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# Twenty-five years of late prehistoric archaeology in the Iberian Peninsula. Looking back, looking forward

## *Veinte años de arqueología de la Prehistoria tardía en la Península Ibérica. Mirando hacia atrás y hacia adelante*

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## ABSTRACT

Archaeological investigations of the agrarian communities of the 6th-2nd millennia BC in the Iberian Peninsula have undergone fundamental transformations over the past 25 years. This paper attempts to provide an overview of this research by considering three topics: 1) changes in theory, perspective, and practice, 2) the discovery of new sites or site types, and 3) developments in analytical methodologies and techniques. It concludes with some thoughts about possible future challenges and directions for research.

## RESUMEN

*Las investigaciones arqueológicas de las comunidades agrarias del VI al II milenios a. C. en la Península Ibérica han sufrido transformaciones fundamentales en los últimos 25 años. Este artículo trata de proporcionar una visión general de esta investigación considerando tres temas: 1) los cambios en la teoría, la perspectiva y la práctica, 2) el descubrimiento de nuevos sitios o tipos de sitios, y 3) la evolución de las metodologías y técnicas analíticas. Se concluye con algunas reflexiones sobre posibles futuros desafíos y direcciones para la investigación.*

**Key words:** Neolithic; Chalcolithic; Bronze Age; History of research.

**Palabras clave:** *Neolítico; Calcolítico; Edad del Bronce; Historia de la investigación.*

## INTRODUCTION

Archaeological investigations of the agrarian communities of the 6th-2nd millennia BC in the Iberian Peninsula have undergone fundamental transformations over the past 25 years (Fig. 1). This paper attempts to provide an overview of this research by considering three topics: 1) changes in theory, perspective, and practice, 2) the discovery of new sites or site types, and 3) developments in analytical methodologies and techniques. Although discussed separately, these trends are interrelated, and many can be linked to broader geopolitical changes. For example, the expansion of CRM beginning in the 1980s, generated in large part by the implementation of new cultural heritage laws, the Valletta (or Malta) Treaty of 1992, and infrastructural developments in Portugal and Spain, led to the discovery of numerous ditched enclosure sites and, consequently, changes in archaeological thinking about the political and economic landscape of the Iberian Peninsula during the 3rd millennium BC. The paper concludes with some thoughts about possible future challenges and directions.

This paper is written from the perspective of someone who is both an 'outsider' and an 'insider': an anthropological archaeologist trained in the US, who has carried out fieldwork and research in the Iberian Peninsula (primarily Portugal) since the mid-1980s. Although this is a perspective different from most readers of this article, it is my hope that it might reveal some distinctive ideas and serve as a useful contribution.

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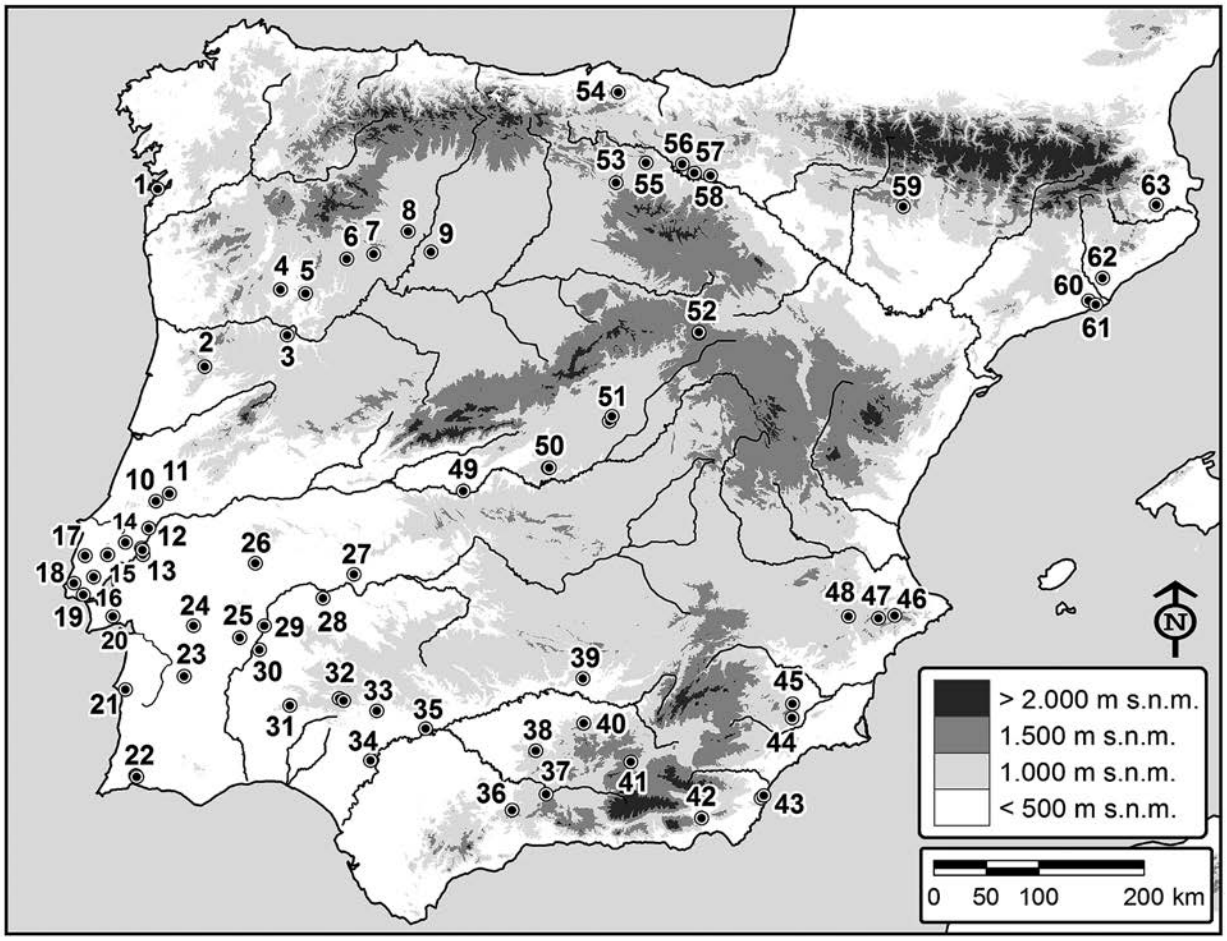


Fig. 1. Distribution of the archaeological sites mentioned in the text in the Iberian peninsula: 1. Monte de Os Remedios (Pontevedra); 2. Baiões (Viseu); 3. Castelo Velho (Vila Nova de Foz Côa); 4. Buraco da Pala (Bragança); 5. Fraga dos Corvos (Bragança); 6. El Pedroso (Zamora); 7. Palazuelo de las Cuevas (Zamora); 8. Las Peñas de Quiruelas (Zamora); 9. Molino Sanchón II (Zamora); 10. Casa da Moura (Leiria); 11. Caldeirão (Tomar); 12. Cisterna/Almonda (Torres Novas); 13. Cortiçóis (Santarém), Cabeço da Amoreira (Santarém), Cabeço da Arruda and Moita de Sebastião (Salvaterra de Magos); 14. Vila Nova de São Pedro (Santarém); 15. Algar do Bom Santo (Alenquer); 16. Penedo de Lexim (Mafra); 17. Zambujal (Torres Vedras); 18. Lapiás das Lameiras (Sintra); 19. Leceia (Oeiras); 20. Quinta do Anjo (Palmela); 21. Vale Pincel (Sines); 22. Alcalar (Faro) and Rocha das Gaivotas (Portimão); 23. Porto Torrão (Beja); 24. Vale de Rodrigo (Évora); 25. Perdigões (Évora); 26. Rabuje (Portalegre); 27. Carrascalejo (Badajoz); 28. La Pijotilla (Badajoz); 29. San Blas (Badajoz); 30. Porto das Carretas (Mourão); 31. La Traviesa (Sevilla); 32. El Trastejón and Pico Centeno (Huelva); 33. Almadén de la Plata 2 (Sevilla); 34. Valencina de la Concepción and Montelirio (Sevilla); 35. Setefilla (Lora del Rio, Sevilla); 36. Menga (Málaga): 37. Fuente Camacho (Granada); 38. Cueva de los Murciélagos (Córdoba); 39. Peñalosa (Jaén); 40. Marroquíes Bajos (Jaén); 41. Castellón Alto (Granada); 42. Los Millares (Almeria); 43. Gatas and Las Pilas (Almería); 44. La Bastida (Murcia); 45. La Almoloya (Murcia); 46. Mas d'Is (Alicante); 47. El Abric de la Falguera (Alicante); 48. El Cabezo de la Escoba (Alicante); 49. Azután (Toledo); 50. El Castillejo and Valle de las Higueras (Toledo); 51. Casa Montero and Camino de las Yeseras (Madrid); 52. La Lámpara, La Peña de la Abuela, La Sima, and La Revilla del Campo (Soria); 53. Alto de Reinoso (Burgos); 54. El Mirón (Cantabria); 55. El Prado (Burgos); 56. Las Yurdinas (Álava); 57. San Juan ante Portam Latinam (Álava); 58. Longar (Navarra); 59. Cueva de Chaves (Huesca); 60. Can Sadurní (Barcelona); 61. Gavà (Barcelona); 62. Cami de Can Grau and Bòbila Madurell (Barcelona); 63. La Draga (Girona).

## THEORY, PERSPECTIVES, PRACTICES

The current institutional organization of Spanish and Portuguese archaeology developed in the 1970s and 1980s following the end of the Franco and Salazar dictatorships, with the expansion of public universities, the creation of the Spanish autonomous governments, and the entry of both countries into the EU. Today, archaeologists are employed in diverse institutional spaces, each with different stakeholders (or patrons, Gilman 1995). These include museums, private and public universities, private CRM companies, and state

or municipal cultural heritage entities. The construction boom that began in the mid-1990s, partially funded by the EU to improve infrastructure, stimulated hundreds if not thousands of new excavations and employed hundreds of archaeologists. Although the management of archaeology by autonomous governments in Spain was put into place by the late-1980s, the growth of regional cultural heritage entities has created an increasingly fragmented (and bureaucratic) landscape (Martínez Navarrete 1998), and significant differences now exist between autonomous regions in terms of local policies, funding support, and infrastructure. The economic crisis of 2008-2015 impacted this institutional landscape by eliminating many private CRM firms and employment opportunities for archaeologists (for Spain, see Parga-Dans and Varela-Pousa 2014; for Portugal, see Costa *et al.* 2014). In Spain, austerity measures undermined the funding of public universities and CSIC departments.

Increased access to EU institutions as well as economic precarities post-2008 have impacted the practices and personnel involved in Iberian archaeology in significant ways. Increasing numbers of Portuguese and Spaniards have gone abroad (to the UK, France, Germany, and US) for graduate studies, postdoctoral fellowships, and employment. This has created a new generation of scholars who are more fluent in English and other languages, have stronger international connections, and have been better able to situate Iberian archaeology within a European or global context. The success in getting the dolmens of Antequera listed as a UNESCO World Heritage site in 2016 is due, in large part, to these kinds of skills. However, many of these archaeologists (and scientists in general) have not been able to return to their home countries owing to a decline in public funding for research, fewer job opportunities, as well as endogamic hiring practices. Furthermore, the longer these scholars work abroad, the more difficult it is for them to secure employment at home, resulting in a brain drain (González Ruibal 2011; Moro-Martín 2017).

While Portuguese and Spanish archaeologists still tend to do their primary research within their national borders (García Marín *et al.* 1997), they are increasingly going overseas for this research, either as directors of projects or collaborators with local archaeologists. Spaniards have worked in Chile, Peru, Argentina, Morocco, Tunisia, Egypt, Ethiopia, Italy, Syria, and Taiwan, among other countries (reports published in *Informes y Trabajos,* Ministerio de Educación, Cultura y Deporte, Madrid). Portuguese archaeologists have been conducting research in the former Portuguese colonies in Africa, specifically Cabo Verde, Angola, and Mozambique, and students from these countries are coming to Portugal for graduate studies (Carvalho, personal communication 2017). Scholars from Germany, the UK, and the US have been a presence in late prehistoric archaeology, although German archaeologists, through the Madrid branch of the German Archaeological Institute, have maintained the strongest and most enduring foreign presence (despite the closure of the Lisbon branch of the DAI in 1999).

Given this institutional framework, a highly heterogeneous landscape of archaeological practices and theoretical approaches characterizes the archaeology of late prehistoric Iberia. The debates between processualism and post-processualism that occurred in Anglo-American archaeological communities, which sometimes pitted science and the humanities in stark binary terms (Earle *et al.* 1987), did not take place in quite the same way (Vázquez and Risch 1991; Gilman 2000; Martínez Navarrete 2002). One could say that the extremes of both perspectives were largely avoided. In the 1980s, New Archaeology was widely adopted by a then-younger generation of scholars looking for alternatives to the cultural historic approach that had dominated Spanish and Portuguese universities throughout the 20th century. Since then, many tenets of New Archaeology have been further developed, such as functionalism, scientific techniques, and evolutionary concerns (*e.g.*, debates over the state in the 3rd and 2nd millennia BC). In general, however, archaeologists did not adopt the hypothetico-deductive methodology, holistic, ecological, or systems-based approaches to culture, or an overarching concern with comparative social forms and ethnography that characterizes 'classical' processualism, most likely because of their disciplinary home and training within history departments. Cultural historical perspectives and concerns, however, continue to characterize a significant proportion of late prehistoric research. Materialist or Marxist orientations to technology, power, and social life have also enjoyed currency among scholars. As with processualism, post-processualism was selectively incorporated into understandings of later prehistory. For example, there has been increased attention to the political/social entanglement of the practice and history of archaeology (Vázquez Varela and Risch 1991; Lillios 1995; Fabião 1996; Martins 2001; Díaz-Andreu 2002) as well as gender archaeology, though mainly in Spain (Jorge and Jorge 1996; Sánchez 2002; Montón-Subiás 2010; Cruz Berrocal 2013; Alarcón and Sánchez 2015). Another theoretical premise of post-processualism that has been adopted by some (*e.g.*, Valera 2007) is the notion that object/monument production and use are constitutive of social life, and not simply passive markers of status or identity. By focusing on practice rather than meaning, studies inspired by the critical turn have weakened the sharp distinctions traditionally made between the secular and sacred, and the domestic and funerary, and transformed research agendas focused on classification and typology. Along this vein, memory

studies and related investigations into object and monument biographies have left their mark (García Sanjuán and Wheatley 2010; Blanco-González 2011, 2014a and 2014b; García Sanjuán and Díaz-Guardamino 2015; Tejedor *et al.* 2017). These works have enriched and complicated traditional cultural historical narratives.

Perhaps the largest shift in late prehistoric archaeology in Iberia has been the explanatory framework used to explain culture change. Until the advent of radiocarbon dating, diffusionist (or colonialist) models dominated explanations of the development of megaliths, metallurgy, and complex societies. The pendulum swung to the other extreme between the 1980s-early 2000s, with a marked shift toward viewing autochthonous origins for these watershed transitions. However, in recent years, the pendulum has moved again, with much current work emphasizing the connectivity of societies of the 4th-2nd millennia BC (García Alfonso 2014), either in the form of major stimuli to Iberian cultural phenomena (Lull *et al.* 2014) or of less transformative trade or demographic links with peoples in North Africa, the central Mediterranean, or even Scandinavia (Morgado *et al.* 2014). This has been the direct result of isotopic, aDNA, and sourcing studies (see 'New science-based analytical techniques'), that have complicated the picture of what is 'indigenous' and 'non-local'.

A number of topical themes have characterized the last 25 years – some which have occasioned vigorous debates. These include the tension between seeing manifestations of the state (or not) in the Copper Age and Early Bronze Age of southern Iberia (Nocete 1994; Chapman 1995, 2003; Cámara Serrano *et al.* 1996; Contreras 2000; Gilman 2001; Díaz-del-Río and García Sanjuán 2006; Lull *et al.* 2011; Cruz Berrocal *et al.* 2013). Related to this have been inquiries into the degree and nature of violence that was expressed and experienced by populations at the time (Oosterbeek 1997; Aranda *et al.* 2009; Jiménez-Brobeil *et al.* 2009; see also 'Bioarchaeology'). The engraved slate plaques and their social and ideological significance have also stimulated debate (Gonçalves 2004; Lillios 2008; García Rivero and O'Brien 2014).

There has been a shift from site-centered archaeology to landscape studies, with earlier research on settlement pattern and land use practices in Southeast Spain (Gilman and Thornes 1985) and interdisciplinary investigations in Northwest Murcia (López 1991) setting important precedents. Subsequent developments in GIS and the rise of CRM/heritage management, coupled with insights drawn from postprocessualism, have firmly established landscape studies. In Spain, autonomous governments developed their own CRM systems, with early efforts in Galicia and Andalucía, and GIS was instrumental in documenting and managing the cultural (and environmental) resources in their territories[1]. Landscape approaches have also generated new practices, with larger more interdisciplinary teams working to address common problems (see 'GIS/geospatial analyses') and to link sites in integrated social networks (Jorge *et al.* 2013). Related to CRM and heritage management has also been an increasing interest in the impact of past land use practices and present-day landscapes (Castro *et al.* 2000) and the relationship between climate change and economic practices (McClure *et al.* 2009).

Systematic, scientific, and theoretically informed approaches to art and material culture have characterized the last 25 years of Iberian archaeology. Studies have shifted away from attempts to seek connections with the East Mediterranean toward those that engage in direct dating (Bueno *et al.* 2007), digital recording, digital image analysis (Rogerio-Candelera 2015), reconstructing chaînes opératoires, developing interpretations using insights gleaned from ethnography, replication and experimentation, and landscape analyses (see 'New science-based analytical techniques').

## NEW SITES, NEW TYPES OF SITES

The discovery and excavation of new sites and new types of sites have transformed archaeological understandings of chronologies, settlement pattern, economies and ritual practices.

### Neolithic – 6th-4th millennia BC[2]

New excavations of Neolithic sites, in concert with analyses of radiocarbon databases (see 'Radiocarbon/AMS dating'), have provided greater regional nuance to the spread of mixed farming, which tends to be framed in terms of either acculturation, involving the gradual adoption of farming by indigenous populations, or rapid colonization. The excavation and dating of open-air settlements, such as La Lámpara and La Revilla del Campo (Soria), have shown that farming and the raising of domestic livestock occurred by the middle of the 6th millennium BC in the Spanish interior (Stika 2005; Rojo-Guerra *et al.* 2006). At El Mirón (Cantabria), the sudden co-appearance of domestic ovicaprids, cattle, pig, as well as ceramics in a level dated to the mid-5th millennium BC suggests that indigenous foraging peoples in northern Iberia took up the farming 'package' in an abrupt and fairly complete way, although hunting, particularly of red deer, continued at the site

[1] I am grateful to Leonardo García Sanjuán for this information.
[2] All dates in text represent calibrated radiocarbon years.

(Peña-Chocarro *et al.* 2005). The identification of sites dated to the Early Neolithic in western Iberia/Portugal have also enhanced our understanding of the timing and process of early agriculture (Carvalho 2005; Cardoso 2010). Salvage investigations at the open-air sites of Vale Pincel (Sines) (Silva and Soares 2015) and Lapiás das Lameiras (Sintra) (Davis and Simões 2016), and systematic re-dating of the caves of Caldeirão (Tomar) and Cisterna/Almonda (Torres Novas) (Carvalho 2018) point to a rapid and co-synchronous uptake of agriculture in disparate regions.

Excavations of new site types have produced a more textured picture of early agrarian communities. For example, lowland settlements with negative structures have been identified at El Prado (Burgos), dated to the early 5th millennium BC (Alonso Fernández and Jimenez Echevarría 2014). Burials were also found at El Prado, allowing for integrated analyses into lifeways and deathways. The discovery of the ditched enclosure of Mas d'Is (Alicante) demonstrate that this site type, more typically associated with the 3rd millennium BC, has its antecedents in the Early Neolithic (Bernabeu *et al.* 2003). In 1990, as part of construction related to the 1992 Olympics in Barcelona, the Early Neolithic settlement of La Draga (Girona) on the eastern shore of Lake Banyoles was discovered (Bosch *et al.* 2000, 2011; Tarrús i Galter 2008). Dated to the mid-6th millennium BC, La Draga is the first lakeside village known in the Iberian Peninsula and, like its counterparts in Alpine Europe, it has remarkably preserved organic remains, which provide a stunning picture of the diverse resources used by early farming communities for building and subsistence as well as a window into domestic life.

Excavations of quarries and workshops have enhanced our understanding of the production and exchange of raw materials in the Neolithic. One consequence of the mitigation process for the M-50 motorway around Madrid was the discovery in 2003 of the extensive Neolithic flint mines of Casa Montero. These were the first Early Neolithic flint mines to be found in Iberia (Consuegra *et al.* 2004; Díaz-del-Río *et al.* 2006; Consuegra *et al.* 2018). Dated to 5400 BC, the mines extended over 2 ha and revealed over 3700 vertical shafts, some as deep as 7m, and produced a vast collection of flint in all stages of preparation. Investigations of the variscite mines and associated burials at Gavà (Barcelona), dated to the Middle Neolithic (4000-3500 BC), have revealed the scale and organization of variscite mining and production of variscite beads (done, apparently, on-site) and the impact of mining activities on the bodies of miners. That variscite mining also had a potent symbolic component is suggested by the discovery, in one of the shafts, of an anthropomorphic ceramic vessel known as the Gavà Venus (Bosch and Estrada 1994a, 1994b; Bosch and Borrell 2009; Borrell *et al.* 2015). Variscite mines have also been investigated at Pico Centeno (Huelva), used between the early 6th and late 3rd millennium BC (Odriozola *et al.* 2016), and at Palazuelo de las Cuevas (Zamora) (Villalobos and Odriozola 2016).

Archaeologists have discovered new kinds of burials dated to the Neolithic and previously documented burial types in regions where these had been unknown. With more systematic survey, megaliths have been found to be abundant in the Meseta, with the earliest tombs, such as the dolmen of Azután and tumulus of El Castillejo (Toledo), dating to the second half of the 5th millennium BC, displaying a surprising polymorphism. Their locations correspond closely with that of Early Neolithic settlements, demonstrating the link between the earliest farming peoples of central Iberia and megalith-building (Bueno *et al.* 2002; 2005a; 2015). Also notable are the discovery and investigations of the deliberately burnt charnel houses or 'lime-kiln' tombs (*tumbas calero*) in the Ambrona valley (Soria), such as La Peña de la Abuela and La Sima Barrow, both dated to 3800-3700 BC (Rojo 1999; Rojo and Kunst 1999, 2002; Görsdorf 2000; Rojo-Guerra *et al.* 2010). Similar kinds of burial structures, comparable in dating, have also been identified in Valladolid and La Rioja.

## Copper Age – 3rd millennium BC

The most notable development in the archaeology of 3rd millennium BC Iberia has been the discovery and intensive excavations of ditched enclosure sites, particularly along the Guadiana and Guadalquivir rivers, but also in the Meseta (Márquez Romero and Jiménez-Jáimez 2010, 2013; Delibes *et al.* 2014; Jiménez-Jáimez 2015). In 1996 only 5 ditched enclosures were known, but since then, over 30 new sites have been discovered (often using remote sensing) as part of research projects, agricultural expansion, and mitigation work, such as for the Alqueva Dam. Ditched enclosures feature evidence for productive activities (metallurgy), food consumption, depositional processes (placement of broken artifacts, animal bones, soil, etc.) in sunken features, as well as a range of mortuary structures and rituals. The integration of burial and production activities distinguishes them from most fortified sites, where graves (or sepulchral spaces) were rarely integrated with the domestic realm, although human remains have been recovered at the walled sites of Zambujal (Torres Vedras) and Leceia (Oeiras) (Kunst *et al.* 2014). Ditched enclosures of a wide range of sizes are known. Some extend over very large areas, such as Valencina de la Concepción (Sevilla) (450 ha) (Costa *et al.* 2010), La Pijotilla (Badajoz) (80 ha) (Hurtado 1997), and Porto

Torrão (Beja) (70 ha) (Arnaud 1993; Valera and Filipe 2004). Marroquíes Bajos (Jaén) (113 ha) has been considered a 'macro-village' (Zafra *et al.* 1999; Aranda *et al.* 2016), while Valencina has been called a mega-site (García Sanjuán *et al.* 2017). Yet, even smaller sites, such as Perdigões (Évora) (>16 ha) (Valera *et al.* 2014), Alcalar (Faro) (20 ha) (Morán 2010), and Camino de las Yeseras (Madrid) (20 ha) (Blasco *et al.* 2007), suggest that a significant workforce was mobilized to construct them (Díaz-del-Río 2004). For example, some ditches at Perdigões were 3 m deep and 2-3 m wide. Ditched enclosures have transformed our understanding of the social landscape of the 3rd millennium BC. They show that landscapes previously known for their mortuary sites, such as the Alentejo, were also centers for other types of economic and social aggregations. They challenge archaeologists to address questions, including their function, relationship to each other and fortified sites, chronology, and the causes of their abandonment.

In Northwest Iberia, excavations of ditched enclosures, such as Monte de Os Remedios (Pontevedra) (Fábregas *et al.* 2007), walled settlements, such as Castelo Velho (Vila Nova de Foz Côa) (Jorge and Rubinos 2002), and grain storage facilities in rockshelters, such as Buraco da Pala (Bragança) (Sanches 1997), are reminders of the heterogeneity of site types and forms during the 3rd millennium BC. No ditched enclosures have yet been discovered in Catalunya, although a great deal of CRM work has been carried out in the region.

Excavations and analyses of the chronology, architecture, material culture, and associated art at other Chalcolithic settlements as well as burials, such as Zambujal (Torres Vedras) (Sangmeister and Jiménez Gómez 1995; Kunst 1996), Leceia (Oeiras) (Cardoso 1994 1997), Castelo Velho (Vila Nova de Foz Côa) (Jorge and Rubinos 2002), Quinta do Anjo (Palmela) (Soares 2003), Penedo de Lexim (Mafra) (Sousa 2010), Porto das Carretas (Mourão) (Soares 2013), and El Pedroso (Salamanca) (Alves *et al.* 2013), have generated new information regarding the complex histories of these sites.

The discovery and investigation of sites involved in the extraction of important resources have also contributed to our understanding of economic and social life. These include the salt extraction sites in the Villafáfila lagoon, such as Molino Sanchón II (Zamora) dated to 2400-2000 BC (Guerra-Doce *et al.* 2011), and Fuente Camacho (Granada), with predominantly Copper Age ceramics (Terán and Morgado 2011). Salt works have also been identified in the Guadalquivir Valley (Escacena *et al.* 1996). Salt processing sites are known in Portugal along the Tagus and Sado valleys, and in the Algarve (Valera 2017). The variscite mines at Pico Centeno (Huelva) and a variscite workshop at Las Peñas de Quiruelas (Zamora) were also in operation during the 3rd millennium BC (Villalobos and Odriozola 2016).

Excavations at funerary sites, in addition to work on mortuary practices observed at enclosure sites, have revealed a highly variegated picture of funerary and symbolic practices. Excavations at Valle de las Higueras (Toledo), dated to between 3400-1900 BC, have complicated culture histories, as Ciempozuelos Beakers, most often associated with individual tombs, are found in collective graves within artificial caves/hypogea (Bueno *et al.* 2005b). Some tombs, such as the tholos of Montelirio (Sevilla) (Fernández Flores *et al.* 2016), dated to 2800 BC and with its astonishingly rich assemblage of exotic and exquisitely crafted items made from ivory, amber, cinnabar, gold, rock crystal, and shell, pose urgent questions about the nature of power and access to resources.

## Bronze Age – 2nd millennium BC

Excavations of Bronze Age sites have generated new information about the Iberian cultural landscape, funerary practices, metallurgy, and the environment (see overview in Blanco-González *et al.* 2018). Recent investigations point to important regional differences across the Peninsula, but also comparable developments, such as between the Southeast/Argaric and La Mancha in terms of defensive settlements. Bronze Age settlements (pits, enclosures, etc.) have been discovered in southern Portugal, where previously little was known about them (Serra and Porfírio 2017). Excavations have revealed the variability of Bronze Age funerary sites in northern Portugal (Bettencourt 2010) and southern Portugal (Soares *et al.* 2009); in the Northwest, such sites had been thought to have left little or no physical traces, and in the Northwest and Southwest, they were believed to have been restricted to cists. Excavations at Argaric sites, both low-lying and hilltop, and analyses of the architecture, burials, faunal/paleobotanical remains, and associated material culture have played a central role in debates about social inequality. Information from La Almoloya (Murcia) with its 'palace' structure (Lull *et al.* 2015), La Bastida (Murcia) (Lull *et al.* 2014), Castellón Alto (Granada) (Molina *et al.* 2003), and Peñalosa (Jaén) (Contreras 2000) has contributed to these debates (for an excellent overview of the current state of knowledge on the Argaric, see Aranda *et al.* 2014). A landscape perspective coupled with a biographic approach to material culture has also generated new insights into Bronze Age objects and monuments traditionally viewed as 'decontextualized,' such as stelae/statue-menhirs and metalwork/hoards (Díaz-Guardamino 2010; Manteiga Brea *et al.* 2015).

For the Southwest, key contributions include work at La Traviesa (Sevilla) (García Sanjuán 1998), El Trastejón (Huelva) (Hurtado *et al.* 2011), and Carrascalejo

(Badajoz) (Enríquez Navascués and Drake García 2007). Synthetic studies include those by Hunt-Ortiz (2003) and Costa (2010). For the Northwest, excavations at Fraga dos Corvos (Bragança) have elucidated the relationship between metallurgy and social life in the region (Senna-Martinez *et al.* 2010). In Valencia, notable work includes the excavations at El Abric de la Falguera (Alicante) (García and Aura 2006) and El Cabezo de la Escoba (Alicante) (Cabezas 2015) and the synthetic study of Hernández Alcaraz and Hernández Pérez (2004). For the Meseta, notable contributions include those by Díaz-del-Río (2001), Moral del Hoyo (2002), Samaniego Bordiu *et al.* (2002), Fernández-Posse *et al.* (2007), Rodríguez Marcos (2007), Aliaga and Megías (2011), Fernández Martín (2012), Rodríguez Marcos and Fernández Manzano (2012), Pérez Villa (2015), and Mejías Moreno *et al.* (2015).

## NEW SCIENCE-BASED ANALYTICAL TECHNIQUES

In tandem with the excavation of new sites and site types, and perhaps of even greater importance, has been the application of science-based methods and analytical technologies. These investigations have not only generated new kinds of knowledge, but quantitatively new scales of information. This process occurred gradually, beginning in the late 1980s with radiocarbon dating, and gained ground beginning in the 1990s.

### Radiocarbon/AMS dating

The development of radiocarbon dating in the 1970s triggered a revolution in understanding the origins of social inequality in Iberian late prehistory (Renfrew 1973). Radiochronologies have been fundamental to the recognition of the early and independent role of social complexity, the development of megaliths, and metallurgy. Also fueling these new culture histories has been the expansion of radiocarbon/AMS facilities in Spain and Portugal. Over the last 25 years, five laboratories have operated in Spain and Portugal: 1) CSIC at the Spanish National Research Council (1968-2013); 2) UGRA at the University of Granada (1976-present); 3) UBAR at the University of Barcelona (1985-present); 4) Sac (formerly ICEN) at the Laboratório de Isótopos Ambientais in Sacavém, Portugal (1986-present); 5) CNA at the Centro Nacional de Aceleradores in Sevilla (2005-present), currently the only AMS lab in Iberia.

Efforts to collate dates for sites in the Iberian Peninsula and make them available online include IDEArq-C14 (www.idearqueologia.org Bosque González and Vicent García 2016; Uriarte González *et al.* 2017), CronoloGEA (http://www.webgea.es/dataciones/ Aranda *et al.* 2015), and Iber-Crono (http://ibercrono.org/ Barceló and Morell in press). Of these databases, however, only IDEArq, which covers the entire Peninsula, is georeferenced. CronoloGEA only covers southern Iberia, and Iber-Crono is not yet live.

Radiocarbon/AMS dating and analyses using Bayesian statistics and summed calibrated dates have provided more precise understandings of the timing of key transitions, site histories, interregional relationships, and demographic dynamics (for an earlier assessment of the role of radiocarbon dating in Iberian late prehistory, see Gilman 2003). This has been particularly the case when attention to data hygiene has been attended to (such as using only short- versus long-life samples). Important efforts to determine the reservoir effect along the Atlantic, from Galicia to the Gulf of Cadiz, have made it possible to more precisely date marine shells (Soares 1993). The speed and manner of the spread of agriculture has been clarified (some which employ other proxies) (Zilhão 2001; Cruz Berrocal 2012; Isern *et al.* 2014; Fano *et al.* 2015; Martins *et al.* 2015; Bernabeu *et al.* 2016; Drake *et al.* 2016). Long-term demographic dynamics have been investigated (Balsera *et al.* 2015; Lillios *et al.* 2016; Blanco-González *et al.* 2018). Dating of multiple individuals in collective tombs has provided more precise histories of tomb use, often demonstrating their long biographies (McClure *et al.* 2010; Aranda and Lozano 2014; Aranda *et al.* 2017). The chronology of megaliths in south-central Portugal has been also clarified; although caves, dolmens, rock-cut tombs, and tholoi were used/constructed in a general evolutionary sequence, it has become clear that multiple tomb types were in use at the same time (Boaventura 2011). Direct AMS dating of pigments used to decorate megaliths have generated new chronologies for megalith construction, with the earliest megaliths (and painted megaliths) dated to the early 5$^{th}$ millennium BC (Steelman *et al.* 2005; Carrera and Fábregas 2006; Bueno *et al.* 2007). In some cases, AMS dating has corrected assumptions regarding the relationship between individuals in tombs. The Argaric tombs from Gatas (Almería), for example, had been thought to house remains of matrimonial 'couples,' but their dating showed that at least two generations separated them; thus, a relationship of descent between the individuals is more likely (Lull 2000).

### Raw material characterization and sourcing studies

Next to dating, archaeometric techniques to identify and characterize raw materials, conduct sourcing studies, and assess methods of manufacture have made the

most significant contributions. This work has generated a complex picture of interregional interactions.

Archaeometallurgy is a well-developed subfield in Iberian prehistoric studies, given the rich ore sources of the Peninsula and debates surrounding the importance of metallurgy in the emergence of social inequalities (Montero 1993; Gilman 1996; Hunt-Ortiz 2003). It has been suggested that copper metallurgy in Iberia developed independently and early, during the first half of 5th millennium BC (Ruiz-Taboada and Montero-Ruiz 1999), though not all scholars agree (Roberts 2009). Important work on copper metallurgy at Zambujal (Torres Vedras) (Müller *et al.* 2007), Vila Nova de São Pedro (Santarém) (Müller and Soares 2008), and Leceia (Oeiras) (Müller and Cardoso 2008), and on early bronzes in Southwest Iberia (Valério *et al.* 2014) has been carried out. Recent analyses have taken a chaîne opératoire approach to copper metallurgy, as at the Copper Age workshop at Las Pilas (Almería) (Murillo-Barroso *et al.* 2017), and a biographical approach, such as with the bronze objects at the late Bronze Age settlement of Baiões (Viseu), which show their recycling (Figueiredo *et al.* 2010). Some research suggests that metallurgical activities left a geochemical signature on the landscape and can be regarded as the earliest form of environmental pollution in Iberia (Nocete *et al.* 2005; García-Alix *et al.* 2013; Martínez Cortizas *et al.* 2016). Although the characterization of metal artifacts is standard practice and ore sources well-characterized, a major challenge to understanding early metallurgy in Iberia is the scarcity of mines that have been excavated and directly dated to the 3rd and 2nd millennia BC (Hunt-Ortiz 2003: 372-395; Blas Cortina 2014), although recent projects are prioritizing this research (see special issue in *Cuadernos de Prehistoria y Arqueología de la Universidad de Granada* 24, 2014). The fact that many ore bodies have been subjected to intensive exploitation in more recent periods has contributed to this situation.

In recent years, diverse stone, mineral, and organic materials used by late prehistoric peoples in Iberia have been analyzed using a variety of methods (XRF, XRD, INAA, spectroscopy, etc.). These include flint (Lozano *et al.* 2010; Afonso *et al.* 2011), amphibolite (Lillios 1997), obsidian (from Sardinia) (Terradas *et al.* 2014), variscite (Odriozola *et al.* 2010; Villalobos and Odriozola 2016), cinnabar (Hunt-Ortiz *et al.* 2011; Domingo *et al.* 2012), ochre (Capel *et al.* 2006), ivory (Schuhmacher and Banerjee 2012; Schuhmacher *et al.* 2009; 2013), and amber (from Sicily) (Murillo-Barroso and García Sanjuán 2013; Murillo-Barroso and Martinón-Torres 2012). The characterization and sourcing of megalithic stones was undertaken at Vale de Rodrigo (Évora) (Kalb 1996), the antas of Rabuje (Portalegre) (Boaventura 2000), La Pastora (Sevilla) (Cáceres *et al.* 2014), Montelirio (Sevilla) (Borja and Borja 2016), and Menga (Málaga) (Carrión *et al.* 2010; Lozano *et al.* 2014). These studies have demonstrated that megalithic stones were often transported some distance (such as 8 km, in the case of the capstone at Rabuje 1), although more local stones were also used. Of course, even hauling a multi-ton stone over 1 km requires a certain labor force of able-bodied individuals.

Archaeometric studies of ceramics are less well developed than of metal and stone objects, perhaps a result of a long tradition of using ceramics as chronological markers in Iberian prehistory. However, notable studies include those by McClure *et al.* (2006), comparing raw materials and production methods during the Neolithic of Valencia, by Jorge *et al.* (2013), which contextualizes in social terms the circulation of Neolithic vessels in the Mondego, by Kohring (2016) and Kohring *et al.* (2007), which engages in multiscalar analyses of pottery technology at the Copper Age site of San Blas (Badajoz), by Odriozola and Hurtado (2007), which analyzes the use of bone incrustations in Copper Age ceramics from the Middle Guadiana, and by Díaz-del-Río *et al.* (2011), which shows bone used as temper in Neolithic pottery in Madrid. Analyses of Iberian Beaker ceramics reveal a complex picture of both local and non-local production (Prieto-Martínez *et al.* 2015; Salanova *et al.* 2016; Dias *et al.* 2017), with their possible origins in the *copos* of the Estremadura (Carvalho-Amaro 2013).

## Use-wear studies

Although use-wear studies on lithics have been conducted in Iberia since the 1980s, notable examples include work carried out at the Neolithic sites of Cortiçóis (Santarém) (Carvalho *et al.* 2013), Cueva de los Murciélagos (Córdoba) (González *et al.* 1994), Cami de Can Grau and Bòbila Madurell (Barcelona) (Gibaja 2003), and Cueva de Chaves (Huesca) (Mazzucco *et al.* 2015); this research is summarized in Ibañez *et al*. 2017. Also investigated have been bronze halberds (Brandherm 2012) and stone pestles from Argaric sites, which incorporated residue studies (Ache *et al.* 2017).

## Residue studies

Residue studies have begun to provide insights into the use of ceramic vessels. The earliest evidence for beer in Europe has been found in pottery at Can Sadurní (Barcelona), dated to the late 5th millennium BC (Blasco *et al.* 2008). Beakers were used in the consumption of beer and mead (Rojo-Guerra *et al.* 2006), although not exclusively, as they also functioned in smelting copper and to contain cremated remains (Guerra-Doce 2006). Analyses of plain and Beaker pottery from Valle de las

Higueras (Toledo) (Bueno *et al.* 2005b) indicated that the Beaker vessel was used for drinking beer, while the other plain vessels were used to consume fish stew, wheat, mead, and a food with animal fat. Thus, Beakers were not the only vessels used for the consumption of alcohol beverages.

## Experimental archaeology

Experimental studies have been carried out to better understand labor expenditure, techniques of manufacture, and artifact use, such as those involved in constructing and burning a *tumba calero* (Rojo-Guerra 1999), manufacturing and wearing engraved slate plaques (Woods and Lillios 2006; Thomas *et al.* 2009), using grinding stones (Delgado-Raack *et al.* 2009), and making stone bracelets (Martínez-Sevilla *et al.* 2016).

## Palaeobotany and zooarchaeology

Archaeological studies of plants (Peña-Chocarro 2000; Pérez Jordà *et al.* 2011; Tereso *et al.* 2016) and animal bones (Navas *et al.* 2008; Valente and Carvalho 2014) have played a key role in late prehistoric studies. More systematic analyses of fauna in recent years, with attention not only to species, but also size and sex, have expanded our understanding of which animals people hunted or herded, and the relationship between these practices and local ecologies. However, flotation, as means of recovering microfauna or botanical remains, remains a rare practice, particularly for Early Neolithic sites (Carvalho *et al.* 2013: 42).

Dean (2010) analyzed the role of barnacle consumption at the Meso-Neolithic site of Rocha das Gaivotas (Portimão) in mitigating the resource depression that accompanied the transition from foraging to farming in the region. Dean *et al.* (2012) provided further evidence through their study of molluscs that a causal relationship existed between resource stress and the development of agriculture in southern Portugal. This is in contrast to the study of Stiner *et al.* (2003), which argues that shellfish harvesting between the Mesolithic and Neolithic in the Algarve shows little change, suggesting the persistence of hunter-gatherer populations.

The integration of botanical with faunal studies has provided some of the best insights into the nature of early farming practices, such as work carried out at La Draga (Girona) (Antolín *et al.* 2014). Botanical studies of settlement and burials of the Early Neolithic of Soria have provided a rich picture of domestic cereal usage and funerary goods that included willow wickerwork to hold the body (Stika 2005). Studies of ostracods recovered in cores along the Sizandro Valley, Portugal, have documented the changes in the salinity of the estuary/river between 4000-1000 BC, which could be correlated with activities at the neighboring settlement of Zambujal (Lord *et al.* 2011). Charcoal analyzed from sites in Alicante revealed the impact and transformation of vegetation by early farming people (Badal *et al.* 1994). Paleobotanical studies of the Neolithic-Bronze Age rockshelter of Buraco da Pala (Bragança) provided evidence for cereal agriculture (*Triticum, Hordeum,* and *Vicia*) but also a continuation of gathering practices (*Quercus* and *Pinus*) (Ramil and Aira 1993). Waterman *et al.* (2016) analyzed the isotopic signatures of ovicaprids recovered from diachronically distinct periods of the occupation at Zambujal (Torres Vedras), between the 3rd and 2nd millennia BC, and concluded that statistically significant differences in the isotopic measurements between the two sample groups reflect environmental changes.

## Geomorphology, micromorphology

Geomorphology and micromorphology have begun to be integrated to understand local landscapes, the impact of human activities on this landscape, site histories, and microstratigraphies, although their potential has not been fully realized. Studies of Early Neolithic settlements have contributed to understanding the landscapes that early farming populations chose to live in as well as the impact of these populations on these landscapes (Angelucci *et al.* 2007). These studies make clear that the earliest farmers left their mark on the soils and sometimes triggered the beginning of erosional events. Although a Mesolithic context, insights about human activities and site formation processes were illuminated by micromorphology at the shell midden site of Cabeço da Amoreira (Santarém) (Aldeias and Bicho 2016).

## GIS/geospatial research and remote sensing

The development and application of GIS has played an important role in mapping and contextualizing site locations in their natural and cultural landscapes. GIS has been a critical component for the recording and analysis of the large numbers of the often-highly fragmented human remains and associated material culture found in collective tombs (Figueiredo 2011) as well as the large sites of the 3rd and 2nd millennia BC. Particularly interesting spatial analyses include Wheatley *et al.*'s (2010) study of megaliths, the landscape, and Medieval transhumance routes, Cruz Berrocal's (2005; Cruz Berrocal *et al.* 2014) statistical analyses of Levantine rock art landscapes, Fairén-Jiménez' (2011)

landscape-based approach to Neolithic and Copper Age rock art in Mediterranean Spain, and Murrieta-Flores' (2012) analysis of late prehistoric sites and places of passage in the western Sierra Morena.

As noted above, remote sensing (GPR, magnetometry, etc.) have been instrumental in identifying and mapping late prehistoric sites, particularly ditched enclosures and other sites with negative structures (Márquez-Romero *et al.* 2011; Wheatley *et al.* 2012; Becker 2013; Valera *et al.* 2013; Jiménez-Jáimez 2015).

## Bioarchaeology, including isotopic studies (C/N/O/Sr) and aDNA

Bioarchaeological studies, in concert with isotopic and aDNA studies, have played a major role in generating new insights into the lifeways and deathways of late prehistoric peoples, informing on health and disease, diet, biological affinity and ancestry, ritual practice, violence, and mobility patterns. These investigations have been particularly transformative for our understanding of Late Neolithic/Copper Age populations, whose collective burial practices and commingling of human remains have tended to present a picture of social homogeneity and egalitarianism in contrast to the pronounced indicators of social difference from settlement sites (craft specialization, long-distance exchange goods) and monumental burial constructions, fortification, and ditches. The expansion of laboratories for biological anthropological research, such as at the Universities of Coimbra and Granada, and research programs dedicated to the analysis of osteological collections from old excavations (Boaventura *et al.* 2014) have been instrumental in these developments.

Because of the explosion of bioarchaeological research, only a few key contributions are summarized here. Lubell *et al.* (1994) used C/N isotopic studies on Mesolithic-Neolithic populations in Portugal to examine dietary changes, with discernable change noted at 7000 BP. They integrated isotopic data with dental wear evidence (and AMS dates) from multiple sites (10), to provide a multiproxy analysis of dietary change over time. They showed that Mesolithic groups consumed a homogeneous diet of marine and terrestrial foods that shifted to one of terrestrial sources in the Neolithic. Dental attrition also seems to track along with these dietary changes. They coupled this work with demographic studies comparing the Mesolithic sites of Cabeço da Arruda and Moita de Sebastião (Salvaterra de Magos) with the Neolithic site of Casa da Moura (Leiria) (Jackes and Meiklejohn 2008). Their analyses suggest population growth was impacted by rising sea levels in the Tagus Valley and its tributaries, which triggered a move to uplands and an increase in population growth in the Neolithic.

The multiproxy study of the Middle Neolithic burial cave of Algar do Bom Santo (Alenquer), dated 3800–3400 BC, showed a highly mobile population with origins in different geological landscapes (Carvalho *et al.* 2016). Another such study was conducted of the individuals buried at the megalithic tomb of Alto de Reinoso (Burgos), dated to around 3700 BC; multiproxy analyses presented a picture of a local and closely related population with matrilineal kin patterns (Alt *et al.* 2016). Numerous studies have investigated the diet and mobility of Neolithic-Copper Age populations, in large part to assess whether significant differences could be detected in these groups (Waterman, Peate *et al.* 2014; Waterman, Silva *et al.* 2014; Fontanals Coll *et al.* 2017; Díaz-Zorita 2017; Díaz-del-Río *et al.* 2017). In general, these studies tend to show largely 'local' populations, although some tombs present significant numbers of non-local individuals, suggesting that some sites served as aggregations for diverse populations. Children have also been a new research focus (Sánchez Romero 2004; Lull *et al.* 2005; Waterman and Thomas 2011; Beck 2016).

New excavations and bioarchaeological analyses of the burials at Longar (Navarra) (Armendariz *et al.* 1994; Armendariz and Irigaray 1995), San Juan ante Portam Latinam (Álava) (Vegas *et al.* 2012), Las Yurdinas (Álava) (Fernández-Crespo 2017), and those in Portugal (Silva *et al.* 2012) and SE Spain (Jiménez-Brobeil *et al.* 2009) have provided stark illustrations of the sometimes violent conflicts that occurred, perhaps as a consequence of the social inequalities that were emergent during the late 4$^{th}$-2$^{nd}$ millennia BC. Although disease rates (at least, those that leave marks on bones) are low for later prehistoric Iberia, insights into occupational illness or injuries have been gleaned. Emslie *et al.* (2015) detected moderate-high levels of mercury in some individuals from LN/CA burials in southern Portugal caused by contact with cinnabar used in body paint or in painting objects. Postcranial fractures were found on the skeletons of children from the Argaric site of Castellón Alto (Granada) (Jiménez-Brobeil *et al.* 2006), which were likely incurred by falling from steep slopes at the site. DNA studies are shedding new light on the demographic dynamics of late prehistoric populations of Iberia (Fernández *et al.* 2010; Lacan *et al.* 2011; Gamba *et al.* 2012; Hervella *et al.* 2012; Carvalho *et al.* 2016; Martiniano *et al.* 2017; Szécsényi-Nagy *et al.* 2017).

## Digital archaeology (image enhancement and 2.5D/3D technologies, databases)

Image enhancement and 2.5D/3D technologies have helped to detect and more precisely and clearly record ancient imagery. Digital image analysis (DIA)

techniques have been used to study the painted rock art of Levantine Spain and Portugal (Montero *et al.* 1998; Rogerio *et al.* 2011). The recording of carvings or three-dimensional objects has been achieved with Reflectance Transformation Imaging (RTI) or Structure from Motion (SfM) photogrammetry. RTI was used to study the biographies (erasures, superpositions) of the LBA stelae of Setefilla and Almadén de la Plata 2 (Sevilla) (Díaz-Guardamino and Wheatley 2013; Díaz-Guardamino *et al.* 2015). Photogrammetry was used in the study of the shell beadwork (once attached to textiles) at the 3rd millennium BC tholos of Montelirio (Díaz-Guardamino *et al.* 2016). Digital databases for particular artifact classes, such as the engraved stone plaques (Lillios 2004) and decorated stelae of the LBA (González 2007), as well as sites for radiocarbon dates (see 'Radiocarbon/AMS dating') have also been important tools.

## FUTURE DIRECTIONS

This final section outlines some reflections based on the key developments of the last 25 years and identifies specific ideas on how research might move forward.

1. It is likely that funding for archaeological research in Spain and Portugal will be increasingly competitive and pressure will intensify to demonstrate the relevance of this research to the public and academic communities in addressing importance questions of international – and not only regional or national – concerns, such as climate and environmental change, demographic shifts/mobility, inequality, and conflict. This research will require teams of interdisciplinary and international specialists to collaborate and productively engage with scholarly communities and the public through traditional academic venues as well as social media. The archaeology of late prehistoric Iberia has, fortunately, ample material that speaks to these issues. Community-based archaeology, as being developed at Vila Nova de São Pedro (Arnaud *et al.* 2014-2015), could also be a productive avenue to pursue, as it more directly brings archaeologists and stakeholders together in collaborative and mutually beneficial projects.

2. Given increasing constraints on funding, it also seems important to shift away from major excavations and the excavation of large sites toward the analysis of objects (and human remains) already excavated and housed in museum storerooms. Countless objects remain unanalyzed, and important sites remain not fully published (*i.e.,* Los Millares). In many ways, the stories that individual objects tell can be more illuminating and more compelling than the stories generated by the excavation of a site, given their intimate connections with individual people's lives; witness the popularity of the British Museum's *History of the World in 100 Objects*, http://www.bbc.co.uk/ahistoryoftheworld/about/british-museum-objects/. The emphasis on excavation may be a consequence of what is perceived by funding agencies as 'important research', and if so, archaeologists may need to make a stronger case for the importance of collections or object analysis. One way to match museum collections with researchers might be for curators to disseminate ideas for possible research projects based on their museum's holding via a website. It might also be productive to develop archaeological projects that require lower levels of funding. These could include systematic surveys of river valleys, with more explicit sampling strategies, and excavations of small sites. Smaller sites can provide key information related to economic and social hierarchies, and they can be more completely excavated and analyzed in shorter periods of time, ensuring more timely dissemination.

3. One lamentable consequence of the competition for funding and media attention has been a preoccupation with 'firsts.' As the historian Marc Bloch (1992: 24)[3] noted, an obsession with origins is the "idol of the historian tribe". Bloch queries what it means to find the 'origins' of an important phenomenon, as the term is ambiguous, unless it helps us understand a causal relationship that led to that particular development. Rather than seeking the earliest evidence for farming, collective burials, metallurgy, or Beakers, it would be more productive, in the long-term, to focus efforts on the factors that lead to such early practices, for example, and why they didn't develop elsewhere.

4. Another productive direction would be to improve integration of research at different scales of analysis (Mills *et al.* 2015). This is particularly critical since archaeological research has moved in divergent directions, from attention to individuals and micro-practices (*e.g.*, aDNA, chaînes opératoires, biographies, and taphonomy [as in Weiss-Krejci 2005]) to macro-structural dynamics (*e.g.,* demographic movements).

5. The development of regional approaches to the landscape has been a productive direction in Iberian archaeology. However, contemporary political entities, such as autonomous communities, do not correspond with ancient political realities. Therefore, it is critical to ensure that research engages across contemporary political or national borders and to find ways to incentivize this research, since it involves dealing with more layers of bureaucracy. For Iberia, considerations of Mediterranean (including north African) and Atlantic cultural/demographic contacts and their dynamics over time, along the lines of Harrison and Gilman (1977), would be an avenue of productive investigations.

[3] I am grateful to Pedro Díaz-del-Río for this reference.

6. Just as gender and biological sex are understood to be distinctive expressions of identity, it is problematic to conflate the social constructions of alterity (local, exotic, non-local, etc.) with geographic, geological, or biological categories. More critical inquiries into the application and interpretation of isotopic and aDNA studies as well as materials sourcing analyses are needed in order to avoid rendering biological categories the same as social categories (and playing into racist and nationalist narratives).

7. Other than for the Early Neolithic, relatively little attention has been devoted to subsistence practices. We need a better understanding of how farming or herding practices shaped or constrained the socio-political dynamics of communities. For example, it does not seem to be an accident that some of the largest, most complex, and most artifactually rich (in terms of exotic and highly crafted goods) of the 3rd millennium BC sites –the ditched enclosures– are found in the most agriculturally productive river valleys of the Iberian Peninsula. If these weren't settlements, in the traditional sense of the word, why and how did these populations manage to access these prime arable zones?

8. Another fruitful direction would be the creation of central digital repositories to house and disseminate geochemical and photographic information. One consequence of the explosion of new scientific techniques is that these often produce large datasets, which can be difficult to share and compare. Unlike radiocarbon dates, the results of these studies remain highly dispersed and the possibility that archaeologists are duplicating efforts in characterizing source materials is high (though some preliminary efforts to create isotope databases can be found at idearqueologia.org and http://isomemo.com/open_access.html).

9. To help improve the quality of archaeological publications and ensure balanced perspectives are presented, more peer-review in journals and edited volumes should be implemented. Most Portuguese archaeology journals and many Spanish journals are not peer-reviewed.

10. Finally, despite some developments in gender archaeology and the recognition of the social context of archaeology, disparities exist in the number of women and men in different spheres of employment. In 2012, for example, significantly more male archaeologists in Portugal were employed in research centers than females, while more females were employed in the public sector (Costa *et al.* 2014: 53). Recognizing these disparities, and understanding the factors that have contributed to them, and rectifying them would help to ensure a vital discipline, which addresses questions that engage with the diversity of human experiences in the past and present.

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