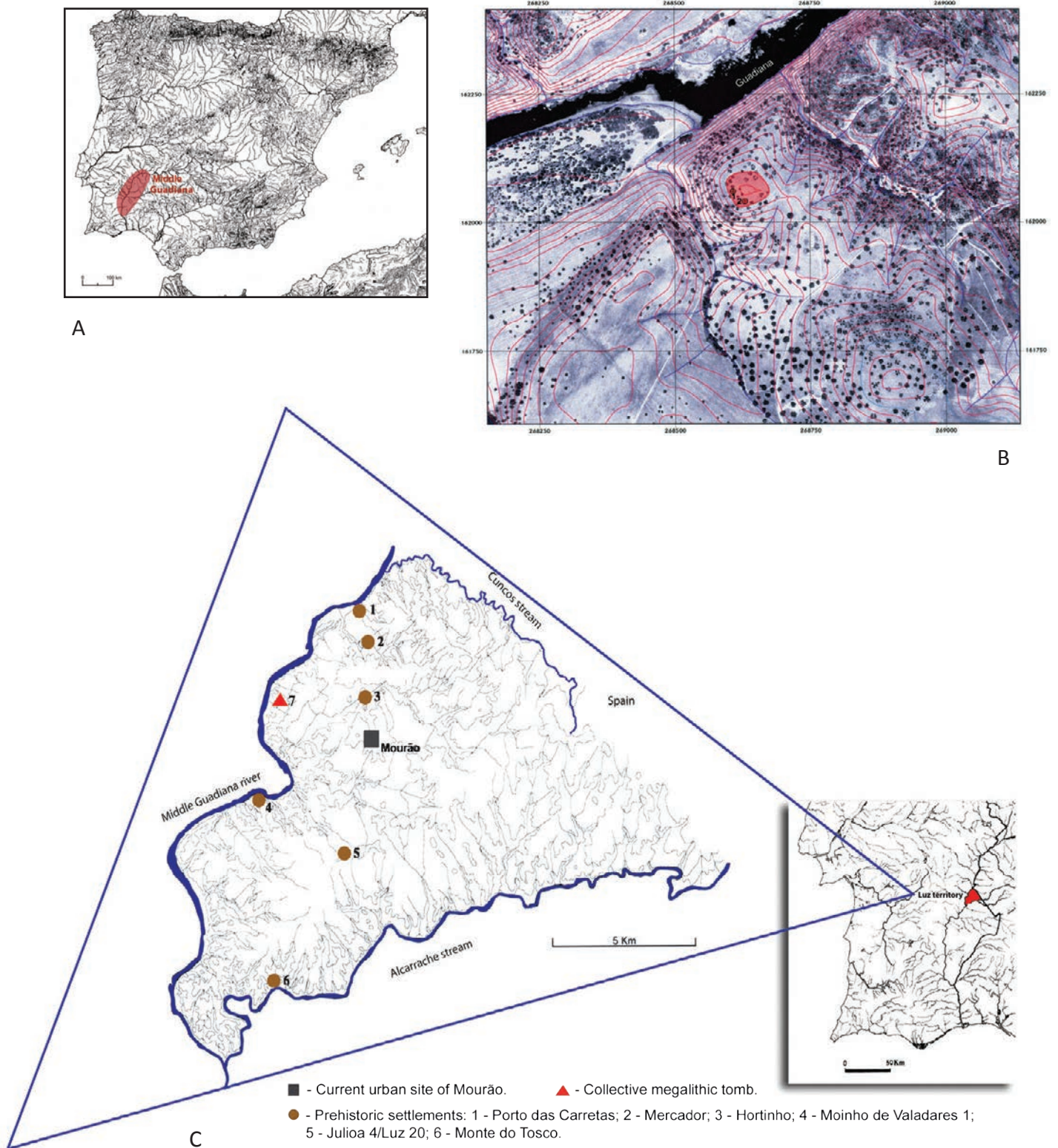


Fig. 2 - Geographical setting of the empirical record referred in the text. A- the Middle Guadiana River Basin in the Iberian Peninsula; B- location of Porto das Carretas (red); C- the local productive system of the Luz territory during the first half of the third millennium cal BC. Apud Soares, 2013.

maritime trade of foodstuffs, metals and luxuries (Mayet and Tavares da Silva, 2000). Indirectly, the upper class of the eastern early empires were ruling this interregional trade, reaping the major benefits for themselves (Aubert, 1994; Frank, 1993; Polanyi, 1957).

Social complexity has been recognized as a process internal to cultural contexts, resulting from the dynamics of the social system, its interaction with environmental changing factors, and its integration in supra-local/regional scales. Thus, the pathways to complexity can be quite diversified according to resources availability, power and political organization, forms of religiosity, history and sociabilities (Mcintosh, 1999). Despite the recognized multidimensional character of social complexity, in our approach, we are focusing attention on the major economic transformations – Secondary Products Revolution and metallurgical specialization – which this paper propounds to be the prime mover of the cultural change in the direction of stratification (Soares, 2013); the economic and technological innovations mentioned were quite powerful to provoke increasing rates in the volume of production and productivity.

In order to analyze the settlement systems from the end of the fourth to the first half of the third millennia cal BC we considered the anthropological concepts of unilocal/plurilocal clan and conical territory (Friedman and Rowlands, 1982; Sahlins, 1963). In the conic clan the affinity of primary segments of the tribal society is replaced by the growing hierarchization of lineages with unequal status legitimated by the genealogical distance from the mythic ancestor (Sahlins, 1963). The tribal internal tensions could escape through inter-tribal conflict zones. Furthermore, we take into account the multiple forms of transition between the horizontal political territories of simple segmented societies and the vertical political organization of State (Clark and Blake, 1999; Carneiro, 1981; Earle, 1991, 1997; Gailey and Patterson, 1988; Garrido-Pena, 2006; Hayden, 1995; Lillios, 1992; Mcintosh, 1999).

The Middle Guadiana River Basin is the geographical setting of the main archaeological record used in this paper (Fig. 2A) with a particular

focus on Porto das Carretas (Fig. 2B), a small and permanent fortification (about 1 ha) directly overlooking the Guadiana on its left bank (Municipality of Mourão). In addition to its defensive function, farming was probably a core activity as indicated by material culture, faunal remains and botanic information (charcoal analysis), as well as by the availability of productive soils in its proximity (Soares, 2013; Tereso *et al.*, 2011). Thus, the evidence we use for reading sociopolitical complexity came mostly from domestic contexts and settlement patterns (Fig. 1). Indeed, we put less emphasis on funerary practices. As a case study, we shall look at the material culture of Porto das Carretas (Tavares da Silva and Soares, 2002; Soares, 2013) but in articulation with a set of coeval (Table 2) Prehistoric settlements (Fig. 2C), representatives of a probable *community of practice* (Bourdieu, 1977, Wenger, 1999). The majority of these sites was object of the Alqueva rescue excavations program (Tavares da Silva, Soares, Mascarenhas, 1986; Soares and Tavares da Silva, 1992; Soares, 2013, Valera, 2013). This way it will be possible to achieve the probable connections between local, regional and even supra-regional scales (Hurtado 2003, 2008), and so it will be defendable to address social complexity in a relational approach.

In sum, we are trying to build a dynamic image of the wider social organization of the Middle Guadiana River Basin in the third millennium cal BC, through the selection of the two major economic transformations (SPR and metallurgical craft):

I - The Secondary Products Revolution (SPR), mainly plow agriculture (cart, plough and integration of bovine cattle in agriculture), occurred in the Late Neolithic of Iberia, about 3250-2900 cal BC (Sherratt, 1981, 1983; Soares, 2003, 2013). The SPR induced a remarkable acceleration in the growth rate of all the indicators of socio-economic development: productivity; volume of production; increase in population density and in social interaction. Sedentism was reinforced. The population got concentrated in macro-villages surrounded by ditches and appointed with silos and other storage facilities to keep economic surplus (Díaz-Del-Río, 2008; Castro Lopez *et al.*, 2008; Zafra de la Torre

et al., 1999, 2010). Besides the function of settlement delimitation, these ditches would also operate as important reservoirs of water supply (Díaz-Del-Río, 2003) and in some cases they could integrate hydraulic features possibly for irrigation programs in dry environments, like the Middle Guadiana Basin e.g. the site of Águas Frias (Calado, 2006) or the Middle-Upper Sado Basin e.g. the site of Porto Torrão (Rodrigues, 2015). In the external borders of each tribal territory, regardless of size, the permanent settlements were generally fortified. In the case of the supposed tribal territory of La Pijotilla to which Porto das Carretas would belong, the ecological border of Guadiana River was strongly defended on its left bank by a line of fortresses (Fig. 12) located close to the natural crossings of the river (downstream):

- San Blas - 16km to the north of Porto das Carretas, a powerful macro-village (about 30ha of residential area and 20ha of necropolis) with a very complex fortification system formed by an inner citadel, surrounded by a wall, a ditch and a harbor entrance defended by towers. An external wall was also identified with about 2km in length, reinforced by a ditch and bastions (Hurtado, 2004);

- the middle and small sized fortifications of Porto das Carretas, Monte do Tosco, Cerros Verdes, Outeiro de S. Bernardo (Bubner, 1979), Cerro dos Castelos de S. Brás (Parreira, 1983) and the surveillance site of Moinho de Valadares 1 (Soares, 2013, Figs. 42, 256).

In southern Portugal, the traction power of the bovine cattle that pulled the ploughs and carts was represented by engravings in the open-air rock art shrine of Escoural superimposed by a Chalcolithic fortified settlement (Gomes *et al.*, 1983, 1994), and by bone pathology in the metatarsal, observed on faunal remains of *Bos taurus*, namely from the site of Mercador, a satellite open site of Porto das Carretas (Moreno and Valera, 2006). Animal traction substantially increases the area a person can work with hoe and allows the cultivation of the thickest and most fertile soils, thereby increasing profit and lessening the fallow cycle.

The intensification of agriculture generates economic surplus, precondition for social division of labour (weaving, metallurgy, etc.), consequently providing economic sustainability not only for settlement stability and large communities, but also for substantial environmental changes and greater social inequalities caused by changes in the social relations of production.

As defended by Antonio Gilman (1981; see also Chapman, 1990), the intensification of subsistence clearly precedes the emergence of elites in the Late Prehistory of Iberia.

II - The metallurgical craft specialization on copper-arsenic alloys and gold was developed in the middle/third quarter of the third millennium cal BC. The metallurgical production increased social division of labour; metal artefacts brought new growth rates of productivity on overall subsistence production, and provided means for a more hierarchical political economy; power and prestige items such as weapons, adornments, means by which elites displayed their superiority, could be the engine factors for a large exchange system of prestige goods. Weapons, fine and exotic goods are associated to elite burials, like that of Quinta da Água Branca, Vila Nova de Cerveira, in northern Portugal (Armbruster and Parreira, 1993, p. 36-39; Fortes, 1905-1908) or the Amesbury tomb (Fitzpatrick, 2002), in England. Although our main focus is not the funerary space, for searching vertical differentiation in the archaeological record of the second half of the third millennium cal BC, it become indispensable to take into account the individual "aristocratic" graves, where the paramount chiefs were exhibited and deposited with prestige goods and weapons, signs of their political power. In the dawn of the Bronze Age we can observe that political action is organized through conspicuous vertical control hierarchies that can be seen as a social organization alternative to class societies.

Commodities in exotic raw materials and rare rocks (Schuhmacher, Cardoso and Banerjee, 2009; García Sanjuán *et al.* 2013) such as amber, ivory, ostrich eggs (Hurtado, *et al.* 2002), green stones,

and metals are also present in the central-places¹ of the third millennium settlement systems of southern Iberia, like Marroquies Bajos (Zafra de la Torre *et al.*, 1999, 2003), Valenciana de la Concepción or La Pijotilla (Hurtado *et al.*, 2002). Long-distance exchange of foodstuffs was beyond the capacity of the Chalcolithic transport system, not prestige goods. The specialized production of copper and gold as ideological values and coercitive items, mainly for display, burials and votive deposits, could have a strong social meaning that gave a central role to prestige goods exchange in the legitimation of political leadership (Kipp and Schortman, 1989). So, *the similar but different* (Case, 2004) Pan-European Beaker package (Guerra Doce and Liesau, 2016) is a reflection and agent of interconnections, alliances and allegiances at local, regional and supra-regional scales.

In short (Fig. 1), no single theory of the increasing social complexity in the path to social stratification can encompass the multitude of cultural circumstances (contingency). Therefore, admittedly a strictly structural analysis is made in the present article that provides two quite different forms of political economy in a diachronic approach that really requires the broadening of the empirical base. This attempt to explain the preconditions of the State formation assigns a central role, in sequential moments, to agriculture intensification (Soares, 2003) and interregional prestige goods trade (Brumfiel and Earle, 1987) related namely with the metallurgical specialization (Soares, 2013). Specialization and social division of labour (weaving, metallurgy, management and military activities) are inherent to the process of increasing social complexity and emergence of hereditary elites. Besides, once again we agree with A. Gilman (1981) when he argues that exploitation rather than management could be the main purpose of the political elites, and subsequently of the ruling classes.

¹ - Central-place is used in this text as meaning the more qualified site of the tribal territory, from where decision-makers would act. For the seminal meaning of this concept see Christaller, 1966.

Chalcolithic settlement system: the Luz territory

The dam of Alqueva gave the opportunity to construct a database that represents the archaeological remains in a territorial perspective (Soares, 2013; Soares and Tavares da Silva, 1992; Tavares da Silva, Soares and Mascarenhas, 1986; Valera, 2013). The blue triangle of Figure 2C illustrates the hydrographic borders of the Luz territory which represents, in this theoretical model, the minimal area of an organized community: a *local productive system* with a shared geography (Figs. 2, 8-10, 12, 13).

In the Luz territory the first cluster of sedentary sites took place during the last quarter of the fourth millennium cal BC (Late Neolithic) (table 3):

i) the large ditched enclosure (about 5 ha) of Julioa 4 / Luz 20, located in the most fertile area of the territory (Tertiary deposits), with a panoramic view (Figs. 2, 8-9, 12-13; Table 3);

ii) a small surveillance site (Moinho de Valadares 1), on soils merely adequate for herding of sheep and goats, probably embedded in a more general agricultural strategy. Moinho de Valadares 1 is located on a cliff over the Guadiana River, the external western border of the territory (Figs. 2, 8-10, 12-13);

iii) a collective megalithic tomb with a polygonal chamber and a short corridor (Fig. 2C) (Oliveira, 2000).

In the Luz territory a demographic peak occurred in the Chalcolithic, first half of the third millennium cal BC (Table 3), as indicated by the great number of archaeological sites (Table 3): fortifications of Porto das Carretas and Monte do Tosco; the surveillance site of Moinho de Valadares 1; the main settlement of Julioa 4/Luz 20; Mercador and Hortinho, both small satellite sites of Porto das Carretas (Table 3, Figs. 8-13). All the Chalcolithic sites were interconnected; their resources were exploited in a very skilled way, with the aim of obtaining successful results for the whole local productive system (Figs. 8-13).

In the second half of the third millennium cal BC the previous local productive system of the

Luz territory had presumably collapsed. The demographic pressure over the landscape of Porto das Carretas seems reduced, enhancing the development of the Mediterranean forest with the growth of *Quercus faginea*, as well as the development of the riparian forest (*Fraxinus angustifolia*) (Duque Espino, 2004, Soares, 2013, tabs 7-8).

Population density had probably decayed along with the number of sites (Table 3). Seemingly, the main settlement of Julioa 4/Luz 20 was abandoned. Its coordination functions would be transferred to the nearby macro-village of San Blas. This site had reached its peak of demographic aggregation by the middle of the millennium, with about 30 ha of residential area and 20 ha of necropolis as already mentioned (Hurtado, 2004). A reduction of the dwelling spaces even in the macro-villages (Pajuelo Pando and López Aldana, 2016) seems to be a general trend, connected to deep social changes. At the end of the millennium the abandonment process would be evident, beside the occurrence of the dispersion of settlements (social fission) and power concentration in skilled trade-persons who were

also connected with the control of metallurgy. This new economic sector (not regulated by the traditional peasant society) could be the starting point for the formation of the hereditary elites of the Bronze Age societies.

Stratigraphy and radiocarbon chronology of Porto das Carretas

The stratigraphy and radiocarbon chronology of Porto das Carretas showed two occupational phases separated by the occurrence of a large fire and subsequent abandonment. This hiatus probably lasted no longer than a century (Fig. 3, Table 1).

The first occupation corresponds to the first half of the third millennium cal BC and the second occupation, to the third quarter of the same millennium associated with Bell Beaker material culture (International Beaker-style pottery) and copper-arsenic metallurgy; both phases had been radiocarbon dated.

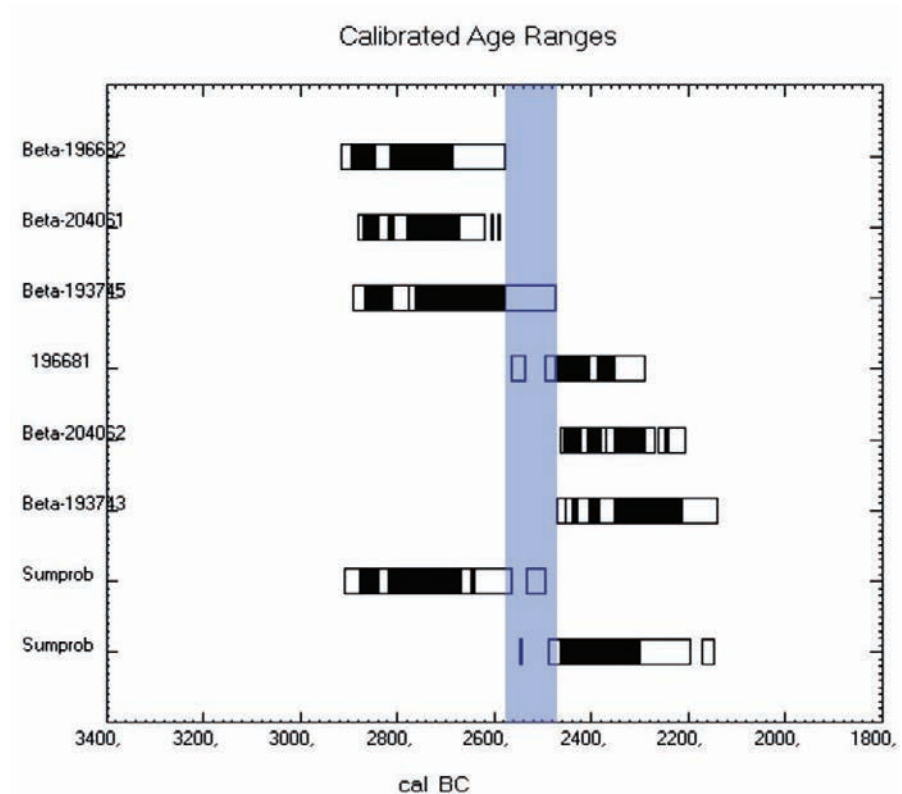


Fig. 3 – The stratigraphy and radiocarbon chronology of Porto das Carretas showed two phases of occupation separated by an abandonment caused by an extensive fire. Phase 1 corresponds to the first half of the third millennium cal BC, and phase 2 occurred in the third quarter of the same millennium.

Table 1- Radiocarbon dates of Porto das Carretas. After Soares, 2013.

	Ref. Lab.	Context	Sample	Date ¹⁴ C (BP)	Calibrated date (cal BC)	
					1σ	2σ
Phase I Chalcolithic	Beta-196682	Corte H, Sector XXXVI, Q.J13, C.4B2 (área de combustão)	Charcoal (<i>Pinus</i> sp.)	4200±70	2890-2670	2920-2580
	Beta-204061	Corte A, Sector XXXVI, Q.M8, C.4B2 (área de combustão)	Charcoal (<i>Vicia faba</i>)	4150±40	2870-2630	2880-2580
	Beta-193744	Corte A, Sector XXXVI, Qs.K- L/13-14, C.4B2 (área de combustão sobre piso de argila)	Charcoal (<i>Quercus</i> sp.)	4130±120	2890-2490	2930-2360
	Beta-193745	Corte A, Sector XXXVI, Q.L12, C.4B (área de combustão)	Charcoal (<i>Pinus</i> sp.)	4110±60	2860-2580	2880-2480
Phase II Bell Beaker Period	Beta-196681	Corte A, Sector XXXVI, Q. N- O/12-13, C.2B2 ("Torre" M13; Lareira D)	Charcoal (<i>Pinus pinea</i>)	3920±40	2470-2340	2490-2290
	Beta-204062	Corte A, Sector XXXVI, Q.M14, C.2B2 ("Torre" M13; Lareira B)	Charcoal (<i>Pinus pinea</i>)	3860±40	2430-2280	2460-2200
	Beta-193743	Corte A, Sector XXXVI, Q.L13, C.2B2 ("Torre" M13; Lareira A)	Charcoal (<i>Olea</i> sp.)	3840±60	2430-2200	2470-2130

Phase I (Chalcolithic): 2890-2580 cal BC at 1 sigma; 2920-2480 cal BC at 2 sigma. Program Calib 5.0.1 (Stuiver and Reimer, 1993) and calibration courb IntCal04 (Reimer *et al.*, 2004). Hiatus: less than a century. Abandonment subsequent to an extensive fire. Phase II (International Bell Beaker phase): 2470-2200 cal BC to 1 sigma; 2490-2130 cal BC to 2 sigma.

Table 2 – Radiocarbon dates from the settlements of the Luz territory in the third millennium cal BC (Soares, 2013; Valera, 2013). Apud Soares, 2013.

	Site	Phase	Sample	Ref.	BP	cal BC	
						1 Sigma	2 Sigma
Second half third millennium	Moinho de Valadares 1	Aband.	charcoal	OxA-12715	3726±29	2200-2030	2210-2030
	Mercador	Phase II	human bone	OxA-11981	3664±29	2116-1973	2134-1926
			fauna	Sac-1900	3720±80	2271-1980	2399-1885
			fauna	Sac-1933	3790±60	2295-2138	2458-2032
	Porto das Carretas	Phase II	charcoal	Beta-204062	3860±40	2430-2280	2460-2200
			charcoal	Beta-193743	3840±60	2430-2200	2470-2130
charcoal			Beta-196681	3920±40	2470-2340	2490-2290	
First half third millennium	Moinho de Valadares 1	Phase II	seeds	OxA-12714	4167±30	2880-2670	2880-2620
	Porto das Carretas	Phase I	charcoal	Beta-193745	4110±60	2860-2580	2880-2480
			seeds	Beta-204061	4150±40	2870-2630	2880-2580
			charcoal	Beta-196682	4200±70	2890-2670	2920-2580
			charcoal	Beta-193744	4130±120	2890-2490	2930-2360

Table 3 - The main settlements of the Luz territory. They emerged in the Late Neolithic, reached its peak of demographic increase in the first half of the third millennium and declined in the second half of the same millennium.

2500 - 2000/ 1800 cal BC Bell Beaker Period/ Early Bronze Age	Porto das Carretas Phase II	Mercador Phase II	Monte do Tosco I Phase II			
2900 - 2500 cal BC Chalcolithic	Moinho de Valadares 1 Phase II	Porto das Carretas Phase I	Mercador Phase I	Monte do Tosco 1 Phase I	Julioa 4/Luz 20	Hortinho
3250 - 3000 cal BC Late Neolithic	Moinho de Valadares 1 Phase I	Julioa 4/Luz 20				

Architectural reconstruction, economy and functional structure of Porto das Carretas

Phase 1. First half of the third millennium cal BC

Architectural features

A small fortification spanning 0,5-1 ha was built (Figs. 2B, 4-5), constituted of three lines of walls, with a large bastion and a tower, whose technique of construction and architectural plan are characteristic of the first half of the third millennium of the Iberian Peninsula. Many similarities can be found in other stone-walled settlements, although of different sizes and geographical settings, such as Castelo Velho (Jorge, 1998), Zambujal (Kunst, 2007; Sangmeister and Schubart, 1981), Chibanes (Tavares da Silva and Soares, 2014), Monte da Tumba (Soares, 1994; Tavares da Silva and Soares, 1985, 1987), São Pedro (Mataloto *et al.*, 2007), Los Vientos de la Zarcita (Piñon Varela, 1995), the fortresses of Los Millares (Molina *et al.*, 2004; Monks, 1999).

The domestic structures of Porto das Carretas, namely huts, were built of perishable materials, except for hut “P4” which was constructed with a masonry foundation (0,60m in width) of schist and clay, with an external diameter of 5m. It was surrounded by a concentric courtyard, also defined by stone foundation, with an inner diameter of about 12 m (Soares, 2013).

Economy

The economy of Porto das Carretas in phase 1 (and its satellite Mercador) was based on an integrated and intensive agroforestry-livestock strategy of the territory exploitation oriented to the production of economic surplus (Soares, 2013, p. 350-360), complemented by hunting and riverine fishing. This variant of the *Mediterranean polyculture* agro-managerial model (Gilman, 1981) generated a special man-made landscape, referred to as *montado* (Soares, 1994, 2013; Stevenson and Harrison, 1992). The understory of the mediterranean forest of *Quercus rotundifolia* and *Quercus suber* (*montado*) was exploited for pig grazing, taking advantage of the huge production of holm oak acorns. *Sus domesticus* was the main species consumed

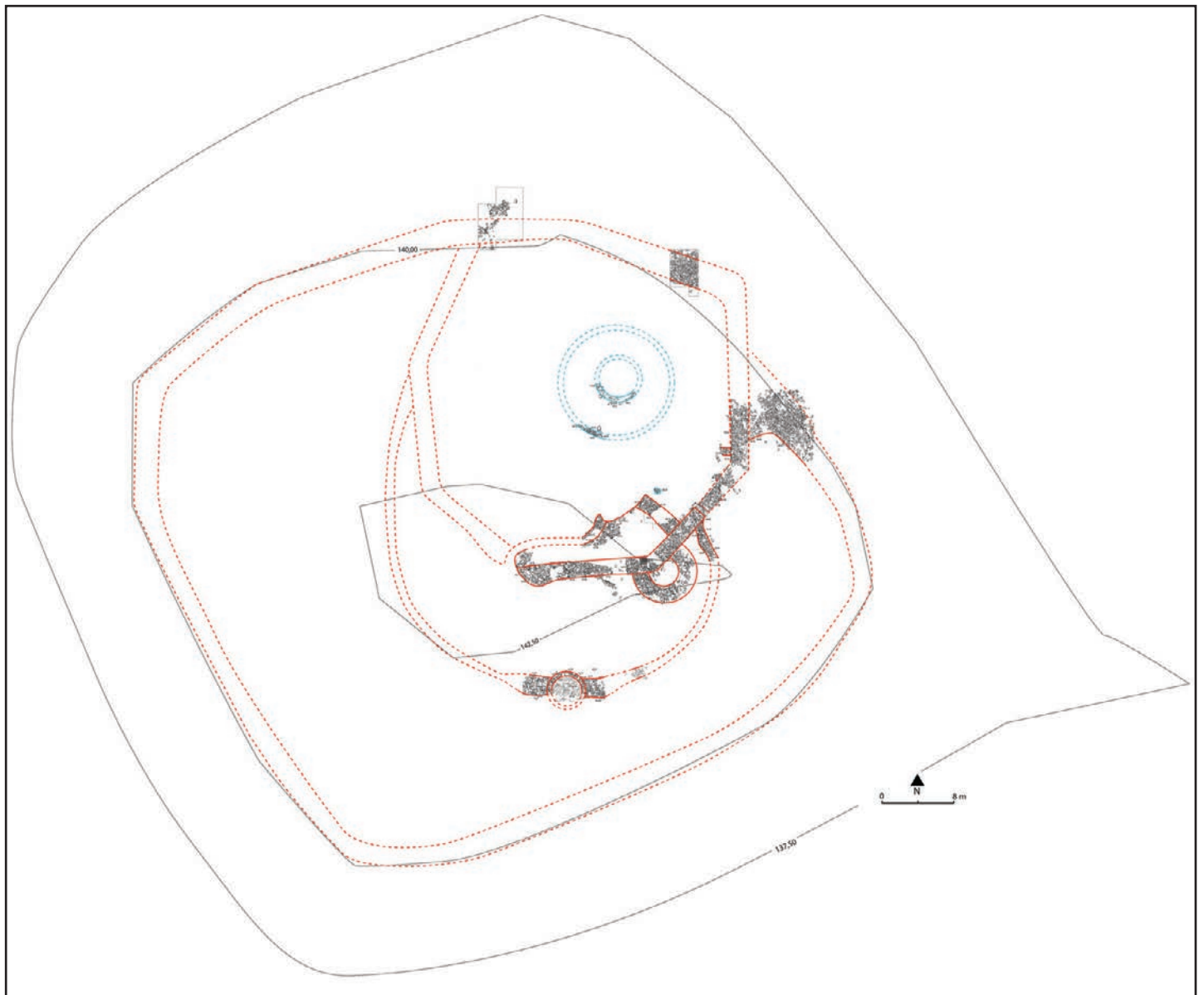


Fig. 4 - Plan of the fortification of phase 1 of Porto das Carretas, with 0,5-1ha with three lines of walls. In blue, the only hut (P4) built with a masonry foundation, surrounded by a courtyard also with stone foundation. First half of the third millennium cal BC. After Soares, 2013.

by Chalcolithic regional population. Regarding to capital-intensive subsistence technologies (plow agriculture, vine and olive cultivation and irrigation systems) in the Luz territory, cereals cultivation with plow pulled by bovine cattle was complemented by vegetables (*Vicia faba minuta*); fruit trees like olive (*Olea europaea*) and pear/apple tree (?) (*Pyrus* sp.) (Tereso *et al.*, 2011) were at least manipulated.

In the Chalcolithic macro-village of Alcalar, from southern Portugal (Algarve), the preservation of a large set of macro-botanic remains completes the previous framework with the cultivation of cereals (*Triticum aestivum*, *Hordeum vulgare*), beans, peas (*Vicia faba*, *Pisum fabacea*), linen (*Linum usitatissimum*), *Papaver somniferum* and vines (*Vitis vinifera* L.). Alcalar, with about 20 ha of residential

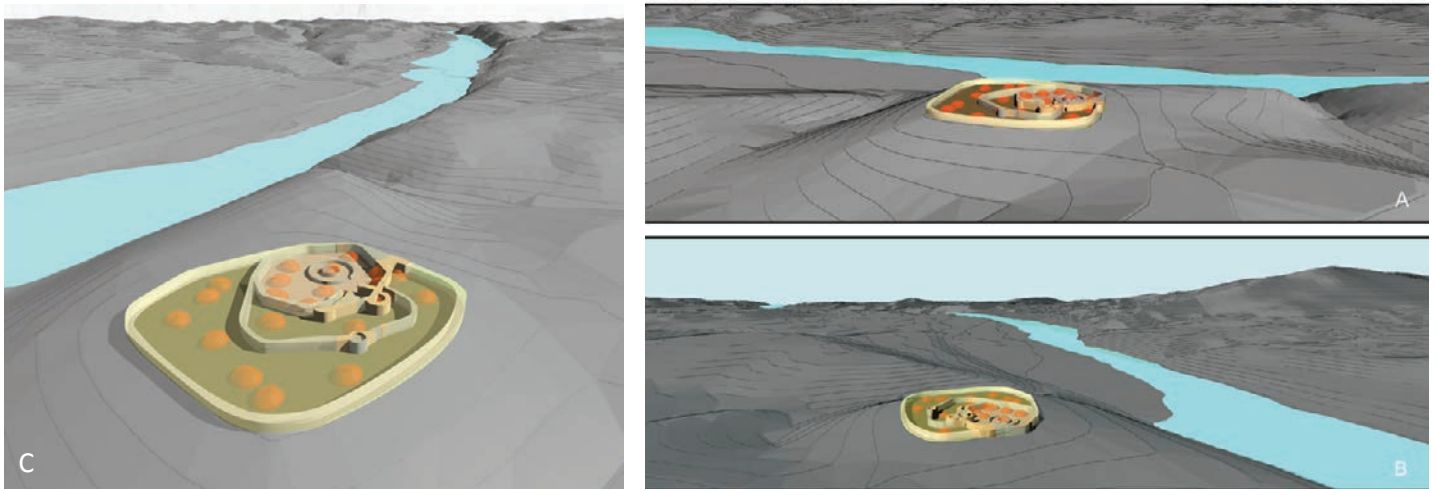


Fig. 5 -Architectural reconstruction of Porto das Carretas, phase 1, by António Alfarroba in Soares, 2013. A- southeast view; B-view from east to downstream; C- from Southwest to upstream. The two main locative factors were the good position for the surveillance of the Guadiana River and the proximity of fertile soils.

area and necropolis (Morán, 2014), was probably a central-place of a politically organized territory. Its monumentalized necropolis, namely the very impressive *tholos* 7, had been built at the beginning of the Bell Beaker phase. It could not only have funerary function but also religious purposes (Morán and Parreira, 2004).

Functional structure and social relations

The functional structure of the innermost sector of Porto das Carretas (Fig. 6) did not exhibit evidence of wealth concentration. Only elements of millstones were collected in the more elaborated hut (P4). These lead us to believe that P4 probably was a granary whose content has been saved before the fire. The weaving was the only craft activity that showed capacity for spatial segregation (Fig. 6) in relation to the remaining domestic chores. Zones J and I were dedicated to it. In Zone I there was, among a concentration of loom weights, an engraved schist plaque, with a characteristic textile decoration pattern, that can be interpreted as an expression of a close rapport between weaving and the ancestor megalithic feminine divinity associated with death (Fig. 7).

Interaction networks

As already referred, Porto das Carretas couldn't survive on its own. It acquires significance and importance when integrated in the local productive system of the Luz territory.

The intervisibility network (Fig. 9), economic scope and ranking size of each site as well as their interdependence in relation to critical resources allow the hypothesis of a hierarchical settlement system where inequality was masked by mechanisms of reciprocity and solidarity inherited from the megalithic kinship structure. It had been possible to distinguish a settlement hierarchy with 3 decreasing levels:

- 1) the major site (a ditched enclosure) which should control the local productive system – Julioa 4 / Luz 20 (Becker and Valera, 2012; Valera, 2013);
- 2) sites that had coercive functions – the fortifications of Porto das Carretas and Monte do Tosco;
- 3) small and open sites that were satellites

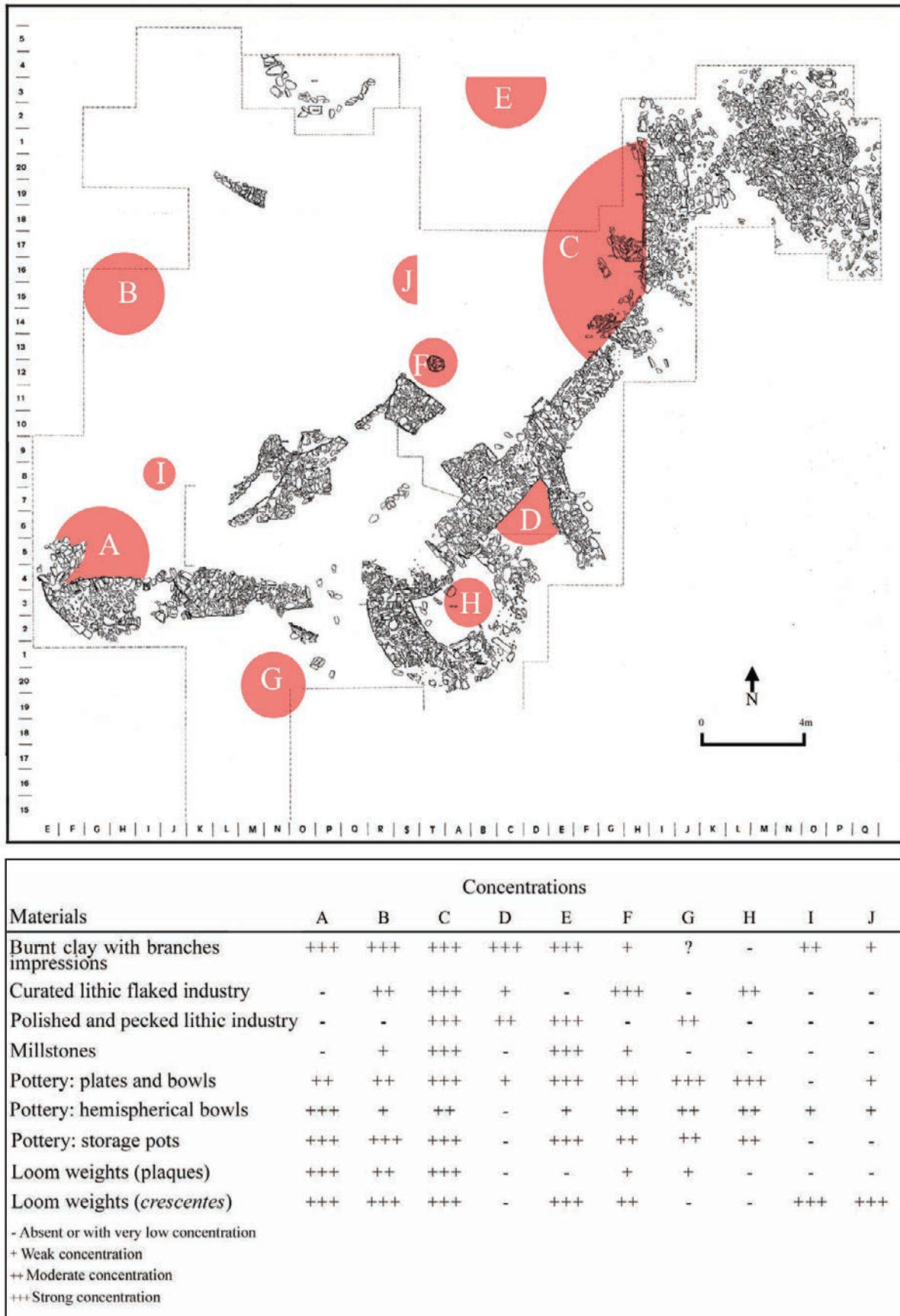


Fig. 6 - The functional structure of the innermost sector of the Porto das Carretas fortification. Phase 1. The typology of pottery is presented in Fig. 18.

Fig. 7 - Porto das Carretas. Phase 1. Engraved schist plaque and loom weights (plaques and crescents).



Upper ranked agricultural soils adequate for cereal cultivation (classes A+B).



Middle ranked agricultural soils (class C).



Low ranked agricultural soils, suitable for cattle herding (class E).



Archaeological sites:

- 1 - Porto das Carretas; 2 - Mercado; 3 - Hortinho; 4 - Moinho de Valadares 1; 5 - Julia 4/Luz 20; 6 - Monte do Tosco 1.

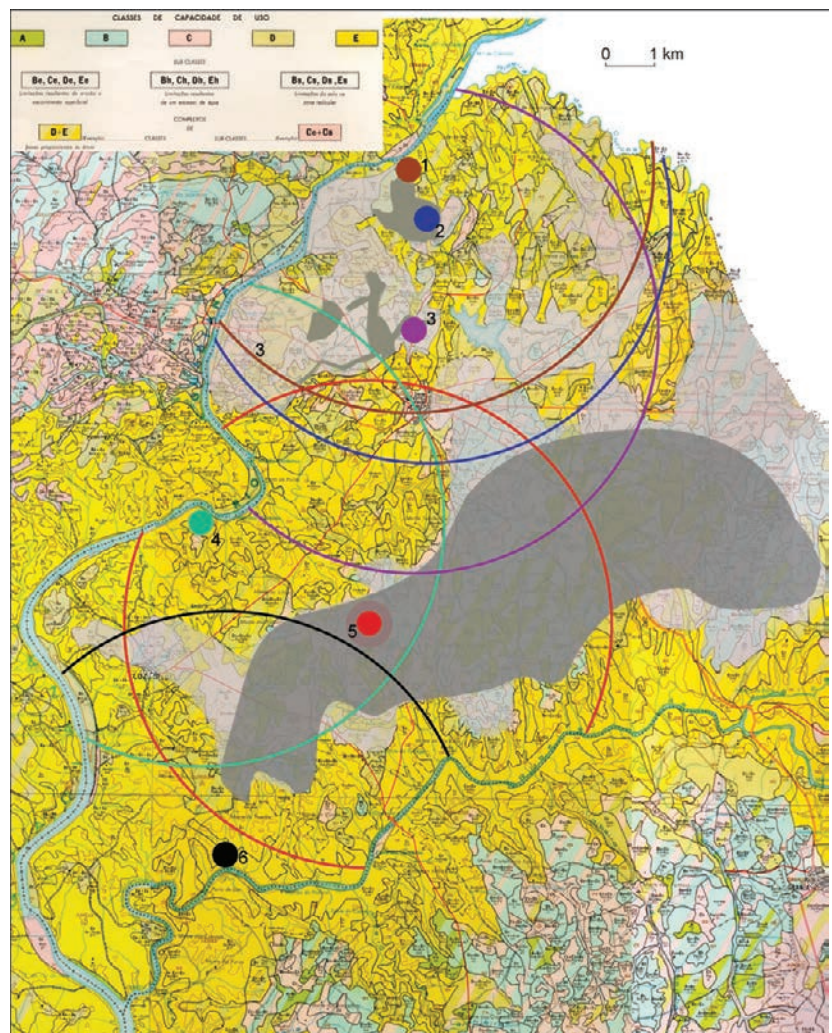


Fig. 8 - SROA map of land use capacity classes. The 5 km ratio circles used in the site catchment analysis (Higgs, 1975) illustrate the interconnections of the settlements inside the local productive system of the Luz territory. After Soares, 2013.

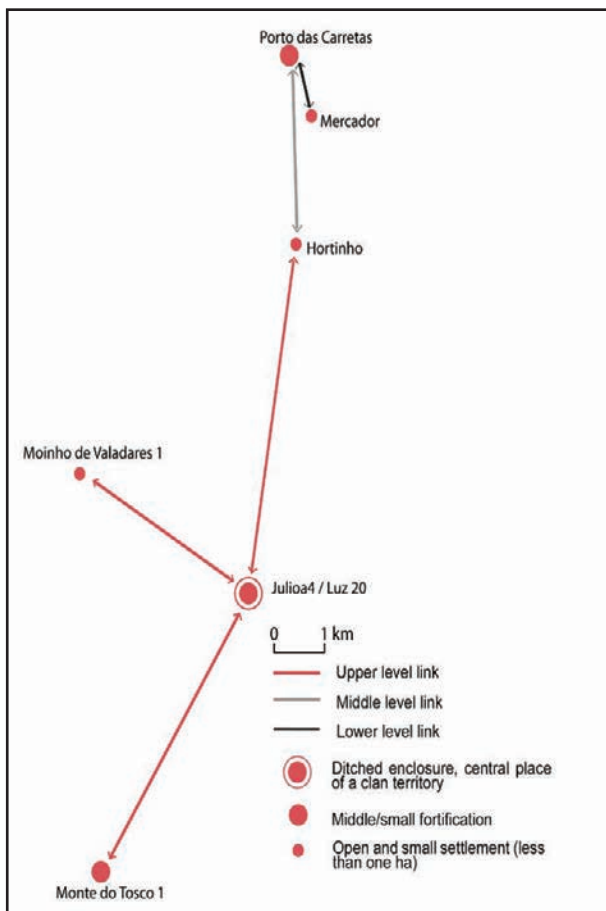


Fig. 9 - Settlement hierarchy of the Luz territory in accordance with the intervisibility and size ranking networks: upper level – the Julioa 4/Luz 20 ditched enclosure that controlled the local productive system; middle level – the fortifications of Porto das Carretas and Monte do Tosco; lower level – the small and open sites of Mercador and Hortinho, satellites of Porto das Carretas; the surveillance site of Moinho de Valadares 1, even in direct connection with Julioa 4/ Luz 20.

of those of the second level. As theoretically expected, Porto das Carretas, Mercador and Hortinho shared a strong intervisibility (Fig. 10).

The local productive system of the Luz territory could correspond to a segment of a tribal society (Figs. 12, 13), whose main centre would be located at La Pijotilla (Badajoz), the largest macro-village known in the Middle Guadiana River Basin, with about 80 ha, located in the most productive soils of the region, from the alteration of Miocene deposits (Hurtado, 2003, 2008).

General remarks

During the transition to the Chalcolithic, the megalithic society incorporates substantial productivity gains as a result of the SPR; the surplus accumulated could support the intra-social division of labour (weaving and defense) and inter-social division of labour (socio-territorial division of labour), organized in estuarine areas with an agro-maritime economy of shellfish gathering, fishing and salt exploitation in a traditional domestic mode of production (Soares, 2001, 2008, 2013b), peripherally integrated in the hegemonic Chalcolithic mode of production (Soares, 2013, p. 7, table 94).

The Chalcolithic society could achieve the coordination for political action, as the previous megalithic organization, by hypothesis, through assemblies, consensus, local solidarity, communal rituals and collective graves. The political power could be shared among multiple *loci*, preventing the growth of hierarchy and State formation.

Segmentary lineages or tribal systems have two components of complexity archaeologically expressed:

In the more open configuration, peasant communities with free access to communal resources (communal land) dispersed over the territory; the political integration would be probably realised by fertility and ancestor rituals. A particular kind of polity based on ritual power and religious authority could mobilize a significant amassing of labour and wealth for communal purposes, preventing social fission in a scenario where intra-social coercion or military control were probably not quite effective.

In these kin-based societies the other component was the macro-village in which a large population aggregation, central functions of religiosity, social coordination, craft specialization, trade and other networks of interaction, generated conditions for increasing complexity and inequality. To the macro-villages would converge tribute paid by segments dispersed over the territory.

Progressively, increasing contradictions might occur related to the raise of inequality in the core/periphery relations of each tribal redistribution system. These relations, pretending to be submit-



Fig. 10 - Porto das Carretas, Mercador and Hortinho shared a strong intervisibility. Porto das Carretas and Moinho de Valadares 1 have a strategic position over the riverine border. The Prehistoric site of S. Cristóvão (not yet excavated) in the right bank, looking to the megalithic necropolis of Reguengos de Monsaraz, seems not linked to the river. Its study is outside the scope of this work. Map of soil classes (A-E). Adapted from António Alfarroba in Soares, 2013.

ted to a communitarian/parental ideology, could in practice include unequal distribution of extra goods, in favor of the centre of each subsystem. To a certain

limit, internal stresses had probably been directed to the inter-tribal conflict zone. Typical border fortifications (Cara Barrionuevo and Rodríguez López,



Fig. 11 –Visual control of the Porto das Carretas fortification over the Gadiana river (downstream). After Soares, 2013, Fig.52, p.106.

1989) like the ones in the tribal territory of La Pijotilla in the Middle Gadiana River Basin (Hurtado, 2003, 2008; Soares, 2013) could serve not only for military purposes, but also as “gateways” to control the circulation of commodities and people between the competitive neighboring territories of Porto Torrão extended west towards the Atlantic coast (Valera and Filipe, 2004; Rodrigues, 2015), and Valencina de la Concepción, eastwards in the Guadalquivir Basin (Costa Caramé *et al.*, 2010).

In sum, we propose, for the first half of the third millennium cal BC, a complex tribal organization in which mainly status and horizontal inequality (heterarchy) could be hidden in the kinship structure inherited from megalithic society. The theoretical model introduced here gives coherence to the Luz territory when integrated in the whole tribal context. This was presumably managed by the macro-village of La Pijotilla (Figs. 12-13), which would accumulate surplus coming from the exploitation of peripheral social segments. It is possible that uneven wealth distribution and social inequality were imposed by psychosocial pressure inside the kinship structure rather than by coercive means. The inter-tribal sphere could have been the escape valve for conflict.

Phase 2. Third quarter of the third millennium cal BC. Bell Beaker International Group. Collapse of the local productive system of the Luz territory

Architectural features

After the abandonment of Porto das Carretas that may have lasted about a century, in consequence of an extensive fire, a rebuilding started to take place on the site. A set of three monumentalized and terraced towers, three huts and a metallurgical furnace had been constructed in an open area higher up (Figs. 14-16).

The central tower, N7, has an internal diameter of 5.70m; its walls are 0.90m and 1.5m wide. The best similarities may be found in the tower of Miguens 3, on the opposite bank of the Gadiana, and in the subcircular tower of Monte da Tumba, with 12m of external diameter; all of them were built in the Bell Beaker period (International group).

The architectural features of this phase can be interpreted as a metaphor for the emerging social organization. The communitarian enclosure has

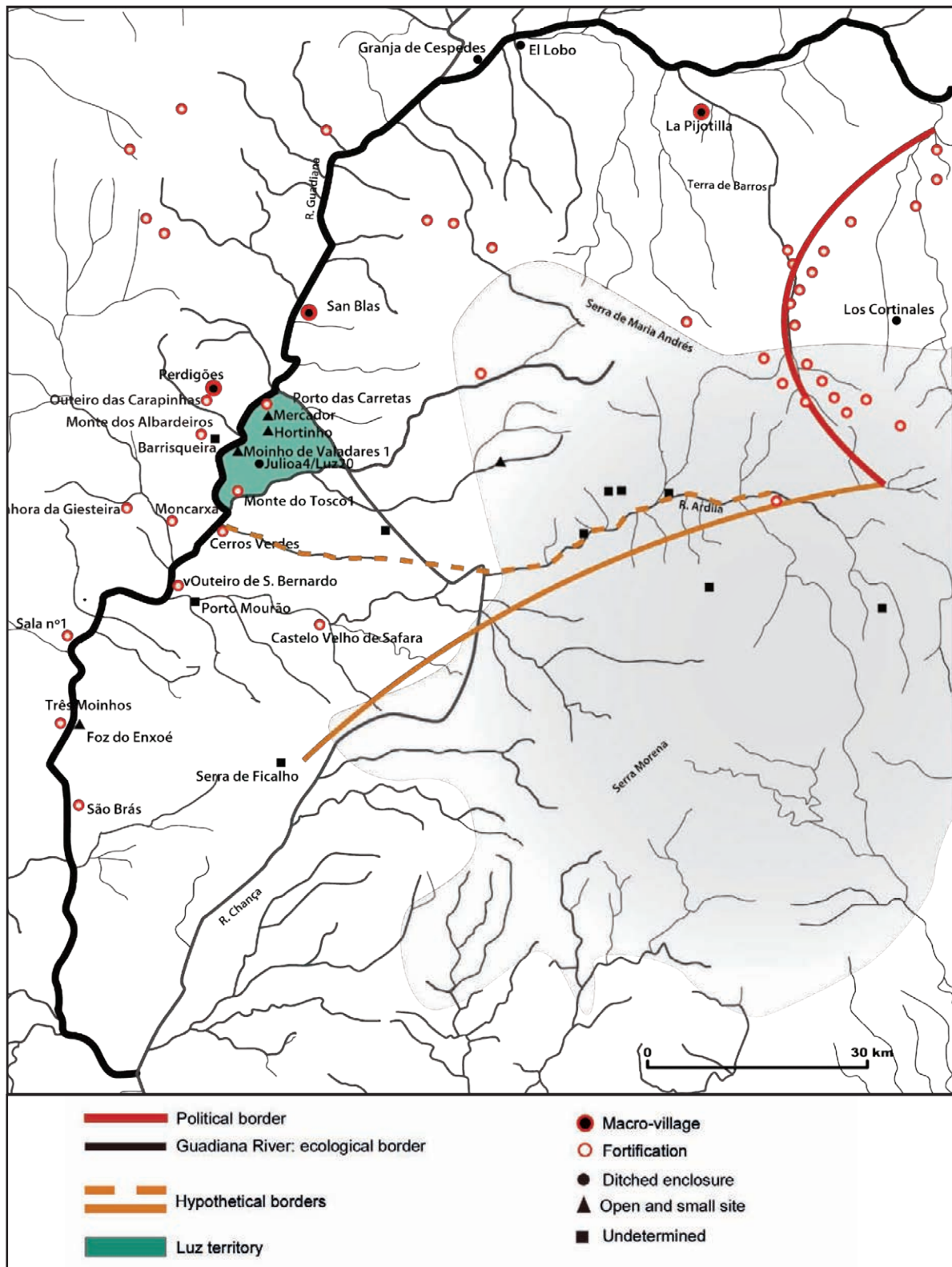


Fig. 12 –Reconstruction of the hypothetical tribal territory of La Pijotilla. The Luz territory (green) draws its importance when placed in the whole tribal context.

Map sources: Hurtado, 2008; Enríquez Navacué, 2007; Soares, 1992; Soares and Tavares da Silva, 1992; Soares, 2013.

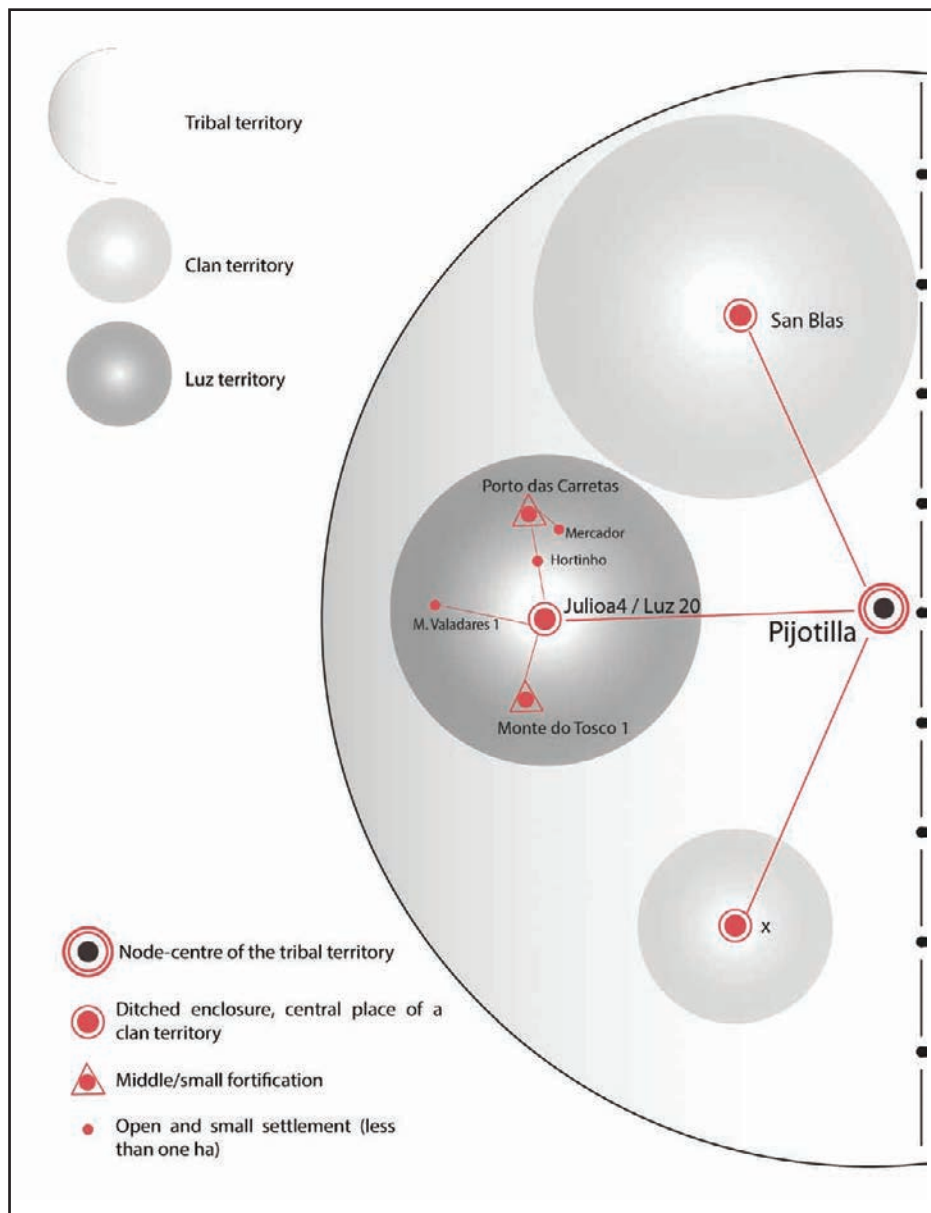


Fig. 13 - A complex tribal organization model for the Middle Guadiana Basin in the first half of the third millennium cal BC commanded by La Pijotilla. The Luz territory could correspond to a clan segment.

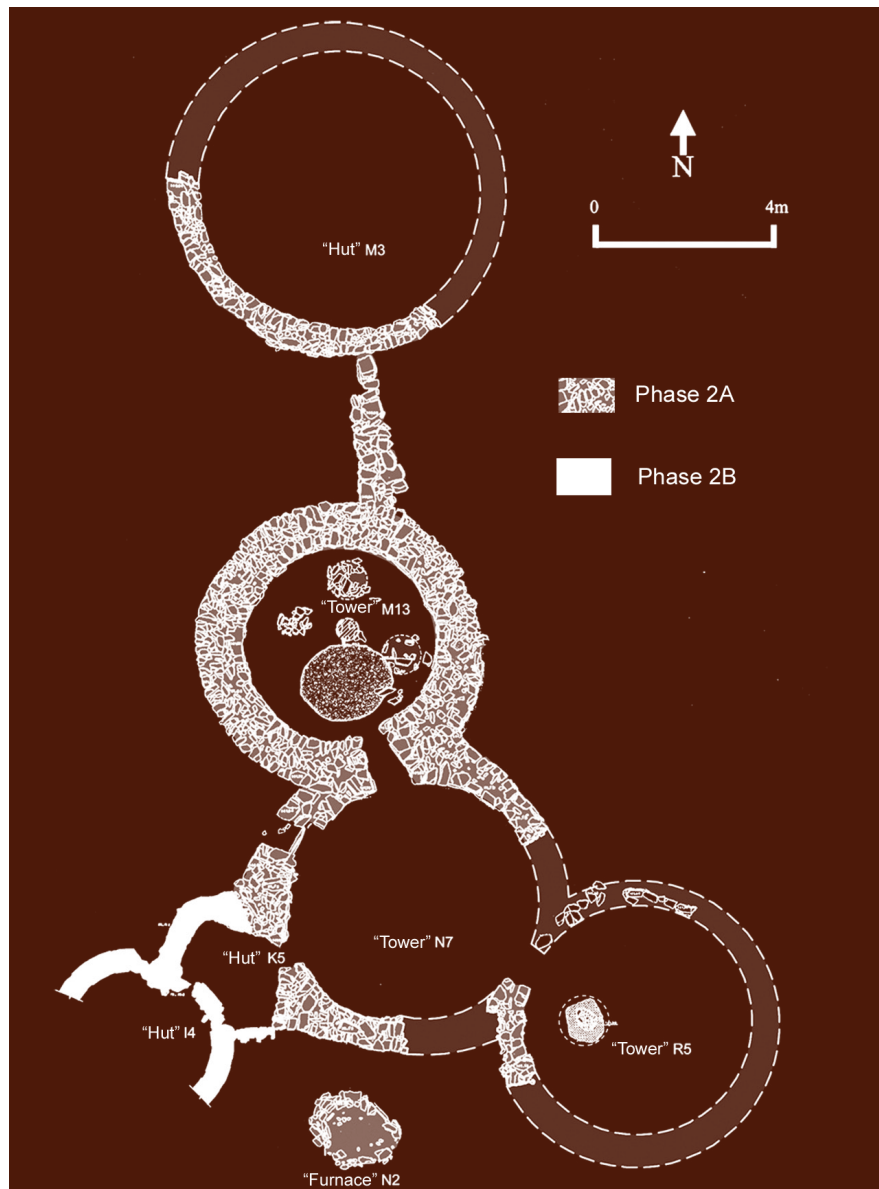
disappeared and had been replaced by monumentalized fortress-towers.

These architectural features reflect the emergence of elites that controlled political power. The material culture indicates an economy of prestige goods, supposing a social integration of the site at a supra local scale.

Economy

The subsistence economy was most likely based on cereals and livestock (*Sus sp.*, *Bos taurus*, *Ovis aries/Capra hircus*); the millstones are better represented than in phase 1 (Soares, 2013, table 33), which can indicate that the resident elite might

Fig. 14 - Architectural plan of Porto das Carretas. Constructive phases 2A and 2B (Bell Beaker period – International group), constituted by a set of three terraced and monumentalized towers interconnected, three huts and a metallurgical furnace, built in open space.



be receiving tribute from peasant households. The increase of hunting for big species is quite remarkable, namely *Cervus elaphus* and *Bos primigenius* (“aristocratic hunting”) as observed at the Bell Beaker occupation of Monte da Tumba in the Middle Sado River Basin (Antunes, 1987, p. 125); riverine fishing is also documented by fishing net weights. The weaving activity reached a peak of development (Soares, 2013, p. 305-312). The typology of loom weights (*crescentes*) and the high quality of linen revealed by a painted fragment of linen from the necropolis of Belle France in Algarve, directly

dated from the second half of the third millennium (Soares and Ribeiro, 2003), illustrate the technological development of weaving craft in southern Portugal. It might be an advantage of southwest compared to other regions of the Iberian Peninsula (Cardito Rollán, 1996; Soares, 2013).

The most striking economic differences compared to phase 1 are the local arsenical copper metallurgy and the participation in the regional trade of marine resources (most likely salt associated with shellfish). Porto das Carretas is about 170km far from the River estuary (about 34 hours of walking),

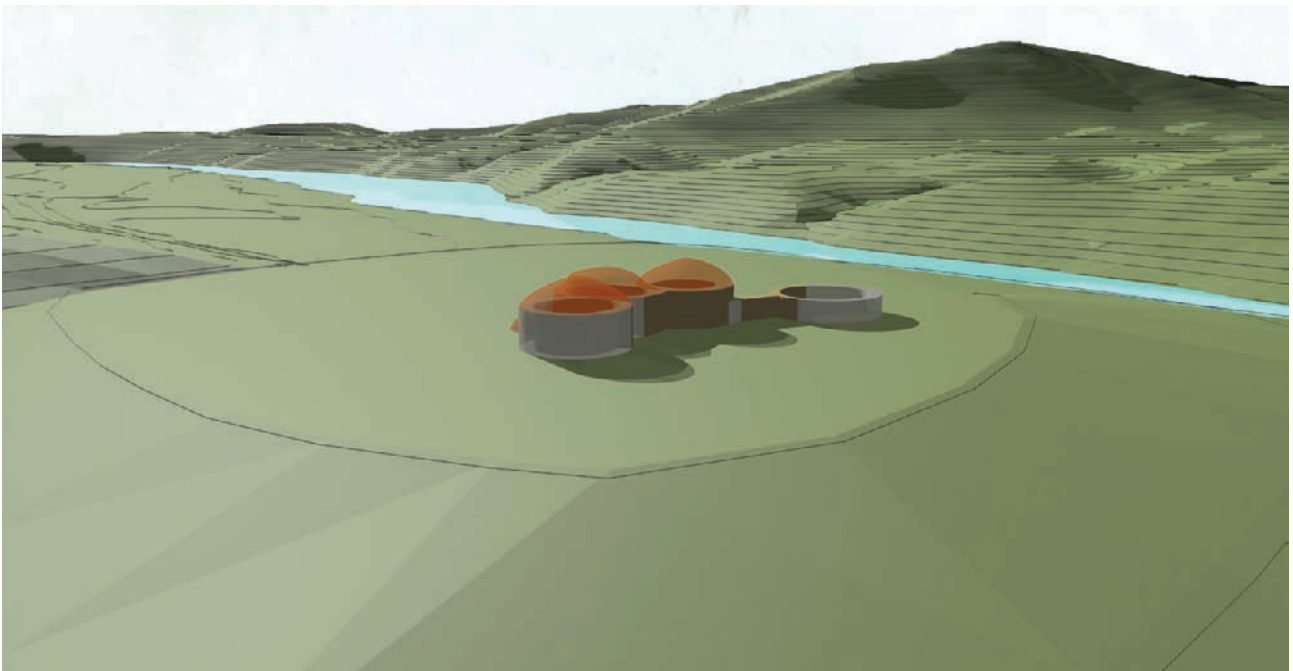
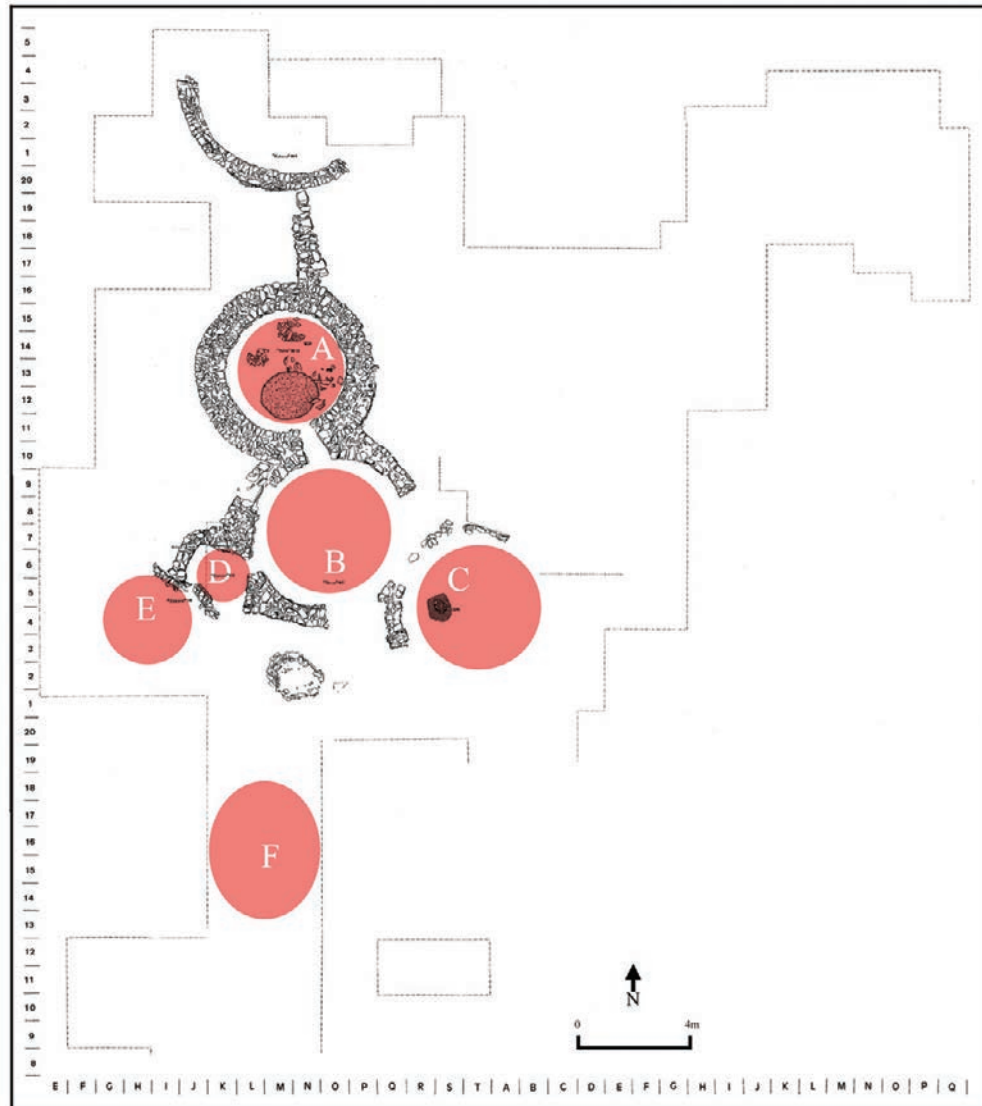


Fig.15 - Architectural reconstitution of Porto das Carretas in phase 2A, integrated in the geomorphological context. After Alfarroba, in Soares, 2013.



Fig. 16 - Fortress-towers reconstitution of Porto das Carretas in phase 2A. Southwest view. Drawing by Cristina Menezes.



Materials	Concentrations						
	A	B	C	D	E	F	
Burnt clay with branches impressions	+	+	+	-	+	?	
Curated lithic flaked industry	+++	++	+	+	+	-	
Fishing net weights	+++	+	-	-	-	-	
Millstones	+	+	+	+	+	+	
Pottery: plates and bowls	++	+++	+	+++	+++	+++	
Pottery: hemispherical bowls	++	+++	+	+++	+++	++	
Pottery: storage pots	++	++	++	+++	++	+	
Bell Beakers vessels	+++	+	-	-	-	-	- Absent or with very low concentration
Loom weights	++	++	+	++	+++	++	+ Weak concentration
Copper-arsenic tools	+++	-	-	-	-	-	++ Moderate concentration
Copper minerals	-	-	-	+++	-	-	+++ Strong concentration

Fig. 17 - The functional structure of the innermost sector of the Porto das Carretas. Phase 2B. Tower M13 (zone A) concentrates the most qualified artefacts (Bell Beaker ceramics, copper implements and prestige polished stone artefacts). In hut 14 (Zone E) was concentrated weaving activity and hut K5 (Zone D) was dedicated to storage. The typology of pottery is presented in Fig. 18.

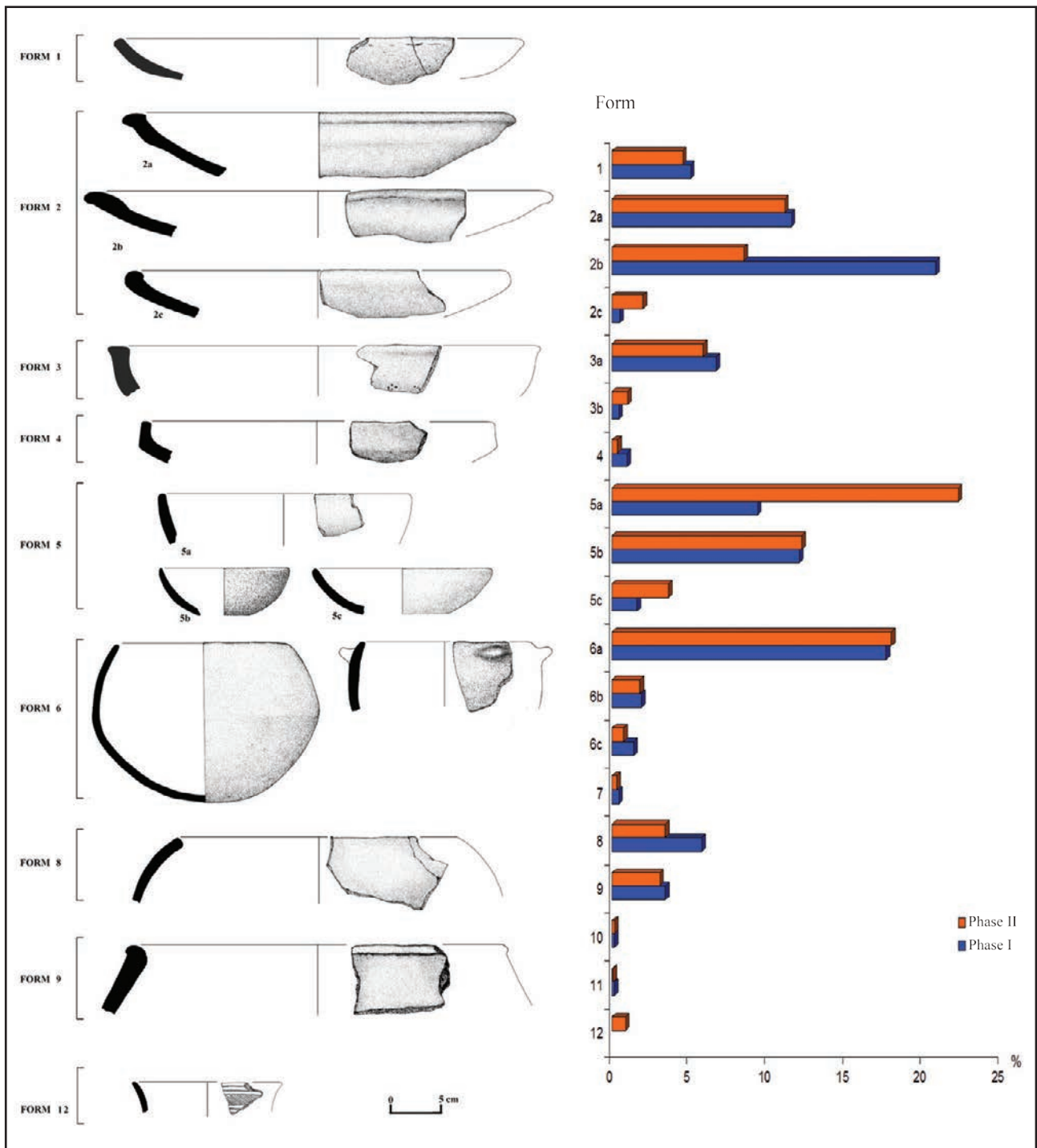


Fig. 18 - Porto das Carretas pottery (phases 1 and 2). Morphology of vessels. This typology is applicable to Chalcolithic domestic contexts of southern Portugal. In Soares, 2013, p. 280.

Common pottery, mostly without any decoration, is very abundant in both phases of Porto das Carretas, with a total of 121045 fragments of vessels. A sample of 1367 pieces from phase 1 and 1602 from the phase 2 had been studied (Soares, 2013). Pottery is the main cultural link between both occupational phases, only with quantitative differences. Large plates probably for collective use (form 2b) are more abundant in phase 1, and small hemispherical bowls (form 5a) hypothetically for individual use are more abundant in phase 2. The exception to this pattern is the fine International Bell Beaker pottery (form 12) that appears in Porto das Carretas only in the phase 2, concentrated in the tower M13.



Fig. 19 - Porto das Carretas. Phase 2. Wristguard polished on quartzite with a high-tech quality.

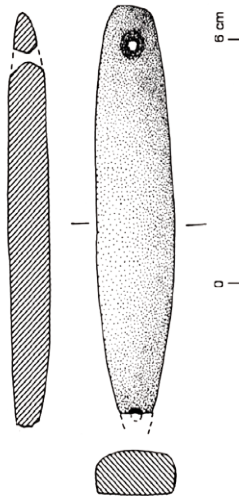


Fig. 20 - Porto das Carretas. Phase 2. Spatial distribution of the Bell Beaker ceramic.

and about 80km from La Pijotilla (about 16 hours of walking), supposedly the main regional market for the marine salt (Fig. 24). In phase 2, the river didn't seem to be anymore a rigid boundary, as it was in phase 1, but an axis of interaction. Finally, a set of 14 International or Maritime style Bell Beaker vessels, regionally manufactured (Fig. 21), connects this site with a long-distance exchange network, in an economic system of prestige goods, with sub-continental expansion.

The valuation of copper

The curated management of copper with recycling (Gil and Guerra, 1987) can explain the shortage of metal artefacts in dwelling spaces as well as the constitution of metal deposits (hoards) for votive purposes like that of the tholos of Alcalar 3 (Estácio da Veiga, 1889) or for smelting reuse as the deposits of the settlements of Outeiro de S. Bernardo (Cardoso *et al.*, 2002) and Cerro dos Castelos

Fig. 21 - Porto das Carretas. Phase 2. Bell Beaker pottery (International style).

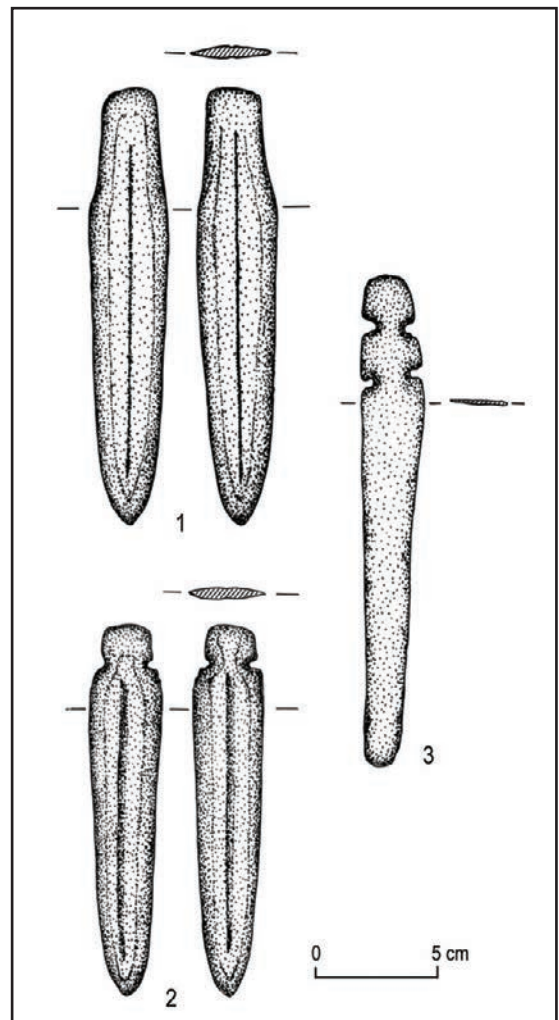
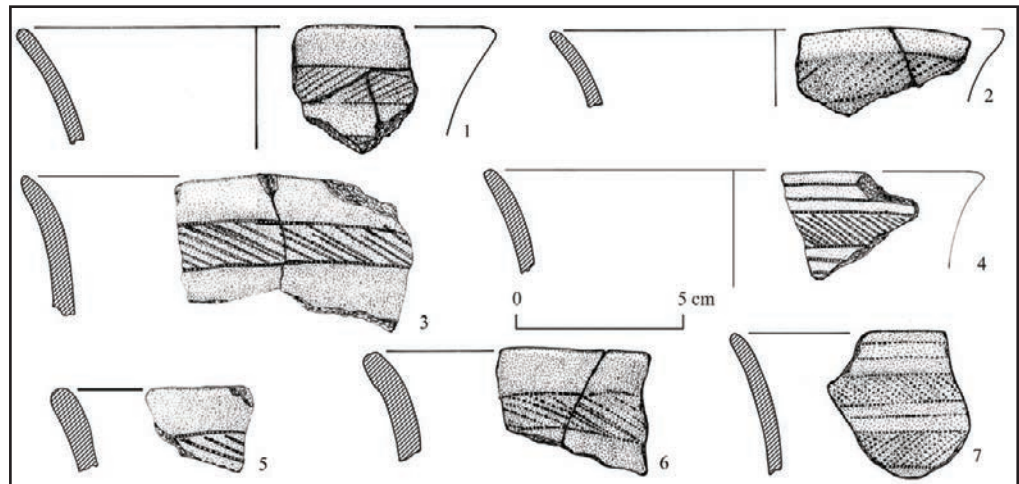


Fig. 22 -Weapons in arsenical copper included in the deposit of Cerro dos Castelos de São Brás (Serpa). The metallic artefacts were inside a ceramic storage pot (form 6, Fig. 18).

1. Tanged dagger; 149x32x4mm; Weight: 74,2grs; inv. CAST.BR/21.
2. Tanged dagger with a pair of opposite side notches for hafting; 129x29x2mm; Weight: 32grs; inv. CAST.BR /19.
3. Dagger with two pairs of opposite side notches for hafting; 170x25x1.5mm; weight: 19grs; inv. CAST.BR /20.

de S. Brás (Soares, 2013, p. 400-407). The metallurgical items recovered at Porto das Carretas (Soares, 2013, p. 315-319) represent different phases of the productive chain: minerals, furnace, slags, vitrified pottery (crucibles) and metal artefacts made of copper arsenic alloys as observed in the settlement of San Blas. This site is closely connected with La Pijotilla in regards to metallurgy (Hunt *et al.*, 2009) and Bell Beaker pottery production (Odriozola, 2012). They shared the economic chain of metallurgical activity: San Blas was a very important copper production centre and La Pijotilla, without evidence of copper smelting, was supplied by San Blas in metallic artefacts (Hunt *et al.*, 2009), ensuring its redistribution. The metals from the deposits of Outeiro de S. Bernardo and Cerro dos Castelos de S. Brás are also mostly in copper arsenic alloys. The

largest known deposit in Guadiana Basin is that of Cerro dos Castelos de S. Brás (Soares, 2013) with 25 work tools and 3 weapons (daggers) (Fig. 22), which weights in total 6,356 Kg. Regardless of the underlying purposes of the deposit constitution, the wealth in the form of metal is a suitable equivalent for exchanges and very adequate for storage.

The Middle and Lower Guadiana River Basin encompasses a very rich area in copper ore deposits: the Ossa Morena domain and the Iberian Pyrite Belt (Barriga and Carvalho, 1983). This corridor (Fig. 25) was a perfect scenario for craft specialization in metallurgy to which (in articulation with prestige goods exchange) is here assigned a central role in the increasing social complexity. Over the Iberian Peninsula, in regards to metallurgy, craftsmanship is well expressed in some sites dedicated to mining/

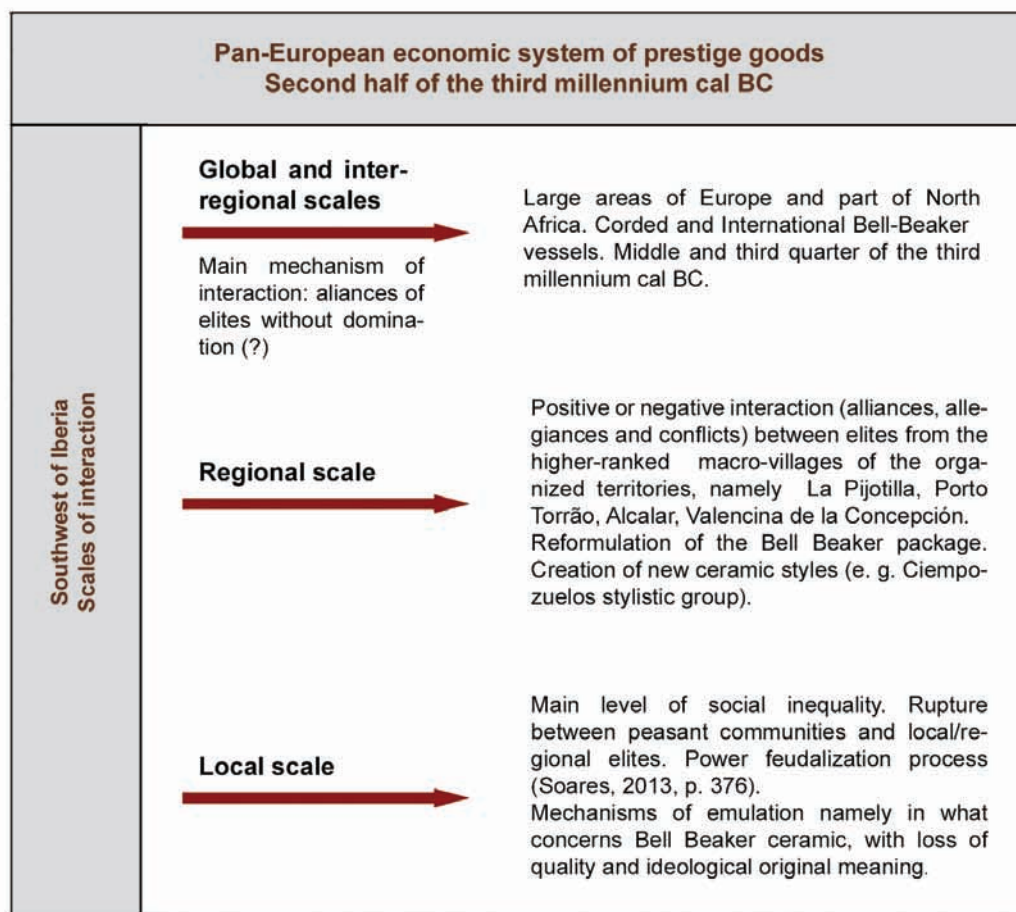


Fig. 23 - Outline of the main interaction scales during the second half of the third millennium in the Southwest Iberia.

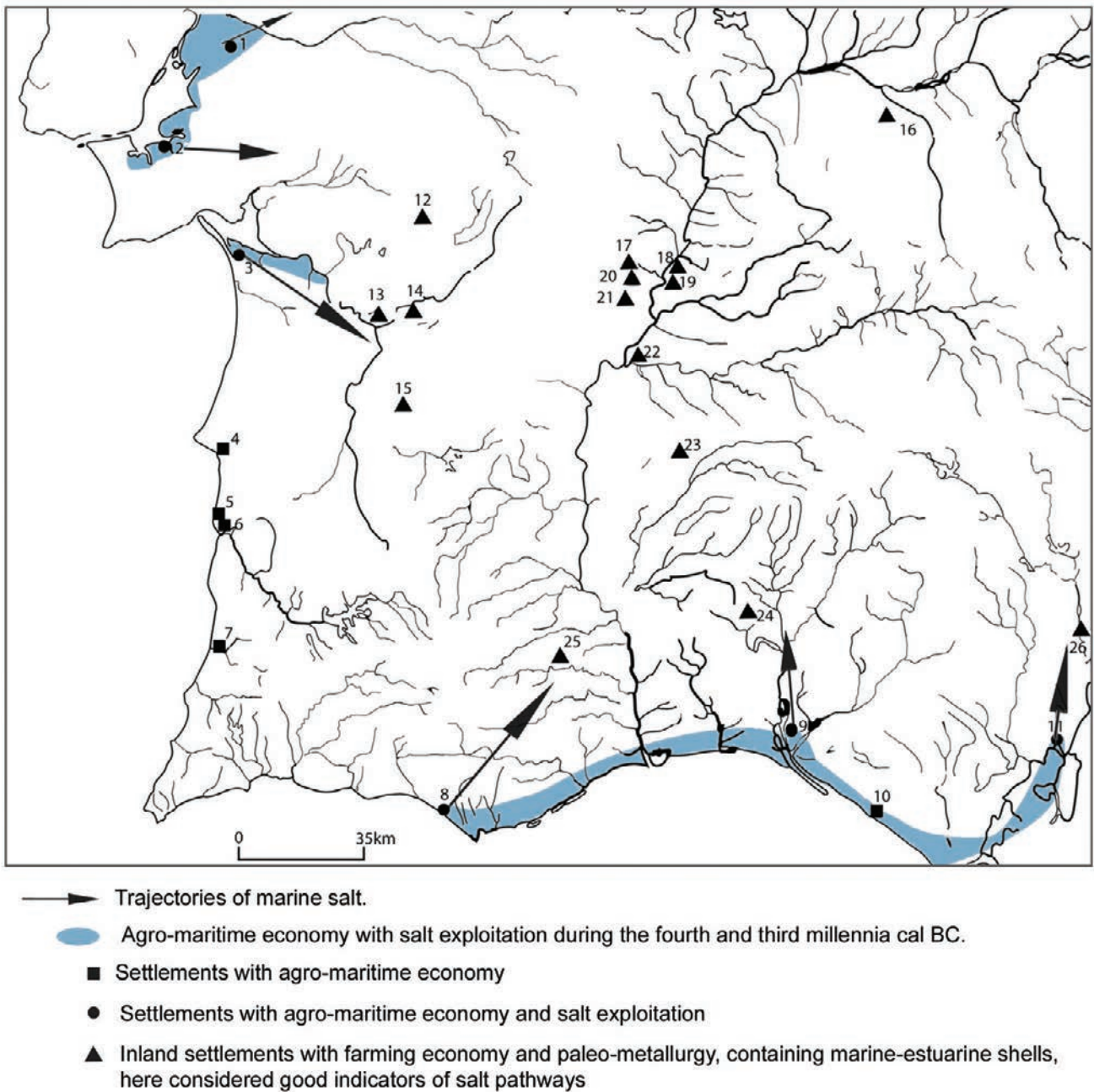


Fig. 24 - Probable trajectories of the marine salt exchange networks during the fourth and third millennia cal BC, with emphasis on the Guadiana and Sado Rivers Basins.

Settlements with agro-maritime economy:

1 - Monte da Quinta 2 (Benavente), 2 - Ponta da Passadeira (Barreiro), 3 - Possanco and Barrosinha (Comporta), 4 - Vale Pinçel II, 5 - Palheirão Furado, 6 - Etar de Vila Nova de Milfontes, 7 - Montes de Baixo, 8 - Praia do Forte Novo (Quarteira), 9 - El Rincón (Huelva), 10 - Asperillo, 11 - Marismilla.

Inland settlements with farming economy and paleo-metallurgy, containing marine-estuarine shells, here considered good indicators of salt pathways:

12 - Escoural, 13 - Barrada do Grilo, 14 - Monte da Tumba, 15 - Porto Torrão; 16 - Pijotilla, 17 - Monte Novo dos Albardeiros, 18 - Porto das Carretas, 19 - Mercador, 20 - Perdigões, 21 - Sítio 3 da Torre do Esporão TESP3, 22 - Outeiro de S. Bernardo, 23 - Igreja Velha de S. Jorge (Vila Verde de Ficalho), 24 - Cabeço Juré, 25 - Cerro do Castelo de Santa Justa, 26 - Valencina de La Concepción.

/metallurgical activities like Cortadouro (Tavares da Silva and Soares, 1976-77), Santa Justa (Gonçalves, 1989), Cabezo Juré (Sáez *et al.*, 2003), Malagón (Keesmann *et al.*, 1991-92), La Loma da la Tejería (Montero Ruíz *et al.*, 2008), La Profonda, León (Blas Cortina and Suárez Fernández, 2009). Other settlements had specialized metallurgical sectors like San Blas (Hunt *et al.*, 2009; Hurtado, 2004), Valencina de la Concepción (Costa Caramé *et al.*, 2010; Nocete *et al.*, 2008), Chibanes (Tavares da Silva and Soares, 2014).

Functional structure and social relations

The social inequality in phase 2 was expressed not only in the monumental architecture of the “fortress-towers” in contrast to the invisibility of the remaining site, certainly made out of perishable materials, but also in the distribution of artefacts (Fig. 17). Tower M13 (Zone A) contained the most valuable materials: Bell Beaker pottery, copper implements, polished stone prestige goods such as a spatula on amphibolite and a wristguard on quartzite (Fig. 19). The exclusively Bell Beaker International ceramic style had a very selective distribution: nine in Tower M13, two in Tower N7, one in the metallurgical furnace N2, and the remaining two vessels outside the architectural ensemble (Fig. 20). This spatial segregation of Bell Beaker pottery has been also observed at Miguens 3 (Alandroal), in the innermost part of the fortress-tower (Calado, 2006), and at San Blas, in hut J27. Returning to the functional structure of Porto das Carretas (Fig. 17), Zone E (hut I4) was specialized in weaving and Zone D (K5 hut) was dedicated to storage.

Interaction networks

In the third quarter of the third millennium cal BC, the complex tribal society was exhausted probably due to excessive territorial segmentation, which blocked the development of the productive forces (metallurgy, weaving and interregional trade).

The central settlement of the previous local

productive system (Julioa 4/Luz 20), as already referred, was most likely abandoned, and the population density decayed in the Luz territory. Porto das Carretas got integrated probably in a more extended territory, polarized by the macro-village of San Blas; the importance of the Guadiana River as an avenue of communication is reinforced in the new reorganization of settlement patterns (Fig. 25). The central place of the politically organized territory of the Middle Guadiana River Basin continues to be established in La Pijotilla as illustrated by material culture. La Pijotilla participated in the trade of prestige goods (Bell Beaker package), which extended through large areas of Europe and North Africa (Guilaine *et al.*, 2009). La Pijotilla was most likely connected to this new European enlarged social network of emerging elites, through southeast France (Hurtado and Amores, 1982).

The distribution of Bell Beakers² in the region reveals the differences in access to prestige items, which can be interpreted as a reflection of the hierarchy of the settlement system. In La Pijotilla, Bell Beakers have a widespread distribution (multiple contexts of appropriation) and a great diversity in decorative styles and techniques (Kohring, 2011). San Blas, Porto das Carretas and Miguens 3 have displayed a very different distribution pattern of Bell Beaker pottery, quite restricted to selected and central contexts of use. At other sites within the same regional network, such as Los Cortinales, Bell Beaker ware is rare (Gil-Mascarell and Rodríguez 1987; Hurtado 1999), or even absent as in Mercador (Valera, 2013).

Regarding the Middle Guadiana Bell Beaker exchange networks (García Rivero, 2006; Soares and Tavares da Silva, 1984, 2010b), it is possible to isolate several sequential hierarchical interaction modes in connection with the settlement system that

2 - Bell Beaker pottery is currently considered a prestigious and ideological element of the Beaker package (plus tanged arrowheads, copper daggers, archer wristguards, v-perforated buttons, gold jewels), even if it is a local/regional production, associated with the strategic sphere of political interaction. Bell Beaker pottery would create a sense of shared identity namely in the context of feasts between elites (Rojo-Guerra *et al.*, 2006, 2008; Guerra, 2006).

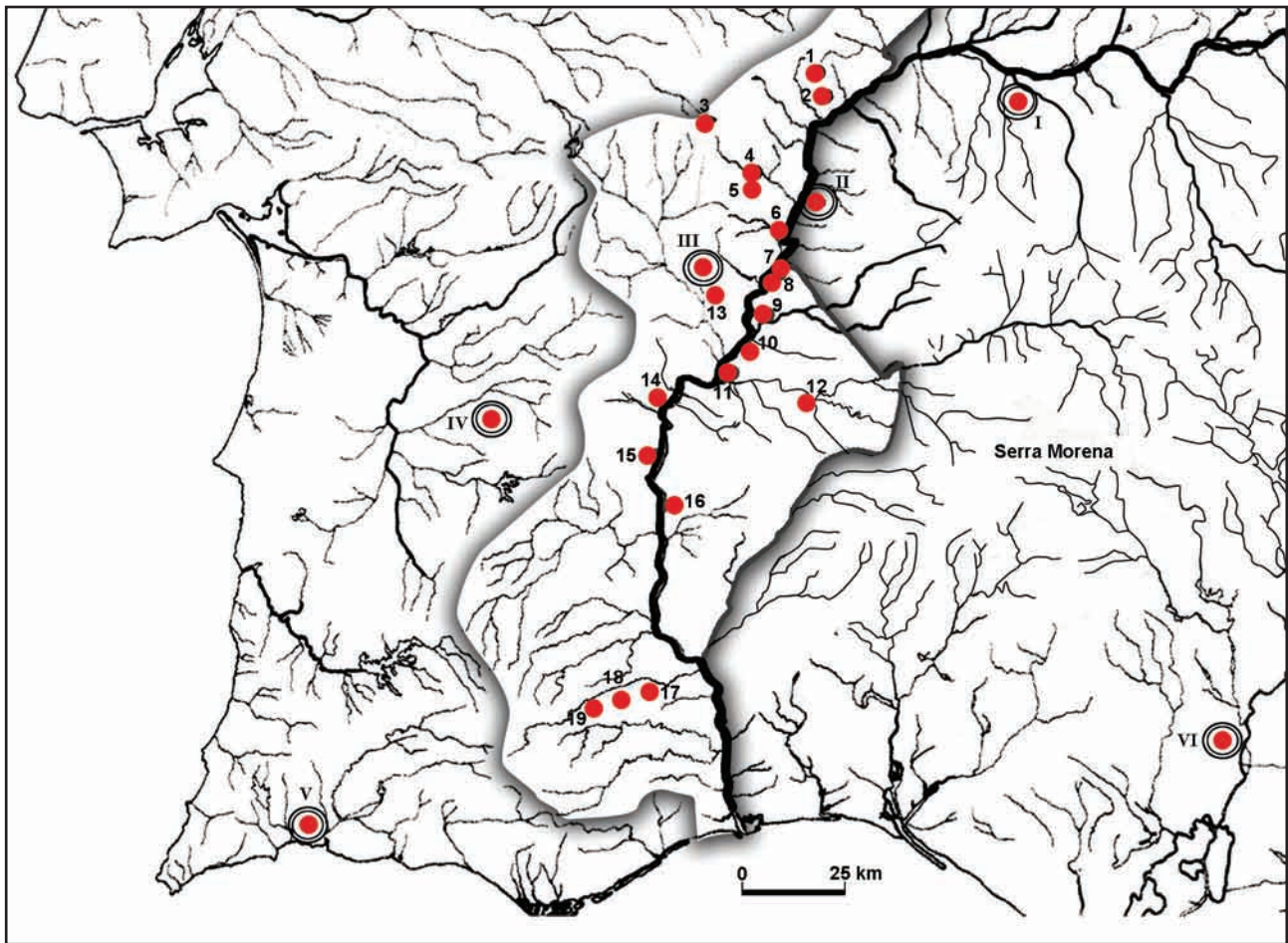


Fig. 25 -Archaeological sites from the Middle/ Second half of the third millennium cal BC in the Portuguese Middle - Lower Guadiana River Basin.

1 – Terrugem; 2 – Famão; 3 – Fonte Ferrenha; 4 – São Gens; 5 – São Pedro; 6 – Miguens 3; 7 – Porto das Carretas; 8 – Mercador; 9 – Monte do Tosco 1; 10 – Cerros Verdes; 11 – Outeiro de São Bernardo; 12 – Castelo Velho de Safara; 13 – Monte Novo dos Albardeiros; 14 – Sala nº1; 15 – Três Moinhos; 16 – Cerro dos Castelos de S. Brás; 17– Cerro do Castelo de Santa Justa; 18 – Cerro do Castelo das Mestras; 19 – Cerro do Castelo de Corte João Marques;

Macro-villages ((•)) of the southwest of Iberia:

I – La Pijotilla; II – San Blas; III – Perdigões; IV – Porto Torrão; V – Alcalar; VI – Valencina de la Concepción.

Map sources: Nocete, 2001; Soares, 1992; Soares, 2013, Valera, 2013

illustrates the construction of a complex network of social relations. They moulded the solidarity or competitiveness/exploitation at each relational level and are quite eloquent about the complexity of the pos-egalitarian and pre-stratified social organization of the Late Copper Age/Early Bronze Age of southern Portugal and Iberia (second half of the third mil-

lennium cal BC). From the top to the base of the interaction networks (Fig. 23):

-First level. Global interaction. Long distance exchange networks with the participation of macro-villages (chiefdom central places): Pijotilla, Porto Torrão, Alcalar, Valencina de la Concepción. The main indicator of this interaction process is the ap-

pearance of the corded Bell Beaker pottery style in the middle of the third millennium cal BC.

-Second level. Interregional interaction. Regional exchange networks between central places and between these settlements and the more ranked sites in their dependence: La Pijotilla, San Blas, Porto das Carretas, S. Brás; Porto Torrão, Monte da Tumba, Perdigões, Miguens 3, among others. The main indicator of this interaction process is the appearance of the international and the geometric pointillé Bell Beaker styles, in the third quarter of the third millennium (Soares and Tavares da Silva, 2010b).

-Third level. Intraregional interaction. Reformulation of Bell Beaker pottery and creation of regional decoration styles, like the Ciempozuelos group, which is well represented in the Middle Guadiana River Basin (La Pijotilla, San Blas, Monte do Tosco, Outeiro de S. Bernardo, Perdigões) with consistent use of incised decoration often incrustated with white paste mostly made of biogenic apatite (crushed bones) (Odriozola, 2012). This identity-based community in the Middle Guadiana River Basin was probably fed by a shared ideological system, and was extending influence westwards till the Atlantic coast. Porto das Carretas was abandoned as well as its symmetric site Miguens 3 on the opposite bank of the river. The maximum development of the Ciempozuelos Bell Beaker group occurred in the last quarter of the third millennium, and it may have prolonged up to about 1800 cal BC (Liesau *et al.*, 2014; Ríos Mendoza, 2011; Soares and Tavares da Silva, 2010b).

- Fourth level. Local interpretations (emulation process) of the Bell Beaker Ciempozuelos ware, which spread through peripheral small sites on the plain without any defensive structures as Barrada do Grilo in the Sado paleo-estuary (Santos, Soares and Tavares da Silva, 1972) and Vale Vistoso, located on the Alentejo coast (Soares and Tavares da Silva, 1976-77). These ceramics are very coarse and low quality, which can indicate the loss of skill and previous ideological meaning. The end of the third/beginning of the second millennia corresponds to a sociopolitical disregulation, with many shadows in

the archaeological record. The local scale could be increasingly isolated towards self-sufficiency.

The important socioeconomic position of La Pijotilla in the regional settlement system during the whole third millennium is expressed by material culture and more recently by the isotope analysis of ^{87/86}SR and ¹⁸O (Díaz-Zorita and Waterman, 2014). The results of these analyses indicate that mobility performed a crucial role in the macro-villages of La Pijotilla and Valencina de la Concepción in opposition for example to Palacio III where all the individuals analysed were of local origin. A minimum of 29% of the population from La Pijotilla (sample of 17 individuals from tomb 3) was immigrant. Similar results (31,6%) for immigrants were obtained in the macro-village of Valencina de la Concepción.

General remarks

The regional engine activities of the new economic system of prestige goods seem to be metallurgy, weaving and the trade of copper and marine salt (Fig. 24). Political power was likely vertical and personalized. The elites that controlled production and distribution of metals also appropriate the right to use coercive means, such as weapons and fortress-towers. This could be the beginning of a new type of social organization (chiefdom). As this process advanced, the old world of tribal societies and the correlated communitarian ideology entered a profound crisis.

Conclusion

Striking social changes took place in the third quarter of the third millennium cal BC (phase 2 of Porto das Carretas). The complex tribal organization of the first half of the third millennium was exhausted, probably due to excessive territorial and social segmentation, which was blocking the development of productive forces (craft activities of weaving and metallurgy, and trade).

The main changes, compared to the previous complex tribal society, can be listed as follow:

1) weakening of kinship networks *versus* strengthening of residential solidarities;

2) power centralization + knowledge-based political economy linked to personalized leaderships integrated in extended networks of prestige goods exchange (D'Altroy and Earle, 1985; Earle, 1999; Graham *et al.*, 2000; Soares, 2013) → unstable and “omniscient” leaderships (Soares, 2013, p. 69-70) based on the control of esoteric and ecological knowledge systems, using the rhetoric of heritage (Lash and Urry, 1999; Soares, 2013, p. 386-388) → fluidity of territorial boundaries.

3) development of copper-arsenic metallurgy → gains in productivity;

4) development of metallurgy of gold and production of other precious commodities, such as ivory artefacts, green stone beads, fine textiles and garments (Murra, 1962) → expansion of production and standardization of prestige items;

5) intensification of the social division of labour → skilled craftsmen → skilled merchants in extended exchange systems → managerial activities → political leaderships.

In synthesis, in the second half of the third millennium cal BC, we find evidence of an unstable politic power, still without capacity for hereditary perpetuation, which fits well with the anthropological concept of chiefdom.

The early State constitutes perhaps the most unequal sociopolitical organization (Clastres, 1974; Foucault, 1978); thus, the arguments to support its emergence and consolidation require a careful analysis based on a much larger and qualified archaeological record than what is currently available (Nocete, 2001). Chiefdom is used here according to the neo-evolutionist American anthropology as a standard category of society previous to the emergence of State. Chiefdoms are redistributive societies with a centralized coordination for action

that controls socio-political and religious activities (Service, 1962, 1975).

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