Chapter 3

From systems of power to networks of knowledge: the nature of El Argar culture (southeastern Iberia, c. 2200–1500 BC)

Borja Legarra Herrero

El Argar culture has been depicted traditionally as a series of highly hierarchical geo-political systems that were mainly interested in the internal control and organisation of their territory. This article reinterprets new archaeological evidence to suggest an alternative vision of Argaric societies that emphasises interconnectivity between a mosaic of differing regions and a more fluid socio-political organisation. Network approaches emerge as a useful theoretical and methodological referent to make sense of the complexity of the archaeological data and help to place El Argar within the typical Mediterranean themes of connectivity, volatility and fragmentation that so well suit the study of the landscapes of southeastern Iberia.

Key words: network analyses, Argar culture, prehistory, Iberia, Mediterranean, social complexity

1. Introduction: networks, the Mediterranean and El Argar

El Argar culture characterises the archaeology of southeastern Spain during the end of the third to the middle of the second millennium BC. Once a 'classic' culture in the handbooks of European prehistory (Childe 1957), it commanded less attention from the academic world outside Spain in the second half of the twentieth century. This marginalisation is being addressed by a new wave of publications that reconnects the study of the region with wider archaeological interests (Cámara Serrano and Molina González 2006; Lull *et al.* 2010b; 2014; Gilman 2013; Scarre 2013; Aranda Jiménez *et al.* 2015). Much of this renewed impetus relies on the lively debate around the concept of state and its applicability to the understanding of Argaric culture (Chapman 2003; Contreras Cortés *et al.* 2004; Lull and Micó 2011; Bartelheim 2012; Gilman 2013; Legarra Herrero 2014; Aranda Jiménez *et al.* 2015).

The recent studies have brought a new growing acknowledgement of regional differences in the Argaric world with the identification of temporal and spatial variations in the way typical Argaric traits were deployed (Chapman 2008; Ramos Millán 2013) and how these interacted with other local traditions (Aranda Jiménez 2013). The studies are breaking down cultural history assumptions that El Argar culture was a homogeneous phenomenon that covered the entirety of southeastern Iberia. Therefore, authors have started to move away from the label 'culture' and start to refer to the Argaric 'norm' (Aranda Jiménez *et al.* 2015, 8) to try to convey more accurately the diversity in the way Argaric traits appear in the record of Bronze Age southeastern Iberia.

Mediterranean paradigms of fragmentation, uncertainty and connectivity (Horden and Purcell 2000; Broodbank 2013) are also starting to influence novel approaches to El Argar. At the geographical level, southeastern Spain can be defined as a typically fragmented Mediterranean landscape (Horden and Purcell 2000), with an arid and unstable climate (Castro *et al.* 1998; Carrión *et al.* 2010). The river valleys (Vinalopó, Almanzora, Segura) contrast with the arid badlands typical of the region and against the high-altitude landscapes of the interior. At the same time, those valleys create routes that connect the mountains with the Mediterranean coast, bringing together the various landscapes and the unique resources in each of them such as metals (Murillo-Barroso *et al.* 2015).

It could be argued that Argaric societies may not fit well in the Mediterranean paradigm of interconnectivity (Horden and Purcell 2000) as long trade connections do not seem to be part of the essence of the Iberian Bronze Age. The presence of ivory, amber and ostrich eggs in several sites proves that exchange routes connecting Argaric sites with Africa existed (López Padilla 2009; Lillios 2014; Murillo Barroso *et al.* 2018) but it is true that the number of such items is relatively low (but see Nocete *et al.* 2013; Lull *et al.* 2014) and may reflect tenous links between southeastern Spain and the rest of the Mediterranean.

But the Mediterranean paradigm does not just rely on long distance networks, and the evidence for significant exchange links at the short and medium scale in south Iberia is much stronger than normally recognised. The presence of distinct Argaric materials and cultural traits across southeastern Spain constitutes in itself strong evidence of the significance of movement and trade in the Bronze Age (Fig. 3.1). The above-mentioned variability in the Argaric record indicates a wealth of different types of links between regions. Further support is presented by new studies that have identified how raw materials moved in fluid networks across a large geographical area (Montero Ruiz and Murillo-Barroso 2010) and the importance of placing sites near main routes of communication (Andrés Rodriguez 2017).

The time has come to consider how this new information impacts the understanding of Argaric societies, moving the focus of investigation away from their internal organisation that the discussion of the 'Argaric state' has favoured towards the interactions between communities. As part of this effort, network approaches

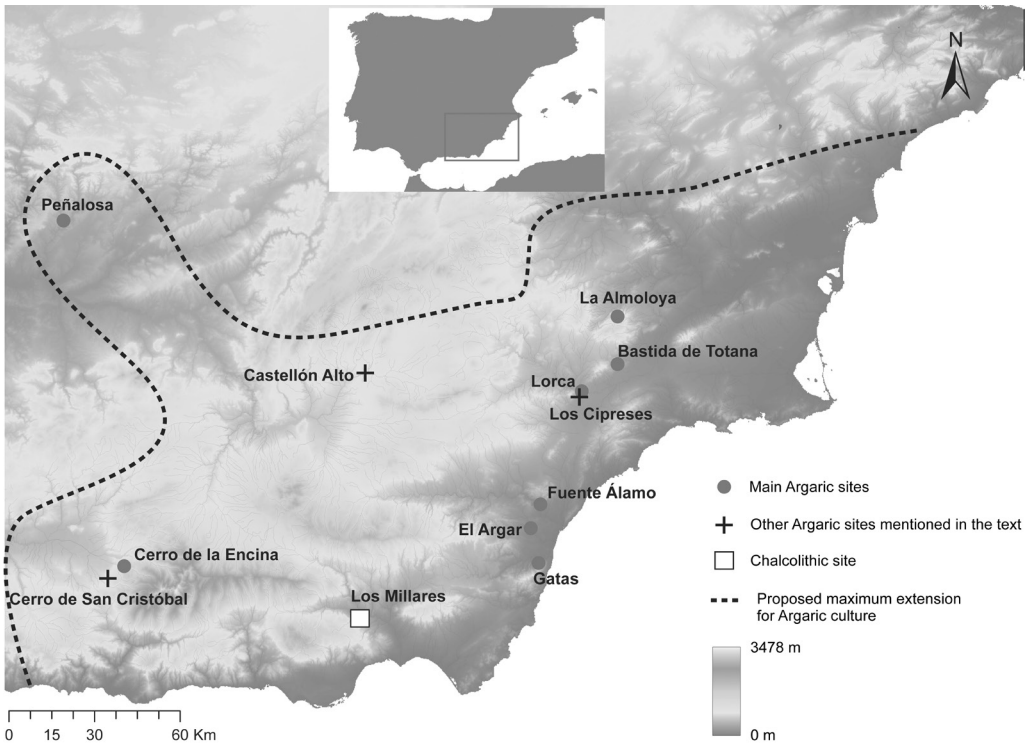

Figure 3.1 Sites mentioned in the text and proposed maximum extension of the Argaric culture.

(Brughmans 2010; 2013; Knappett 2011; Collar *et al.* 2015) may offer particular advantages to study the challenges that the Argaric record presents. In particular, many of the questions regarding socio-political complexity may be better understood by including the fluid nature of social and economic relationships amongst Argaric communities (Schortman 2014) rather than paying attention solely to the internal organisation of each community or region.

2. El Argar: a 500-word introduction

Third-millennium BC southern Spain is starting to be recognised as an extremely dynamic period, with an increasing number of large settlements and imported materials identified in the archaeological record (Nocete *et al.* 2008; García Sanjuán and Murillo-Barroso 2013). It is about 2200 BC when the last of the large Chalcolithic sites, Los Millares (Fig. 3.1 for sites mentioned in the text), goes out of use, coinciding with the appearance of a distinctive group of sites in southeastern Spain, centred first in the areas of modern north Almeria and south Murcia (Lull *et al.* 2010a).

Argaric sites were first investigated in the nineteenth century by the Siret brothers, two Belgian engineers who defined this culture archaeologically (Siret and Siret

Figure 3.2 View of the site of Fuente Álamo (top of hill) from below.

1890) using the name of the most important site discovered, El Argar (Fig. 3.1; modern Almeria, Spain). Argaric culture was defined through two main features: highly defensible sites found on hilltops (Fig. 3.2), and individual burials in cists, pits and jars normally found nearby or underneath houses (Fig. 3.3; Lull 1983; 2000; Aranda *et al*. 2009; Aranda Jiménez *et al*. 2015). Argaric communities also have a distinct material culture, particularly with the use of highly burnished black ceramics replacing the incised and impressed vessels of the Chalcolithic period (Fig. 3.4; Siret and Siret 1890; Lull 1983) and with new shapes added to the repertoire such as pedestalled cups, and the carinated and biconical jars normally found in burials. Metal items occur more regularly in the archaeological record, normally in the form of ornaments and tools (Montero Ruiz 1991) with a small number of specialised weapons (Aranda Jiménez *et al*. 2009; Lull *et al*. 2010b).

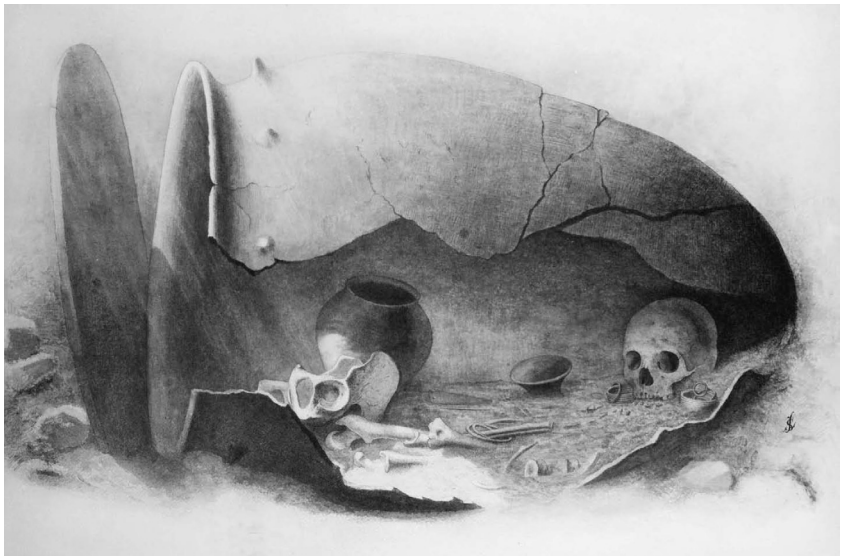

Figure 3.3 Tomb 9 in El Argar (Siret and Siret 1890, plate 35).

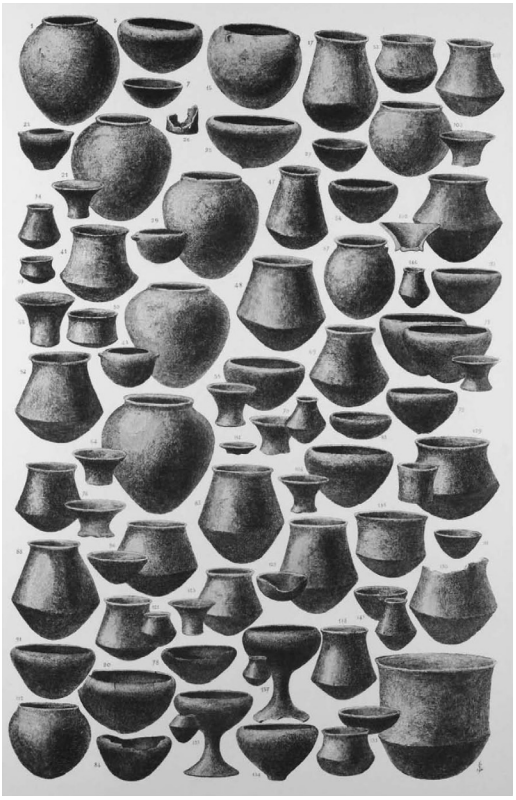

Figure 3.4 Ceramic vases from El Argar site tombs (1/4 actual size) (Siret and Siret 1890, plate 55).

Traditionally, it was thought that Argaric society reached its zenith around 1750–1550 BC (Lull 1983; Aranda Jiménez *et al.* 2015), a moment in which Argaric sites appear across most of southeastern Spain (Fig. 3.1). Recent discoveries, however, are rapidly reshaping the chronological and geographical framework. The formative period of Argaric societies at the end of the third millennium BC is being redrawn by new discoveries at the site of La Bastida, where large fortifications have been dated to 2200 BC (Lull *et al.* 2014). The early date of such formidable construction does not fit well with the evolutionary understanding of Argaric societies (Lull 1983) and it raises questions about the early development of Argaric communities and their relation to earlier Chalcolithic sites such as Los Millares. Similarly, the regional configuration of Argaric communities is undergoing major reinterpretation. The first area in which Argaric culture appeared is being expanded to include the region of modern south-central Murcia (Lull *et al.* 2014). This is part of an attempt to define more precisely the varying character of Argaric culture across different regions of southeastern Spain (Chapman 2008; Jover Maestre and López Padilla 2009). It is increasingly evident that each region underwent different trajectories in the Argaric period with distinctive regional settlement patterns (Legarra Herrero 2014; López Padilla *et al.* 2015), the exploitation of resources (Moreno Onorato and Contreras Cortés 2010), and the relationship of Argaric cultural traits with contemporaneous local traditions (Aranda Jiménez 2013).

3. The inward view: El Argar as a system

Despite new advances in the understanding of the spatio-temporal framework, the prevalent view of Argaric societies still relies heavily on a study of the organisation of each community and regional system in isolation. Traditional approaches in the nineteenth and twentieth centuries that depended heavily on diffusionist paradigms (Siret and Siret 1890; Aranda *et al.* 2015, 8–10) were replaced in the 1980s developments of the study of Argaric societies (Lull 1983; Gilman and Thornes 1985; Chapman *et al.* 1987; Chapman 1990). The most discussed view proposed that Argaric society was

organised in at least three distinct classes: a small elite, a group of free men and a class of dependants and/or slaves (Lull and Estévez 1986). The elite would have exercised control over the production and transformation of basic resources, such as cereal and metals, using violence as a practical but also ideological means to secure authority over the population (Chapman 1990; 2003; Lull 2000; Lull *et al.* 2009; 2010b). Other voices, such as Gilman's (Gilman 1981; Gilman and Thornes 1985) and Mathers' (1994) proposed that Argaric societies were more akin to 'chiefdoms' in which central figures had a looser political and economic control. Despite the significant differences amongst approaches, all these studies were mostly concerned with internal socio-economic factors.

This focus on the internal structure continues to be popular (Lull *et al.* 2009; Molina González and Cámara Serrano 2009), such as statistical approaches that aim to identify wealth levels in burials that support the idea of three distinct social classes (Lull and Estévez 1986; Lull 2000; Lull Santiago *et al.* 2005). Locational studies have also tried to find a link between wealthy tombs and their privileged spatial position at the centre of the sites that would reinforce the idea of a separate elite class living at the core of the major sites (Cámara Serrano and Molina González 2004; 2010).

This strict socio-political order is projected into the geo-political organisation of Argaric landscapes (Jover Maestre and López Padilla 1999; Arteaga Matute 2000; Chapman 2003; Eiroa García 2004; Molina González and Cámara Serrano 2004; Cámara Serrano and Molina González 2010; Lull *et al.* 2010b; López Padilla *et al.* 2014). The more distinguished social elites occupied the largest hilltop settlements from which they controlled a significant territory. Fortified areas at the centre of the large settlements are argued to be elite residences, and large storage areas such as cisterns in many of the larger settlements have been seen as evidence of the close control of subsistence resources (Castro *et al.* 2001). At the second level, smaller hilltop settlements helped to control those areas further away from the central site. At the third level, most of the lower classes lived in small sites normally in lowlands with easy access to agricultural land. In this view, Argaric culture was formed by a specialised territorial organisation in which each part of the society had a well-defined role, implying that Argaric culture could be divided in distinct regions with well-defined political boundaries, each of them headed by a 'capital' (Arteaga Matute 2000).

The study of trade and interaction between each Argaric group has been largely limited to the movement of metals (Molina González and Cámara Serrano 2009; Lull *et al.* 2010b). The scarcity of metal, and its unique properties (hardness, appearance) would have made copper and silver ideal materials for elites to construct and maintain a hierarchical socio-political order. Elites would have secured exclusive access to metals giving them a militaristic advantage and exclusive access to the prestigious identities attached to weaponry and silver adornments. Leaders would also have regulated the circulation of metals to other social groups as a mechanism of securing socio-political control (Lull *et al.* 2010b). Specialised metallurgical centres in the highlands, such as Peñalosa would have been controlled by central Argaric sites and the movement of metals would have been done through highly restricted and directional

channels under the supervision of the elites (Lull *et al.* 2010b; Moreno Onorato and Contreras Cortés 2010) leaving most of the population out of the exchange activities. Distribution and interaction within each Argaric group would also have been organised in highly hierarchical re-distribution systems in which metals would move downwards and basic staples upwards.

4. Elements of critique: El Argar as a fluid phenomenon

A new impetus in fieldwork in recent years has produced more fine-grained understanding of the archaeological record and one of the immediate outcomes of these new patterns of data is the need for more fluid interpretations of Argaric societies.

4.1. Territorial configuration and basic resource access

Major emphasis has been placed on the study of the relationship of Argaric settlements with surrounding resources (Gilman and Thornes 1985; Risch 1998; 2002; Carrión Marco 2004; Delgado Raack 2008) including some large projects around the area of Gatas (Chapman *et al.* 1987; Castro Martínez *et al.* 1999), Aguas (Mederos Martín 1994; Castro *et al.* 1998) and Antas (Cámalich Massieu and Martín Socas 1998). This legacy data has been recently reviewed for a new investigation of the relationship between communities, demography, territoriality and regional organisation (Serrano Ariza 2012; Ramos Millán 2013; Legarra Herrero 2014).

Recent research has questioned the view of a strictly organised territory, presenting a more fragmented and chaotic picture (Legarra Herrero 2014). The Vera region has in the past been presented as a geo-political unit in which the site of El Argar acted as the capital to a number of subordinate settlements that exploited different areas of the region (Arteaga Matute 2000; Schubart and Arteaga 1986). The data provided by intensive surface survey (Cámalich Massieu and Martín Socas 1998; see detailed discussion in Legarra Herrero 2014) has shown, however, that El Argar (c. 2.2 ha) is not significantly larger than several other sites in the region (Fig. 3.5) that appear to have comparable populations (Legarra Herrero 2014). It is difficult to envision such compact communities being able to control territories beyond their immediate hinterland (Feinman 2011). Under these sites, there seems to be only a second tier of smaller settlements (c. 0.1–0.2 ha) normally located at the edge of the catchment areas of the central sites, and probably somehow related to the latter.

Investigation of the resources available in the one-hour catchment area for each potential central site (Fig. 3.6) indicated that each of the possible settlements had direct access to the necessary agricultural resources for its subsistence (Legarra Herrero 2014). The fact that the catchment areas did not overlap, and the evidence that most abiotic resources were procured mainly from the immediate landscape surrounding each site (Risch 2002; Haro Navarro *et al.* 2006), adds to the picture of a region divided mainly into autonomous communities with a handful of hamlets in their hinterland.

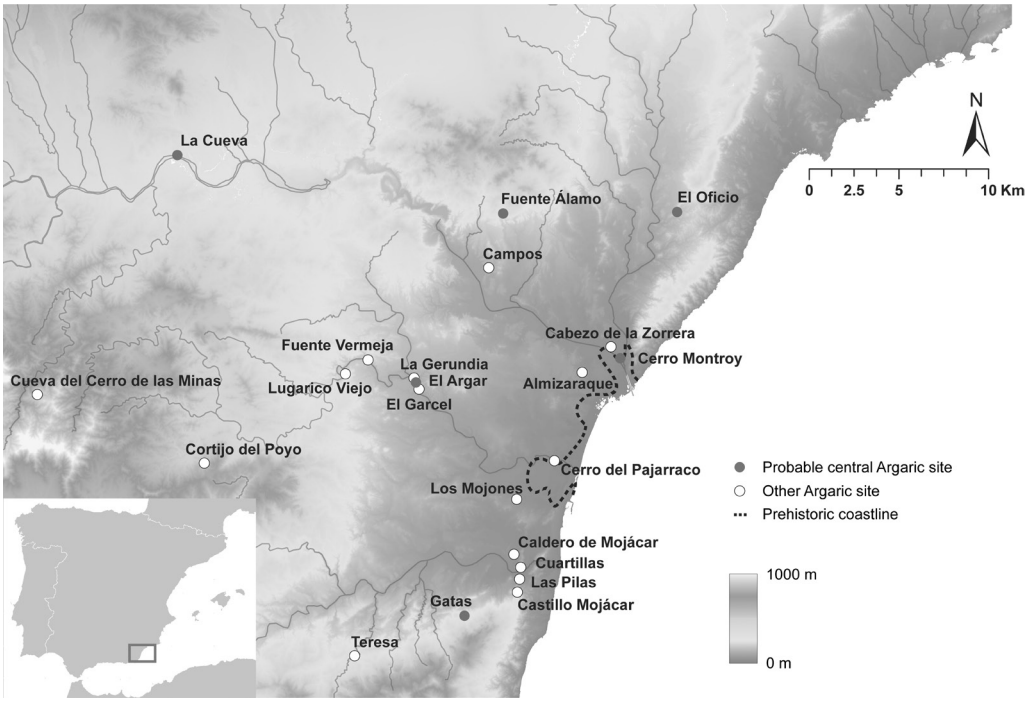

Figure 3.5 Known Argaric sites in the Vera region.

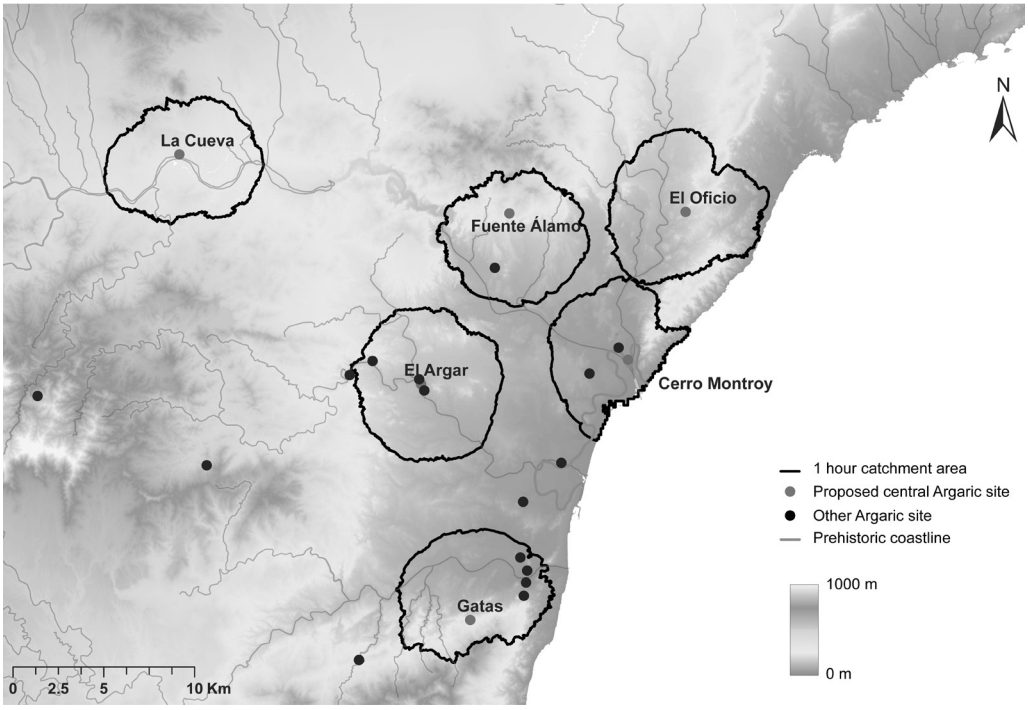

Figure 3.6 One-hour catchment areas of the main Argaric sites in the Vera region.

An alternative view presents the region as a mosaic of small independent communities perched on top of hilltops that controlled the immediate territory around them, enough to secure their subsistence. Small sites may have helped to expand these territories slightly or just survived in the spaces between larger sites. The two-tier settlement hierarchy and the constrained geographical imprint of each site encourages the interpretation of the Vera Basin as a region constructed over a flexible configuration of several comparable socio-political units. While these units may rely heavily in their own resources, their small size does not allow them to remain autarchic. Exogamy would be a major issue in such small communities, but also the creation of social and economic links with other communities as mechanisms for risk aversion (Halstead 1989) and in order to secure basic resources such as metals. The malleable regional structure would mean that the history of the Vera region was ever changing socially, economically and politically as the balance between sites varied depending on short-term contingencies (Legarra Herrero 2014).

Settlement size and frequency of settlements in several Argaric regions are similar to that identified in Vera, perhaps indicating comparable organisations (Chapman 2008; Serrano Ariza 2012; Ramos Millán 2013). In some other cases, larger sites such as Lorca (12 ha; Fontella Ballesta *et al.* 2004) and La Bastida de Totana (4–6 ha; Lull *et al.* 2014) may suggest a different territorial organisation. In Granada, the location of el Cerro de la Encina (Aranda Jiménez *et al.* 2008; Legarra Herrero 2014) in an area with very little direct access to agricultural resources but only a few kilometres away from of El Cerro de San Cristobal, which is located in the middle of the rich agricultural plain (Aranda Jiménez *et al.* 2012), may indicate a specific dynamic for this region.

Considering Argaric settlement patterns as small highly independent units that adapted differently to specific regional situations helps explain the variability encountered in the record. The interaction of the different settlements in specific geographical settings would produce different histories and regional organisations. There may be cases in which these evolved in larger territorial organisations but the fluidity at the basis of the system may have kept these instances rare and short-lived. The main point here is that the conceptualisation of Argaric communities as independent or semi-independent units makes the study of the relationships between settlements more relevant than ever and intrinsically linked to the investigation of their internal organisation.

4.2. Metallurgy and long-distance resource access

Recent archaeometallurgical analyses are providing a wealth of new information, shifting considerably the understanding of the processes of extraction, production and consumption of silver and copper by Argaric communities (Montero Ruiz and Murillo-Barroso 2010; Moreno Onorato and Contreras Cortés 2010; Hunt Ortiz *et al.* 2011; Bartelheim *et al.* 2012; Murillo-Barroso *et al.* 2014; 2015).

In particular, a new wave of lead isotope analyses is helping to build a much more complex picture of the movement of metals around the Argaric landscapes (Bartelheim *et al.* 2012; Murillo-Barroso *et al.* 2015). Analyses of Argaric silver items

have only identified the use of native silver (Bartelheim *et al.* 2012), available in just a few areas in southeastern Iberia. It also suggests that the production of silver items would have involved relatively simple procedures that may not have required full-time specialists. The analysis has also revealed that silver seems to have moved across Argaric landscapes through quite fluid channels, with metals of diverse origin appearing in different settlements (Bartelheim *et al.* 2012).

This complex picture has been corroborated by lead isotope analyses of copper items (Murillo-Barroso *et al.* 2015). They provide a similar picture as copper of different origins was found across the different Argaric landscapes in complex distribution patterns. The more focused analysis of material at Cerro de San Cristobal and Cerro de la Encina has shown not only that the copper in these closely located sites comes from different origins, but also that the metal within each site had several origins (Murillo-Barroso *et al.* 2015). Evidence for manufacturing metal items is found in most excavated Argaric sites, normally at a domestic level, without real indication of specialised workshops, and therefore denoting a local, decentralised activity (Montero Ruiz and Murillo-Barroso 2010). Production, exchange and consumption of metals may therefore be explained as locally determined activities with metals from different regions moving through several types of exchange involving different parts of a society and with products being produced mainly locally (Bartelheim 2007; Montero Ruiz and Murillo-Barroso 2010; Murillo-Barroso *et al.* 2015).

4.3. Burial customs, heterogeneity and interaction

Burial analysis in recent decades has mainly concerned the study of tombs in relation to socio-economic differentiation (Cámara Serrano *et al.* 1996; Lull 2000; Contreras Cortés and Cámara Serrano 2002; Lull *et al.* 2004; 2009; Aranda Jiménez 2008) which has led to other aspects of funerary ritual remaining understudied (Montón-Subías 2010). This focus on socio-economic factors has normally assumed that the comparable nature of most burials indicates a similar relation between funerary rituals and social, economic and ideological aspects across the Argaric landscapes. Such an assumption is based on the striking similarities in burials that are hundreds of kilometres apart, with very similar burial rites, material assemblages and tomb types appearing in distant regions.

But these facts should not obscure the actual variability encountered in burials across Argaric landscapes (Aranda Jiménez *et al.* 2015, 130–7). Tombs appear in Argaric sites in many ways. Some houses included burials, while others did not, as in the case of Fuente Álamo (Pingel *et al.* 2003) and Castellón Alto (Molina González *et al.* 2003). Single inhumations tended to be the norm but double ones were not rare, and a few cases of tombs with multiple individuals have been recorded (Aranda Jiménez *et al.* 2015, 130–7). The proportion of single and multiple burials was not regular amongst settlements, and in some of them such as Cerro de la Encina, there was a much higher proportion of double and triple burials than in most other sites (Aranda and Molina 2006).

There may have been also differences in the number of burials per settlement, although this is more difficult to document due to different levels of preservation and excavation. In the El Argar settlement more than 1000 burials were reported (Siret and Siret 1890; Kunter 1990). At the neighbouring site of Fuente Alamo 120 were excavated, but the site may have housed more than 1000 tombs (Bartelheim 2012, 347). What seems clear is that only a small part of the population was buried in each site (Bartelheim 2012), and it may be possible that the choices about whom to bury varied for each settlement. Such a possibility is further supported by differences in the demography of the burials; for example, in the well excavated settlements of Gatas and Fuente Álamo adult males were underrepresented (Aranda Jiménez *et al.* 2015). Therefore, it becomes extremely difficult to understand the rules that governed interment. Why were some people buried while others were not? Why were some buried inside houses and others not? How do these differences relate to other types of variability in the tombs, such as wealth (Aranda Jiménez *et al.* 2015, 127–30)? The tendency to locate wealthy burials at the central areas of sites suggested in the cases of Castellón Alto and Peñalosa (Cámara Serrano 2001; Molina González and Cámara Serrano 2009), does not seem to be corroborated by data from Cerro de la Encina or Fuente Álamo (Aranda Jiménez *et al.* 2015). While wealth differences in burials can be recognised as elements of hierarchisation, it is difficult to match the funerary evidence with a society rigidly organised in classes (Bartelheim 2012; Gilman 2013; Montón Subías 2007) and aspects of gender (Montón-Subías 2010), and identity (Aranda Jiménez 2013) may explain much of the variability of tombs. This quick overview aims to raise the possibility that the presence of burials with Argaric traits may have obeyed different customs across southeastern Spain, or at least that the canons that regulated burial customs in Argaric societies were open enough to allow communities to make their own interpretations.

In order to understand better this tension between similarities and differences in the burial record, it may be worth considering the Argaric funeral as a charged cultural context that helped to articulate interaction between Argaric communities. Similar burials would express similar ideological and social conventions that could be played out in shared practices. In particular, the strong homogeneity of Argaric burnished wares found in tombs (Fig. 3.3; Aranda 2001), defying patterns of regional material variation, may provide evidence of ideologically significant practices that were very similar in every Argaric community. The association with drinking of certain ceramic shapes (cups, small jars) common in Argaric burials (Aranda Jiménez 2010; Aranda Jiménez and Montón Subías 2011) may indicate that there was much importance bestowed on certain liquid consumption practices across the Argaric territory.

Prescribed consumption rituals organised under a set of similar rules across Argaric populations would have been important cultural arenas for interaction, familiar to all. One of the roles of such practices may have been to provide a sort of culturally agreed context in which people that otherwise had very little knowledge of each other could meet under a familiar set of rules. The shared knowledge of what to

expect and how to behave would have tempered many of the uncertainties of meeting a stranger and would have offered a common ground onto which they develop an understanding of each other.

The most highly burnished cups and lenticular vases, closely imitating metal counterparts, are rare items and they were probably largely made specifically for the wealthiest burials. The recent discovery in La Almoloya of a ceramic jar decorated with silver bands further prove that drinking practices in which burnished wares were used constituted significant social arenas of communication where wealth and prestige differences could be stated.

Argaric funerary evidence presents a complex relationship between material culture, burial customs and identity that results in a seemingly contradictory set of homogeneous traits and heterogeneous behaviours. Argaric mortuary customs not only refer to local choices in the way death was related to the living, but they also offer evidence of the significance of a common set of practices, a shared cultural language, that enabled interaction between Argaric societies.

5. The Argaric network: potential and limitations

The patchy nature of the archaeological data precludes the implementation of formal network analyses in Argaric Iberia (*e.g.* Brughmans 2013). Nevertheless, network-based approaches can contribute significantly to the interpretation of the variability and fluidity found in the record, providing new information that otherwise would be difficult to obtain (Collar *et al.* 2015). It also opens new avenues in the study of social complexity in Argaric groups by emphasising the significance of interaction in such processes (Mizoguchi 2009; Schortman 2014).

The potential of network analysis is evident when considering settlement patterns and the interrelation between sites in Argaric landscapes. In the Vera basin, the fluid nature of the regional configuration (Legarra Herrero 2014) suits a network approach well. The settlement probably provided a distinct social identity to its residents that regulated major parts of their lives such as access to land, political and social rights, and so forth. The densely packed habitation of most of the major sites further suggests closely knit relationships between its inhabitants, and their location on visible hill tops visually underlined the common identity of its dwellers to the outsider. The use of Argaric settlements in a network analysis would tie the analysis of social interactions with the realities of Argaric geography (Brughmans 2013), providing new insights into the nature of Argaric territorial configuraton. For example, in the case of the Vera Basin, thinking about central sites as connected nodes exploiting a densely habited region poses questions about the gaps in the archaeological record of the region and the possible presence of other major sites in the area (Fig. 3.7). Such evidence not only can help in future territorial analyses but it can also inform efforts in the preservation of the archaeology of the region.

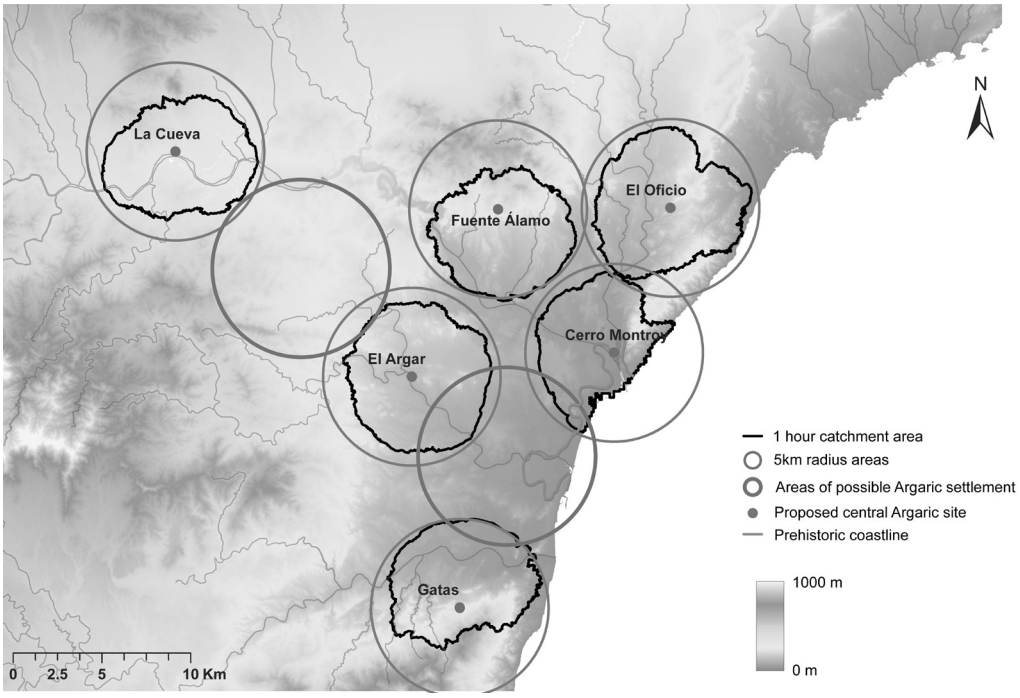

Figure 3.7 Proposed missing Argaric sites in the Vera region.

The use of network approaches can also provide fresh insights in the understanding of socio-political complexity in Argaric societies. In particular, the application of a small-world network model (Brughmans 2010, 278–80; Knappett 2011, 126–7) could offer a way to explain variability and homogeneity in the record in relation to processes of social differentation. Under this model, each Argaric region would present a densely connected network, while the links between the regions would rely on more sporadic connections. Argaric societies lived by combining a variety of types of interaction at several scales with different types of relationships, information and materials moving in the intra-regional and inter-regional levels (Robb 2007).

Most resources present in Argaric sites were obtained from areas immediate to the site (Legarra Herrero 2014) suggesting communities that were organised primarily around small geographical scales. It seems reasonable to propose that many of the necessary relationships beyond the settlement (exogamy, networks of social and economic support, Halstead 1989; Robb 2007) would be established with nearby populations creating a dense network of closely located sites. The relationships that would fuel these small networks would have been varied in their nature, including economic, social and ideological transactions and would have included a wide spectrum of the

population. Traditionally defined Argaric regions, such as Vera, Orce (Schüle 1986), the Granada plain (Molina González and Cámara Serrano 2009) or the area of Villena (Jover Maestre *et al.* 2015; López Padilla *et al.* 2015) are good candidates for such densely connected regions. The configuration of each region would vary depending on local geography and resources ending in different contingent histories.

Interaction occurring beyond the scale of each region is well attested by metal trade, by the expansion of Argaric sites and by shared customs and practices as indicated in the burials. These longer distance connections involve a more restricted, although highly important, set of materials and ideas. This is well exemplified by the consumption practices marked by burnished wares in burials. They indicate a set of practices with a strong cultural value that would probably have helped to override the challenges of establishing social and economic relationships beyond the regional scale. Such practices could have funnelled the distribution of key materials and ideas across large areas of southeastern Iberia. Such a ritualised type of interaction does not preclude other types of connections, and the fluid picture coming from metal analyses opens the possibility of other types of more commercially oriented trading activities.

Small-world network approaches therefore would allow for the explanation of independent regional paths as adaptations to the specific situation of a geographical region while at the same time acknowledging the importance of long-distance connections. Such a framework provides a basis for explaining complexity in the heterogeneous Argaric world.

It has been argued that the mapping and understanding of the relationships of distinct social groups in a landscape may help to explain the appearance of hierarchies and complexity (Schortman 2014). Privileged location of certain communities may provide them with the necessary advantages to gain wealth and regional dominance in highly connected landscapes. Certain sites would arise as political and economic powerhouses by controlling the movement of materials in exchange networks (*e.g.* Broodbank 1993). Such sites are not necessarily the producers, nor the final consumers, but those in key positions at the middle of the exchange networks. Those communities able to articulate local advantageous characteristics (resources, agricultural potential, demographic density) and large-scale ones (location with respect to main transportation routes, metal resources) would have been in particularly strong positions.

In terms of network-based approaches, the exceptionality of certain Argaric sites could be studied through the measurement of concepts such as degree centrality (rank based on number of edges or connections for each node), betweenness (rank based on the location of a node in the connection joining two other sites) and closeness (rank based on the calculation of how many steps are necessary to reach a node from another node; Mizoguchi 2009; Schortman 2014; Collar *et al.* 2015). While these may be difficult to implement until a more extensive knowledge of Argaric settlement patterns is achieved, it provides a hypothesis for thinking about power differences and political and economic inequalities within the heterogeneous character of the Argaric record. Recent studies have established that the location of certain Argaric sites responds

to the interest in controlling communication routes (Andrés Rodríguez 2017), and support the relevance of network studies for the Bronze Age of southeastern Iberia.

6. Conclusions

There is obvious work ahead to fulfil the potential of network approaches in southeastern Spain, starting from intensive archaeological surveys that provide a better understanding of settlement patterns in several Argaric regions. More extensive petrographic analysis of ceramics from Argaric tombs and settlements could provide a picture of how material moved (Knappett 2011) that would complement the data provided by archaeometallurgical studies. Ceramic analyses have proved to be particularly useful in understanding interaction both at the large (Day *et al.* 2011) and at the local levels (Whitelaw *et al*. 1997) in the Mediterranean.

Still, this study has tried to prove the potential of network analysis and 'Mediterranean' approaches in order to move beyond static conceptions of culture and to explain better the mix of diversity and similarity that characterise the Argaric archaeological record. It enables us to understand the importance of interaction and mobility for the Argaric communities and to relate these aspects to more local processes of resource exploitation and internal social organisation. This mixture of local, regional and large-scale patterns opens new ways to understand socio-political complexity in the Bronze Age of southeastern Iberia.

References

Andrés Rodríguez, L. (2017) El poblamiento Argárico en la costa de la Depresión de Vera (Almería, España) en el II milenio BC. Un acercamiento mediante el análisis espacial de base SIG. *Arqueologia y Territorio* 14, 35–45.

Aranda, G. (2001) *El análisis de la relación forma-contenido de los conjuntos cerámicos del yacimiento arqueológico del Cerro de la Encina (Granada, España)*. Oxford, Archaeopress.

Aranda, G., Montón-Subías, S., Sánchez-Romero, M. and Alarcón, E. (2009) Death and everyday life. The Argaric societies from Southeast Iberia. *Journal of Social Archaeology* 9**,** 139–62.

Aranda Jiménez, G. (2008) Cohesión y distancia social. El consumo comensal de bóvidos en el ritual funerario de las sociedades argáricas. *Cuadernos de Prehistoria y Arqueología de la Universidad de Granada* 18**,** 107–23.

Aranda Jiménez, G. (2013) Against uniformity cultural diversity: the 'others' in Argaric societies. In M.C. Berrocal, L. García Sanjuán and A. Gilman (eds) *The Prehistory of Iberia. Debating early social stratification and the state*, 99–118. New York, Routledge.

Aranda Jiménez, G., Alarcón García, E., Murillo-Barroso, M., Montero Ruiz, I., Jiménez Brobeil, S.A., Sánchez Romero, M. and Rodríguez Ariza, M.O. (2012) El yacimiento argárico del cerro de San Cristóbal (Ogíjares, Granada). *Menga. Revista de Prehistoria de Andalucía* 3**,** 141–66.

Aranda, G. and Molina, F. (2006) Wealth and power in the Bronze Age of the south-east of the Iberian Peninsula: the funerary record of Cerro de la Encina. *Oxford Journal of Archaeology* 25, 47–59.

Aranda Jiménez, G., Molina González, F., Fernández Martín, S., Sánchez Romero, M., Al Oumaoui, I., Jiménez Brobeil, S.A. and Roca, M.G. (2008) El poblado y necrópolis argáricos del Cerro de la Encina (Monachil, Granada): Las campañas de excavación de 2003–05. *Cuadernos de Prehistoria y Arqueología de la Universidad de Granada* 18**,** 219–64.

Aranda Jiménez, G. and Montón Subías, S. (2011) Feasting death: funerary rituals in the Bronze Age societies of south-eastern Iberia. In G. Aranda Jiménez, S. Montón Subías and M. Sánchez Romero (eds) *Guess Who's Coming to Dinner: feasting rituals in the prehistoric societies of Europe and the Near* East, 130–57. Oxford, Oxbow Books.

Aranda Jiménez, G., Montón Subías, S. and Jiménez Brobeil, S.A. (2009) Conflicting evidence? Weapons and skeletons in the Bronze Age of south-east Iberia. *Antiquity* 83, 1038–51.

Aranda Jiménez, G., Montón Subías, S. and Sánchez Romero, M. (2015) *The Archaeology of Bronze Age Iberia. Argaric societies.* London, Routledge.

Arteaga Matute, O. (2000) La sociedad clasista inicial y el origen del Estado en el territorio de El Argar. *Revista Atlántico Mediterránea de Prehistoria y Arqueología Social* 3, 121–219.

Bartelheim, M. (2007) *Die Rolle der Metallurgie in vorgeschichtlichen Gesellschaften. Sozioöknomische und kulturhistorische Aspekte der Ressourcennutzung; ein Vergleich zwsichen Andalusien, Zypern un dem Nordalpenraum*. Rahden/Westf., Verlag Marie Leidorf.

Bartelheim, M. (2012) Detecting social structures in the Bronze Age of southeastern Spain. In T. Kienlin and A. Zimmermann (eds) *Beyond Elites. Alternatives to hierarchical systems in modelling social formations. International conference at the Ruhr-Universität Bochum, Germany, October 22–24, 2009. Teil 1*, 339–54. Bonn, Habelt.

Bartelheim, M., Cortés, F.C., Onorato, A.M., Murillo-Barroso, M. and Pernicka, E. (2012) The silver of the south Iberian El Argar culture: a first look at production and distribution. *Trabajos de Prehistoria* 69**,** 293–309.

Blake, E. (2013) Social networks, path dependence, and the rise of ethnic groups in pre-Roman Italy. In C. Knappett (ed.) *Network Analysis in Archaeology: new approaches to regional interaction*, 203–22. Oxford, Oxford University Press.

Broodbank, C. (1993) Ulysses without sails: trade, distance, knowledge and power in the early Cyclades. *World Archaeology* 24, 315–31.

Broodbank, C. (2013) *The Making of the Middle Sea. A history of the Mediterranean from the beginning to the emergence of the Classical world*. London, Thames and Hudson.

Brughmans, T.O.M. (2010) Connecting the dots: towards archaeological network analysis. *Oxford Journal of Archaeology* 29, 277–303.

Brughmans, T.O.M. (2013) Thinking through networks: a review of formal network methods in archaeology *Journal of Archaeological Method and Theory* 20, 623–62.

Cámalich Massieu, M.D. and Martín Socas, D. (1998) *El territorio almeriense desde los inicios de la producción hasta fines de la anqtigüedad: un modelo, la depresión de Vera y cuenca del Río Almanzora*. Sevilla, Consejería de Cultura, Servicio de Investigación y Difusión del Patrimonio Histórico. Junta de Andalucía.

Cámara Serrano, J.A. (2001) *El ritual funerario en la Prehistoria Reciente en el Sur de la Península Ibérica*. Oxford, John and Erica Hedges Ltd.

Cámara Serrano, J.A., Contreras Cortés, F., Pérez Bareas, C. and Lizcano Prestel, R. (1996) Enterramientos y diferenciación social II. La problemática de la Edad del Bronce en el Alto Guadalquivir. *Trabajos de Prehistoria* 53, 91–108.

Cámara Serrano, J.A. and Molina González, F. (2004) El megalitismo en el sureste de la Península Ibérica. Ideología y control territorial. *Mainake* 26, 139–63.

Cámara Serrano, J.A. and Molina González, F. (2006) Selection of data, determinism and scientific relevance in interpretations of social development in the late prehistory of the Iberian Southeast. In P. Díaz-del-Río and L. García Sanjuán (eds) *Social Inequality in Iberian Late Prehistory*, 21–36. Oxford, Archaeopress.

Cámara Serrano, J.A. and Molina González, F. (2010) Relaciones de clase e identidad en El Argar: Evolución social y segregación espacial en los Altiplanos granadinos (c. 2000–1300 cal. A.C.). *Arqueología espacia* 28, 21–40.

Cámara Serrano, J.A. and Molina González, F. (2011) Jerarquización social en el mundo argárico (2000–1300 aC). *Quaderns de Prehistòria i Arqueologia de Castelló* 29, 77–100.

Carrión, J.S., Fernández, S., Jiménez-Moreno, G., Fauquette, S., Gil-Romera, G., González-Sampériz, P. and Finlayson, C. (2010) The historical origins of aridity and vegetation degradation in south-eastern Spain. *Journal of Arid Environments* 74, 731–36.

Carrión Marco, Y. (2004) Análisis antracológico del yacimiento de Fuente Álamo (Cuevas de Almanzora, Almería): uso de la madera y paleovegetación. In L. Hernández Alcaráz and M.S. Hernández Pérez (eds) *La Edad del Bronce en tierras valencianas y zonas limítrofes*, 477–86. Alicante, Ayuntamiento de Villena, Instituto Alicantino de Cultura Juan Gil-Albert.

Castro Martínez, P.V., Chapman, R.W., Gili I Suriñach, S., Lull, V., Micó, R., Rihuete Herrada, C., Risch, R. and Sanahuja Yll, M.E. (1999) *Proyecto Gatas 2. La dinámica arqueoecológica de la ocupación prehistórica*. Sevilla, Junta de Andalucía.

Castro, P., Chapman, R., Gili, S., Lull, V., Micó, R. and Rihuete, C. (eds) (1998) *Aguas Project. Palaeoclimatic reconstruction and the dynamics of human settlement and land use in the area of the middle Aguas (Almería) in the south-east of the Iberian Peninsula*. Luxemburg, European Comission.

Castro, P.V., Chapman, R.W., Gili Suriñach, S., Lull, V., Micó Pérez, R., Rihuete Herrada, C., Risch, R. and Sanahuja Yll, M.E. (2001) La sociedad argárica. In M. Ruiz-Gálvez Priego (ed.) *La Edad del Bronce, ¿Primera Edad de Oro de España? Sociedad, economía e ideología*, 181–217. Barcelona, Crítica Arqueología.

Chapman, R. (2008) Producing inequalities: regional sequences in later prehistoric southern Spain. *Journal of World Prehistory* 21, 195–260.

Chapman, R. (2014) Scales, interaction, and movement in later Mediterranean prehistory. In S. Souvatzi and A. Hadji (eds) *Space and Time in Mediterranean Prehistory*, 32–48. New York, Routledge.

Chapman, R., Lull, V., Picazo, M. and Sanahuja, M.E. (1987) *Proyecto Gatas. Sociedad y Economía en el Sudeste de España c. 2500–800 a.n.e. 1. La prospección arqueoecológica*. Oxford, British Archaeological Reports.

Chapman, R.W. (1990) *Emerging Complexity: the later prehistory of south-east Spain, Iberia and the west Mediterranean*. Cambridge, Cambridge University Press.

Chapman, R.W. (2003) *Archaeologies of Complexity*. London, Routledge.

Childe, V.G. (1957) *The Dawn of European Civilization*. London, Routledge and Paul.

Collar, A., Coward, F., Brughmans, T.O.M. and Mills, B.J. (2015) Networks in archaeology: phenomena, abstraction, representation. *Journal of Archaeological Method and Theory* 22, 1–32.

Contreras Cortés, F. and Cámara Serrano, J.A. (2002) *La jerarquización en la Edad del Bronce del Alto Guadalquivir (España). El poblado de Peñalosa (Baños de la Encina, Jaén).* Oxford, Archaeopress.

Contreras Cortés, F., Cámara Serrano, J.A., Moreno Onorato, M.A. and Aranda Jiménez, G. (2004) Las sociedades estatales de la Edad del Bronce en el Alto Guadalquivir (proyecto Peñalosa 2ª fase). Quinta campaña de excavaciones (2001). *Anuario Arqueológico de Andalucía* 2001**,** 24–38.

Day, P.M., Rutter, J.B., Quinn, P.S. and Kilikoglou, V. (2011) A world of goods: transport jars and commodity exchange at the late bronze age harbor of Kommos, Crete. *Hesperia*, 80.4, 511–58.

Delgado Raack, S. (2008) *Prácticas económicas y gestión social de recursos (magro)líticos en la prehistoria reciente (III-I milenios aC) del mediterráneo occidental.* PhD Thesis. Universitat Autónoma de Barcelona.

Delgado Raack, S. and Risch, R. (2006) La tumba nº 3 de Los Cipreses y la metalurgia Argárica. *Alberca: Revista de la Asociación de Amigos del Museo Arqueológico de Lorca* 4, 21–50.

Feinman, G.M. (2011) Size, complexity, and organizational variation: a comparative approach. *Cross-Cultural Research* 45, 37–58.

Eiroa García, J.J. (2004) *La Edad del Bronce en Murcia.* Murcia, Real Academia Alfonso X El Sabio.

Fontella Ballesta, S., Gómez Martínez, J.A. and Miras García, M. (2004) Lorca, poblado más extenso y primigenio de la cultura del Argar. *Alberca: Revista de la Asociación de Amigos del Museo Arqueológico de Lorca* 2, 39–52.

García Sanjuán, L. and Murillo-Barroso, M. (2013) Social complexity in Copper Age southern Iberia (ca. 3200–2200 Cal BC): reviewing the state hypothesis at Valencina de la Concepción (Seville, Spain). In M.C. Berrocal, L. García Sanjuán and A. Gilman (eds) *The Prehistory of Iberia. Debating early social stratification and the state*, 119–40. New York, Routledge.

Gilman, A. (1981) The development of social stratification in Bronze Age Europe. *Current Anthropology 22,* 1–23.

Gilman, A. (2013) Were there states during the later prehistory of southern Iberia? In M.C. Berrocal, L. García Sanjuán and A. Gilman (eds) *The Prehistory of Iberia. Debating early social stratification and the state*, 10–28. New York, Routledge.

Gilman, A. and Thornes, J.B. (1985) *Land-use and Prehistory in South-east Spain.* London, George Allen & Unwin.

Halstead, P. (1989) The economy has a normal surplus: economic stability and social change among early farming communities of Thessaly, Greece. In P. Halstead and J. O'Shea (eds) *Bad Year Economics: cultural responses to risk and uncertainty*, 68–80. Cambridge, Cambridge University Press.

Haro Navarro, M., Carrión Méndez, F. and García González, D. (2006) Territorio y georrecursos en el Cabo de Gata (Níjar, Almería) durante la edad del cobre. In G. Martínez Fernández, A. Morgado Rodríguez and J A. Afonso Marrero (eds) *Sociedades prehistóricas, recursos abióticos y territorio*, 315–26. Granada, Fundación Ibn al-Jatib de Estudios de Cooperación Cultural.

Hernández Pérez, M.S. (2009) Tiempos de cambio. El final del Argar en Alicante. In M.S. Hernández Pérez, J.A. Soler Díaz and J.A. López Padilla (eds) *En los confines del Argar: una cultura de la Edad del Bronce en Alicante en el centenario de Julio Furgús*, 292–305. Alicante, Fundación Marq.

Hérnandez Pérez, M.S., Soler Díaz, J.A. and López Padilla, J. (eds) (2009) *En los confines del Argar: una cultura de la Edad del Bronce en Alicante en el centenario de Julio Furgús*. Alicante: Fundación MARQ. Diputación Provincial de Alicante, Museo Arqueológico de Alicante.

Horden, P. and Purcell, N. (2000) *The Corrupting Sea. A study of Mediterranean history*. Oxford, Blackwell.

Hunt Ortiz, M., Contreras Cortés, F. and Arboledas Martínez, L. (2011) La procedencia de los recursos minerales metálicos en el poblado de la Edad de Bronce de Peñalosa (Baños de la Encina, Jaén). In J.M. Mata Perelló, L. Torrí I Abat, M.N. Fuentes Prieto, A. Niera Campo and O. Puche Riart (eds) *Actas del Quinto Congreso Internacional sobre Minería y Metalurgia Históricas en el Suroeste Europeo, León, 19–21 de Junio de 2008. Libro en Homenaje a Claude Domergue*, 195–206. La Poble de Segur, Sociedad Española para la Defensa del Patrimonio Geológico y Minero.

Jover Maestre, F.J. and López Padilla, J.A. (1999) Caracterización del patrón de asentamiento en la cuenca del Río Vinalopó (Alicante) durante el II milenio ANE. *XXIV Congreso Nacional de Arqueología: Cartagena 1997*, 241–9. Cartagena, Gobierno de la Región de Murcia, Instituto de Patrimonio Histórico.

Jover Maestre, F.J. and López Padilla, J.A. (2004) 2.100–1.200 BC. Aportaciones al proceso histórico en la cuenca del río Vinalopó. In L. Hernández Alcaráz and M.S. Hernández Pérez (eds), *La Edad del Bronce en tierras valencianas y zonas limítrofes*, 285–302. Alicante, Ayuntamiento de Villena, Instituto Alicantino de Cultura Juan Gil-Albert.

Jover Maestre, F.J. and López Padilla, J.A. (2009) Más allá de los confines del Argar. Los inicios de la Edad del Bronce y la delimitación de las áreas culturales en el cuadrante suroriental de la Península Ibérica, 60 años después. In M.S. Hernández Pérez, J.A. Soler Díaz and J.A. López Padilla (eds) *En los confines del Argar: una cultura de la Edad del Bronce en Alicante en el centenario de Julio Furgús*, 268–91. Alicante, Fundación Marq.

Jover Maestre, F.J., López Padilla, J.A. and Martínez Monleón, S. (2015) Espacios sociales en la Edad del Bronce: La Cubeta de Villena como caso de estudio. In M.J. De Pedro Micho and B. Soler Mayor (eds) *Vivir junto at Turia hace 4.000 años. La Lloma del Betxí*, 118–23. Valencia, Museu de Prehistòria de València. Àrea de Cultura. Diputació de València.

Knappett, C. (2011) *An Archaeology of Interaction: network perspectives on material culture and society*. Oxford, Oxford University Press.

Kunter, M. (1990) *Menschliche Skelettreste aus Siedlungen der El Argar-Kultur. Ein Beitrag der prähistorischen Anthropologie zur Kenntnis bronzezeitlicher Bevölkerungen Südostspaniens.* Mainz am Rhein, P Von Zabern.

Legarra Herrero, B. (2014) Estructura territorial y estado en la cultura Argárica. *Menga. Revista de Prehistoria de Andalucía* 4, 21–43.

Lillios, K.T. (2014) Crossing borders: death and life in second millennium BC southern Iberia and North Africa. In A.B. Knapp and P. Van Dommelen (eds) *The Cambridge Prehistory of the Bronze and Iron Age Mediterranean*, 554–70. Cambridge, Cambridge University Press.

López Padilla, J.A. (2009) El irresistible poder de la ostentación: la artesanía del marfil en la época del Argar. *Alberca: Revista de la Asociación de Amigos del Museo Arqueológico de Lorca* 7, 7–23.

López Padilla, J.A., Jover Maestre, F.J. and Martínez Monleón, S. (2014) San Antón y los orígenes de la Edad del Bronce en el sur de Alicante. *Orihuela. Arqueología y Museo*, 80–103. Alicante, MARQ. Museo Arqueológico de Alicante. Diputación de Alicante.

López Padilla, J.A., Martínez Monleón, S. and Jover Maestre, F.J. (2015) Estudio y caracterización del territorio argárico alicantino. In M.J. De Pedro Micho and B. Soler Mayor (eds) *Vivir junto at Turia hace 4.000 años. La Lloma del Betxí*, 124–31. Valencia, Museu de Prehistòria de València. Àrea de Cultura. Diputació de València.

Lull, V., Micó Pérez, R., Rihuete Herrada, C. and Risch, R. (2004) Las relaciones de propiedad en la sociedad argárica. Una aproximación a través del análisis de las tumbas de individuos infantiles. *Mainake* 2004, 233–72.

Lull Santiago, V., Micó Pérez, R., Rihuete Herrada, C. and Risch, R. (2005) Property relations in the Bronze Age of south-western Europe: an archaeological analysis of infant burials from El Argar (Almeria, Spain). *Proceedings of the Prehistoric Society,* 71, 247–68.

Lull Santiago, V., Micó Pérez, R., Rihuete Herrada, C. and Risch, R. (2010) Las relaciones políticas y económicas de El Argar. *Menga. Revista de Prehistoria de Andalucía* 1, 11–35.

Lull, V. (1983) *La 'cultura' de El Argar: Un modelo para el estudio de las formaciones económico-sociales prehistóricas.* Madrid, Akal.

Lull, V. (2000) Argaric society: death at home. *Antiquity* 74, 581–90.

Lull, V. and Estévez, J. (1986) Propuesta metodológica para el estudio de las necrópolis argáricas. *Homenaje a Luis Siret (1934–1984)*, 441–52. Sevilla, Junta de Andalucía.

Lull, V. and Micó, R. (2011) *Archaeology of the Origin of the State: the theories.* Oxford, Oxford University Press.

Lull, V., Micó, R., Rihuete-Herrada, C. and Risch, R. (2014) The La Bastida fortification: new light and new questions on Early Bronze Age societies in the western Mediterranean. *Antiquity* 88, 395–410.

Lull, V., Micó, R., Rihuete Herrada, C. and Risch, R. (2010a) Límites históricos y limitaciones del conocimiento arqueológico: la transición entre los grups arqueológicos de Los Millares y El Argar. In P. Bueno, A. Gilman, C. Martín Morales and F.J. Sánchez-Palencia (eds) *Arqueología, sociedad, territorio y paisaje. Estudios sobre prehistoria reciente, protohistoria y transición al mundo romano en homenaje a Ma. Dolores Fernández Posse*, 75–94. Madrid, Consejo Superior de Investigaciones Científicas.

Lull, V., Micó, R., Rihuete Herrada, C. and Risch, R. (2010b) Metal and social relations of production in the 3rd and 2nd millennia BCE in the southeast of the Iberian peninsula. *Trabajos de Prehistoria* 67, 323–47.

Lull, V., Micó, R., Risch, R. and Rihuete Herrada, C. (2009) El Argar: la formación de una sociedad de clases. In M.S. Hernández Pérez, J.A. Soler Díaz and J.A. López Padilla (eds) *En los confines del Argar: una cultura de la Edad del Bronce en Alicante en el centenario de Julio Furgús*, 224–45. Alicante, Fundación Marq.

Mathers, C. (1994) Goodbye to all that? Contrasting patterns of change in the south-east Iberian Bronze Age c. 24/2200–600 BC. In C. Mathers and S. Stoddart (eds) *Development and Decline in the Mediterranean Bronze Age*, 21–72. Sheffield Archaeological Monographs 8. Sheffield, J.R. Collis.

Mederos Martín, A. (1994) *Los estados incipientes del sureste de la Península Ibérica. Repercusiones en las cuencas de los ríos Aguas, Antas y Almanzora. Almería (4500–1300 a.C./5300–1600 a.C.).* PhD Thesis. Universidad de La Laguna.

Mizoguchi, K. (2009) Nodes and edges: a network approach to hierarchisation and state formation in Japan. *Journal of Anthropological Archaeology* 28, 14–26.

Molina González, F. and Cámara Serrano, J.A. (2004) Urbanismo y fortificaciones en la cultura de El Argar: homogeneidad y patrones regionales. In M.R. García Huerta and J. Morales Hervás (eds) *La Península Ibérica en el II milenio A.C.: poblados y fortificaciones*, 9–56. Cuenca, Universidad de Castilla-La Mancha.

Molina González, F. and Cámara Serrano, J.A. (2009) La cultura argárica en Granada y Jaén. In M.S. Hernández Pérez, J.A. Soler Díaz and J.A. López Padilla (eds) *En los confines del Argar: una cultura de la Edad del Bronce en Alicante en el centenario de Julio Furgús*, 196–223. Alicante, Fundación Marq.

Molina González, F., Rodríguez Ariza, M.O., Jiménez, S.A. and Botella López, M. (2003) La sepultura 121 del yacimiento argárico de El Castellón Alto (Galera, Granada). *Trabajos de Prehistoria* 60, 153–8.

Montero Ruiz, I. (1991) *Estudio arqueometalúrgico en el sudeste de la Península Ibérica.* PhD Thesis. Universidad Complutense de Madrid.

Montero Ruiz, I. and Murillo-Barroso, M. (2010) La producción metalúrgica en las sociedades argáricas y sus implicaciones sociales: una propuesta de investigación. *Menga. Revista de Prehistoria de Andalucía* 1, 37–52.

Montón-Subías, S. (2010) Muerte e identidad femenina en el mundo argárico. *Trabajos de Prehistoria* 67, 119–37.

Montón Subías, S. (2007) Interpreting archaeological continuities: an approach to transversal equality in the Argaric Bronze Age of south-east Iberia. *World Archaeology* 39, 246–62.

Moreno Onorato, A. and Contreras Cortés, F. (2010) La organización social de la producción metalúrgica en las sociedades argáricas: el poblado de Peñalosa. *Menga. Revista de Prehistoria de Andalucía* 1, 53–76.

Murillo-Barroso, M., Montero Ruiz, I. and Aranda Jiménez, G. (2015) An insight into the organisation of metal production in the Argaric society. *Journal of Archaeological Science: Reports* 2, 141–55.

Murillo-Barroso, M., Aranda Jiménez, G. and Montero Ruiz, I. (2014) Aspectos sociales del cambio tecnológico: nuevos datos para valorar la introducción de la aleación del bronce en las sociedades argárica. In E. García Afonso and B. Ruíz González (eds) *Movilidad, Contacto y Cambio. II Congreso de Prehistoria de Andalucía. Antequera 15–17 de febrero de 2012*, 417–27. Sevilla, Consejería de Educación, Cultura y Deporte de la Junta de Andalucía.

Nocete, F., Queipo, G., Sáez, R., Nieto, J.M., Inácio, N., Bayona, M.R., Peramo, A., Vargas, J.M., Cruz-Auñón, R., Gil-Ibarguchi, J.I. and Santos, J.F. (2008) The smelting quarter of Valencina de la Concepción (Seville, Spain): the specialised copper industry in a political centre of the Guadalquivir Valley during the third millennium BC (2750–2500 BC). *Journal of Archaeological Science* 35, 717–32.

Murillo-Barroso, M., Peñalver, E., Bueno, P., Barroso, R., de Balbín, R., Martinón-Torres, M. (2018) Amber in prehistoric Iberia: New data and a review. *PLoS ONE 13.8* e0202235. https://doi.org/10.1371/journal.pone.0202235.

Nocete, F., Vargas, J.M., Schuhmacher, T.X., Banerjee, A. and Dindorf, W. (2013) The ivory workshop of Valencina de la Concepción (Seville, Spain) and the identification of ivory from Asian elephant on the Iberian Peninsula in the first half of the 3rd millennium BC. *Journal of Archaeological Science* 40, 1579–92.

Pingel, V., Schubart, H., Arteaga, O., Roos, A.M. and Kunst, M. (2003) Excavaciones arqueológicas en la ladera sur de Fuente Álamo: campaña de 1999. *Spal* 12, 179–230.

Ramos Millán, A. (2013) Villages of wealth and resistance in paradise: Millaran and Argaric chiefdoms in the Iberian southeast. In M.C. Berrocal, L. García Sanjuán and A. Gilman (eds) *The Prehistory of Iberia. Debating early social stratification and the state*, 74–98. New York, Routledge.

Risch, R. (1998) Análisis paleoeconómico y medios de producción líticos: el caso de Fuente Alamo. In G. Delibes (ed.) *Minerales y metales en la prehistoria reciente: algunos testimonios de su explotación y laboreo en la Península Ibérica*, 105–54. Valladolid, Universidad de Valladolid.

Risch, R. (2002) *Recursos naturales, medios de produccion y explotacion social: un analisis economico de la industria litica de Fuente Alamo (Almeria), 2250–1400 antes de nuestra era.* Mainz am Rhein, P. von Zabern.

Robb, John. (2007) *The Early Mediterranean Village: agency, material culture, and social change in Neolithic Italy.* Cambridge, Cambridge University Press.

Scarre, C. (2013) Social stratification and the state in prehistoric Europe: the wider perspective. In M.C. Berrocal, L. García Sanjuán and A. Gilman (eds) *The Prehistory of Iberia. Debating early social stratification and the state*, 381–406. New York, Routledge.

Schortman, E.M. (2014) Networks of power in archaeology. *Annual Review of Anthropology* 43**,** 167–82.

Schubart, H. and Arteaga, O. (1986) Fundamentos arqueológicos para el estudio socio-económico y cultural del area de El Argar. *Homenaje a Luis Siret (1934–1984). Actas del Congreso, Cuevas del Almanzora*, 289–307. Sevilla, Junta de Andalucía.

Schüle, A. (1986) El Cerro de la Virgen, Orce (Granada): consideraciones sobre su marco ecológico y cultural. *Homenaje a Luis Siret (1934–1984). Actas del Congreso, Cuevas del Almanzora*, 208–20. Sevilla, Junta de Andalucía.

Serrano Ariza, R. (2012) Fortificaciónes y estado en la cultura argárica. *Arqueología y Territorio* 9, 49–72.

Siret, E. and Siret, L. (1890) *Las primeras edades del metal en el sudeste de España.* Barcelona, Henrich & Co.

Whitelaw, T.M., Day, P.M., Kiriatzi, E., Kilikoglou, V. and Wilson, D.E. (1997) Ceramic traditions at EM IIB Myrtos, Fournou Korifi. In R. Laffineur and P.P. Betancourt (eds) *TEXNH: Craftsmen, craftswomen and craftsmanship in the Aegean Bronze Age. Proceedings of the 6th International Aegean Conference/6e Rencontre égéenne internationale, Philadelphia, Temple University, 18–21 April 1996*, 265–74. Liège, Université de Liège.