

## The local appropriation of warrior ideals in Late Bronze Age Europe: a review of the rock art site of Arroyo Tamujoso 8 and the ‘warrior’ stela of Cancho Roano (Badajoz, Spain)\*

*La apropiación local de ideales guerreros en la Europa de la Edad del Bronce Final: una revisión del sitio de arte rupestre de Arroyo Tamujoso 8 y la estela de Cancho Roano (Badajoz, España)*

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### ABSTRACT

This study offers new insights into the local appropriation of warrior ideals in Late Bronze Age Europe. Through the new study of the carvings of Cancho Roano and Arroyo Tamujoso 8, located in Southwest Iberia and their landscape settings with state-of-the-art digital technologies, this paper unpicks some of the key idiosyncrasies of Iberian Late Bronze Age warrior iconography, revealing that responses to the warrior ideals circulating across Europe during that period were diverse. To understand the contexts of circulation and appropriation of these ideas from a local perspective, we also consider very briefly the multiscale connections in which the communities who created warrior stelae in Iberia were involved. The ultimate goal of this paper is to lay the groundwork for further work developing more detailed comparisons between Iberian warrior stelae and Swedish warrior iconography on rock art, also taking into account other evidence.

### RESUMEN

*Este estudio ofrece nuevos datos sobre la apropiación local de los ideales asociados al guerrero en Europa durante la Edad del Bronce Final a través del nuevo estudio de los*

*grabados de Cancho Roano y Arroyo Tamujoso 8, situados en el Suroeste de la península ibérica, de sus soportes y contextos paisajísticos. Emplea tecnologías digitales de vanguardia para identificar algunos de los particularismos más distintivos de esa iconografía, revelando diversas respuestas a los ideales de guerrero que estaban en circulación en Europa durante dicho período. Para comprender los contextos de circulación desde una perspectiva local, también consideramos brevemente las conexiones multi-escala en las que estaban involucradas las comunidades que crearon estelas de guerrero en Iberia. El objetivo final de este artículo es sentar las bases para un próximo trabajo donde se comparan con mayor detalle la iconografía de las estelas de guerrero y la de los guerreros del arte rupestre escandinavo, teniendo también en cuenta otros aspectos.*

**Key words:** appropriation of warrior ideals; rock art; stelae; Iberia; high-resolution 3D recording; GIS-based spatial analysis; visual culture; metallic weapons; chaîne opératoire of rock art production; Late Bronze Age.

**Palabras clave:** apropiación de ideales asociados con el guerrero; arte rupestre; estelas de guerrero; península ibérica; registro 3D de alta resolución; análisis espacial mediante SIG; cultura visual; armas metálicas; cadena operativa de la producción de arte rupestre; Edad del Bronce Final.

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1. INTRODUCTION: THE WARRIOR ARCHETYPE IN BRONZE AGE EUROPE

During the Bronze Age (BA), burials with weapons were common in some European regions, such as Scandinavia, Central Europe and the Aegean (Kristiansen 1999; Harding 2007), while in others like Atlantic Europe weapons are typically found in hoards or rivers, especially from the Middle BA onwards (Ruiz-Gálvez 1998; Fontijn 2002; Bruck & Fontijn 2013). Graves with weapons materialize aspirations to a series of warrior ideals bestowed with high status. In some instances, the individual’s lived experience as shown through their osteobiographies or the associated weapons, reveal involvement in actual combat, and is the testimony of real warrior elites (Kristiansen 1984; Vandkilde 2013).

It has been proposed that a warrior ideology underpinning these material expressions spread across Europe during the Late Bronze Age (LBA) (Harrison 2004; Kristiansen & Larsson 2005) but the contrasting evidence from the different regions indicates that this ideology and its associated notion of the self (Treherne 1995) emerged or were appropriated locally and regionally in different ways (Frieman *et al.* 2017). Local precedents of a warrior ideology or warrior-related ideals (Guilaine & Zammit 2004; Hansen 2013; Jeunesse 2014) may have contributed to variations of the warrior ideal in different European regions during the LBA. Testimony of this during the LBA is the variable quantities of weapons documented throughout Europe. The sword, for example, a key element in the constitution of ‘warriorhood’, is most abundant in Ireland and Denmark-Northern Germany (8.6 and 6.9 swords/1000 km<sup>2</sup>), while in Britain or Iberia the index of recorded swords per 1000 km<sup>2</sup> is very low (2.3 and 0.2 respectively) (Fig. 1 and Tab. 1). Furthermore, of the 152 swords recorded in Iberia up to 2007, around half (78 and some fragments of others) were found as part of the Huelva ‘hoard’. Importantly, the context of the appearance of these weapons differs from one region to another (Piccolini & Kienlin 2018), and we should consider that the lower number of swords in Iberia could be linked to the archaeological invisibility of these items, for they may have been primarily deposited in rivers. However, deposition in watery contexts is very abundant in other European regions where numbers of recorded swords are much higher, so it would be worth comparing the level of dredging activity carried out in the rivers of these different regions (*e. g.* Iberia vs Britain) to evaluate the significance of these patterns. Finally, weapons and warriors may be depicted in the context of specific regional visual cultures, some of which stem from long-term traditions, such as painted pottery in the Aegean, rock art in Scandinavia and the Alps, or the distinct stelae and statue-menhir traditions from Iberia, Corsica or the Italian peninsula.

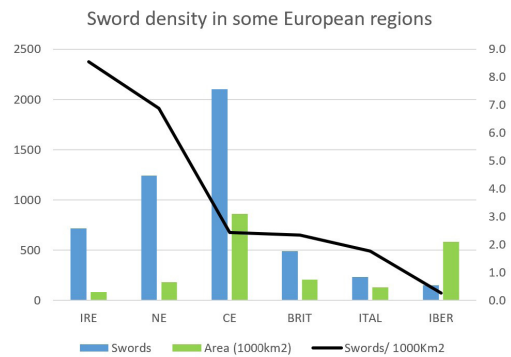


Fig. 1. Comparison of sword density between different European regions: IRE Ireland; NE Northern Europe (Denmark and Northern Germany); CE Central Europe (Switzerland, Austria, South Germany, Romania, Hungary, Former Yugoslavia); ITAL Italian Peninsula; BRIT Britain; IBER Iberian Peninsula. For data sources see Tab.1. In colour in the electronic version.

Region/Country	Total	Area (1000 km <sup>2</sup> )	Swords/1000 km <sup>2</sup>	Reference
Ireland	719	84	8.6	Colquhoun 2015
Northern Europe (Denmark and Northern Germany)	1245	181	6.9	Harding 2007
Central Europe (Switzerland, Austria, South Germany, Romania, Hungary, Former Yugoslavia)	2102	862	2.4	Harding 2007
Britain	490	209	2.3	Bridgford 2000
Italian Peninsula	232	131	1.8	Harding 2007
Iberian Peninsula	152	583	0.3	Brandherm 2007

Tab. 1. Data of chart in Fig. 1. These numbers are only illustrative and may have changed since they were originally published.

Precisely, these distinct visual cultures demonstrate how knowledge in motion (in this case a warrior ideology and/or associated notion of personhood) was appropriated differently in different regions of BA Europe. This entailed the selection of aspects of the ideals in circulation, their mixing with elements of local or other origins, and the representation through local forms of visual expression, which sometimes could have a long-standing tradition.

Focus on these regional traditions of visual culture contributes to the globalization agenda (Maran 2011; Versluys 2014; Hodos 2016; Vandkilde 2016; Monroe 2018), which attempts to overcome the limitations of

core-periphery models and post-colonial theories in investigating the unfolding of complex cultural affinities and connections across Europe and the Mediterranean during the Bronze and Iron Age, and the roles of people, things and knowledge in their making. Core-periphery models assume that modern ideas about space, economy and time apply to the pre-modern world, while local actors are deprived of agency and ideas are thought to have been transferred without transformation (Maran 2011: 283; Vandkilde 2016: 104, 107-108; Monroe 2018). Conversely, post-colonial theory directed the focus to local responses, while some of its approaches (e. g. hybridization) presuppose problematic cultural archetypes and dichotomies (e. g. indigenous vs Phoenicians). Globalization theory attempts to overcome these limitations through a 'global' (i. e. in relation to situated known worlds) focus on connectivity at multiple scales (global, regional, local) simultaneously, emphasizing local participation in wider (messy) networks and on the continuous entangled flow of things, ideas and people. A perspective that can be particularly valuable for the study of pre-modern societies is that of 'glocalization' (Maran 2011; Roudometof 2016), which places the focus on and explores the co-presence and co-constitution of the global and the local. Some of the approaches introduced by post-colonial theory, such as transculturation (i. e. a relational phenomenon constituted by acts of appropriation), are deployed to examine the interplay between ideas (incl. institutions and technological knowledge), things, social practices, and intercultural connections (e. g. Maran & Stockhammer 2012).

This paper focuses on the local appropriation of warrior ideals in LBA Iberia. As part of the 4-year project 'Rock Art, Words and Warriors' (RAW) funded by the Swedish Research Council (*Vetenskapsrådet*), we are conducting a systematic comparative analysis between Iberian warrior stelae and Scandinavian rock art. One of the key aims of the project is to reveal the diversity of local responses to this Europe-wide warrior ideology and its associated ideals by investigating the commonalities and differences between the warrior iconographies documented in these two regions (for comparable work see Vandkilde et al. 2022, which is exclusively focused on depictions of horned warriors from Scandinavia, Sardinia and Iberia). While some general comparisons will be made in this paper, it aims to present some key preliminary findings of this project which lay the ground for a forthcoming, more detailed and systematic comparison between Iberian warrior stelae and Scandinavian rock art. The analysis of the project draws on new high-resolution 3D recordings of Swedish rock art sites and c. 100 Iberian warrior stelae. This documentation is disseminated through the web-

site of the Swedish Rock Art Research Archive<sup>1</sup> and thereby allows researchers worldwide to access and compare remote immovable objects in fine detail. Some of the documentation has already been published. Enabling remote access is particularly significant for rock art sites and those stelae that are still *in loco/in situ*, in difficult-to-access locations, or privately held.

In line with these aims, this paper presents the results of the new study of the carvings of Cancho Roano (CR) and Arroyo Tamujoso (AT) 8 with state-of-the-art digital technologies (Fig. 2). The study offers new insights into the idiosyncrasies of Iberian LBA warrior iconographies, and the multiscale connections of the communities who created warrior stelae in Iberia. In particular, the research sheds new light on three key areas of inquiry: 1) rock art carving technology and the connection between warrior stelae and local traditions of rock art and monumentality; 2) the landscape contexts of LBA warrior iconography in Iberia, where places of special significance were important, due to water sources, ritual activity, proximity to mining resources or proximity to territorial boundaries and passages; 3) the role of rivers and natural corridors in facilitating the multiscale connections of communities linked to warrior stelae.

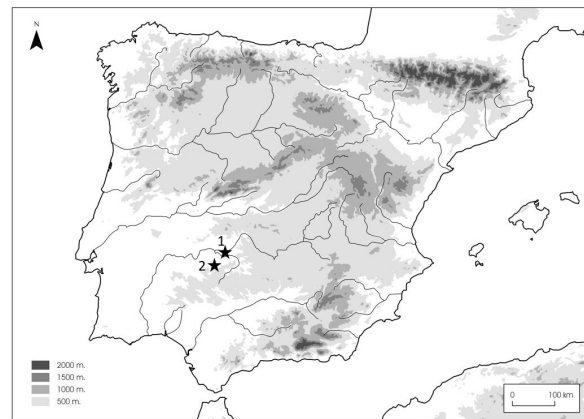


Fig. 2. Location of the rock art site of Arroyo Tamujoso 8 (1) and the stela of Cancho Roano (2), Badajoz, Spain.

## 2. THE ROCK ART SITE OF ARROYO TAMUJOSO 8 AND THE 'WARRIOR' STELA OF CANCHO ROANO (BADAJOZ, SPAIN): BACKGROUND

During the 2019 stelae digital documentation season, on 18 and 19 April we conducted new recordings

<sup>1</sup> <http://www.shfa.se/?lang=en-GB>, accessed June 21, 2022.

of the warrior stela of CR and the rock art panel of AT 8 (La Serena district, Badajoz). These two cases offer very valuable data to reassess the landscape contexts of warrior stelae in LBA southwest Iberia. Both are particularly inaccessible, ‘in context’ and not in museums. Thus, the digital documentation not only aids our research inquiries but also allows the broader public and community of researchers to access these visual displays remotely.

The so-called ‘stela’ of CR (Zalamea de La Serena, Badajoz) is a phallic-shaped menhir of a probable Neolithic date that was reused during the LBA to carve a stela with typical warrior iconography, and then again to serve as the entrance steppingstone of a post-orientalizing palace-sanctuary built in the 5<sup>th</sup> century BC (CR A) (Fig. 3) (Celestino 2001a: 387, 2001b: 54). The palace-sanctuary has several building phases between the 7<sup>th</sup> – early 5<sup>th</sup> centuries BC and has its origin in a circular stone and daub structure of 3 m in diameter (CR D) dating to the late 9<sup>th</sup> – early 8<sup>th</sup> century BC<sup>2</sup>. This structure was interpreted as a sacred building or a monumental stone setting (Celestino 2001c: 21-26; Jiménez Ávila 2009: 71-74). In any case, as a possible primary context for the warrior stela, the undertaking of ritual (perhaps mortuary) activity cannot be ruled out if we take into account comparable finds (Díaz-Guardamino *et al.* 2019). Two aspects are essential for understanding the context of the warrior stela. Firstly, it is made of granite, of a type that, pending petrographic analysis, abounds in the area and is visible in outcrops. Secondly, the site is located in the lowlands, with no prominence at all (in fact it goes unnoticed in the landscape unless you are quite close), but it is in an area that is very rich in aquifers, immediately adjacent to the Cagancha stream, which has water all year round, even in the dry, hot season, which can reach extreme temperatures in this area (Celestino 2001c: 18-21).

The stela from CR was first recorded with hand drawing from photography with raking light conveying only the outline of the motifs identified (i. e. shield, human figure, sword and mirror). This was limited to the surface that is visible, as most of the stela (or menhir) was, and still is, fitted within the CR building and was not removed (Fig. 3) (Celestino 2001a, 2001b). Today a methacrylate plate covers the stela to facilitate pas-

sage into the building. Despite protecting the stela, the plate makes it almost impossible to see the motifs.

The rock art panel of AT 8 (Campanario, Badajoz) was discovered during a rock art survey and documentation project conducted in the La Serena district. It was originally recorded using direct tracing with raking light (Domínguez & Aldecoa 2007: 18-19). The tracings are very detailed, and they discriminate as much as possible between different carving techniques (mostly pecking and incision) but do not include information on superimpositions or secondary transformations. The site of AT 8 is located on a farm, around 800m from the nearest road. Despite being exposed to the elements, the carvings are mostly well-preserved although some are obscured by lichens. They are found in a horizontal (5%) panel orientated to the southeast, located right by the Tamujoso creek, in a huge slate outcrop looking over a creek crossing (Fig. 5) (Domínguez & Aldecoa 2007: 349-352). AT 8 is particularly relevant to the study of warrior stelae, as it holds the same iconography, including composition, as the latter while it is clearly related to local rock art traditions, acting as a connector between both expressions (rock art and warrior stelae). Therefore, as we will discuss below, the panel provides precious information about the contexts in which these iconographies were chosen to be presented, the features that were important for their location (e. g. proximity to water, (in)visibility), orientation), and also the techniques that could be employed to create them.

In the area, there are two more panels (all on slate outcrops) featuring carved motifs that are comparable to those of warrior stelae. La Serrezuela (Campanario) displays an engraved V-notched shield, 33 cm in diameter on a panel orientated to the southwest and 10% inclination located on the top of a hill but close to the Zújar River (Domínguez & Aldecoa 2007: 319-320). Finally, the panel of AT 21 is located on the top of a hillside, orientated to the east, towards the Tamujoso creek, on a relatively horizontal plane (10%) (Domínguez & Aldecoa 2007: 384-389). The panel is complex as it shows numerous carved motifs, some of them superimposed, including two small v-notched shields, two daggers, one sword, one spear, and a series of rectangular motifs (archer’s bracers?).

### 3. METHODS

Within the RAW project, we follow a multi-method, multi-scale approach to rock art recording. For each stela or rock art site, we use laser scanning and SfM to create two sets of 3D models. We also use two methods to improve the visualization of the microtopography of the 3D models, as well as reflectance

<sup>2</sup> Cancho Roano D was covered by a level where a carinated bowl dated typologically to the 6<sup>th</sup> century BC (not calibrated) was found. This means that the oval structure must be dated before that date. Celestino (2001b) proposes to interpret this structure as the base of a hut, and as Celestino and Rodríguez (2018: 79) demonstrate, these oval/circular structures correspond to the Late Bronze Age; in this paper they also propose that Cancho Roano C is the earliest ‘orientalizing sanctuary’ in Cancho Roano). Therefore, a dating (in calendar dates) of 9-8<sup>th</sup> century BC for CR D is perfectly congruent with the available archaeological evidence.



Fig. 3. Location of the menhir/stela, reused as the entrance stepping stone of the Cancho Roano palace-sanctuary (Zalamea de La Serena, Badajoz, Spain). In the upper part a reconstruction of the building (Celestino, 2001b: 76), and in the lower part two photos of the stela when it was found (Celestino 2001b: 54). In colour in the electronic version.



Fig. 4. 3D model of the entrance to the palace-sanctuary of Cancho Roano where the menhir/warrior stela can be seen re-used as a stepping stone (the 3D model can be explored in <https://skfb.ly/otvot>). In the upper part a snapshot of the model with the wooden and metal walkway but without the methacrylate. In the lower part, the model shows the entrance as it stands now but with the walkway structures (virtually) removed. In colour in the electronic version.

transformation imaging (RTI) for the analysis of rock art's surface detail, in particular the marks related to (re)carving. Finally, we also use GIS (ArcGIS) to facilitate the analysis of the spatial dimension of rock art and stelae. The aims of such recording strategy are twofold: 1) to enable the archaeometric study of rock art through the creation of accurate and high-precision 2.5D and 3D documentation that allows consideration of issues beyond motif identification and analysis at

multiple scales, from the micro-topography of carvings to assess the *chaîne opératoire* of rock art production (including carving techniques, superimpositions and transformations) to landscapes to assess the setting of those sites in relation to resources, pathways, and other archaeological activities and sites (Díaz-Guardamino & Wheatley 2013; Díaz-Guardamino *et al.* 2019, 2020; García-Arilla *et al.* 2021), 2) to facilitate remote access and dissemination through interactive visualization

tools improving the experience of rock art inspection (Bertilsson *et al.* 2017; Horn *et al.* 2018).

Laser scanning was conducted using the red-light laser scanner Handyscan 700, which sends out c. 480,000 measurement points per second which can reproduce the scanned area with a resolution of 0.05 mm. Through interpolation the highest actual output resolution is 0.2 mm (Horn *et al.* 2018). SfM is an image-based modeling method using multiple static images and pixel recognition to generate three-dimensional point clouds (De Reu *et al.* 2013). For 3D reconstruction, the software Metashape was used. To improve the perception of depth in 3D models we applied two visualization methods, one is called TVT<sup>3</sup> and was programmed to work with laser scans, while the other approach relies on local relief modeling in ArcGIS 10.6 (Horn *et al.* 2019, 2021). Both methods use depth maps. The higher depth variation of the global curvature of surfaces cloaks the local depth variation containing the rock art. To isolate the global curvature focal statistics and PCA are used. The output is then subtracted from the original depth map which leaves the local depth variation. Standard deviation and several color ramps are used to enhance the image. TVT also calculates normals and blends them with the enhanced image output. In contrast to other approaches using, for example, Photoshop to manipulate color differences (Carrero *et al.* 2018), these methods consistently preserve the relative depth variations.

We also used RTI for the recording and analysis of surface detail, and specifically marks produced through rock (re)carving and other modifications of the surface. The technique is particularly good at the photorealistic rendering of surface texture through easy to manipulate 2.5D models. RTI uses the reflection of light on any given surface to reconstruct its shape through polynomial texture maps (Mudge *et al.* 2006, 2012). We used the capture method Highlight RTI, which is cost-effective, mobile and flexible, allowing for the recording of elements of variable size. The capture and processing of RTI datasets, also for the study of rock art, is described elsewhere (*e. g.* Cultural Heritage Imaging 2011, 2013a, Díaz-Guardamino & Wheatley 2013). The output can be analyzed using the RTI Viewer (Cultural Heritage Imaging 2013b), which allows for interactive visualization through dynamic re-lighting of the surface and the application of filters for enhanced perception of minute details.

Finally, we also examined the landscape context. Stelae were traditionally thought of as de-contextualized remains but recent studies (*e. g.* Pavón *et al.* 2018, Díaz-Guardamino *et al.* 2019, 2020) reveal that some

warrior stelae did not move much from where they were sourced, and that their find spots are their context (Galán 1993). These studies also reveal that warrior stelae were multivalent monuments (Harrison 2004), that they fulfilled complementary and changing roles, including as burial and territorial markers. Given that the landscape context of the stela of CR and the rock art site of AT 8 had not been studied previously, we carried out a GIS-based spatial analysis whose results are particularly relevant as these sites are *in situ/in loco*, and confirm certain patterns previously discovered.

## 4. RESULTS

### 4.1. Arroyo Tamujoso 8

We recorded the panel (and broader outcrop) through: 1) laser scanning (1 mm resolution), 2) high-resolution photography of the panel and broader outcrop for SfM, 3) three Highlight-RTI captures of the decorated surface. With the data we produced three high-resolution 3D models (Tab. 2), various improved visualizations derived from these, three RTI files, and a synthetic drawing with our interpretation of the marks documented on the panel and the processes involved in their production.

	Data capture	Vertices	Faces	Resolution	Accuracy	Size (.OBJ)
3D model 1	Laser scanning	1.709.084	3.304.047	1 mm	0.03 mm	386 MB
3D model 2	Laser scanning	3.174.791	6.150.632	1 mm	0.03 mm	721 MB
3D model 3*	969 .NEF pictures; 45MB each	6.688.871	13.313.529	0.00005 (horizontal error)	0.001 mm	2.12GB
RTIs (1-3)	57; 156 and 71 HD pictures on .NEF format	NA	NA	NA	NA	NA

Tab. 2. Quality parameters of the digital documentation of Arroyo Tamujoso 8. \* We created a lower resolution 3D model of this one that can be explored in Sketchfab: <https://skfb.ly/ooosn9>

Lichens were very abundant on the panel surface, especially in the cavities created through carving and on the natural fissures of the outcrop. To optimize the documentation of the carvings, we removed only the most conspicuous lichens through mechanical means (water and wooden tools) to avoid surface damage.

<sup>3</sup> <https://tv.t.dh.gu.se/>

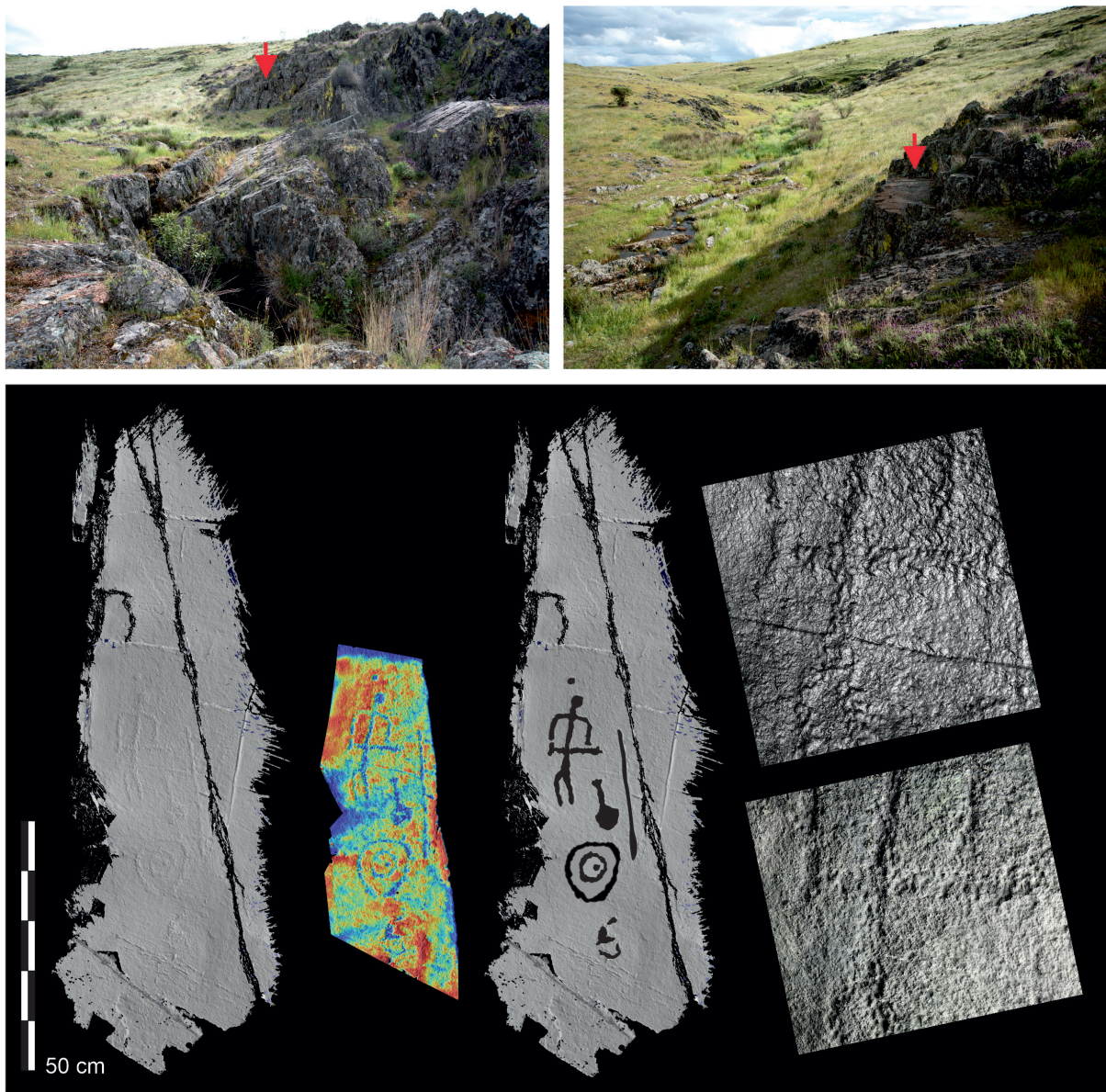


Fig. 5. View of the location of the rock art site of Arroyo Tamujoso 8. The rock carvings are found on a flat surface. Upper left image: view from the northeast. Upper-right image: view from the north. Lower image: 3D model of the ‘warrior-stela-like’ rock carvings of Arroyo Tamujoso 8; visualization through TVT; interpretative synthesis and RTI snapshots (upper: specular enhancement; lower: luminance unsharp mask). The RTI datasets can be downloaded in [https://doi.org/10.15128/r1zk51vg78z\\_A](https://doi.org/10.15128/r1zk51vg78z_A) A 3D model of this panel can be explored in Sketchfab: <https://skfb.ly/oosn9>. In colour in the electronic version.

Added to confirming the features identified through the recording by Domínguez and Aldecoa (2007), the high-resolution documentation of the surface revealed a variety of additional details (see below), including those informing us about the *chaîne opératoire* of production and marks of possible new motifs (Fig. 5):

1. Surface: a distinctive trait of this rock art panel is that the surface on which it was carved is flat and smooth, being naturally so due to the characteristics of the slate. This reiterates the connection between this rock art panel and warrior stelae (see below), as ‘flatness’, normally achieved through arduous levelling



work, is a key characteristic of the latter. Natural fissures were also part of the iconographic program, as the carved motifs were carefully placed to the south of one of the main fissures crossing the panel from east to west.

2. LBA carving of ‘warrior’ iconography: five already known motifs are clearly identified (see also Fig. 5): a human figure with a sword (with indicated pommel), a cup-mark over its head, a mirror, spear, and shield seen from the front (no handgrip is visible, rather a cup-mark decorating the boss). The peck marks are now clearly visible within the grooves of all motifs (except the sword pommel), indicating that no work was invested in achieving a smoother finish (this can also be seen on warrior stelae, where different degrees and types of finish are documented). The outline of the mirror is slightly different from what was previously thought: the main body is not oval/circular but semi-circular/palm-form, and its handle includes a well-defined angular pommel. Equally, we can see in the new renderings the outline of a (possibly leaf-shaped) spearhead for the first time. The only superimposition seems to be that of the human body and the sword, as the former seems to be carved over the latter, but closer inspection reveals that the human body was carved first, and then the sword blade at both sides of the body, without crossing it. All the other motifs are close to each other but do not touch/overlap. Finally, one possible motif was revealed: on the lower part there are some carvings of an undefined (unfinished?) motif. Importantly, the whole iconography is put on an almost flat surface and is orientated towards the sunrise, east.

#### 4.2. Cancho Roano

The digital documentation of the CR stela was particularly difficult. The methacrylate plate was removed but the metal structure supporting the walkway to access the building restricted visibility. Also, as the stela is reused as a stepping stone at the entrance of the building only part of its surface is exposed (a large proportion of the standing stone/stela is buried within the structure and could not be recorded).

We documented the exposed surface through: 1) laser scanning (1 mm resol.), 2) high-resolution photography of the stelae and surrounding building structure for SfM, 3) three Highlight-RTI captures of the decorated surface. The data captured allowed us to produce two high-resolution 3D models (Tab. 3), various improved visualizations derived from these, three RTI files, and a synthetic drawing with our interpretation of the marks documented on the stela and the processes involved in their production.

	Data capture	Vertices	Faces	Resolution	Accuracy	Size (.OBJ)
3D model 1	Laser scanning	5.209.856	6.744.584	1 mm	0.03 mm	815 MB
3D model 2	232 .NEF pictures; 43MB each	1.642.340	3.277.121	0.01 (horizontal error)	1 mm	143 MB
RTIs (1-3)	84; 47 and 87 HD pictures in .NEF format	NA	NA	NA	NA	NA

Tab. 3. Quality parameters of the digital documentation of Cancho Roano. \* We created a lower resolution 3D model of this one that can be found in Sketchfab: <https://skfb.ly/otvot>

The high-resolution documentation of the surface revealed a variety of previously unknown significant details (see below) informing us about activities related to the monument’s biography, including aspects of the *chaîne opératoire* of production (Fig. 6):

1) Neolithic standing stone: the phallic shape of the block, already noted by Celestino (2001), is clearly revealed by the 3D model. The latter also shows what appears to be a broad groove indicating a glans (this being a new observation). Other surface marks of work involved in shaping the block are not visible perhaps because a naturally shaped boulder was used, and/or because the surface finish included smoothing. This type of menhir was relatively common in Neolithic western Iberia, e. g. the phallic menhirs from the Algarve (Gomes 1994) or the examples from Alentejo region (Díaz-Guardamino 2010: Ch. 6.1.) and at least in five instances similar menhirs were used during the BA as surfaces for warrior imagery (Díaz-Guardamino 2010).

2) LBA carving of ‘warrior’ iconography: The LBA carvings were placed without additional preparatory steps on the already smooth surface and consist of two human figures, one large and one small (this is a newly discovered motif), a shield composed of three concentric circles that do not seem to fully close and having no handle (contrary to previous documentation), four small cupmarks possibly representing weights (these are new observations) between the human figures and the shield, and a fourth feature on the other side of the large human figure, partially covered nowadays by the building restoration materials. When we compare the picture and line drawing of the 2000s and today’s digital recording, we can see a discrepancy, even if we can’t document this area to the extent that was possible in the early 2000s. What we document

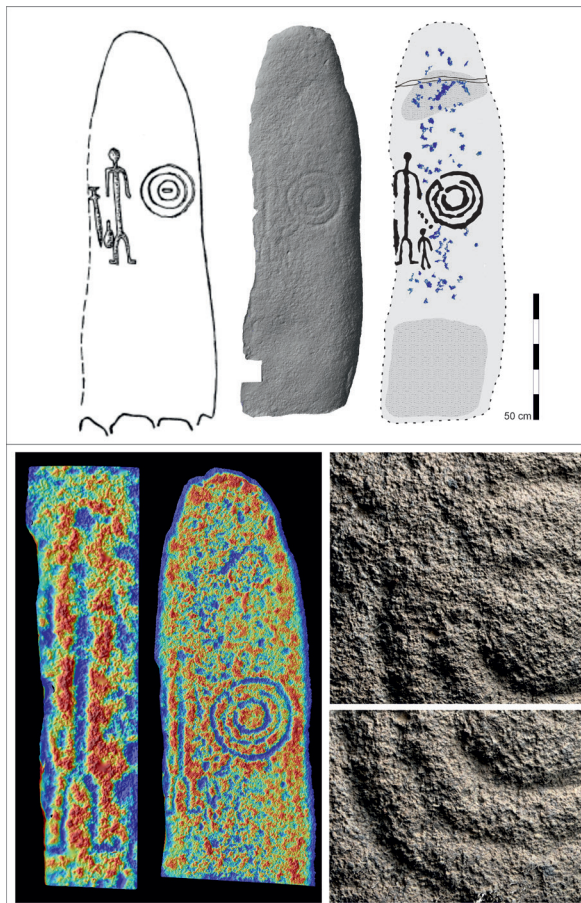


Fig. 6. Menhir of Cancho Roano. Up from left to right: existing tracing by Celestino (2001a: 387), 3D model, and interpretative synthesis based on 3D models; TVT visualization; and RTI information (note that the fraction of the menhir visible is 178 cm in height, around 22 cm shorter than indicated in Celestino, 2001a: 387. The blue stains indicate flaking of the surface and the grey patterned areas indicate very smooth/eroded surfaces). Down left: enhanced visualization of the carved area of the menhir through the application of TVT. Right: Detailed RTI snapshots of areas of the shield where the marks of pecking and abrasion, as well as the coarse granite grain can be seen. RTI filter: luminance unsharp masking. The RTI datasets can be downloaded in <https://doi.org/10.15128/r1zk51vg78z>. In colour in the electronic version.

today is an elongated motif (sword?) but not the representation of a mirror documented by Celestino. This discrepancy may be due to conservation issues. The techniques of production are difficult to discern due to the weathering of the granite's surface but include pecking (upper body of the small human figure), in some cases followed by abrasion (some sections of the shield and the large human figure). There are no superimpositions between images, and therefore no evident sequence in their engraving,

3) Late Iron Age reuse as entrance steppingstone: it seems that only two areas of the surface of the stela were stepped onto—and they show considerable wear—whereas the rest of the surface does not. This is relevant as it suggests various possibilities: a) that the stela had been previously used as a stepping stone but with much of its surface covered, b) that while in this position the engravings were covered, c) that local people held some kind of taboo against stepping on the images, resisting the original intention of the authorities responsible for building Cancho Roano of this reuse as being some kind of *damnatio memoriae*.

## 5. LANDSCAPE CONTEXT

The landscape contexts of these two sites differ in some fundamental ways but they share some important commonalities. AT 8 was carved on the horizontal surface (similar to a 'shelf') of a slate outcrop located on the side of the small basin of one of the tributaries of the Tamujoso creek, in their confluence (Annex SF1). This landscape setting, known in other Iberian rock art sites with carved weapons (*e. g.* Cachão do Algarve in the Tagus valley, Gomes 2011), reminds one of Scandinavian rock art panels in two ways: firstly, the close connection to water, and secondly the selection of a horizontal carving surface. At first sight the rock art of AT 8 seems secluded: the shelf of the outcrop sits on the side of the basin, within it, and the carvings are not visible unless one is directly over the surface. Nonetheless, the motifs were most probably visible with the rising sun when they were freshly carved and clean of lichens, as the carvings are oriented towards the eastern sunrise. It should be noted that many Scandinavian rock art sites have similar properties (Goldhahn & Ling 2013), as do the ones known in the Tagus valley.

Furthermore, a viewshed analysis confirmed our field observation that the shelf and the larger outcrop of AT 8 are visible from within variable distances (up to 500 m) from the north, northeast, east, southeast and south, but not from the northwest, west or southwest (Annex SF1). This is relevant because that means that the rock art site is secluded from the path within the Tamujoso creek basin that leads to the Guadiana River (5 km away), which is navigable from a lower section, c. 100 km downstream. The rock art site also seems to be at some distance (c. 2.5 km) from the *Cañada Real Leonesa Oriental*, one of the main drove-ways of *La Mesta* (a medieval Castillian-wide association of livestock owners) for long-distance transhumance. These medieval drove-ways frequently followed existing long-distance paths that facilitated access to the extensive lands for (winter) pastures in southwestern Iberia (here the La Serena high plateau, at c. 350–400 m

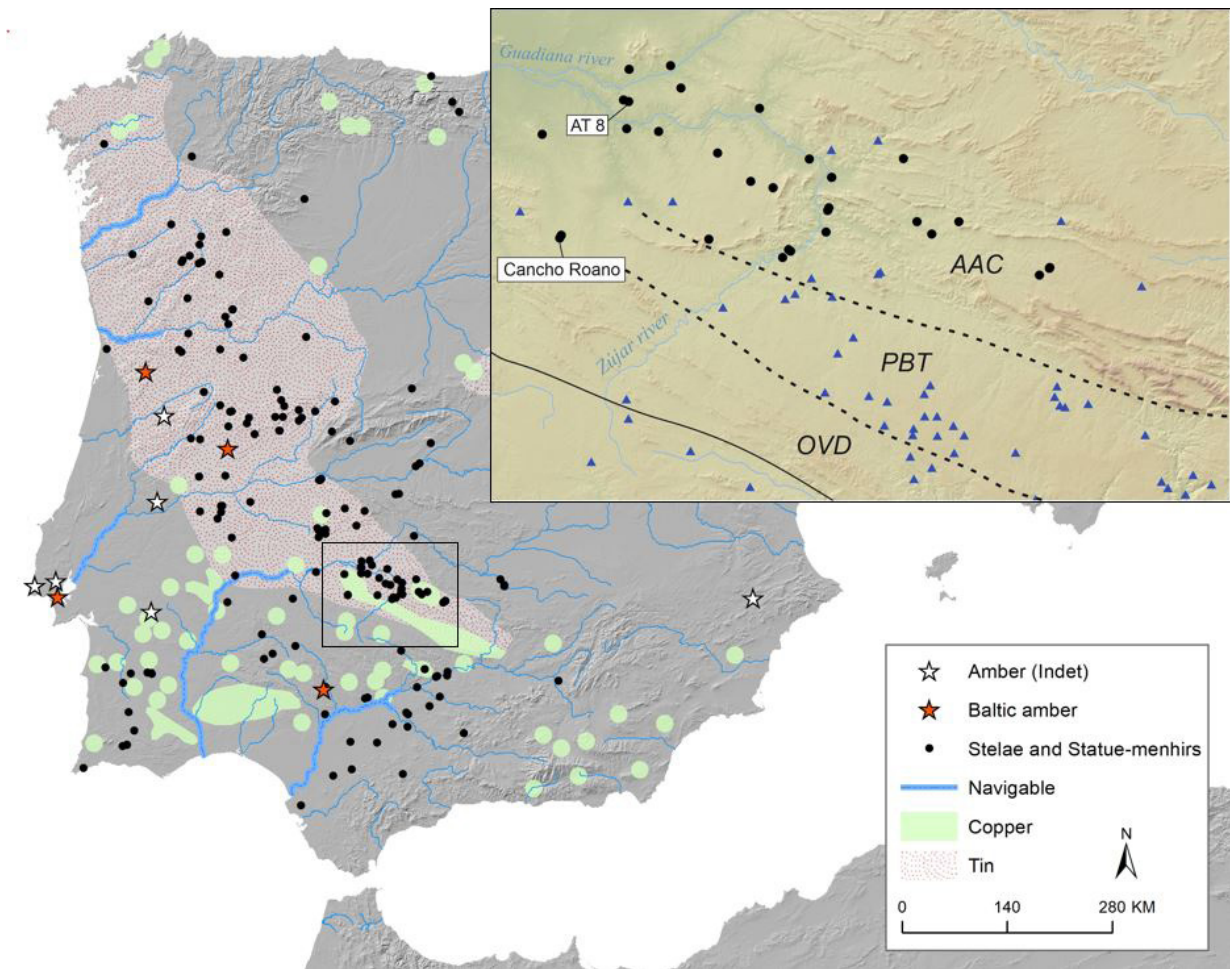


Fig. 7. Distribution of Bronze Age stelae and statue-menhirs in Iberia with the location of amber finds of/from confirmed and probable Baltic provenance LBA contexts, and major tin and copper deposits in Iberia. Inset: Distribution of 'warrior' stelae and prehistoric mining activity inferred from the presence of stone (grooved) hammers in mines (Domergue 1987; Hunt 2003) between the middle Guadiana and the middle Guadalquivir rivers, with indication of the mining districts and sectors relevant to this study (OVD: Los Pedroches sector, exocontact batholite, PBT: Los Pedroches sector, inner batholite occurrences, AAC: Alcuía-Almadén-Castuera). In colour in the electronic version.

asl). That this site is at a distance from this drove-way is relevant, as warrior stelae have been traditionally interpreted as territorial markers mainly due to the proximity of some of them to medieval drove-ways (Ruiz-Gálvez & Galán 1991). This is not fulfilled in this case not only because the rock art panel is found 2.5 km away from the drove-way, but also because the carvings were located on an horizontal panel and, therefore, were only visible from a short distance.

The fact that AT 8 seems to be 'hidden' from these two main paths (to Guadiana River and drove-way) does not mean that the site was isolated. On the contrary, this fact highlights the sacred (and perhaps restricted) nature of these sites with warrior iconography, while their relative proximity to key communication

routes (fluvial or terrestrial) at a macro-scale is very important to understand them from a global perspective. This is reinforced by the site of AT 21, which holds a warrior-related iconography composed of shields, swords, archers' bracers, and other icons carved without apparent order and with some superimpositions, on a slightly inclined levelled surface of a rock outcrop located on top of a hill commanding views over the Tamujoso valley (Annex SF1).

Similar to AT 8, the stela (or menhir) of CR was found right by the Cagancha River, a tributary of the Ortigas River, which flows into the Guadiana. If we accept the hypothesis proposed by Jiménez Ávila (2009) about its original setting on a small (perhaps mortuary) mound, the stela would have stood out in the surround-

ing landscape (Annex SF2). Landscape reconstruction indicates that the surroundings of CR were heavily deforested during the Early Iron Age (from c. 7<sup>th</sup> century BC), possibly as a result of intensive agricultural activity (López *et al.* 2005: 396-98). This may have been preceded by a rather open *dehesa* landscape composed primarily of *Quercus t. perennifolio*, similar to that attested in the orientalized site of La Mata, c. 25 km north of CR (Grau *et al.* 1998). Either way, the CR stela and its mound would have been visible for those travelling along the bottom of the valley, especially if it was originally part of a group of stelae (and perhaps related mounds) as the nearby stela of Quintana de la Serena suggests. Nonetheless, prominent paths, such as the Cañada Real Leonesa Oriental, only cut across this valley further north (c. 3 km).

The highest concentration of warrior stelae in Iberia is found in the Zújar valley, one of the few areas where abundant resources of both tin and copper are found jointly (Fig. 7). AT and CR have copper and/or tin resources within 5-9 km distances, as well as evidence of prehistoric mining slightly further away. Stone hammers and superficial trenches were found in the Lomo del Perro and Miraflores mines (both with argentiferous galena and malachite, the first also with chalcopyrite mineralizations), which are c. 20-26 km away from CR and Quintana de la Serena (Domergue 1987: 32-33; Hunt 2003: 129-131, see also Pavón *et al.* 2018 for two newly discovered mines in the region with open trenches and grooved stone hammers). Added to the mining evidence, some metalwork has been documented in La Serena, as well as some settlements, all on the top of hills, although knowledge of these is very limited (Pavón *et al.* 2018). Prominent among the metal artefacts found in the region are the Huelva-type bronze sword of Almorchón, found in the vicinity of the castle of Almorchón in Cabeza del Buey, and the Sagradas-Berzocana Nordic-style golden torcs of Castuera and Orellana, the latter found in the Guadiana River ford of Orellana (Pavón *et al.* 2018; Enríquez 2017).

The Zújar valley is an important corridor connecting (via several ford crossings across the Guadiana) various copper and tin-rich areas of the Central Iberian Zone mining district, that is, the Middle Tagus valley area, with Los Pedroches/ La Alcudia to the southeast of the Zújar (Fig. 7) (see also Hunt 2003), where the copper employed in manufacturing some Huelva-type swords from the eponymous hoard can be sourced (Montero *et al.* 2007), as well as some metal artefacts from southern Scandinavia (Ling *et al.* 2014, 2019). Furthermore, it is precisely through the lower and upper Zújar that both navigable sections of the Guadiana River and, via the Guadiato, the Guadalquivir River could be reached from these metal-rich regions. This

is quite important, as the lower Guadalquivir and the lower Guadiana Rivers played pivotal roles in articulating long-distance contacts between communities and their mining activities in the Iberian interior and the wider Atlantic and the Mediterranean regions (the middle/lower Tagus played a comparable role, see Vilaça & Cardoso 2017). Because of some very strong commonalities between the rock carvings on specific Iberian warrior stelae and Scandinavian rock art (Ling & Koch 2018), and the geographic distribution of the former, we believe that contacts with Scandinavia could have taken place, directly or indirectly through Ireland/Britain/France (MacWhite 1951; Ling & Koch 2018), primarily via the lower Tagus, Guadiana and Guadalquivir valleys, but also through the lower Douro and Miño valleys and the Lower Rias further north. It should be noted that the Guadiana River poses more challenges for navigation than the Guadalquivir or the Tagus Rivers due to the waterfall called Pulo do Lobo. Evidence from the Roman period indicates that communication between the middle and lower Guadiana could have unfolded through ‘interrupted’ navigation (*e. g.* Álvarez Martínez 2015). The type of boats that existed in Europe during the Late Bronze Age allowed this kind of fluvial navigation (see ethnographic analogies such as the Haida on the Northwest Coast of North America, see also von Arbin & Lindberg 2017; van der Noort 2011).

## 6. DISCUSSION AND CONCLUSIONS

The case studies exemplify very neatly how warrior ideals, which had ‘global’ circulation in Europe during the LBA, were appropriated by local communities in Iberia. As noted above, warrior stelae are found in areas of inner Iberia where resources of tin and copper are abundant and with relatively easy access to the Atlantic seaboard through the navigable stretches of major rivers (Fig. 7). In this context it is important to consider the parallelisms between Iberian LBA warrior stelae and Scandinavian rock art (the southern tradition). These include, amongst others, strong formal similarities between chariot depictions in both traditions (Fig. 8)<sup>4</sup>, as well as the parallelism between the shields rep-

<sup>4</sup> There are almost two hundred wheeled vehicles recorded in Scandinavian rock art, 92 of which are two-wheeled chariots, similar (and broadly contemporary) to those depicted in Iberian warrior stelae (Johannsen 2010: 160-171; see also Swedish Rock Art Archives (<https://www.shfa.se/?lang=en-GB>, accessed August 21, 2022)). The parallelisms in the conventions used to represent chariots in both traditions is very significant, and also quite fundamental to the idea of the circulation of knowledge. We do not claim that chariots or the idea of them came to Iberia from Scandinavia but we believe that these similarities in the selection of chariots and their representation using similar conventions provide a

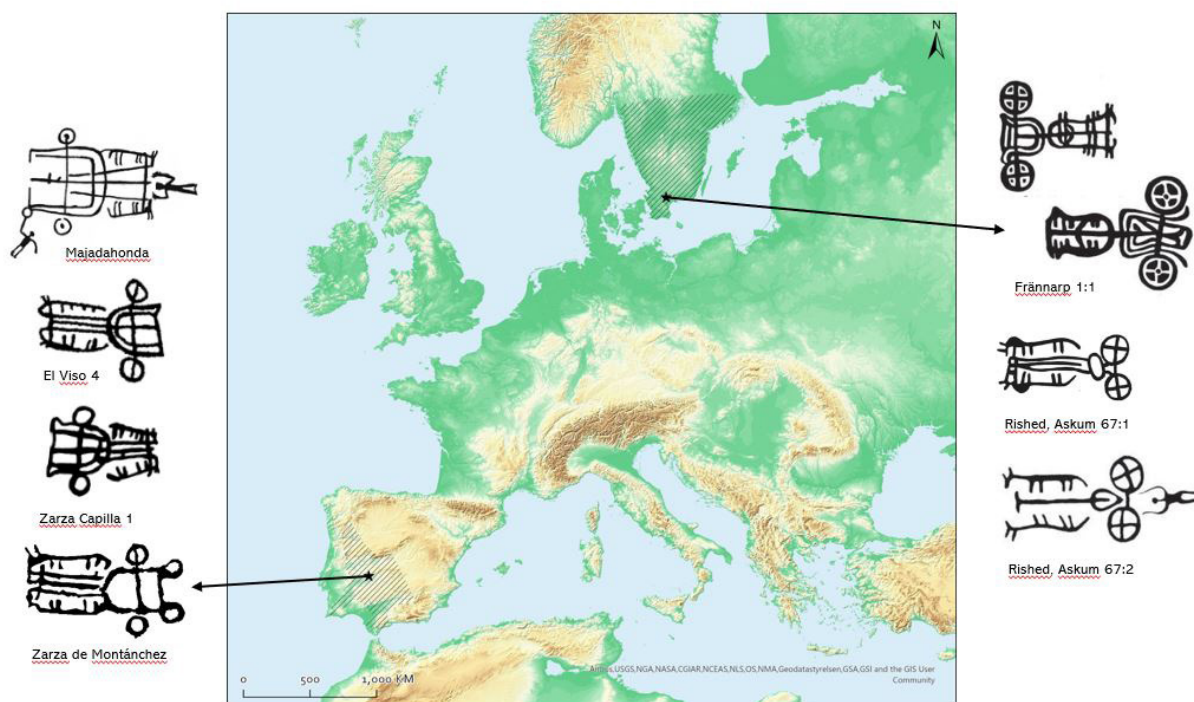


Fig. 8. Distribution of chariot images in Scandinavian rock art (southern tradition) and Iberian warrior stelae, with indication of some examples. Iberian examples measure between 35-45 cm in length, while the Scandinavian ones between 31-75 cm. In colour in the electronic version.

resented on Iberian warrior stelae and the shields found in other regions, mainly in the eastern Mediterranean and in northwest Europe, including Scandinavia (Harrison 2004; Ling & Koch 2018). Other images such as the mirrors may point to shared notions of personhood (Treherne 1995) which are exemplified in Scandinavia, for example, with razors for burials that also occasionally occur in rock art, for instance in Lövsäsen.

Whilst AT 8 and CR lack motifs like chariots or v-notched shields, they reproduce some of the most typical features of the tradition of warrior stelae, *i. e.* schematic human figures accompanied by a shield, a sword and a spear. These are key traits of the warrior ideal that circulated across Europe, including Scandinavia, which are here organized reproducing a composition that is highly standardized and can be found across the whole area of distribution of warrior stelae in Iberia (Fig. 7). The striking characteristic of these two particular cases is that they appear on typically local or traditional ‘canvases’ or contexts, that is, rock art and a menhir (Díaz-Guardamino 2010).

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relevant line of evidence for understanding the broader background and the connections of southwest Iberia with the Atlantic.

AT 8 reiterates the link between warrior stelae and regional rock art traditions (Galán 2011), which can be carved, as in this case, or painted, as can be seen at the site ‘II Milenio’, La Serena (Pavón *et al.* 2018). In both these cases there is a thematic similarity with traditional warrior stelae but, from a technological and a landscape perspective, it is the sites of AT that sit closer to the stela tradition. They are made with pecking, a technique that is widely documented on the warrior stelae of the Guadiana basin (Enríquez & Fernández 2010), and are close to water, especially AT 8, similarly to the depictions of LBA weapons (swords and v-notched shield) documented on outcrops by the Tagus River, at Cachão do Algarve, which are also pecked (Gomes 2011: 186-192).

The landscape settings of these rock art sites can be interpreted as places of activities of exclusive groups and the transmission of specialist knowledge and traditions, as it has been proposed for the bulk of Scandinavian rock art (Ling *et al.* 2018). In Iberia, stelae and rock carvings were monuments that referred to existing ancestor/hero cults and traditions rooted in earlier BA traditions and beyond (Díaz-Guardamino 2010, 2021; Bueno *et al.* 2019), which has also been proposed for the Scandinavian material (Horn 2019). The reuse of a

megalithic standing stone at CR can be seen as an act of appropriation of an ancestral monument or site of much earlier significance, similarly to what is documented in Magacela, found c. 27 km to the North, or other cases in which older menhirs or statue-menhirs are reused for displaying typical warrior stelae iconographies (*e. g.* Díaz-Guardamino 2010: 336, 2021). Finally, the close connection of AT 8 to water, its setting on a horizontal surface and orientation towards the sunrise, suggests its association with the mortuary realm (*c. p.* Bradley 2000), a theme that is expressed by Iberian warrior stelae (Díaz-Guardamino 2014). Their imagery often includes the body of the deceased surrounded by their ‘warrior’ paraphernalia, as if these scenes were re-enacting the grave. The monuments themselves appear in regions where funerary contexts are scarce, and, where associated burials occur, they do not contain weaponry (Díaz-Guardamino 2014). Similar to other Atlantic regions, metallic weapons in some parts of Iberia tend to appear in hoards and watery contexts (Bradley 1998; Ruiz-Gálvez 1998) but rarely in the areas where the warrior stelae are found (Díaz-Guardamino 2010: 361-362). Metalwork and rock art also seem to concentrate in different regions of Scandinavia (Malmer 1981; Ling 2014). In this context one may ponder whether stelae stood for elements (bodies, objects, relations) that had been transformed through ritual practice. This is supported by a warrior stela from Setefilla, which appeared close to cremated remains in urns without metal, as part of LBA mortuary rituals (Díaz-Guardamino *et al.* 2019). Stelae could have acted as mnemonic inscriptions, materializations of a warrior persona in a liminal state (burial) before it was ‘deconstructed’ through ritual practice (*i. e.* through cremation, fragmentation, distribution and exchange of items, etc.).

CR and AT 8 exemplify how, at a local level, stelae or rock art with warrior iconography are frequently closely related to water sources that are available throughout the year, this can be significant in La Serena region, where many watercourses frequently run dry in the summer. There was *dehesa* landscape, not much tree density around CR during the LBA. These sites are not particularly prominent in the landscape but they seem linked to symbolically changed places, places of special significance, as documented in other places with stelae (Díaz-Guardamino *et al.* 2019, 2020). The sites are close to sources of copper and tin with evidence of prehistoric mining activity. The Zújar basin was a corridor of intense cultural and economic activity connecting metal-rich regions and the wider Atlantic and Mediterranean spheres through the navigable middle-lower Guadalquivir and Guadiana basins. It is also the locale with the highest density of warrior stelae. The prevalence of carved chariots, shields shaped as concentric circles, as well as other motifs such as

mirrors reflecting widespread BA phenomena is also consistent with a region vitally connected to long-distance networks. There are other elements to be seen as potentially inspired, in part at least, by contacts specifically with Northwest Europe, such as the Sagrajas-Berzocana torcs.

The parallelisms between warrior stelae and Scandinavian rock art gain more significance when considered within a broader context of long-distance exchange recently revealed through evidence that amber from the Baltic reached Iberia during the LBA (Vilaça *et al.* 2002; Murillo & Martínón 2012; Murillo-Barroso *et al.* 2018). These authors consider the so-called ‘amber route’ and Mediterranean networks as the most probable paths for the introduction of Baltic amber in Iberia but it is important to note that all but one of the 6 LBA samples analysed come from contexts located in western and southwestern Iberia, and that these contexts can contain items that are linked to the Mediterranean *and* the Atlantic world (*e. g.* ‘hoard’ of Nossa Senhora da Guia in Baiões, see Vilaça *et al.* 2002).

Additionally, lead isotope and chemical analysis of Scandinavian and British bronzes indicated that copper with an isotopic signature matching southern Iberian ores (most probably the Alcuía valley and the Ossa Morena region) was used to manufacture artefacts from around 1400 BC (Period II, 1500-1300 BC), but more intensely in Periods IV and V (1100-700 BC) including swords and shields (Ling *et al.* 2014: 121-129, 2019). Thus, we must therefore consider an Atlantic route that connected the terminus zones of Atlantic Europe, Iberia and Scandinavia (Ling & Uhnér 2014) in addition to the aforementioned ‘amber route’ (see also Vandkilde *et al.* 2022).

In this context of involvement of local communities in long-distance connections, also attested by artefacts that can be related to other areas of Europe and the Mediterranean (Harrison 2004), it is not surprising to find warrior iconographies in interior regions which are depicting motifs and compositions that are broadly shared, not only within Iberia but also beyond, as far away as the Aegean or Nordic Europe (Vandkilde *et al.* 2022). But, as the case studies illustrate, as well as local communities’ involvement in the extraction and circulation of metals (Senna-Martínez *et al.* 2011), and probably other resources, they were actively involved in the appropriation and reinterpretation of ideas and objects that had broad circulation (Vilaça 2013: 22), such as the warrior archetype and related gear. This appropriation entailed the mixing of a variety of iconic images and concepts of diverse origins (*e. g.* Scandinavia, Central Europe, the Aegean), reaching Iberia through long-distance exchange networks, and their material expression using places, materials, techniques and genres with long-standing tradition in Iberia, such as rock art and

various categories of stone monuments (*i. e.* menhirs, statues, stelae).

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## ANNEX: SUPPLEMENTARY FILES

The electronic version of this paper, which is available on the website of the journal, includes two annexes with the following contents:

Annex SF1: Landscape setting of the rock art sites of Arroyo Tamujoso 8 and 21 with indication of the Cañada Real Leonesa (discontinuous line). Visibility of both locations from their surrounding landscape (cell size: 2 × 2 m). Tracings of Arroyo Tamujoso 8 and 21 made with raking light by Domínguez and Aldecoa, 2007.

Annex SF2: Landscape setting of the findspots of the Cancho Roano and the Quintana de la Serena stelae (the location of the Quintana de la Serena stela is approximate) with indication of the Cañada Real Leonesa (discontinuous line). Visibility of both locations from their surroundings (cell size: 5 × 5 m).

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