The absolute chronology of Argaric halberds

Vicente Lull (1), Rafael Micó (2), Cristina Rihuete-Herrada (3), Roberto Risch (4), Nicolau Escanilla (5)
(1,2,3,4,5) Universitat Autònoma de Barcelona
(1) vicenc.lull@uab.cat, (2) rafael.mico@uab.cat, (3) cristina.rihuete@uab.cat, (4) roberto.risch@uab.cat, (5) nescanilla@gmail.com

Abstract. We present the results of an extensive dating programme of Argaric burials containing halberds. In Southeast Iberia elite males were buried with this weapon during the first two centuries of the second millennium BCE. After discussing what does this chronology involve for the typological development of the Argaric halberds and their funerary contexts, a general overview is provided on the origin and expansion of western and central European halberds, taking into account all the absolute dates currently available. Finally, we return to the Iberian Peninsula, placing the appearance of the metal halberds within the general social and political changes that took place during the second half of the third millennium BCE and at the beginning of the Argaric state.

La chronología absoluta de las alabardas argaricas

Resumen. Presentamos los resultados de un extenso programa de datación de enterramientos argáricos con alabarda. En el sureste ibérico, los varones de élite fueron enterrados con esta arma durante los dos primeros siglos del segundo milenio antes de Cristo. Después de discutir qué implica esta cronología para el desarrollo tipológico de las halberas argáricas y sus contextos funerarios, se ofrece una visión general sobre el origen y la expansión de las alabardias de Europa occidental y central, teniendo en cuenta todas las fechas absolutas disponibles actualmente. Finalmente, volvemos a la Península Ibérica, situando la aparición de las alabardias metálicas dentro de los cambios sociales y políticos generales que se produjeron durante la segunda mitad del tercer milenio a. C. y al inicio del estado argárico.

Introduction

Most researchers working on Later Prehistory share the suspicion that metal halberds remain one of the keys to understanding the development of the early Bronze Age societies of central-western Europe. However, access to that key requires answering a combined set of questions about these weapons. In the first place, a very wide but heterogeneous geographic distribution is observed, in which high concentrations of halberds in certain regions stand out next to extensive empty spaces or sporadic finds. Did societies as far apart as those of central and northern Italy, Germany, Ireland and Southeastern Iberia, where the highest densities of these artefacts are recorded, have something in common?

A second surprising issue is the type of contexts in which halberds usually appear: mainly metal hoards or outstanding male burials. Moreover, halberds are a class of objects often represented on rock engravings or *stelae*, although these rarely appear in regions with abundant findings of metallic items. What was common and what was unique among the contexts of use, representation and deposition of European halberds?

Lastly, the halberd is one of the first true or specialised weapons manufactured in Western Europe, a function which links it closely with the emergence of new forms of combat, physical violence and with the imposition and safeguarding of unprecedented social hierarchies. Can we then understand halberds as an indicator of the rupture or extinction of Neolithic forms of life and, in some cases, of the emergence of the first states in Western Europe?

Any satisfactory answer to these questions demands reliable chronological evidence. The fact that the original context of many halberds is unknown (casual finds, private collections and unsystematic excavations) has hampered this objective, forcing a reliance on typo-chronological inferences through the associated items found in hoards and, to a lesser extent, graves. The uncertainties of this method, coupled with the relative scarcity of closed contexts, have opened up so many possibilities that a range of proposals could seem reasonable. Not surprisingly, a review of the literature offers a wide variety of hypotheses that locate the origin of halberds in Italy, Iberia, Ireland or central Europe. Many alternative proposals have also been put forward concerning the succession and the soundness of the proposed types or subtypes of halberds at a regional level.

Radiocarbon dating has not contributed sufficiently to a resolution of the chronological debate due to the scarcity of organic samples associated with halberds. In regions where halberds come from hoards or lack a known context, only the occasional preservation of wood fibres from the shafts has allowed sampling for a limited number of ^{14}C dates. In principle, expectations improve where halberds appear in graves associated with dateable human bones. However, the scarcity of tombs in many regions has limited this option. In this respect, southeast Iberia offers a privileged situation. This article presents the results of a dating programme on human bone samples from burials containing halberds. This absolute chronology offers the most reliable proposal in the European context. Once the lifetime period of these weapons has been established in the Argaric society, we will discuss how this may modify the general chronology of European halberds as well as the historical and social dynamics of the Iberian Peninsula at the transition from the Copper to the Bronze Age.

1 Typology and relative chronology of Argaric halberds

Since the early recognition of halberds by the Siret brothers (1887), various classification schemes have been proposed [Sch63, Sch73, Lull83, Ulr94, Bra03 and Hor14]. In general, they agree in identifying a class of halberds, typical of the Argaric Bronze Age, characterized by a wide flanged hafting plate. Of minor importance or only present in the outskirts of the Argaric territory are the Montejícar type halberds, defined by a proximal extension of the hafting plate, as well as some specimen of Atlantic affiliation [Sch73]. More problematic has been the classification of those pieces morphologically similar to daggers. The criteria used to consider these objects as halberds are usually the size of the blade, presence of midrib, arrangement, length, diameter and number of rivets, asymmetry of the blade, shafting traces on the hafting plate and orientation of eventually preserved wood fibres. However, each of the proposed classifications differs with regards to the number of variables considered and their relative importance. Consequently, the corpus of halberds in the Southeast is far from being a closed set, and this has had a negative impact on the chronological debate of the Argaric and Iberian halberds in general, as we shall see below.

Some authors have proposed that the simplest metallic shapes are the oldest halberds, arguing that they would have derived from flint prototypes [Sch13], [Ori37: 296-298]. Later, more complex forms would develop, like the typical Argaric halberd with a wide flanged hafting plate. The same reasoning was used by Blance [Bla71: 14] in her study on the beginnings of Iberia's metallurgy.

Among the classification proposals of Argaric halberds, the first one to combine morphometric and non-morphological criteria was offered by Lull [Lul83: 192-200]. Three types of Argaric halberds (I, II, III) were defined by distinctive values in *Blade Concavity Index* (IC) and *Proportion Index* (IP) supplemented by the morphology of the hafting plate and the number of rivets. We can advance here that, as a result of a research currently under way, this tripartite typological division maintains its consistency with a sample more than twice as large than the one originally analysed in 1983 (Fig. 1). Lull also proposed that this typological division might have had a chronological dimension. More specifically, type III, which includes the largest variation and also those objects most similar to daggers, would be the most archaic as well. Types II and I, on the other hand, would manifest the progressive consolidation of the Argaric model by improving the efficiency of the hafting and saving raw material.

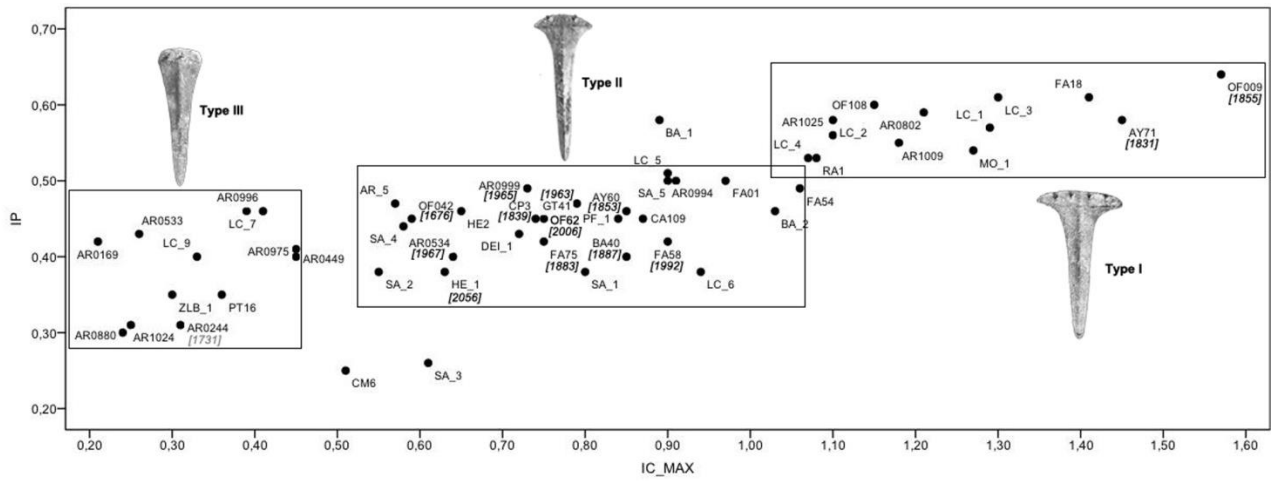

Figure 1 - Definition of the three types of halberds proposed by Lull, according to the correlation between IC and PI indices in a sample of 55 well preserved Argaric halberds. The alphanumeric codes refer to the site and to the tomb where a halberd was found. The underscore between the name and the number refers to an under-documented funerary context. In brackets and in italics appears the median value of the 1 sigma calibration interval for the 14C dates associated with certain tombs.

Key: AR: El Argar; AY: La Almoloya; BA: La Bastida; CA: Castellón Alto; CM: Cabecico de los Moros; CP: Los Cipreses; DEI: Deifontes; FA: Fuente Álamo; GT: Gatas; HE: Las Herrerías; LC: Laderas del Castillo; MO: Monteagudo; OF: El Oficio; PF: Puebla de Don Fadrique; PT: Puntarrón Chico; RA: El Rincón de Almendricos; SA: San Antón; TA: Tabaià; ZLB: El Zalabí.

AR244 is plotted in a lighter tone because the dating corresponds to the female found with the male skeleton associated with the halberd.

TA1 high values (IP = 0.71; CI = 1.71) exceed the limits of the graph. It would be an extreme example of Lull's Type I. It should also be mentioned that we have not included the halberd from El Barranquete, which gives its name to one of the types proposed by Brandherm [Bra03, Bra04], as it was found in a superficial archaeological context and, in any case, stands outside the Argaric norm [Alm73: 84-85]. Its outstanding low indices (IP = 0.32, CI = 0.19) lie even below Lull's Type III values.

Ulreich followed Lull's approach with regards to the metrical proportions of the artefacts [Ulr94], but ended up with only two typological variants, the 'classical' Argaric shape with a wide hafting plate ("Variant 1"), and the dagger-like forms ("Variant 2"). Based on a contingency analysis of 21 halberds from three neighbouring sites (El Argar, El Oficio and Fuente Álamo) and of four different types of burial structures stratigraphically placed in the then recently documented sequence of Fuente Álamo, the author concludes that variant 1 would be earlier than variant 2, thus reversing Lull's sequence[1].

Ten years later, Brandherm emphasised the number of rivets as the main discriminating factor [Bra03][2], a criterion already used by Schickler [Sch63: 20] in his unpublished but frequently quoted thesis on the European Early Bronze Age daggers and halberds[3]. This procedure results in splitting up blades of similar shape into different types and *viceversa*, as has already been pointed out by other authors [Hor14: 19-21]. It is also surprising that a crucial criterion is ignored, namely the orientation of the artefact in relation to the asymmetry of the blade, given that this is a specific trait of a halberd's design and manufacture and has a direct effect on the kinetic properties of the weapon. In chronological terms, all the Argaric types (AA20-San Antón, AF6-Arrayanes, AF7-Monteagudo, AF8-Barranquete and AF9-Laderas) appear during an early phase of El Argar ("Frühbronzezeit A2" according to Brandherm's chronological scheme) and most of them last until the early Middle Bronze Age ("Mittelbronzezeit B1") [Bra03: 247-248 and 405-409]. In a later publication, Argaric halberds were sequenced according to a new chronological scheme [Bra04: 309-312 and figs 16, 24]. The series starts with the Monteagudo type, showing a slightly widened hafting plate and three or more rivets, at the beginning of El Argar, around 2200 cal BCE. The San Antón type closely resembles the Monteagudo type but with only two rivets; the Las Laderas type, with a much wider hafting plate, and the Arrayanes type, with a triangular blade, would start a little bit later, 2100 BCE. Between 2100 and 1850 cal BCE, all five types would be in use, although the Monteagudo type went out of use ~1950 cal BCE. After 1850 cal BCE, only the dagger-like Barranquete type lasted until 1750 cal BCE [Bra04: plate 24].

Finally, the typology which has recently been proposed by Horn rejects both Ulreich's and Brandherm's schemes and ignores or is unaware of the analytical procedure introduced by Lull. In this case, a variety of criteria are used in a non-systematic way to identify and classify the Iberian halberds [Hor14: 91-93]. In general, the characteristic Argaric halberds with a wide hafting plate are included in type 3, while the simpler, dagger-like ones appear mostly under type 14a. Taking into consideration the funerary contexts and the first absolute dates presented by Castro and co-workers [Cas94] instead of those from more recent publications [Lul11], type 3 is dated between 2350/2300-1850/1800 cal BCE [Hor14: 21]. Surprisingly, a sandstone plaque with a blade-like shape found in the Copper Age *tholos* burial 3 of La Pijotilla (Badajoz) is drawn on to date the beginning of simpler blades of type 14a around 2850-2600 cal BCE, although the chronology of the Argaric objects of 14a would be much later [Hor14: 51-52].

The classification of certain blades considered by Horn as evidence of the first halberds in South or Southwest Iberia at the transition from the 4th to the 3rd millennium, inspired by the earlier Italian examples [Hor14: 106], is equally questionable on technological and morphometric grounds. The specific type of blades with a midrib found in the Copper Age *tholos* tombs of Alcalar 3 or Los Millares 57, on which this dating is mainly based, cannot be classified unequivocally as halberds (see also [Bra03: 80-81 and 413]). Moreover, all five metal blades were found in the lateral chamber of this *tholos* burial, where only an adult male could be identified [Est89: 169][4].

In order to clarify this chronological and typological debate, a focus on direct and absolute, rather than indirect and relative, dating is needed. Only those artefacts classified unambiguously as halberds based on a combination of traits (shape and asymmetry of the blade, length of the rivets, presence of a midrib and, where present, orientation of the wooden fibres in the hafting plate) [Lul17] should be considered.

[1] This typological division and chronological succession was later assumed by Schuhmacher [Sch02a] without any reference to Lull's study.

[2] Amongst the halberds with three or more rivets, Brandherm introduces further morphological criteria.

[3] We wish to express our gratitude to Christoph Huth, U. Freiburg, for having made accessible to us a copy of this thesis.

[4] Horn and Schenck have recently proposed a Neolithic origin and long development for the European halberds, drawing mainly on similar shaped artefacts made of bone and stone [Hor16]. However, such functional or morphological references do not explain why a specific type of metal weapon was used only in certain regions and times, mainly in the second half of the 3rd and the early 2nd millennia BCE.

2 The radiocarbon chronology of the Argaric halberds

Argaric halberds have been the subject of a chronological debate both in Prehistoric research and in the internal dynamics of Argaric Bronze Age [Bla71, Sch73, Lul83]. Unfortunately, despite the relative abundance of contextualized finds in tombs [Sir87], until the mid-1990s only one radiocarbon date was available for this type of weapon, namely that of the Herrerías-Mina Iberia cist burial 1 [Alo78, Cas94, Bra00]. Only the deployment of a programme designed to determine the absolute chronology of Argaric funerary practices [Cas94], which in recent years has also included bone samples kept in several museums and from the new excavations of La Bastida and La Almoloya, has allowed us to build up a sufficiently broad and contextualized series of radiocarbon dates.

Table 1 - Absolute dates directly associated with Argaric halberds (calibration according to OxCal 4.2–terrestrial curve IntCal2013). **(*)** Not included because of inconsistencies with Beta-240410 and reverse stratigraphy with KIA-38217. (**) *Terminus ante quem* for the halberd found in TA1 because tomb TA3 is stratigraphically younger. Uncertain validity because the analysis was performed when Kiel's University lab. provided inconsistent results.

Site Burial	**Lab. Nr.**	**^{14}C (BP)**	**calibration 1*s* (cal BC)**	**calibration 2*s* (cal BC)**	**calibration (median cal BC)**	**Sample**	**Context**	**Observations Bibliography**
El Argar AR534	MAMS-15344	3609±21	2018 (21.1%) 1994 1981 (47.1%) 1936	2028 (95.4%) 1908	1967	Hand middle phalanx	Small rock-cut tomb. Single burial of unknown age and sex. Grave goods: 3-rivet halberd and 2-rivet dagger	Unpublished
El Argar AR999	KIA-42496	3607±21	2016 (17.7%) 1996 1980 (50.5%) 1930	2026 (95.4%) 1906	1965	Fibula fragment and metacarpal bone	Slab cist. Two adults, male and female. Grave goods: 2 carinated pots (F5) and 2-rivet halberd	Pooled mean of two analysis (KIA-42496: 3615±30 and 3600±30 BP) after a first anomalous result (KIA-42496: 3825±30 BP) [Lul15b: table 6]
El Oficio OF9	OxA-4968	3530±50	1932 (31.5%) 1863 1850 (36.7%) 1772	2016 (2.1%) 1996 1980 (91.9%) 1740 1712 (1.3%) 1699	1855	Metacarpal and metatarsal	Slab cist. Two adults, male and female. Grave goods: one pot (F4), 4-rivet halberd, 3-silver rivet dagger and a two rivet dagger.	[Hed95, 425]
El Oficio OF42	MAMS-14429	3383±23	1730 (7.5%) 1722 1692 (60.7%) 1641	1741 (21.4%) 1711 1700 (74.0%) 1625	1676	Wooden handle fragment	Slab cist. Two adults, male and female. Grave goods: bowl (F1), pot (F3), 3-rivet halberd, 5-rivet dagger and animal bones.	Unpublished
El Oficio OF62	OxA-4970	3635±60	2128 (13.8%) 2088 2046 (54.4%) 1921	2198 (3.1%) 2162 2152 (91.1%) 1878 1840 (0.8%) 1827 1792 (0.4%) 1784	2006	Skull fragments	Slab cist. Two adults, male and female. Grave goods: 4-rivet halberd, three daggers (two 4-rivet and one 3-rivet), open silver bracelet and open silver earring.	[Hed95, 425]
El Oficio OF210	KIA-43166	3518±18	1890 (16.6%) 1872 1844 (29.3%) 1812 1802 (22.3%) 1777	1906 (95.4%) 1770	1830	Metatarsal	Slab cist. Two adults, male and female. Grave goods: bowl (F1), carinated vessel (F5), two goblets (F7) placed outside the cist), 2-rivet halberd, dagger, bone awl and five flint blades placed outside the cist, fragment of a slate bracelet, fragment of rock	Pooled mean of KIA-43166: 3530±25 and 3505±25 BP after a first anomalous result: 4000±25 BP [Lul15b: table

							crystal and animal bones.	6]
Fuente Álamo FA58	KIA-42492	3631±14	2023 (68.2%) 1966	2032 (95.4%) 1946	1992	Hand and foot phalanges	Small rck-cut tomb. Two adults, male and female. Grave goods: carinated vessel (F5), 6-rivet, 3-rivet dagger and goat/sheep bones.	Pooled mean of four analysis from the same sample KIA-42492: 3600±25, 3625±30, 3645±30 and 3665±25 BP) [Lul15b: table 6]
Fuente Álamo FA75	OxA-4972	3545±65	1960 (68.2%) 1771	2116 (1.1%) 2098 2038 (91.7%) 1732 1720 (2.5%) 1692	1883	Calcaneus	Small rck-cut tomb. Two adults, male and female. Grave goods: lenticular pot (F6), bowl (F1), 7-rivet halberd, 7-rivet dagger, golden bracelet and beef bones.	[Hed95: 425]
Gatas GT41	MAMS-15345	3606±22	2016 (16.9%) 1996 1980 (51.3%) 1926	2026 (95.4%) 1902	1963	Metatarsal	Slab cist. Two adults, male and female. Grave goods: pot (F5), 3-rivet halberd and 3-rivet dagger.	Unpublished
Herrerías Mina Iberia 1 (HE1)	CSIC-248	3670±70	2140 (68.2%) 1950	2284 (2.5%) 2248 2234 (92.9%) 1882	2056	Wooden handle fragment	Slab cist. Adult male. Grave goods: lenticular pot (F6), bowl (F1), 5-rivet halberd, 5-rivet dagger, another dagger, silver earring, green-stone bead and beef bones.	[Alo78, 168] [Bra00, 165]
La Almoloya AY60	MAMS-25589	3532±24	1913 (34.5%) 1875 1842 (19.8%) 1818 1798 (13.9%) 1780	1938 (95.4%) 1771	1853	Left femur fragment	Slab cist. Two adults, male and female. Grave goods: carinated pot (F5), 3-rivet halberd, 2-rivet dagger and sheep/goat bones.	Unpublished
La Almoloya AY71	MAMS-26615	3514±27	1888 (14.6%) 1869 1846 (53.6%) 1775	1916 (95.4%) 1752	1831	Left humerus fragment	Slab cist. Adult male. Grave goods: carinated pot (F5), 4-rivet halberd and sheep/goat bones.	Unpublished
La Bastida BA40	KIA-40753	3542±26	1934 (48.9%) 1876 1841 (11.6%) 1822 1796 (7.7%) 1782	1951 (60.7%) 1862 1852 (34.7%) 1772	1887	Right femur medial shaft fragment	Slab cist. Two adults, male and female. Grave goods: two carinated pots (F5), 2-rivet halberd, 3-rivet dagger, copper awl and beef and sheep/goat bones.	Second analysis of KIA-40753 (3345±60 BP) because of low quality of the sample. Unpublished
Los Cipreses CP3	KIK-242 / UtC-2738	3510±90	1950 (63.8%) 1736 1715 (4.4%) 1696	2126 (2.1%) 2090 2045 (93.3%) 1621	1839	Wooden handle fragment	Slab cist. Adult male. Grave goods: two pots (F5 and F6) placed outside the cist, 3-rivet halberd, 3-rivet knife, bracelet, two anvils/hammers, ivory fragment (knob?), beef bones.	[Van95, 28] [Mar96, 12 and 36]
Setefilla	I-11070	3520±95	1971 (64.9%) 1738 1713 (3.3%)	2134 (3.7%) 2080 2061 (91.7%) 1623	1852	Charcoal	Burned layer of floor sealing the burial context (Corte 3, Estrato XIV). Partial recovery	[Aub81, 229]

			1697				of adult human remains associated to the halberd. Sex unknown.	
Tabaià TA1	Beta-240409	3480±40	1878 (23.7%) 1838 1828 (44.5%) 1749	1900 (95.4%) 1691	1807	Sheep/goat bone	Stone cist. Adult male. Grave goods: carinated pot (F5), 6-rivet halberd and sheep/goat bones.	(*) [Lop09, 257] [Her10, 227]
Tabaià TA1	Beta-240410	3340±40	1686 (56.1%) 1607 1582 (12.1%) 1560	1738 (5.5%) 1714 1696 (89.9%) 1521	1628	Human bone	Id.	(*) [Lop09, 257] [Her10, 227]
Tabaià TA3	KIA-38217	3557±26	1946 (68.2%) 1881	2010 (1.2%) 2000 1976 (79.5%) 1871 1846 (8.8%) 1812 1802 (5.9%) 1776	1907	Human bone		(**) [Lop09, 255-257] [Lul15b]

Table 2 - Absolute dates of female individuals found in the same tombs as males with Argaric halberds (calibration according to OxCal 4.2–terrestrial curve IntCal2013). (*) GT42 was found next to the single male tomb GT41 and belongs to the same stratigraphic context.

Site Burial	**Lab. Nr.**	**^{14}C (BP)**	**calibration 1*s* (cal BC)**	**calibration 2*s* (cal BC)**	**calibration (median cal BC)**	**Sample**	**Context**	**Observations Bibliography**
El Argar AR244	KIA-42494	3425±45	1866 (6.3%) 1849 1773 (61.9%) 1661	1879 (12.2%) 1837 1831 (83.2%) 1626	1731	Skull fragment	Slab cist. Two adults, male and female. Grave goods: carinated and lenticular pots (F5 and F6), 3-rivet halberd, 6 rivet-halberd/dagger, 2-rivet knife, closed silver bracelet and silver ring/earring.	Unpublished
Fuente Álamo FA58	KIA-42493	3761±14	2201 (13.0%) 2192 2180 (55.2%) 2142	2274 (4.2%) 2258 2208 (91.2%) 2136	2170	Lower jaw	Small rck-cut tomb. Two adults, male and female. Grave goods: carinated vessel (F5), 6-rivet, 3-rivet dagger and goat/sheep bones.	Pooled mean of four analysis from the same sample (KIA-42493): 3795±25, 3765±30, 3750± 25 and 3710±35 [Lul15b, table 6]
Fuente Álamo FA75	OxA-4973	3635±50	2120 (10.4%) 2094 2042 (57.8%) 1930	2141 (95.4%) 1884	2004	Left calcaneus	Small rck-cut tomb. Two adults, male and female. Grave goods: lenticular pot (F6), bowl (F1), 7-rivet halberd, 7-rivet dagger, golden bracelet and beef bones.	[Hed95, 425]
Gatas GT42 (*)	OxA-10994	3765±38	2278 (13.5%) 2250 2230 (3.6%) 2220 2212 (51.0%) 2135	2294 (81.3%) 2115 2100 (14.1%) 2038	2181	Foot phalanges and long bone shaft fragment	Slab cist. Adult female. Grave goods: carinated pot (F5), 2-rivet dagger and meat offerings.	[Lul10a, 83]
La Almoloya AY60	MAMS-26640	3544±27	1937 (52.7%) 1877 1840 (9.4%)	1954 (95.4%) 1771	1889	Right Metacarpal 2	Slab cist. Two adults, male and female. Grave goods: carinated pot (F5), 3-rivet	Unpublished

			1824 1794 (6.1%) 1783				halberd, 2-rivet dagger and sheep/goat bones.	
La Bastida BA40	KIA-40752	3558±31	1952 (65.6%) 1879 1837 (2.6%) 1831	2015 (2.9%) 1997 1980 (73.5%) 1866 1848 (18.9%) 1774	1907	Right femur medial shaft fragment	Slab cist. Two adults, male and female. Grave goods: two carinated pots (F5), 2-rivet halberd, 3-rivet dagger, copper awl and beef and sheep/goat bones.	Unpublished

3 Male tombs with a halberd: the radiocarbon series

At present, the radiocarbon series of Argaric halberds is formed by 24 absolute dates (Tables 1 and 2). However, its composition needs to be detailed before starting the analysis. The most numerous set, which we will deal with in this section, consists of 15 dates from nine sites (Table 1), although three more dates from Tabaià are important too. Of this series, 11 dates were obtained from bone samples of the males associated with a halberd, three from wood fragments, and one from a charcoal sample from a context stratigraphically related to the halberd (Setefilla). In addition, five dates correspond to bone samples of women buried in double tombs, including a halberd associated with the second interment, which is always a male. Finally, in one case the female tomb shows a close spatial, stratigraphic and typological proximity to that of the male halberdier[5] (Table 2).

So far, we have catalogued 76 Argaric halberds in our research programme[6] corresponding to 31 sites, of which 23 are located within the limits of the El Argar territory (Fig. 2). More than half of the pieces (39) come from graves documented in more or less detail, while the rest have no known context. In summary, around 20% of all halberds and 40% of the contextualized ones can be associated with an absolute date, a circumstance which in principle backs the reliability of the chronological proposal.

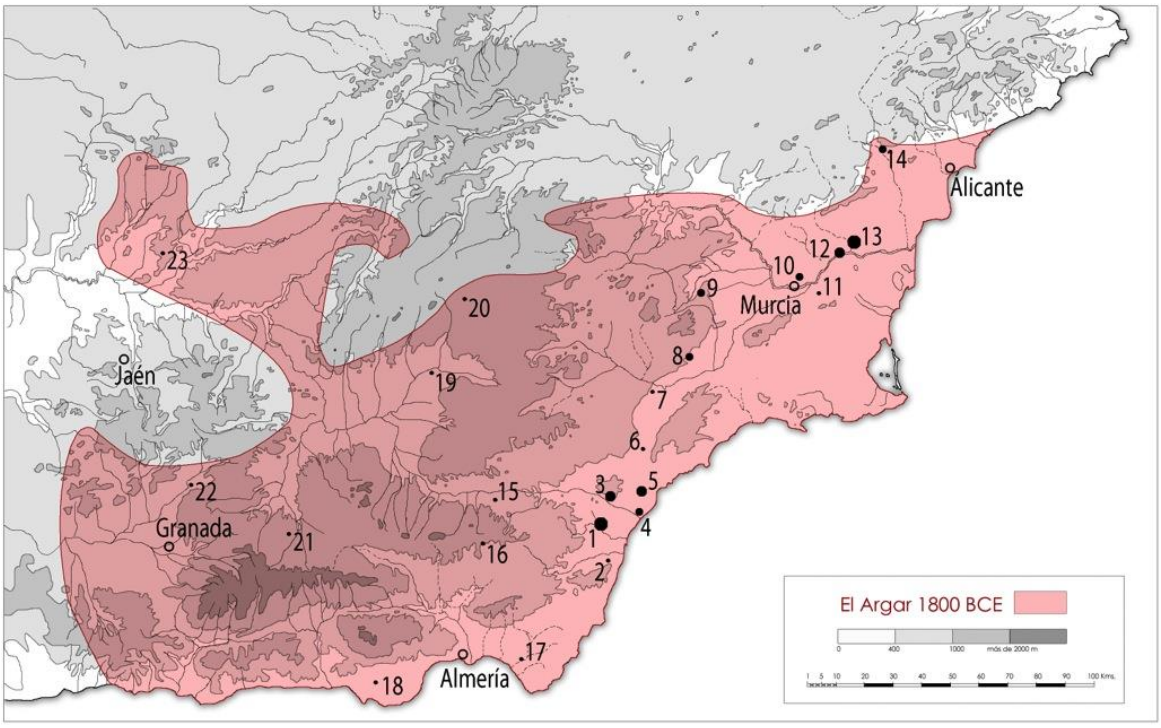

Figure 2- Distribution of the Argaric halberds with known provenance in southeast Iberia;
• = 1, • = 2-3, • = 4-7, • > 7 blades.

[5] The GT42 cist is contiguous to the GT41 cist burial, which contained a halberd. Both belong to the same stratigraphic unit and include two very similar carinated vessels.

[6] In this figure are included the halberds found in unequivocally Argaric sites in southeast Iberia and eight very similar objects documented outside this territory.

The 14 dates obtained from samples of male skeletons or wood from handles correspond to eight sites, most of them located in the coastal and pre-coastal regions of Almería and Murcia.

After calibrating single dates and calculating the sum of probabilities of the series (Fig. 3)[7], the main conclusion is that the dates referring to men with halberds or to the weapons themselves fall in the interval whose central tendency lays between *c.* 2000 and 1800 cal BCE[8]. This is an unexpectedly brief period in which the full implementation of the Argaric halberds or, at least, their archaeological visibility, should be placed. It is also striking that this interval is similar to that obtained in the 1990s based on only five dates [Cas94: 91-92].

Few central probabilities fall outside this range. The date of the wooden handle of the halberd from Mina Iberia 1 is slightly older, but might result from an old-wood effect.

On the other side, only the date of tomb OF42, placed in the first half of the 17th century cal BCE, falls below the 2000-1800 cal BCE interval. However, in this case we are dealing with a reused blade, as it is suggested by the reshaping of the hafting plate and the diversity of the rivets. The accompanying grave goods also point towards a late burial date, after 1800 cal BCE.

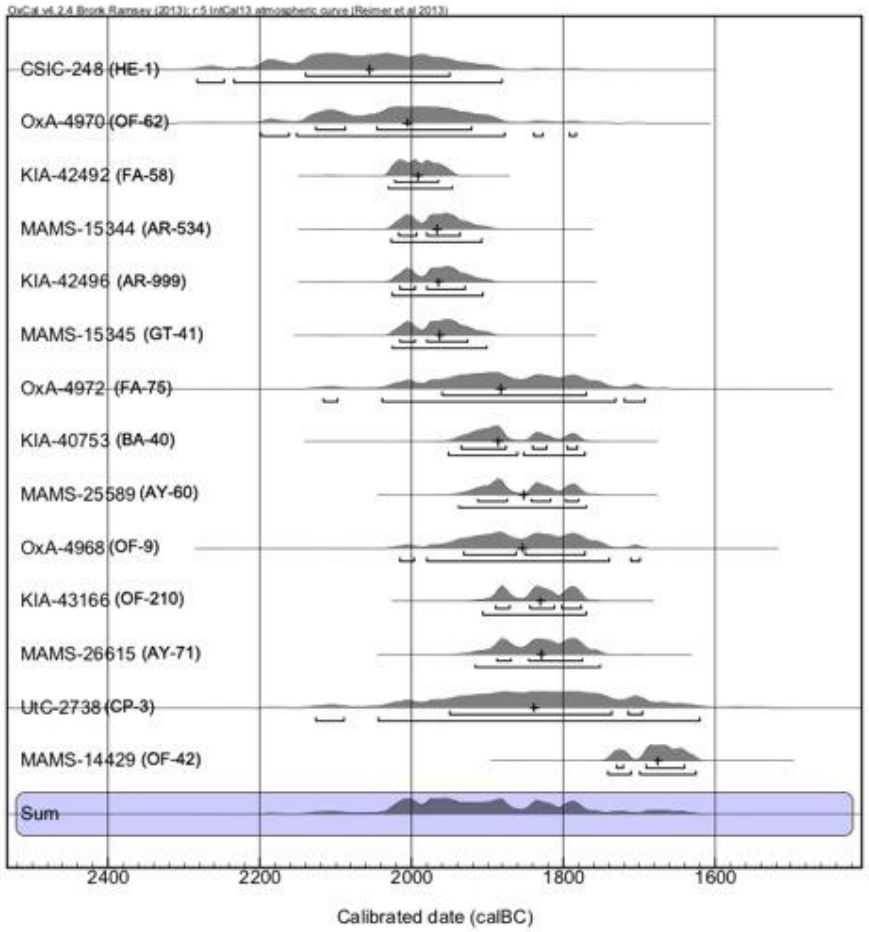

Figure 3 - Individual calibrations and probability sum of the fourteen ^{14}C dates directly associated with tombs containing halberds.

[7] Calculations made using OxCal 4.2 (calibration curve IntCal2013).

[8] One Sigma Ranges: [start:end] relative area
[cal BC 2023: cal BC 1874] 0,775813
[cal BC 1843: cal BC 1816] 0,127467
[cal BC 1799: cal BC 1779] 0,09672
Two Sigma Ranges: [start:end] relative area
[cal BC 2131: cal BC 2085] 0,031153
[cal BC 2051: cal BC 1707] 0,908602
[cal BC 1700: cal BC 1633] 0,060245

The chronological inferences of the two dates concerning indirect stratigraphic contexts do not contradict the proposed interval[9]. Thus, the date of Setefilla was obtained from fragments of charcoal recovered on the floor of the room under which the tomb with halberd was found. Despite its high standard deviation, the result is compatible with the later part of the 2000-1800 cal BCE interval. On the other hand, the halberd of Tabaià tomb 1 raises a more problematic case, given the wide difference between the two dates provided by the same grave (human and fauna), and the discrepancy with respect to the date of tomb 3, which is stratigraphically later. López Padilla argues that samples from tomb 1 may have been contaminated by humic acids, a circumstance that would have made them seem younger [Lop09: 255-256]. The dating of tomb 3 would indicate a later time with respect to the deposition of tomb 1, which would thus fit in the high band of the 2000-1800 BCE interval. The use of tomb 3 date is however not without controversy, since it was obtained by the laboratory of the University of Kiel at a time when it produced erroneous results [Lul15b].

3.1 Dating female skeletons

Over one third of the males buried with halberds are associated with a female, six of which have been dated[10] (Table 2, Fig. 4). In most cases, both adults belong to different generations and were probably linked by descent ties [Lul13]. The subtleties introduced by these female skeleton dates affect mainly the upper limit of the probability range of the halberds. Since the Argaric funerary practices start in the 22nd century BCE, the delay seems surprising for an artefact that is considered a characteristic trait of the early Argaric. However, the scarcity of tombs dated between 2200-2000 cal BCE [Lul15a: Appendix 2] and, in particular, of male burials, needs to be taken into account. It can therefore not be excluded that the funerary trends in the formative phase of Argaric society did not include halberds[11]. Future excavations and the continuation of the radiocarbon dating programme will be crucial in order to clarify this issue.

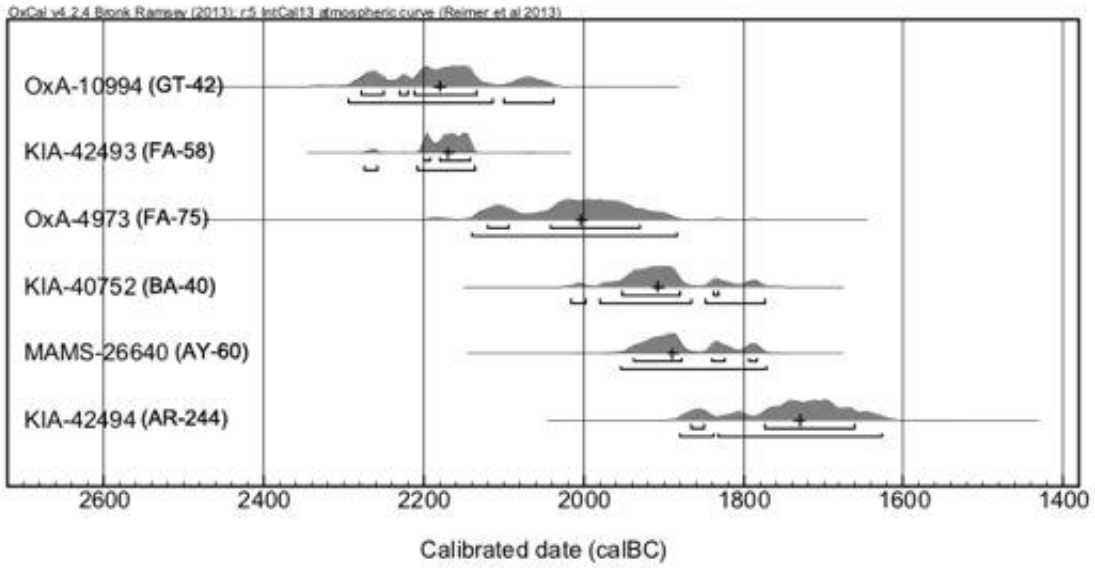

Figure 4 - Calibration of the six ^{14}C dates from female skeleton samples associated with male halberdiers.

[9] Another indirect argument favouring the proposed age range is the fact that the elemental composition does not reveal any tin and copper alloys, which were introduced after 1750 cal BCE [Cas99].

[10] See the remarks on tombs 41 and 42 from Gatas.

[11] The burial 58 from Fuente Álamo shows a chronological inversion which is difficult to explain: the radiocarbon dating of the woman has provided a result older than that of the male, although she was buried in the second place, as it is evident from the layer of earth accumulated between both skeletons [Sch12, 125-126 and Plate 4]. This problem was raised by Lull and co-wrkers [Lul15a, 387, note 34], but new dates from the Kiel 14C laboratory have not solved this paradox. Therefore, it would be advisable not to include this tomb among the earliest evidence defining the Argaric formative stage between 2200-2000 cal ANE [Lul15a, Fig. 16b].

4 Implications for Argaric archaeology: chronology and typology

As we have already pointed out, the three original morphometrical types proposed by Lull in 1983 remain consistent after analysing 55 well preserved halberds from indisputably Argaric deposits. If we consider the dated artefacts, most correspond to Lull's type II (Figs. 1 and 5). Halberd HE1, close to type III, is the oldest, while OF62, the second in decreasing chronological order, already corresponds to type II, although it suggests a gradual trend with respect to type III. Regarding the most recent examples, OF9 belongs to type I and dates to the 19th century cal BCE, being contemporary with AY60 and CP3, which are probably the last examples of type II.

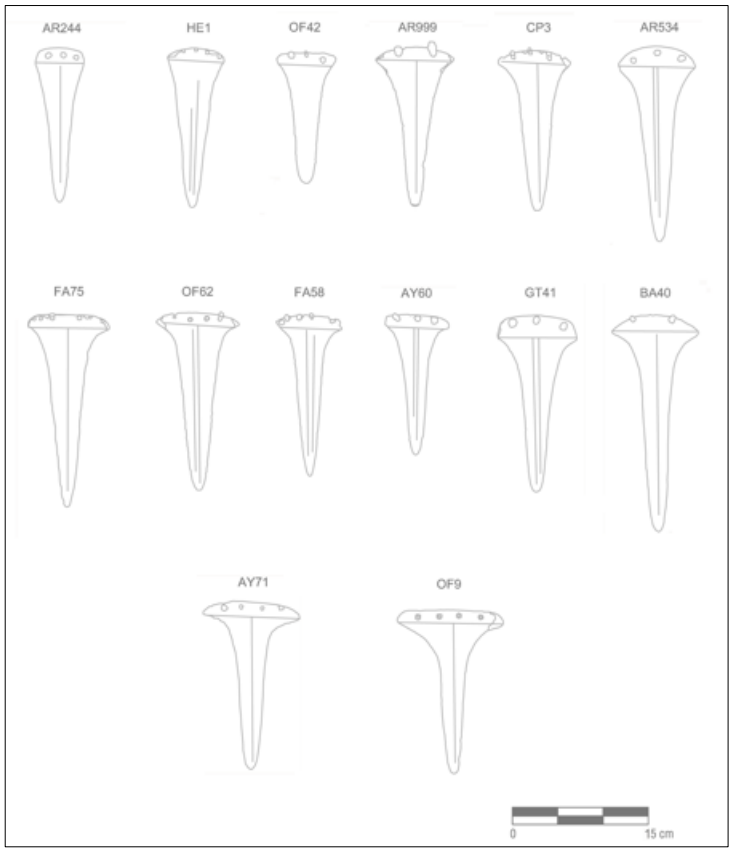

Figure 5 - Argaric halberds associated with absolute dates (OF62 has been excluded from this figure due to bad preservation). AR244 (upper left) is the only example of Lull's type III; AY71 and OF9 (lower row) belong to Type I.

This chronology hints at a temporal succession of types II and I throughout the 20th and 19th centuries. However, absolute dates are not accurate enough to establish this trend. In addition, the fact that some of the simpler halberds (type III AR244 and type II OF42) are by now the most recent ones, does not fit the supposed early chronology of dagger-like shapes. However, as already pointed out, the peculiarities of both halberds and their contexts may explain their relatively late chronology.

The chrono-typological schemes of Ulreich [Ulr94] and Brandherm [Bra04], which, in general terms, propose an earlier date for the Argaric halberds with broad hafting plates with respect to dagger-like pieces, are supported by the recent dates of AR244 and OF42, despite the fact that the first one has an indirect dating. However, the opposite proposal, as defended by Lull, is supported by the date of HE1 and the objection that OF42, the only halberd with a direct date, is a typologically controversial example. Even so, HE1 and OF62, belonging to type II and with dates close to the upper limit of the interval, do not leave room for a hypothetical greater antiquity of type III, provided that these do not go back to the beginning of the Argaric around 2200 BCE. The same observations also question the alleged older antiquity of Brandherm's Monteagudo Type. On the other hand, the younger date of Lull's type I depends on direct chronometric references, although this cannot be proven at the moment in statistical terms.

It can be concluded that, in order to confirm the proposed chrono-typological sequences, it would be necessary to date more contexts with Lull's type III halberds. This would (or would not) set their appearance in the last two centuries of the 3rd millennium BCE, regardless of their survival. In addition, new series of radiocarbon dates from short-lived samples are

needed in order to discriminate typological variations in probabilistic terms within the narrow margins of the two centuries when the full development of the halberds takes place (ca. 2000-1800 cal BCE).

5 Implications for Argaric archaeology: halberds and grave goods

Halberds distinguish a group of adult men buried in cists and rock-cut tombs[12], including different grave goods apart from halberds. The contents of 39 tombs have been recorded in a reasonably complete manner and allow us to analyse the composition of grave goods (Table 1). Among the metal objects, the most represented artefact is the dagger, since it is only absent in five graves. Both weapons must have been associated with a specific combat modality [Lul17]. Bracelets and rings, sometimes made of gold or silver, are only documented in ten graves. The two chisels from Fuente Álamo 1 and Laderas del Castillo are rare grave goods. On the other hand, except in three tombs, ceramic vessels are included in all cases. As is well known, Argaric pottery production can be classified into eight standardized "Forms" (F1-8) [Sir87], [Lul83]. The most common vessel is the carinated Form 5 (n = 26 tombs), followed by the exceptional carinated Form 6, and by bowls (Form 1 and Form 2), globular pots (Form 4) and small cups [Form 8]. 17 tombs included two pottery vessels, emphasizing the combination of the carinated forms F5 and F6 (six times) or two F5 (five times). Only in the case of a double grave (AR994) has there been a triple association (one F5 and two bowls of F1 and F2 shape). The association between a halberd and the characteristic Argaric goblet (F7) has not been documented. Finally, in almost two-thirds of the tombs, one or two meat offerings are documented, among which *Bos taurus* are four times as frequent as ovicaprids[13].

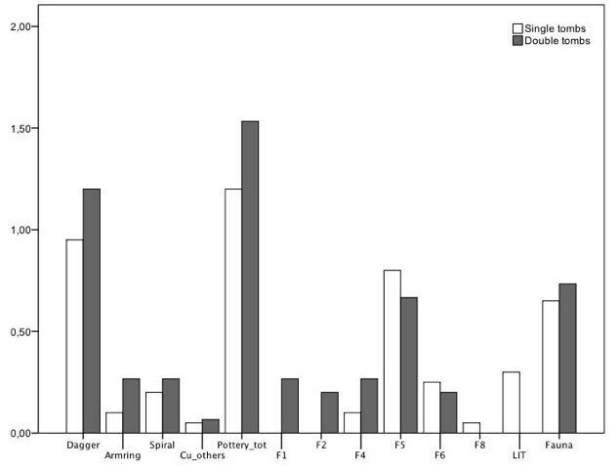

Figure 6 - Grave goods associated with halberds in 20 single and 15 double tombs. The values show the ratio between the number of a particular class of items found in single or double tombs, and the number of each class of tombs.

The fact that 43% of the halberdiers are associated with a female (15 out of 35 graves with a halberd from which the number of burials is known), whereas usually less than 10% of Argaric tombs include two adults [Lul16a, table 1] deserves closer attention, particularly because these women were usually buried first in the grave. Given the usually large chronological distance between both deaths [Lul13], the inhumation of these warriors would seem to acknowledge certain female ancestors. Yet, it appears as a paradox that these women are not distinguished by particularly rich grave goods (Table 2). For example, the copper awl, an item associated with middle and high-class female burials, has only been found in one out of 15 double burials (BA40). The other characteristic item of the middle class female is the dagger, which is equally underrepresented in comparison to single burials (Fig. 6). Also the number of pottery vessels does not increase significantly in double tombs with respect to single ones. Recent findings in La Almoloya provide evidence of removing funerary goods when the second body was buried[14]. Only small items such as, for example, copper and silver ornaments, could have gone unnoticed and remained in the tomb together with the mixed bones of the already skeletonised first body. Thus, the scarcity of grave goods associated with these females would be the effect of a delayed ritual practice, rather than involving a low social ranking (Figs. 7 and 8).

[12] The only halberd found in a *pithos* burial (AR 575) belongs to the so-called Montejícar type [Sch73], which is very scarce in the Argaric and in contrast relates to similar artefacts in southwestern Iberia.

[13] Exceptionally, only one tomb had remains of both species. We owe all this information to the archaeofaunal investigation by Lourdes Andúgar (Bastida Project).

[14] In La Almoloya double tomb 68 the distal femur of the first burial showed the typical green stain of copper corrosion. Nevertheless, this cist, which was completely sealed and all of its contents showed and excellent state of preservation, had no copper items at all.

Figure 7 - La Almoloya tomb 60. The remains of the elderly female, who was buried first, were carefully positioned above the man (left). The male skeleton was found in anatomical position (right). The halberd can be seen above his right shoulder, while the dagger lies on his chest.

Figure 8 - Grave goods from burial La Almoloya 60. The carinated vessel and the limbs of a goat or sheep were placed at the feet of the halberdier.

In 25 cases where we have enough anthropological information, the frequency of objects according to age reveals relatively favourable values for elderly men compared with younger adults. However, here again the figures do not indicate significant differences, suggesting that wealth invested in the funerary ritual depended primarily on belonging to a social class rather than on an age group [Lul05].

Finally, there is not a clear relationship between any of Lull's morphometric types and a specific age category. Type II weapons seem to be associated with larger grave assemblages, especially with regard to the quantity of ceramic vessels and animal portions. However, as in the previous comparisons, here again the differences do not reach conventional levels of statistical significance.

6 Argaric halberds in the context of other European halberds

With regards to the halberd as a general phenomenon, some aspects of the Argaric funerary ritual, mainly the close relationship between certain male individuals, halberds and daggers, can be traced back to the burials and stelae of the Italian Copper Age and is also found in some distinguished Early Bronze Age burials of central Europe (Leubingen, Leki Male, Feuersbrunn). On the other hand the frequent burial of these armed men in an older female tomb is a specific trait of the Argaric and suggests that this society was possibly matrilineal and dominated by warrior elite.

In chronological terms, the radiocarbon series of Argaric halberds is far bigger than that of the rest of Europe (Table 3). This hinders any interregional comparison. However, we can use the available radiocarbon dates and contextual criteria to evaluate the current proposals and suggest some working hypotheses.

Table 3 - Absolute dates associated with non-Argaric halberds in Europe (calibration according to OxCal 4.2–terrestrial curve IntCal2013).

Site Burial	**Lab. Nr.**	**^{14}C (BP)**	**calibration 1*s* (cal BC)**	**calibration 2*s* (cal BC)**	**calibration (median cal BC)**	**Sample**	**Context**	**Observations Bibliography**
Carn (Ireland)	D-50	3000±140	1406 (68.2%) 1054	1594 (0.2%) 1589 1531 (94.3%) 892 876 (0.9%) 849	1222	Wooden handle (oak)	Bog find.	Result considered to be erroneous. [Mca61, 34], [Lav71, 4E2], [Bri01,148], [Cha10]
Casanuova de San Biagio (Italy)	LTL-1783A	4396±60	3097 (68.2%) 2916	3331 (17.6%) 3214 3186 (3.3%) 3156 3128 (74.5%) 2900	3039	Human bone	Rinaldone Culture. Male burial in rock cut tomb. Grave goods: halberd, dagger, axe and two pottery vessels.	[Man09, 163, fig. 15]
Feuersbrunn (Austria)	GrN-11895	3690±40	2139 (68.2%) 2025	2198 (8.4%) 2162 2152 (87.0%) 1960	2081	Human bone	Pit burial (V 111). Male, 40 y. Grave goods: 1-2 halberds, axe, dagger with midrib, awl, chisel, two vessels, fauna.	[Sch02, tab. 1], [Kli06, 143-147 and plate1]
Humanejos (Spain)	Ua-43524	3917±33	2468 (28.1%) 2434 2421 (15.1%) 2404 2379 (25.0%) 2349	2474 (93.3%) 2338 2320 (2.1%) 2309	2409	Human bone	Late Chalcolithic in the middle Tagus valley. Double burial UE 1853 (underground chamber covered by a stone mound). Grave goods: halberd (Baútas type), tanged dagger, 2 Palmela points, stone bracelet, Bell Beaker pottery, ivory buttons, cinnabar).	[Lie15, 109 and 111], [Bla16, 30-31]
Leki Male (Poland)	M-1325	3900±150	2578 (63.4%) 2189 2182 (4.8%) 2142	2871 (3.9%) 2801 2780 (90.7%) 2013 1998 (0.8%) 1978	2381	Wood from chamber	Central burial A of tumulus I. Grave goods: dagger, axe (Randleistenbeil), 2 bracelets, needle (Schleifennadel), gold spiral, 6 pottery vessels.	[Ged76, 35, fig. 30B], [Sch02, table 1]
Leki Male (Poland)	Bln-3218	3760±88	2298 (68.2%) 2032	2460 (95.4%) 1958	2185	Wood from chamber	Id.	Id.
Leki Male (Poland)	Bln-1296	3645±106	2196 (4.5%) 2170 2146 (63.7%) 1886	2338 (95.0%) 1740 1711 (0.4%) 1700	2026	Wood from chamber	Id.	Id.
Leki Male (Poland)	Bln-1293	3620±106	2188 (0.6%) 2184 2141 (62.5%) 1876 1841 (3.0%) 1822 1796 (2.1%) 1782	2290 (93.9%) 1730 1721 (1.5%) 1692	1992	Wood from chamber	Id.	Id.

Leki Male (Poland)	GrN-5037	3605±35	2021 (19.9%) 1992 1984 (48.3%) 1918	2118 (2.5%) 2096 2040 (92.9%) 1882	1964	Wood from chamber	Id.	Id.
Leki Male (Poland)	Bln-1294	3585±106	2125 (6.4%) 2090 2044 (45.8%) 1862 1852 (16.1%) 1772	2275 (0.8%) 2255 2209 (94.6%) 1661	1943	Wood from chamber	Id.	Id.
Leki Male (Poland)	Bln-1295	3570±106	2111 (1.2%) 2104 2036 (67.0%) 1755	2203 (95.4%) 1642	1923	Wood from chamber	Id.	Id.
Leubingen (Germany)	Dendochronology	-	-	-	1942±10	Wood	Unetice group. Wooden chamber under tumulus. Male. Grave goods: three daggers, two axes (*Randleistenbeile*), three chisels, perforated battle axe of stone (*Schuhleistenkeil*), stone anvil, golden bracelet, two golden needles (*Ösennadeln*), two golden spiral, one pottery vessel.	[Beck89], [Sch02,78], [Mel14, 628-633]
Lough Ree (Ireland)	UBA-23195	3780±29	2278 (20.4%) 2250 2229 (5.3%) 2220 2211 (14.5%) 2192 2178 (28.0%) 2143	2294 (93.5%) 2133 2079 (1.9%) 2062	2204	Wooden handle (probably oak)	Unknown context. Cotton type halberd.	[Bel14, 15-16]
Melz (Germany)	Bln-985	3770±106	2390 (0.7%) 2386 2346 (67.5%) 2031	2476 (95.4%) 1910	2202	Wooden handle (ash)	Hoard with six halberds with bronze handles, one axe with the same type of handle and two bronze handles with no blade.	[Wüs95, 73], [Sch02, table 1]
Melz (Germany)	Bln-982	3720±106	2285 (7.2%) 2246 2235 (61.0%) 1965	2466 (95.4%) 1880	2130	Wooden handle (ash)	Id.	Id.
Melz (Germany)	Bln-983	3680±106	2266 (0.7%) 2261 2206 (67.5%) 1912	2448 (0.2%) 2444 2437 (0.7%) 2420 2404 (1.2%) 2378 2350 (93.3%) 1770	2076	Wooden handle (ash)	Id.	Id.
Melz (Germany)	Bln-1527	3665±106	2199 (7.8%) 2159 2154 (60.4%) 1902	2401 (0.7%) 2382 2348 (94.7%) 1748	2055	Wooden handle (ash)	Id.	Id.
Melz (Germany)	Bln-984	3655±106	2198 (5.9%) 2166 2150 (62.3%) 1891	2390 (0.1%) 2386 2346 (95.2%) 1743 1707 (0.1%) 1704	2040	Wooden handle (ash)	Id.	Id.
Moylough (Ireland)	GrA-14775	3610±40	2025 (68.2%) 1921	2131 (6.7%) 2086 2050 (88.7%) 1881	1971	Carbonate from cup	Cremation in cist. Type Breaghwy halberd.	[Ofl02, 373], [Bri07, 272], [Cha10]
Saint-Fiacre (France)	Gif-863	3900±135	2572 (8.9%) 2512 2505 (57.2%) 2198 2166 (2.1%) 2150	2864 (3.0%) 2806 2760 (1.8%) 2716 2711 (90.4%) 2021 1992 (0.3%) 1984	2380	Wooden case (grave good)	Burial under tumulus. Probably not a halberd.	[Del71, 216], [Bal01,148]
Saint-Fiacre (Grance)	SUERC-30676	3555±35	1947 (52.1%) 1876 1841 (9.6%) 1821 1796 (6.6%) 1782	2010 (1.6%) 2000 1977 (93.8%) 1770	1895	Sheath of the dagger (alder)	Burial under tumulus. Probably not a halberd.	[Nic15, table 1]
Trecastell (Wales, UK)	Beta-240338	3860±40	2455 (14.8%) 2418 2408 (14.1%) 2374 2368 (2.3%) 2361 2354 (33.2%) 2286 2246 (3.8%) 2235	2464 (79.8%) 2268 2260 (15.6%) 2206	2339	Wooden handle *Pomoideae*	Top of the fill of a pit inside a ring ditch. Roscrea type halberd.	[Nee15, 11]

The earliest absolute date, falling at the end of the fourth millennium BCE, is from the Casanuova hoard of San Biagio (Umbria, Italy). The sample comes from an individual male tomb linked to the Rinaldone tradition [Man09, Dol10]. It is necessary to wait until the beginning of the second half of the 3rd millennium BCE to find the next dated halberd, from Humanejos (Madrid, Spain). The sample comes from a male skeleton buried in a double grave and allows to date a halberd classified within type Baútas, of Atlantic affiliation [Lie15]. It is striking, on the one hand, that this date falls in the third quarter of the third millennium and it is thus contemporary to the heyday of the Bell Beaker phenomenon. Moreover, it is surprising that the dates of Trecastell (Wales, Great Britain) and Lough Ree (Ireland) are younger, since the Atlantic façade, and in particular Ireland, are often proposed as the cradle of metal halberds. To the same temporal horizon belongs the halberd of Szigetszentmiklós tomb (Hungary), an individual cremation in a grave with two bell-shaped vessels, a

dagger knife, a stone wrist guard and other objects. The radiocarbon series of this necropolis occupies the interval between ca. 2500-2200 BCE, in the recent horizon of which the tomb may be placed [Pat13: 300, 308 and figs. 19, 21].

The remaining radiocarbon dates[15] and dendro-chronological determinations are concentrated somewhat later, between approximately 2080 and 1800 BCE. Most of them come from Germany (Melz, Leubingen), Austria (Feuersbrunn) and Poland (Leki Male), while only one dating refers to an Irish halberd (Moylough) and another one to a French artefact (Saint-Fiacre), which raises serious doubts with regards to its classification as a halberd[16].

Considering this chronological evidence, and with the necessary caution due to the scarcity of absolute dating, it is possible to draw the following conclusions:

1. Central and northern Italy would be the cradle of Western halberds until proven otherwise by further Carpathian contexts [Nee15: fig. 26][17].

2. The internal sequence of the radiocarbon series does not illustrate a hypothetical, progressive diffusion from northern Italy towards the rest of Europe, since the earliest non Italian items are located in the centre of the Iberian peninsula, the extreme western Atlantic (Wales and Ireland) and the Carpathian basin (Hungary), while the dates from central Europe, which are closer to northern Italy, are more recent.

3. Except in central Europe (Germany, Austria, Poland), halberds of all the other regions are older than the Argaric ones, whose first representatives date from ~2000 cal BCE. Therefore, the typical halberds of southeast Iberia should be understood in the context of a late regional development that was quite specific given the combination of several traits: a.) high concentration of halberds at a spatial and a temporal scale; b.) absence of metal hoards; c.) association with a male of the ruling elite buried inside the settlement; and d.) relatively high frequency of double tombs inaugurated by a woman, into which only much later a male is buried with a halberd.

4. The chronological scheme that best fits currently available data is the one proposed by Needham and co-workers [Nee15: fig. 26].

5. Halberds of the Unetice area and its periphery seem contemporary with the Argaric ones. In fact they are also the only regions where some halberds were placed in funerary contexts, often of outstanding wealth, something almost unheard of in the British Isles, Scandinavia and northern Germany, where hoards are the rule. In addition, according to the revision of the central German hoards and their interpretation as a reflection of Unetice's military organization, halberds distinguish a military and political control [Mel15]. Given this temporal and contextual coincidence, some form of communication and emulation seems to have been likely between the dominant social classes of these territories after 2000 cal BCE.

In sum, in certain European regions, among which the Argaric stands out, halberds were found in the hands of a military group involved in the formation of stable territorial States[18].

7 Argaric halberds and the transition between the Copper and Bronze Ages in Iberia

One of the most interesting questions in prehistoric research is how to understand the formation of Argaric society, at least in the context of the Iberian peninsula. The unexpected early date of the UE1853 tomb of Humanejos [Lie15, Bla16] opens a new panorama for Iberian halberds, but it also highlights other novelties in the field of funerary practices and settlement patterns. In this section we will try to synthesize them and to place them in a sequence, as well as outlining some historical and social hypotheses.

1. In the middle basins of the Douro and Tagus the characteristic Copper Age settlements surrounded by ditches were abandoned by 2600-2500 BCE (Las Pozas, Casetón de la Era, Gózquez de Arriba) [Del15]. These ditched enclosures are more frequent in the southern half of Iberia, where their emergence dates back to the end of the fourth millennium BCE. They are considered emblematic of the solid communal ties of Chalcolithic societies, expressed also by the collective burial rite in a variety of funerary structures.

2. In those same areas of central-northern Iberia the end of this type of settlement is roughly contemporary with the introduction of the funeral ritual in individual tombs (El Hornazo, Fuente Celada, Soto de Tovilla, Cerro de la Cabeza, El Hundido) [Car13, Car14, Alo13] and, in general, with a tendency to impose severe restrictions on the access to

[15] It must be expected that the radiocarbon series of Leki Male and Melz, measured on long-lived samples (wood of the shafts) are slightly older than their actual use and deposition [Sch02b: 79-82]. Typologically these halberds correspond to the classical Unetice phase, which can be dated 2000-1800 BCE.

[16] The broken blade was classified as type Breaghwy, although its interpretation as a halberd has been questioned by Needham and co-workers, who rather view it as a Trévérec type dagger [Nee15, AS4, 2]. The artefact with a triangular profile found in a settlement context of La Solana del Castillo de Alange (Badajoz, Spain) would also correspond to this temporal range. It belongs to phase IIA, which is stratigraphically earlier than the date Beta-68669: 3600±80 BP [Pav93: 152-153 and fig. 5], [Pav14, fig. 4).

[17] The argument that halberds corresponding to Horn's type 17 and coming from the *tholos* burials Alcalar 3 (Algarve, Protugal) and Los Millares 57 (Almería, Spain) date to a pre-Bell Beaker phase of the Copper Age [Hor14] is challenged by the fact that the classification of these artefacts as halberds is ambiguous and, secondly, that their exact find context in these long-lassting funerary structures remains unknown. Moreover, given that copper metallurgy starts in Ireland around 2500 BCE it is impossible to place the production of metal halberds before this date in its main Atlantic distribution area.

[18] See Lull and Risch [Lul95] for El Argar, and Meller [Mel14] and Zich [Zic16] for the central area of Unetice.

archaeologically documented funerary structures. Towards 2500 cal BCE, individualizing practices are documented in the northern periphery of Southeast Iberia (La Vital) [Gar13].

3. Within the framework of this trend towards the restriction and individualization of the funerary ritual, the first metallic halberds of Atlantic typology are detected in Iberia. In Humanejos' tomb UE1853 one of these weapons was found next to two Palmela points, a tanged dagger and other typical objects of the later Bell Beaker (decorated pottery, ivory buttons, stone wrist guards). This suggests that other halberds of the Middle Tagus basin typologically related to that of Humanejos, such as those of Villamiel, Manzanares and Finca de la Paloma (Toledo), and even that of Torre Benzalá in Jaén, are earlier than 2200 BCE.

4. From what has been pointed out so far, it may be noted that we are dealing with changes that took place especially in the middle basins of the Douro and Tagus. It would not be strange, therefore, that the connections between different regions of the European Atlantic façade, which have been identified archaeologically, would at least date to the middle of the third millennium BCE, associated somehow with the development of metallurgy and to the Bell Beaker phenomenon.

5. In the southeastern part of the Iberian penninsula there is hardly any evidence of individual tombs by the middle of the third millennium BCE[19]. Therefore, it seems that this region, as well as the Southwest, remained resistant to or apart from the new developments in funerary practices and weaponry (copper halberds)[20] that were taking place further north.

6. However, societies in the Southeast also experienced significant changes from approximately 2500 BCE onwards, which were perhaps not unrelated to the dynamics in the northern neighbouring regions and possibly to pressure exercised from there. We refer to the proliferation of small scale hill-top settlements with good defensive conditions, probably indicating an increase in violent conflicts and social fragmentation (Peñón de la Zorra, 'Fortines' of Los Millares, Cerro del Búho, Juan Clímaco, Mola D'Agres, Hoyas del Castillo, Cerro del Bu, Serra Grossa, Morra del Quintanar or Cerro de la Encantada I, to cite just a few examples) [Lul15a].

7. Given the age of the old metallic halberds it is possible that some of the objects called "flint halberds", which have been found in southern chalcolithic sites (Los Millares, Loma del Campo, Almizaraque, estrecho de la Encarnación, etc.), emulate contemporary Atlantic copper artefacts. In any case, it is first of all necessary to certify that the aforementioned flint objects were actually hafted as halberds.

8. Southern Chalcolithic communities disappeared completely by 2200 BCE, while the Argaric society emerged between c. 2200 and 2000 BCE in the coastal and pre-littoral areas of Almería and Murcia. The first individual and double burials in the vicinity of inhabited areas can be dated shortly before 2200 (Molinos de Papel 1, Cerro de la Virgen 30, Gatas 11 and 13), setting the regional precedent of the characteristic Argaric ritual.

9. In general terms, what has hitherto been presented could describe the progressive movement towards the south of groups with a new social organisation and of smaller size than those that inhabited the large scale southern settlements. These groups were able to develop subsistence strategies that were more mobile, favoured individualized funerary recognition and practiced forms of violence that included the use of metallic halberds. It is not possible to speak of a rapid advance, since almost three centuries had elapsed between its first manifestations and the collapse of southern Chalcolithic societies.

10. In the Argaric heartland there is no archaeological evidence of halberds between 2200 and 2000 cal BCE (with the uncertain case of the Atlantic type weapon of the Vélez Blanco hoard, not far from the pre-littoral plains - see above). It is also likely that some Lull Type III objects will mark the formative stage of halberds, since La Bastida fortification system is significant with respect to the novel practice of hand-to-hand fighting [Lul14].

11. It cannot be ruled out that the groups of northern tradition established in the coastal and pre-littoral areas of the Southeast came into contact with other groups connected in some way to the Eastern Mediterranean, where similar military architecture developed during the Early Bronze Age as was later seen at La Bastida. Whatever the case, these communities developed aggressive economic and political relations which led to a relatively rapid expansion into the interior of the Iberian peninsula, especially in the direction of the eastern foothills of Sierra Morena, rich in copper and silver ores. The result was the formation of a society split into similar territorial states, which we know as Argaric. It was the unique culmination of a dynamic leading to different situations in other regions of the Iberian peninsula: essentially egalitarian and sedentary communities conditioned by some form of intergroup violence (the Iberian-Levantine and Manchego Bronze Age regions), and more or less mobile groups with or without warlords (Early and Middle Bronze Age horizons in the great river basins of the Atlantic facade).

[19] The individual tomb found in Glorieta de San Vicente (Lorca, Murcia) and dated around 2600 BCE [Mar06] needs to be considered at present as an isolated case. The dating of a single burial at Campos (Almería) to around the middle of the 3rd millennium BCE (GrN-15509: 4005±40 BP), comes from a charcoal sample and can consequently not be considered in direct association with the interment.

[20] The interpretation of the hoard of Vélez Blanco (a halberd of Baútas type, similar to that of Humanejos, a tanged dagger, two Palmela points and a copper axe) [Con07] depends on its uncertain dating: if it would date before 2200 BCE it would represent a singular case in the context of the Copper Age of the Southeast; if its date would fall after 2200 BCE, we could consider it one of the earliest metal halberds in a region close to the core Argaric area, maybe a prototype of the characteristic Argaric productions.

Conclusions

The analysis of a large radiocarbon series for the Argaric halberds has helped to date their use or, at least, their archaeological visibility, in the period between c. 2000-1800 BCE. The placement of these weapons in individual or double tombs, their high number and spatial concentration, and the implementation of an absolute dating programme have undoubtedly contributed to one of the most solid chronological references in Europe. It is precisely the shortage of absolute dates in other regions that limits the possibilities of comparing the temporality of metal halberds in different areas in order to obtain a reliable picture of the beginnings of the adoption of these weapons and also of the duration of their use.

The survey of the available radiometric data suggests that ever since its first examples in central and northern Italy halberds were linked to a specific form of combat mastered by distinguished males buried in individual tombs or represented on stelae. After ca. 2500 BCE these weapons are attested in central Iberia, in the British Isles and, occasionally, the Carpathians. In these regions, this was a time of social changes. As the Neolithic and Chalcolithic traditions vanished, new forms of power and violence seem to have been concealed behind a new or a different metal production, the shift towards individual funerary practices and a reorganisation of the settlement pattern. According to the available ^{14}C dates associated with these archaeological traits in Iberia, this shift occurred gradually following a North-South direction, reaching the southeast around or slightly before 2200 BCE. At this moment, probably Eastern Europe and Mediterranean influences reached the area, as suggested by the poliorcetic notions ruling the construction of the monumental fortification of La Bastida [Lul14] and the introduction of casting technologies using stone moulds [Lul10b].

In any case, between 2200-2000 BCE a series of communities in coastal southeast Iberia combined all these influences and formed what has become known as the Argaric society. During the next 200 years, between 2000-1800 BCE, this organisation engaged in a rapid inland expansion, particularly in the direction of the eastern foothills of Sierra Morena, with its rich copper and silver ore deposits [Lul10b]. Placing halberds in distinguished male burials would be the ritual correlate of this probably violent territorial deployment of a network of fortified or well-protected hill-top settlements and the enforcing actions of a dominant class of male warriors and powerful women related through kin.

The lack of comparable series of ^{14}C dates in the rest of Europe hinders our ability to trace the temporality of the use of halberds in other regions in similar terms. At least in the case of the Argaric, the halberds were a relatively late weapon, placed as a grave good during a surprisingly short period of time. Between *ca*. 2000-1800 BCE in Europe, only in the "classic" Unetice and its margins did the halberds seem to have enjoyed a similar social and funerary importance as in Argaric society. Here too, this weapon seems to have played a key role in the emergence of new forms of State or State-like organisations that were markedly different from the Near Eastern societies, but also from the local European Neolithic and Chalcolithic communities.

Acknowledgements

This research has been conducted in the framework of the projects 'Political power and violence in the El Argar society (2200-1550 cal BCE)' (Ministry of Economy and Competitiveness, Spain, HAR2014-53860-P), and 'Proyecto Bastida'. We are particularly grateful for the collaboration and attention given by Carmen Cacho (Museo Arqueológico Nacional, Madrid), Nicolas Cauwe (Musées Royaux d'Art et d'Histoire, Brussels), Ben Roberts (Bristish Museum, London) and Hermanfrid Schubart (German Archaeological Institute, Madrid) in the sampling of human bone remains from Argaric tombs excavated by the Sirets. We thank especially Lourdes Andúgar, Eva Celdrán, María Inés Fregeiro, Camila Oliart and Carlos Velasco (ASOME-UAB) for their unvaluable collaboration in Proyecto Bastida and Robert Chapman for the English review of the text.

Bibliography

[Alo78] Alonso J., Cabrera V., Chapa T. and Fernandez-Miranda M. (1978) Apéndice: Indice de fechas arqueológicas de C-14 para España y Portugal. In: *C14 y Prehistoria de la Península Ibérica*. Madrid: Fundación Juan March. Pp. 154-182.

[Alo13] Alonso C. (2013) Las tumbas campaniformes del monumento funerario "El Hundido" (Monasterio de Rodilla, Burgos). *Munibe*, 64, pp. 89-103.

[Alm73] Almagro Mª J. (1973) *El poblado y la necrópolis de El Barranquete (Almería)*. Acta Arqueológica Hispánica, VI, Ministerio de Educación y Ciencia, Madrid.

[Aub81 Aubet Mª E. and Serna Mª R. (1981) Una sepultura de la Edad del Bronce en Setefilla (Sevilla), *Trabajos de Prehistoria*, Vol. 38, Nr. 1, pp. 225-256.

[Bal01] Balquet A. (2001) *Les tumulus armoricains du Bronze Ancien*. Vannes: Institut Culturel de Bretagne, Col. Patrimoine archéologique de Bretagne.

[Bel14] Bell D. (2014) A radiocarbon date for an Irish Bronze Age halberd, *Past*, Vol. 76, pp.15-16.

[Bla71] Blance B. (1971) *Die Anfänge der Metallurgie auf der Iberischen Halbinsel*. Berlin: Studien zu den Anfängen der Metallurgie 4, Reimer Verlag.

[Bla16] Blasco C., Montero I. and Flores R. (2016) Bell Beaker funerary copper objects from the center of the Iberian Peninsula in the context of the Atlantic connections. In: Guerra, E. y Liesau, C. (eds.) *Analysis of the Economic Foundations Supporting the Social Supremacy of the Beaker Groups*. Oxford: Archaeopress Archaeology. Pp. 19-35.

[Bra00] Brandherm D. (2000) El poblamiento argárico de Las herrerías (Cuevas de Almanzora, Almería) según la documentación inédita de L. Siret, *Trabajos de Prehistoria*, Vol. 57, Nr. 2, pp. 157-172.

[Bra03] Brandherm D. (2003) *Die Dolche und Stabdolche der Steinkupfer- und der älteren Bronzezeit auf der Iberischen Halbinsel*. Stuttgart: Prähistorische Bronzefunde VI (12), Franz Steiner Verlag.

[Bra04] Brandherm D. (2004) Porteurs de hallebardes? Überlegungen zur Herkunft, Entwicklung und Funktion der bronzezeitlichen Stabklingen. In: Beier, H. J. and Einicke, R. (eds.), *Varia Neolithica III. Gedenkschrift für Annemarie Häußer und Helmut Spatz*. Langenweissbach: Beier and Beran. Pp. 279-334.

[Bri07] Brindley A. L. (2007) *The Dating of Food Vessels and Urns in Ireland*. Galway: NUI Galway Department of Archaeology.

[Car13] Carmona E., Valdivielso E., Pascual S., Vega J. (2013) Restos humanos, contextos funerarios y diversidad formal: los yacimientos calcolíticos de El Hornazo y el túmulo II.C1 de Cótar (Burgos), *Revista Atlántica-Mediterránea de Arqueología Social*, 15, pp. 53-80.

[Car14] Carmona E. (2014) Dataciones radiocarbónicas de contextos calcolíticos al aire libre en la cuenca media del Arlanzón (Burgos, España), *Spal*, 23, pp. 27-48.

[Cas94] Castro P., Chapman R. W., Gili S., Lull V., Micó R., Rihuete C., Risch R. and Sanahuja M. E. (1993-1994) Tiempos sociales de los contextos funerarios argáricos, *Anales de Prehistoria de la Universidad de Murcia*, Vol. 9-10, pp. 77-107.

[Cas99] Castro P., Chapman R. W., Gili S., Lull V., Micó R., Rihuete C., Risch R. and Sanahuja M. E. (1999) *Proyecto Gatas, 2: La dinámica arqueoecológica de la ocupación prehistórica.* Sevilla: Monografías Arqueológicas. Consejería de Cultura de la Junta de Andalucía.

[Cha10] Chapple R. M. (2010) *Catalogue of radiocarbon determinations and dendrochronology dates*. Belfast: Oculus Obscura Press.

[Con07] Consuegra S. (2007) La alabarda del depósito de Vélez Blanco (Almería) en el Museo Arqueológico Nacional, *Revista Velezana*, 26, pp. 8-12.

[Del71] Delibrias G. Guilier M. T. and Labeyrie J. (1971) Gif Natural Radiocarbon Measurements VI, *Radiocarbon*, Vol. 13, Nr 2, pp. 218-254.

[Del15] Delibes G., Abarquero F. J., Crespo M., García García M., Guerr, E., López Sáez J. A., Pérez Díaz S., Rodríguez Marcos J. A. (2015) The archaeological and palynological record of the Northern Plateau of Spain during the second half of the 3rd millennium BC. In Meller H., Arz H. W., Jung R., Risch R. (eds), *2200 BC – A climatic breakdown as a cause for the collapse of the old world?* Tagungen des Landesmuseums für Vorgeschichte Halle, 12, Halle pp. 429-448.

[Dol10] Dolfini A. (2010) The Origins of Metallurgy in Central Italy: New Radiometric Evidence, *Antiquity*, Vol. 84, pp. 707–23.

[Est89] Estacio da Veiga S.Ph.M (1889) *Paeoethnologia. Antiguidades Monumentaes do Algarve. Tempos Prehistoricos. Volumen III*. Lisboa: Imprensa Nacional.

[Gar13] García Puchol O., Bernabeu J., Carrión Y., Molina Ll., Pérez Jordà G., Gómez Puche M. (2013) A funerary perspective on Bell Beaker period in the Western Mediterranean. Reading the social context of individual burials at La Vital (Gandía, Valencia), *Trabajos de Prehistoria*, 70 (2), pp. 264-277.

[Ged76] Gedl M. (1976) *Die Dolche und Stabdolche in Polen. PBF VI,4*. Munich: Beck'sche Verlagsbuchhandlung.

[Hed95] Hedges R.E.M., Housley R. A., Ramsey C. B. and Klinken G. J. (1995) Radiocarbon dates from the Oxford AMS System: Archaeometry Datelist 20, *Archaeometry*, Vol. 37, Nr. 2, pp. 417-430.

[Her10] Hernández Pérez M. S. and López Padilla J. A. (2010) La muerte en El Argar alicantino. El Tabaià como paradigma. In: Pérez Fernández, Á., Soler, B. (coord.), *Restos de Vida, Restos de Muerte. La muerte en la Prehistoria*. València: Museu de Prehistòria de València. Pp. 221-228.

[Hor14] Horn Ch. (2014) *Studien zu den europäischen Stabdolchen*. Universitätsforschungen zur Prähistorischen Archäologie. Bonn: Rudolf Habelt.

[Hor16] Horn Ch. and Schenck T. (2016) Zum Ursprung der Stabdolche und stabdolchartiger Waffen in Europa. *Praehistorische Zeitschrift*, Vol. 91, Nr 1, pp. 16-41.

[Kli06] Klieber J. (2006) Die Stabdolche aus Österreich, *Archaeologia Austriaca*, Vol. 90, pp. 139-178.

[Lav71] Lavell C. (ed.) (1971) *Archaeological site index to radiocarbon dates for Great Britain and Ireland*. York: Council for British Archaeology.

[Lie15] Liesau C., Blasco C., Ríos P. and Flores R. (2015) La mujer en el registro funerario campaniforme y su reconocimiento social, *Trabajos de Prehistoria*, Vol. 72, Nr 1, pp. 105-125.

[Lop09] López Padilla J. A. (2009) El grupo argárico en los confines orientales del Argar. In: Hernández Pérez M. S., Soler J. A. and López Padilla J. A. (eds), *Los confines del Argar. Una cultura de la Edad del Bronce en Alicante*. Alacant: Museo Arqueológico de Alicante. Pp. 247-267.

[Lul83] Lull V. (1983) *La cultura de El Argar. Un modelo para el estudio de las formaciones económico-sociales prehistóricas*. Madrid: Akal.

[Lul95] Lull V. and Risch R. (1995) El Estado Argárico, *Verdolay*, Vol. 7, pp. 97-109.

[Lul05] Lull V., Micó R., Rihuete C., Risch R. (2005) Property Relations in the Bronze Age of South-western Europe: an Archaeological Analysis of Infant Burials from El Argar (Almería, Spain), *Proceedings of the Prehistoric Society*, 71, pp. 247-268.

[Lul10a]Lull V., Micó R., Rihuete C. and Risch R. (2010) Límites históricos y limitaciones del conocimiento arqueológico: la transición entre los grupos arqueológicos de Los Millares y El Argar, in: Bueno, P., Gilman, A., Martín, C., and Sánchez-Palencia, F. J. (eds.) *Arqueología, sociedad, territorio y paisaje. Estudios sobre Prehistoria reciente, Protohistoria y transición al mundo romano. Homenaje a Mª Dolores Fernández-Posse*. Madrid: Bibliotheca Praehistorica Hispana XXVIII, Consejo Superior de Investigaciones Científicas. Pp. 75-94.

[Lul10b] Lull V., Micó R., Rihuete Herrada C. and Risch R. (2010) Metal and social relations of production in the 3rd and 2nd millenia BC in the southeast of the Iberian Peninsula, *Trabajos de Prehistoria*, Vol. 67, Nr 2, pp. 323-347.

[Lul11] Lull V., Micó R., Rihuete Herrada C. and Risch R. (2011) El Argar and the Beginning of Class Society in the Western Mediterranean. In: Hansen, S. and Müller, J. (eds.) *Sozialarchäologische Perspektiven: Gesellschaftlicher Wandel 5000–1500 v. Chr. Zwischen Atlantik und Kaukasus*. Berlin: Archäologie in Eurasien, 24, Deutsches Archäologisches Institut. Pp. 381–414.

[Lul13] Lull V., Micó R., Rihuete Herrada C. and Risch R. (2013) Funerary practices and kinship in an Early Bronze Age society: a Bayesian approach applied to the radiocarbon dating of Argaric double tombs, *Journal of Archaeological Science*, Vol. 40, pp. 4626-4634.

[Lul14] 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*, Vol. 88, Nr 340, pp. 395-410.

[Lul15a] Lull V., Micó R., Rihuete Herrada C. and Risch R. (2015) Transition and conflict at the end of the 3rd millenium BC in south Iberia. In: Meller H., Arz H. W., Jung R. and Risch R. (eds.) *2200 BC – A climatic breakdown as a cause for the collapse of the old world?* Halle: Tagungen des Landesmuseums für Vorgeschichte Halle, 12. Pp. 365-407.

[Lul15b] Lull V., Micó R., Rihuete Herrada C. and Risch R. (2015) When 14C Dates Fall Beyond the Limits of Uncertainty: An Assessment of Anomalies in Western Mediterranean Bronze Age 14C Series, *Radiocarbon*, Vol. 57, Nr 5, pp 1029-1040.

[Lul17] Lull V., Micó R., Rihuete C., Risch R. and Escanilla N. (2017) Halberdiers and systems of combat in the Argaric. *Oxford Journal of Archaeology* , 36 (4), pp. 375-394.

[Man09] Manfredini A., Fugazzola Delpino M. A., Sarti L., Silvestrini M., Martini F., Conati Barbaro C., Muntoni I., Pizziolo G. and Volante N. (2009) Adriatico e Tirreno a confronto: analisi dell'occupazione territoriale tra il Neolitico finale e l'età del Rame in alcune aree campione dell'Italia centrale, *Rivista di Scienze Preistoriche*, Vol. LIX, pp. 115-180.

[Mar96] Martínez Rodríguez A., Ponce J. and Ayala Mª M. (1996) *Las prácticas funerarias de la cultura argárica en Lorca*. Lorca: Ayuntamiento de Lorca.

[Mar06] Martínez Sánchez C., San Nicolás M., García Blázquez L. A., Ponce J., (2006) Figuraciones esquemáticas pintadas en una sepultura de finales del III milenio en Lorca (Murcia). In Martínez García J., Hernández Pérez M. (eds.) *Actas del Congreso de Arte Rupestre Esquemático en la Península Ibérica, Comarca de los Vélez, 5-7 de mayo de 2004*, Almería, pp. 513-520.

[Mca61] McAulay I. R. and Watts W. A. (1961) Dublin Radiocarbon Dates I, *Radiocarbon*, Vol. 3, pp. 26-38.

[Mel14] Meller H. (2014) Die neolithischen und bronzezeitlichen Goldfunde Mitteldeutschlands – Eine Übersicht. In: Meller H., Risch R. and Pernicka E. (eds.) *Metalle der Macht – Frühes Gold und Silber. Metals of Power – Early Gold and Silver*. Halle: Landesmuseums für Vorgeschichte Halle 11. Pp. 611-716.

[Mel15] Meller H. (2015) Armeen in der Frühbronzezeit? In: Meller H. and Schefzik M. (eds.) *Krieg – eine archäologische Spurensuche*. Halle: Theiss. Pp. 243-252.

[Nee15] Needham S., Davis M., Gwilt A., Lodwick M., Parkes P. and Reavill P. (2015) A Hafted Halberd Excavated at Trecastell, Powys: from Undercurrent to Uptake – the Emergence and Contextualisation of Halberds in Wales and North-west Europe, *Proceedings of the Prehistoric Society*, Vol. 81, pp. 1-41.

[Nic15] Nicolas C., Stevenin C. and Stéphan P. (2015) L'artisanat à l'age du Bronze ancien en basse Bretagne. Iin: Boulud-Gazo, S. and Nicolas, T. (eds.) *Artisanats et productions à l'âge du Bronze*. *Actes de la journée de la Société préhistorique francaise de Nantes, 8 octobre 2011*. Paris: Société préhistorique française, 4. Pp. 123-153.

[Ofl02] O'Flaherty R. (2002) *The Early Bronze Age Halberd in Ireland: Function and Context*. Dublin: PhD University College.

[Ori37] Ó'Riordáin S.P. (1937) The Halberd in Bronze Age Europe. A Study in Prehistoric Origins, Evolution, Distribution, and Chronology, *Archaeologia or Miscellaneous Tracts relating to Antiquity*, Vol. LXXXVI, pp. 195-321.

[Pat13] Patay R. (2013) Bell Beaker Cemetery and Settlement at Szigetszentmiklós: First Results. In: Heyd, V., Kulcsár and G., Szeverényi, V. (eds.) *Transitions to the Bronze Age. Interregional Interaction and Socio-Cultural Change in the Third Millennium BC Carpathian Basin and Neighbouring Regions*. Budapest: Archaeolingua. Pp. 287-317.

[Pav93] Pavón I. (1993) La Solana del castillo de Alange: un yacimiento de la Edad del Bronce en la cuenca media del Guadiana, *SPAL*, Vol. 2, pp. 147-168.

[Pav14] Pavón I. and Duque D. M. (2014) El Cerro del Castillo de Alange (Extremadura, España): un paisaje de la Edad del Bronce. In: Vilaça, R. and Serra, M. (eds.) *Idade do Bronze do Sudoeste. Novas perspetivas sobre uma velha problemática*. Coimbra: Instituto de Arqueologia de la Universidad de Coimbra. Pp. 51-73.

[Sch02a] Schuhmacher Th. (2002) Some remarks on the origin and chronology of halberds in Europe, *Oxford Journal of Archaeology*, Vol. 21, Nr 3, pp. 263-288.

[Sch02b] Schwenzer S. (2002) Zur Frage der Datierung der Melzer Stabdolche, *Praehistorische Zeitschrift*, Vol. 77, pp. 76-83.

[Sch13] Schmidt H. (1913) Der Dolchstab in Spanien, in: *Opuscula Archaeologica. Oscari Montelio Septuagenario*. Stockholm: Haeggstroem. Pp. 69-78.

[Sch63] Schickler H. (1963) *Stabdolche und Vollgriffdolche. Beiträge zur Ornamentik und Technologie der frühen Bronzezeit*. Freiburg: Universität Freiburg, unpublished PhD.

[Sch73] Schubart H. (1973) Las alabardas tipo Montejicar. In: Maluquer de Motes J. (ed.), *Estudios dedicados al Profesor Dr. Luis Pericot*. Barcelona: Universidad de Barcelona. Pp. 247-269.

[Sir87] Siret H. and Siret L. (1887) *Les Premiers Âges du Métal dans le Sud-Est de l'Espagne*. Anvers.

[Ulr94] Ulreich H. (1993-1994) Die zeitiche Ordnung der Stabdolchklingen aus El Argar, El Oficio und Fuente Alamo (Almeria, Spanien), *Mitteilungen der Anthropologischen Gesellschaft in Wien*, Vol.123/124, pp. 301-314.

[Zic16] Zich B. (2016) Aunjetitzer Herrschaften in Mitteldeutschland –"Fürsten" der Frühbronzezeit und ihre Territorien ("Domänen"). In: Meller H., Hahn H.P., Jung R. and Risch R. (eds.) *Arm und Reich – Zur Ressourcenverteilung in prähistorischen Gesellschaften/ Rich and Poor –Competing for resources in prehistoric societies*. Halle: Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt. Pp. 126-129.