ARQUEOLOGÍA Y EVOLUCIÓN
Teoría, metodología y casos de estudio

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Colección Complejidad Humana
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Theoretical basis

The concept of autopoiesis was coined in 1971 and was concerned fundamentally with Biology, particularly to make reference to the capacity of the organizational systems of living beings to constitute themselves. For the moment, rather than in the definition itself, we are interested in the mechanisms and processes which can be observed in different forms of living beings and between different kinds of systems on Earth.

An essential characteristic of an autopoietic system is a membrane or limes, which protects the cellular metabolism from disintegration (Maturana and Varela 1996: 38-40), from the entrance of undesirable elements or from the escape of energy. Another requirement is a network of connexions between the many elements that constitute the system. Both are inextricably linked, because the network of connexions makes possible the creation of a limit, while the limit itself is the essential condition for the performance of the network of connexions (Maturana and Varela 1996: 38-40).

Within the core of Darwinian reasoning, some similar units or systems are effectively established when we focus on the different levels of
selection. Natural Selection can work on many levels, for instance on species, groups, individuals, genes, memes. The importance given by different researchers to the Selection, and to the levels on which it works, varies according to their area of knowledge, their particular perspective and the scale of their analyses.

From whichever evolutionary perspective, the most interesting issue for us here is how organisms and systems are constituted by diverse mechanisms of selection in discrete units that can be measured and analysed by scientific approaches. On this point, there is no discussion between evolutionary researchers, and all of the different theoretical perspectives support the main idea which will be applied in our archaeological analysis. A separate issue is, however, what kind and how much information about behaviours can be inferred from the archaeological record.

According to the general principles of Evolutionary Theory, and in this case ideas more closely related to the particular perspective of Evolutionary Ecology or Human Behavioural Ecology, it would be feasible to use these concepts not only for the study of cells and other living organisms but also for the analysis of human adaptive systems of economic or political nature (market networks, geopolitical units, etc.) (Figure1). Certainly this is not an easy task, mainly because these political, economic and cultural networks are generally dynamic. As such they undergo changes, their boundaries may be modified and independent units may sometimes become fused. Evidently, this also occurs among discrete organic units, but cultural and archaeological cases usually display a much higher rhythm of change than that observed in Macrobiology. However, this difference fades away if we compare the evolutionary rhythms of human culture and of Microbiology. In the particular case of an archaeological approach we are faced with the additional problem that the archaeological record of these systems, networks and membranes, is generally insufficient or sometimes difficulty perceptible. For this reason archaeologists must frequently create those units, those compartments and divisions, which may be analysed and therefore may suggest some conclusions. In any case, all of these units are ultimately acceptable for measure-

ring, analysing and experimenting, and enable the diagnosis of how the system functions and the crosschecking of the working hypothesis.

This kind of approach, although complex, may have some advantages over others, since it takes into account the maximum number possible of elements or units of the system to be analysed. No unit is ruled out arbitrarily prior to the analysis, unlike the case in many other theoretical frameworks due to the biased anthropocentric perspective of the Social Sciences and, particularly, of Archaeology, even when the study issues are within complex systems and phenomena of broad geographical and chronological scale (this issue is developed in García Rivero 2004). Drawing fundamentally on Ecology and the biology of populations, many studies agree with the so-called Red Queen model which demonstrates how all of the elements of an ecological niche or of a given system are tightly related (Van Valen 1973). This model also illustrates how the reproductive increase or the hierarchical climb of a species generally occurs to the detriment of another.

Without any doubt, the most important potential of this kind of approach is its capacity of generating hypotheses and predictions about behavioural patterns based on fitness and cost-benefit parameters, and also its capacity of testing these predictions (empirical falsability).

Anthropological and psychological studies of economic themes have dealt with diverse concepts which are quite interesting for us here. It has been said that “territoriality is expected to occur when critical resources are sufficiently abundant and predictable in space and time, so that costs of exclusive use and defence of an area are outweighed by the benefits gained from resource control” (Dyson-Hudson and Smith 1978: 21). This cost-benefit parameter regulates the model of economic defensibility of resources in many socio-biological and ecological approaches. It has also been noted that group formation can occur as a defensive or offensive strategy to protect or acquire different types of resource. And, importantly, the dynamics of group structure depend on the structure of the resources over which competition occurs (Boone 1992: 311-ff). Finally, it is worth remembering that once the human groups began to invest labour in agricultural land, thus spending important time and energy, they believed themselves to be the lord of those lands. Proving the ownership of the land was achieved through arguments based on ancestry, sacredness or mythology, and quarrels may have taken place frequently. The houses, tool sets, domesticated animals, secondary growth woodlands and, importantly, the agricultural and horticultural lands represented a very important investment of goods for some farmer groups, according to M.
Harris who also wrote that defence of that investment would constitute the basis for the development of territorial identities of stable and exclusive nature (Harris 2007: 265-266).

Turning to the archaeological subject, it is possible to define units of selection for example as groups or lineages within settlements, full settlements, politically defined territories, cultural landscapes, etc. Our particular case-study focuses on the 3rd millennium BC, mainly in the Middle Guadiana Basin, in the Southwest of the Iberian Peninsula (Figure 2a). After two decades exploring this area, V. Hurtado has suggested with strong arguments the existence of a territory defined politically in the region of Tierra de Barros in which the settlement of La Pijotilla would have been the nuclear centre (Hurtado 1995; 1999) (Figure 2b). The formation and maintenance of this territory appears to be due to its favourable agricultural characteristics (agricultural resources are sufficiently abundant and predictable in space and time). This is not the case in contrast in the region of La Serena, adjacent to the East. Between the two, there is a high number of fortified settlements which would have defined the eastern border of the territory of present-day Tierra de Barros. The settlements located to the South display a lesser degree of fortification and this southern boundary remains to be clearly established. There are basically two possibilities. Initially it was thought that the southern boundary of the territory drew a line from Southeast to Northwest, along the Sierra de María Andrés and the Olivenza River, to the Guadiana River itself. However, since more excavations of new settlements along the Guadiana River have recently been carried out, the boundary is now considered to be further South, at the foot of the Sierra Morena. In this way, the territory would include the settlements of San Blas, Porto das Carretas and Monte do Tosco. The northern and western boundaries would be defined by the Guadiana River (Hurtado 1995: 60). There are little doubts regarding the northern limit but the western one could raise some debate (cf. García Rivero 2007, 2008: 66, 81-82). Even though there is some discussion about the precise definition of the boundaries, there are nonetheless a great number of reasons in favour of the idea of this region as a defined territory with political and economic self-organization (Hurtado 1999: 67). In this sense, this territory constitutes a discrete unit of selection in contrast to other possible units such as the Iberian Southeast, the Guadalquivir Valley, the Algarve, possibly the Alentejo, Portuguese Estremadura, the Middle Tagus Basin and the Central Meseta.
Intra-communitarian hierarchization and Bell Beaker

Archaeological studies of social aspects of the human groups of the Late Prehistory of the Iberian Peninsula are scarce, and were initially developed by foreign researchers (for example, Chapman 1978; 1982; Gilman 1976; 1981; 1987; Gilman and Thorne 1985; Mathers 1984), with very occasional contributions from Portuguese and Spanish academics (for instance, Lull 1983). These studies focused mainly on the regions, such as the Iberian Southeast, with a well studied archaeological record. The Copper Age culture of Los Millares and the Bronze Age culture of El Argo took up much of the focus of these initial studies.

More recently, studies of social complexity have been developed in greater depth by Iberian academics (Nocete 1984; Díaz-Andreu 1991; García Sanjuán 1999; Gonçalves 1999; Ontañón 2003), and include monographic works about this issue (for example, Díaz del Río and García Sanjuán 2006).

However, most of these are still limited to Marxist approaches, as is the case of the recent monograph quoted above (edited by Díaz del Río and García Sanjuán 2006). This situation must be understood as a mirror of the current Iberian academic panorama, in which there are little chances of success and replication of other theoretical perspectives. And indeed less attention has been placed on Evolutionary Archaeology.

With regard to the Copper Age, several different schemes of political and social organization have been suggested. Based on the study of the necropolis of Los Millares, it was initially thought that this society possessed an egalitarian basis (Almagro and Arribas 1963: 45-46). However, this view hardly survives in current scientific discourse, and recent studies indicate that the issue is not so straightforward.

With the recovery of new data since the 1980's and, particularly, with the influence of new theoretical perspectives on the way to analyse and understand the archaeological record, that vision of egalitarian societies has become so weak that it is now only an idealistic picture of the past. Some studies have suggested the existence of hierarchical societies in the 3rd millennium bc in several geographic regions of the Iberian Peninsula, for example, in the Northern Meseta (Delibes et al. 1995: 46), the Central Meseta (Garrido-Peña 2006), the Portuguese region of Estremadura (Kunst 1995) and the area towards the Alentejo (Lillíos 2004), the Southwest (Nocete 2001), the Lower Douro Basin (Díaz-Andreu 1995) and the Southeast (Chapman 1991; Arteaga 2000; Cámara and Molina 2006). However, establish
the distance to the river. The following patterns of data can be highlighted on the basis of the macro-regional spatial distribution of this pottery. The main settlements in the territorial organization yield a greater amount of Beaker pottery. These sites are much bigger than the others and are located centrally or strategically with regard to the territory itself. The largest are Porto Torrão (100 hectares), La Pijotilla (90 hectares), San Blas (50 hectares) and Perdigões (16 hectares) (Figure 3). Of the remaining settlements, presumably contemporary in chronology, only a very low percentage have Beaker pottery, suggesting the existence of selective and hierarchical patterns for the macro-distribution of these pots (compare Figure 2b and Figure 3). Thus, these settlements differ very much in comparison to the main ones, not only in terms of size but also in the quantity of fine wares such as Beaker pottery. Smaller settlements can be divided into two groups according to their extension. The first group includes settlements between seven and just over one hectare, and it is interesting to note that these occupy locations in the presumed peripheries of the territory. This is the case of Vista Alegre and La Palacina to the East, Trasera de la Pepina and Três Moinhos close to the possible southern limits of the territory or territories (according to the degree of differentiation assumed between both banks of the river), and Monte da Ponte in the West, in the Alto Alentejo, among others. The second group is formed by the remaining sites with Beaker pottery. In all of the cases in which the extension of the sites is known, these do not exceed one hectare. However, not all site extensions have been defined and many thus remain unknown. Not very much can be said about the patterns of the macro-regional distribution of this kind of settlement, only that they are generally located closer to river courses and more frequently located in the periphery of the territory. There are no clear differences between these two kinds of smaller settlement in terms of the quantity and stylistic variability of the Beaker pottery found within them.

There are however strong differences between what we have defined as the main settlements and the rest of the settlements which possess Beaker finds. The main settlements display much larger quantities of Beaker pottery and also greater variability of decorative styles. The settlements with impressed Beakers such as Maritime and Geometric comb impression (Puntillado Geométrico) styles are very scarce, and these types are practically limited to the main settlements and a few of the settlements of the semi-periphery. Most of the settlements display only incised Beaker and, usually, have yielded no more than four or five vessels (García Rivero 2007: Figure 2; 2008: Map 5).
The macro-regional distribution of fortified settlements does not suggest any relationship to settlement size or presence and diversity of Beaker pottery either. In contrast, it seems to reflect territorial patterns of defence of the discrete units. Indeed, most of the fortified settlements are located particularly close to the boundaries of the territories, thus reflecting the dynamic evolution of the limits over centuries.

With regard to the distribution of Beaker pottery at a semi-micro scale or within each individual settlement, some suggestive patterns must be highlighted. Unfortunately, extensive archaeological excavations have only been carried out in a few settlements, although the archaeological record currently available is of great interest. In most of the settlements, Beaker pottery is found in the neuralgic centre, which normally corresponds to an enclosed area. This area may be defined either by a fortification (walls and usually some semicircular towers) or by a deep ditch, although these features often appear together. These central areas thus form citadels within the settlements. Such areas are known at least in the cases of San Blas, La Pijotilla (Hurtado 1999: 65), Porto das Carretas (Tavares and Soares, oral communication), Perdigões (Lago et al. 1998: 107), Monte do Tosco (Valera 2000; 2002), Monte da Tumba (Tavares and Soares 1987) and Porto Torrão (Arnaud 1993: 46). The archaeologists of La Pijotilla (Hurtado 1999: 53) and Monte do Tosco (Valera 2000: 48) have suggested that this central distribution could in fact reflect the reduction of the occupied area of these two sites during the Beaker phase. However, this interpretation does not stand up to the evidence, as we have argued elsewhere (García Rivero 2008: 69-70). At other sites this debate does not arise given the strong arguments to defend that all of the settlement area was occupied simultaneously. The case of San Blas constitutes a good case-study since we have access to all of the information about this site that was excavated by our team of Seville directed by V. Hurtado. The trench U-7 is of particular relevance here. A small watercourse passed through this area of the site and there is evidence of some hydraulic works, the purpose of which was to accommodate this flood area for domestic use as is demonstrated by the location of a hut (Hurtado 2004: 152). It would have been unnecessary to use techniques of this kind so far away from the central area if the population had effectively been reduced to this area or if the space requirement had not forced the occupation of less suitable areas. Also, importantly, the radiocarbon dates suggest that the wall of the internal enclosure was built at the beginning of 3rd millennium bc (c. 2955: 3020 to 2890 Cal BC, two sigma) and that the ditch was filled in during the last quarter of the millennium (c. 2235: 2340 to 2130 Cal BC, two sigma). The wall of the external enclosure was built around 2550 BC (2630 to 2470 Cal BC, two sigma). Further unequivocal data are the contemporary radiocarbon dates of two very similar huts, one close to the centre and one further away. The former is a hut in trench H22 (SB/H22/ 29) dated to 3950 ± 40 BP - 2550 to 2540 Cal BC, two sigma, while the hut from trench K7 (SB/K7/37) dates to 3990 ± 40 BP - 2580 a 2430 Cal BC, two sigma.

Significantly, it is only within the central huts that other singular items are found. The data thus suggests the restrictive access to this pottery by an exclusive sector of society, possibly the clans with most economic and social power. Leaders would have belonged to these clans which would have competed for the leadership probably by drawing on myths and promoting ritual and strategic feasts.
neous bias towards intra-group hierarchy over many millions of years, and it seems that there is no scientific reason to exclude *Homo sapiens sapiens* from this pattern (Escaena and García Rivero 2007).

Some studies note that strategies of group filiation tend to occur when there is intensive competition and lack of unoccupied lands. Some sectors of the population profit from these strategies to gain control over resources, thus producing an internal hierarchical organization and asymmetric relationships (Boone 1992: 302-307).

Specific socio-biological experiments, for example the testing of the theory of redistribution of social evolution by E.R. Service (Insko et al. 1980), highlight inequality of resources, centrality and geographic circumscript as key factors in the emergence of leadership.

Focusing on interdemic selection, we can consider the supposed political and territorial entities of the Southwest of the Iberian Peninsula as units of selection, which are discrete and measurable at least during part of the 3rd millennium bc. Indeed, it seems more appropriate to work with these units of territories, rather than to work at the settlement level, because there are several aspects of the archaeological record which suggest some patterns at the territorial scale. Territorial patterns are indeed reflected by, for instance, the distribution of diverse prestige goods and status items such as Beaker pottery, the different types of eyed idols in each of these territories (Hurtado 2007), and the supposed territorial pattern of the fortified settlements. In this sense, we should refer to some regional studies which high-light the differences between types of settlements, some of them fortified and related to mining communities, and others open within fertile and flat lands used for agricultural exploitation (Parreira 1990: 33-34). According to Parreira, the proliferation of settlements in the 3rd millennium bc, the access to and exploitation of mining resources, and the control over exchange systems produced an increase in the defensive necessities and in the creation of identities against other communities. Restrictive territories were thus established and Parreira points out clear (archaeological) differences between the territories of Estremadura, Alto Alentejo, coastal Alentejo-Sado valley, Baixo Alentejo, Alto Algarve and, finally, coastal Algarve (Parreira 1990: 36).

From an evolutionary perspective, it can be argued that the internal hierarchy of a community is strongly related to the competition of different communities over resources. This evolutionary pressure was named "interdemic selection" by V. C. Wyne Edwards (1963). We therefore accept that natural selection frequently works upon human groups as units of selection, perhaps more often than upon the specie level. This in turn provokes diverse mechanisms through which many sympatric communities competing for resources have reinforced their ethnic, cultural or religious identities, and probably also their socio-political and territorial boundaries. In most social species this phenomenon has caused a sponta-

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4. Some studies (Barkow 1978) argue that social inequality is a derived character which would have emerged in several non-human primates and probably would have continued without interruptions to the human specie. The primate's social dominance is compared to the human's search for prestige, and both have some important consequences for the organization and, therefore, for social hierarchy of the group. In this way, the cultural systems of social range are based on our primate heritage (Barkow 1978: 554).
Territories of this kind have since been put forward by other specialists of the Iberian Southwest and recently have been named "medium extension territories". Within our geographical setting, we should mention the examples of Serra d’Ossa (Calado 2001) and Ribera do Alamo (Valera 2006), both in the Portuguese Alentejo.

Our main focus is on the data from the Middle Guadiana Basin, although the general theoretical framework and other aspects of this study could be extended to the whole of the Southwest of the Iberian Peninsula.

The main aim of this paper is to consider how the great increase of social hierarchy developed during the 3rd millennium bc within these societies, at an intra-group level (within settlements and communities), is strongly related to the increase of the population and to the competition over resources between different social and political groups and communities (inter-communitarian). It can even be assumed that both tendencies or processes are so closely linked that the evolution of the former has a necessary influence on the latter and vice versa. In this way, they both shape a co-evolutive development by means of mechanisms of retro-alimentation. In other words, we could say that if an increase of population and a decrease of available resources take place, then the competition between these groups will increase and mechanisms of group selection will predominate. The genetic and behavioural changes which benefit the reproduction and survival of the group will be replicated more frequently.

But why should there be a general tendency towards the increase of internal hierarchy in situations of greater inter-group competition? Ecology has easily answered this question. Normally ecologists and biologists of populations have used concepts of young and ripe ecosystems within a comparative methodology to describe ecosystems and more generally systems at large. Taking into account the general tendency towards complexity in these systems, a young system is one which displays a lesser degree of specialization in the sense that its processing of energy is less efficient than that of a ripe ecosystem. The latter is characterised by the higher degree of specialization of its species and by a more optimal exploitation of energy, which is also processed in a wider range of states or qualities. When both systems converge in the same circumstance or common process, the ripe ecosystem generally tends to exploit the young one, basically because the former has better access to resources and more efficiency in its energy processing (García Rivero 2004: 29-30). In our case, we could say that the increase of social hierarchy within a group is due to the increase of the complexity and specialization of some of the productive and reproductive units or groups, in contrast to that of other groups or communities.

Some repetitive patterns are quite well known, mostly in studies of economy, and they usually have a vital importance in the understanding of the processes under analysis.

For example, it is very interesting that the optimal group size is always higher for the dominant individual or group than it is for the group as a whole (Bonne 1992: 315). We know that the population increased considerably in the 3rd millennium bc, and the archaeological record suggests an important development in social hierarchy. It may be impossible for the moment to create models and experiments based on this theoretical assumption, due to the quantity and nature of the data required. However, it would be extremely interesting to explore the size and characteristics of the dominant sectors within each group. In any case, it seems plausible that during this millennium a bias in the economic and power redistribution, in its most diverse forms, emerged.

The archaeological record:
suggestive data for testing the hypothesis

The testing of the proposed hypothesis must centre principally on two lines. On one hand, an analysis of the populational dynamic of the Middle Guadiana Basin in order to shed light on the emergence and development of possible socio-economic and political territorial units. On other hand, an analysis of the indicators of intra-group hierarchy (intra-settlement and intra-territory) in the region during the late 4th millennium and 3rd millennium bc.

With regard to the former, we should begin by noting that settlements with late Neolithic phases in the region are scarce. Some caves such as those of the Sierra de Montánchez or the Cueva de la Charneca are known (Hurtado 1995: 56). There are also some settlements like Araya, El Lobo, Los Caños, Los Castillojos and Los Barruecos, although this chronology remains generally poorly known in this region (Cerrillo 2005: 161-ff). Several of these settlements have been excavated recently.

5. Although effectively it may occur in discontinuous or reversible stages, the wealth and economic capital in human societies tends more and more to be concentrated in less institutions (in fewer of hands). A general review of our past since Prehistory supports this tendency. In this sense, it has been noted that the number of political entities has decreased hugely from the Neolithic until the present (Johnson & Earle 2003: 255).
Although there are no available radiocarbon dates yet, the Late Neolithic should be placed in the second half of the 4th millennium, as in the South of Portugal (Cerrillo 2005: 162).

Along the Western bank of the river there are several Late Neolithic settlements including Igreja Velha de S. Jorge, Possanco, Marco dos Albarreiros, Sala no 1, S. Brás and Foz do Enxóe. Regarding the latter site, M. Diniz has highlighted its small size, the absence of agricultural specialization, the absence of fortifications and visual control over the territory and the limited artefact assemblage. According to her conclusion, a useful synthesis for our purposes, the evidence is seen as characteristic of farmer-herder societies at some time prior to the secondary products revolution (Diniz 1999: 125).

With regard to the burials, the difference between both riverbanks is quite clear. The megalithic clusters of the Alentejo are not reproduced in the same way in Extremadura. In Badajoz there is only one noteworthy group of large passage dolmens in the area of Barcarota, and megaliths are effectively more abundant in the northern province of Cáceres in the areas of Valencia de Alcántara and the Tagus basin. The large number of small tombs has led P. Bueno to consider these as the most numerous and oldest concentrations of dolmens of Extremadura (Bueno 1988).

It thus seems that the Neolithic occupation to the East of the Guadiana is scarce and it would be from the end of the 4th millennium bc that its gradual occupation would take place, linked to the search for suitable land for agriculture. The place of origin of these movements remains unclear, but they could have come from the Portuguese Alentejo (Hurtado 1995: 56), from the North of Africa across the Andalusian region (Escaena 2000), or even from several original foci. In any case, it seems clear that the population at this time was very low. Also, since the landscapes surrounding the Neolithic sites of the region are characterized by rich soils for grazing and with many slate and granite outcrops, it seems plausible that these societies may have had an economy principally based on herding with incipient farming, and that they probably would have lived a semi-nomadic lifestyle (Hurtado 1995: 57). Due to these circumstances, we deduce that the friction between groups or communities would have been scarce. The low occupation of the environment and the semi-nomadic lifestyle suggest that serious problems would rarely have occurred over the availability of resources and competition between groups.

It was at the time named 'Pijotilla phase' by V. Hurtado (1995: 59), initially dated between 2300-2000 bc, that a strong demographic increase and the foundation of numerous settlements took place. With recent pro-
religious nature, suggests that this settlement was a unifying centre. A great variety of idols are found which make up the largest assemblage of items of this kind in all of the Southwest of the Iberian Peninsula. The large volume of idols has suggested the religious character of the site, which would have been of key importance for the maintenance of social relationships within the territory (Hurtado 1995: 68; 1999: 68).

With regard to the indicators of intra-communitarian hierarchy, the differences between settlements, which even suggest mutually exclusive exchange networks, were briefly outlined above. But intra-group hierarchical differences can be observed within settlements too. Apart from the walls and bastions of the external enclosures, an internal enclosure, forming a kind of citadel, is usually found. The reasons for concluding that most of these cases correspond to social factors and not so clearly to the expansion or reduction of the inhabited space are set out above.

Similarly, there is usually a higher volume of singular objects inside these internal enclosures and some of these material items are practically exclusive to these central areas, as is the case of the Beaker pottery (García Rivero 2008: 69-ff).

There is also evidence of technical innovations and even new productive sectors such as metallurgy which may have been controlled exclusively by one sector of the community and would easily have enhanced the possibilities of social differentiation. Specifically in this sector of metallurgy, the proliferation of metal weapons during the Bell Beaker period must be highlighted. Several kinds of pottery also display new technological acquisitions or more efficient productive techniques affecting surface treatments, firing temperatures, decoration and other finishing aspects.

The funerary record yields much interesting information in this sense. During the 3rd millennium BC, a reduction of funerary structures and also a tendency towards the individualization of grave goods developed. In the transition from the Bell Beaker phase to the Bronze Age, called the 'Guadajira-Solana I phase' by V. Hurtado, the evolution from collective to individual burial intensified. Likewise, the number of bodies inside funerary structures diminished and an increase of metal objects can be appreciated which emphasise their warring nature (Hurtado 1995: 77).

For the first time some gold objects appear, for instance at Barbano or La Pijotilla, where all of these objects were found within the internal enclosure (Hurtado 1999: 65). The idols evolve and although the previous types endure there appears to be a tendency towards the representation of more anthropomorphic figures. The sexual differentiation of the figures is expressed explicitly, and the male image appears to be associated with a religious category. Most of the male figures are associated with settlements of very large extension or centres at the top of the territorial hierarchy of the South of the Iberian Peninsula such as Los Millares, Malagón, Marroquín Bajos, Valencina and La Pijotilla, as noted by V. Hurtado (1999: 66-67).

Even some cultural patterns or models of social behaviour appear to have changed substantially. We are referring to the evolution from group behavioural patterns towards new models such as the warrior figure, the enterprising leader, etc. Anthropological studies (Insko et al. 1980; Boone 1992) suggest that enterprising leaders usually pay some group costs such as the maintenance of public goods or the defence against other groups. Could this have been the case of the fortifications that we are dealing with, taking into account that apart from most of the Beaker pottery coming from inside the central huts some of the finds are found in the filling of the ditches? These costs would have had important benefits. In relation to the aspects of cooperation and conflict, the most interesting category is the indivisible and exclusive good, as could have been the case for example of the monopoly of the fortifications or of the main communication roads.

Moreover some ethnographic studies highlight the role of hospitality rituals and feasts in the construction of power in societies with emerging social and economic differences (Dietler 1990; Hayden 1995; 1996; 2001; quoted by Rojo Guerra et al. 2008).

Concluding

Many data suggest that social stratification exploded simultaneously to the intensification of the competition over resources among the different groups and communities of the Middle Guadiana Basin and by extension of the Southwest of the Iberian Peninsula. It does not seem a coincidence that this huge increase in social inequality came about at the same time as the increase in population and number of settlements and the widespread occupation of these lands, particularly taking into account the sedentarization which took place at this time and the need for a higher volume of energetic exploitation, required by a privileged sector of society. All of these factors led to the increase in the competition between groups or communities and to the emergence of some degree of spontaneous bias towards social stratification.

It is noteworthy that in the 3rd millennium BC, and specially during the second half of the millennium, all of these changes took place at
a higher speed than in previous periods due to the complexity itself which was becoming forged. This evolutive acceleration in relation to political, socioeconomic and behavioural systems reminds us of the "punctuated equilibrium model" proposed for the organic world by N. Eldredge and S. J. Gould (1972). This explains how evolution does not always work gradually but frequently also functions through points of inflexion and evolutive accelerations. This topic would require a great task of quantitative documentation for testing, but certainly would be a very suggestive line for future research.

Acknowledgments

I would like to express my best gratitude to José Luis Escacena Carrasco, Víctor Hurtado Pérez and Manuel Casado Ariza for reading the draft of this paper and for their interesting comments. I would also like to thank affectionately Ruth Taylor for revising the final English text.

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EVOLUCIÓN EN LA PERIFERIA. EL CASO DE LA ARQUEOLOGÍA EVOLUTIVA EN ARGENTINA

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En lo que respecta a la ciencia, es claro que hablar de un supuesto “diálogo” entre el Norte y el Sur, es un error ya que más precisamente debiéramos referirnos a un monólogo. Según el Science Citation Index de 1998 y 2000 solo 14 países publicaron más de 10.000 artículos (ver Arunachalam 2002). Los EEUU lideran ese ranking seguido por otros países del grupo de los 7 (Japón, Reino Unido, Alemania, Francia, Canadá, Italia, España, Holanda y Suecia). Sólo dos países en vías de desarrollo, China e India, figuran en esa lista. Desde otro punto de vista estos resultados se traducen en que la producción científica de algunos países en vías de desarrollo es menor que la de un sólo departamento universitario de un país central (Arunachalam 2002).

Dada esta asimetría, la producción de conocimiento científico en escala global fue en general vistas desde la perspectiva de las relaciones centro-perifería. El modelo centro-periferia o (núcleo-periferia ver por ejemplo Wallerstein 1979) es una metáfora que describe e intenta explicar las relaciones estructurales entre un centro avanzado y metropolitano y una periferia menos desarrollada, ya sea dentro de un solo país, o aplicado a las relaciones entre sociedades en vías de desarrollo y sociedades capitalistas. Al analizar la ciencia dentro de este modelo es claro que la globalización de ideas y reconocimiento científico que se da en el siglo XX