

The Engraved Slate Plaques of Late Neolithic and Copper Age Iberia: A Statistical Evaluation of the Genealogical Hypothesis

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The engraved slate plaques were part of an extensive and variable class of ritual objects in Late Neolithic and Copper Age Iberia, with Classic plaques being the most numerous and standardized type. Classic plaques have a top and base separated by a horizontal line or bands, and base registers of repeating design elements (triangles, checkerboard, etc.). Associated with burials, they have been interpreted as genealogical records, with their base design referencing a clan or other social unit and their number of registers denoting the generational distance of the deceased from an important ancestor. The authors evaluate the genealogical hypothesis using a larger dataset than available when originally proposed, employing statistical analyses to examine the relationship between the number of registers and find locations, and between design elements and tomb size. Tomb size is viewed as a measure of collective labour, and hence a proxy of the status of the individuals in the tomb. These analyses show significant patterning between the number of registers and the plaques' geographic distribution, and between specific design elements and tomb size, suggesting that the genealogical hypothesis remains a plausible explanation for the Classic plaques.

Keywords: Iberian Peninsula, Late Neolithic, Copper Age, engraved slate plaques, genealogy, memory

INTRODUCTION

The engraved stone plaques of Late Neolithic and Copper Age Iberia (3200–2200 BC), with their delicately incised geometric designs and ‘eyes’ that occasionally peer out from them, have enchanted prehistorians since the 1800s. The Portuguese prehistorian and medical doctor Augusto Filipe Simões (1835–1884)

wondered whether they might be ‘amulets or insignias or emblems or cult objects’ (Simões, 1878: 53). Recently, the plaques and other idol-like objects were the focus of the international exhibition *Mobile Images of Ancestral Bodies: A Millennium-Long Perspective from Iberia to Europe* (Bueno Ramírez & Soler Díaz, 2021). The plaques’ aesthetic and intellectual appeal is enduring.

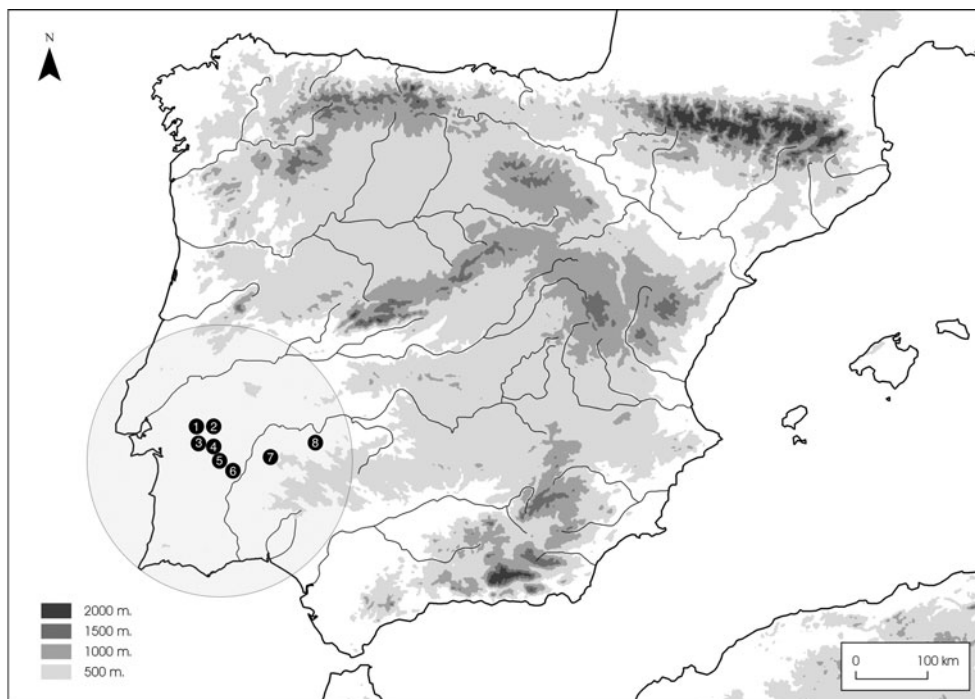


Figure 1. Distribution of engraved plaques and key sites mentioned in text. 1: Comenda da Igreja; 2: Freixa; 3: Escoural; 4: Anta Grande do Zambujeiro; 5: Perdigões; 6: Cebolinho 1; 7: Barcarrota; 8: Pijotilla.

Typically found as grave goods in tombs in south-western Iberia (Figure 1), the plaques are hand-sized objects (150 mm) most often made from slate. They are primarily found in southern Portugal but also known in south-western Spain. In rare occasions, they are found in settlements (Andrade et al., 2015). More than 1800 plaques from over 300 sites have been incorporated in the Engraved Stone Plaque Registry and Inquiry Tool (ESPRIT) online database (<https://iberian.its.uiowa.edu>; Lillios, 2021), which is updated as plaques are excavated, published, or otherwise made known. At the time of writing, ESPRIT contained records for 1826 plaques.

The plaques participated in the social world of Late Neolithic and Copper Age agrarian communities who lived in fortified settlements, aggregated in ditched

enclosures, and constructed monumental collective tombs for their dead (Lillios, 2008). These communities maintained long-distance trade connections within Iberia as well as with people in North Africa, western Europe, and the central Mediterranean. They crafted diverse objects in clay, stone, copper, and gold, some likely produced by specialists. The presence of exotic and finely crafted goods, variability in type and scale of mortuary architecture, and differential forms of treating the dead suggest that some form of social ranking existed. The clearest evidence comes from the opulent graves at Valencina de la Concepción (Sevilla, Spain). There, at the Montelirio tholos, at least fifteen females (or likely females) were found covered in cinnabar and with ivory and amber objects, rock crystal arrowheads, and hundreds of thousands of

beads that were once part of robes (Fernández Flores et al., 2016). Near the tholos, the so-called Ivory Lady was found with, among many items, an African elephant tusk (Cintas-Peña et al., 2023). No plaques were found at Montelirio, so if plaques were markers of social identity or esteem, they were not the only objects that did so.

For this period in Iberia, archaeologists debate the degree of ranking of individuals, families, or lineages, whether they experienced differential access to food, other important resources, or power, and how social distinctions were perpetuated. In bioarchaeological studies carried out by Díaz-Zorita (2017), differences were found between the health status and diet between individuals interred in megaliths and those in non-megalithic structures. She found that people buried in megaliths consumed more protein than those in non-megalithic tombs. This may suggest that megaliths, with their high labour involvement, materialized certain elite identities. Thus, although many archaeologists view megaliths in Iberia as expressions of collectivism among groups without hierarchy, or at least hierarchies that did not translate into exploitation (Díaz-del-Río, 2021), the bioarchaeological data suggest that some groups or individuals may have distinguished themselves or experienced their social world with special privileges. And indeed, there may have been different social logics of hierarchy (achieved *vs* inherited status) at play in different regions or which changed over time. This article considers the role that the engraved plaques may have played in creating the social world of ancient Iberians.

Archaeologists have proposed numerous interpretations for the plaques' iconography and function. The most widely held idea, or at least the one with the greatest longevity, is that they represented a deity,

specifically a Mother Goddess (Gimbutas, 1991; Gonçalves, 1999; Andrade, 2015). A second is that they were images of ancestors (Bueno Ramírez, 2010). A third is that they were heraldic emblems for a class of the dead (Lisboa, 1985; Lillios, 2002, 2008). Recently, Negro et al. (2022) have proposed, using experimental studies, that the plaques were not primarily funerary offerings but rather the art of children who were representing owls. If, however, children had made these plaques, those plaques with owl-like imagery should be much more common, given that children tend to be the largest demographic in any society. In fact, owl-like plaques make up only about four per cent of all plaques. Given the scant evidence for this idea, it will not be considered further here.

The plaques were part of an extensive and variable class of objects made from bone, stone, ivory, and clay that ancient Iberians used in their ritual lives (Bueno Ramírez & Soler Díaz, 2021). There is no reason to think that all the plaques (or these ritual objects) had one function or meaning given their formal and spatial variability, long period of use (approximately 700 years), biographies that sometimes included modification, and the large area in which they are found, roughly 300 × 400 km, or 120,000 km². Eight types have been identified based on their form, composition, number of perforations, number of sides engraved, and design elements (Figure 2). An additional type shows signs of modification (recycled) and tends to be found in settlements (Gonçalves et al., 2003; Lillios, 2010). These recycled plaques are not included in our analyses since their original form or type is not always identifiable.

When closely associated with articulated skeletons, plaques are found on the chest or by the side of the body. The sex and/or age of associated individuals could only be

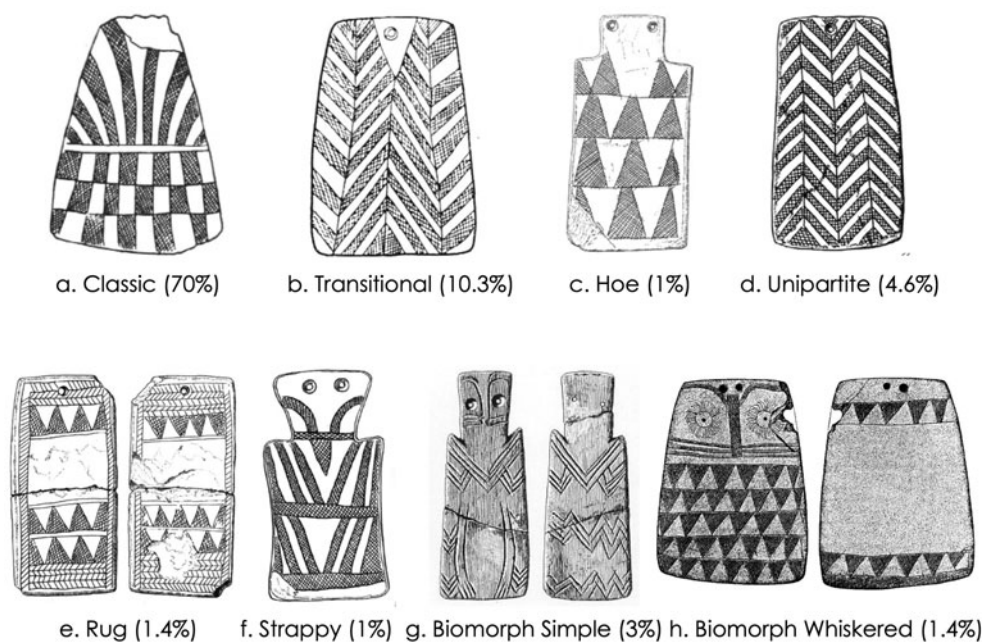


Figure 2. Plaque types and frequency. *a:* Cebolinho 1; *b:* Olival da Pega; *c:* Vega del Peso; *d:* Comenda da Igreja; *e:* Cueva da la Mora; *f:* Marquesa; *g:* Idanha-a-Nova; *h:* Valencina de la Concepción. Sources: a, b: Leisner & Leisner, 1951: pl. XXXIV, 16; pl. XXVIII, 29; c, d, e, f: Leisner & Leisner, 1959: pl. 53, 1, 4; pl. 27, 1, 66; pl. 53, 7, 11; pl. 4, 5, 8; g: Leisner, 1998: pl. 75, 2 [a-g: reproduced by permission of Deutsches Archäologisches Institut]; h: Fernández Gómez & Oliva Alonso, 1980: fig. 6, reproduced by permission of author.

determined in a few instances; in these cases, they were found with females and males (Table 1). Not all the dead were buried with a plaque. When the minimum number of individuals is known, it is almost always larger than the number of plaques. The tomb of Santa Margarida 3 (Gonçalves, 2003) is unusual in that it has almost the same number of plaques as individuals, with twenty-two plaques and an MNI of twenty-five (Gonçalves, 2004: 61). The plaques’ dating is challenging

given that they are often found in disturbed commingled contexts, and the soils in which most are found, in the Portuguese Alentejo, are acidic. The few dates of associated remains point to their use between 3200 and 2500 cal BC (Gonçalves, 2021). Since the Alentejo is also where the greatest variety of plaque types is found and has an abundance of slate outcrops, it seems reasonable to assume that plaque-making began there. Unfortunately, we know little about the

Table 1. Plaques found with sexed individuals.

Site	Sex/Age	ESPRIT No.	Reference
Monte Canelas (Faro, Portugal)	Female (45 yo)	871	Parreira, 2010
Porto Torrão (Beja, Portugal)	Female (‘young’)	1419	Santos et al., 2014: 76
Santa Margarida 3 (Évora, Portugal)	Female (40–45 yo)	1144	Gonçalves, 2003: 88–89
Cova das Lapas (Leiria, Portugal)	Male (<20 yo)	1805	Gonçalves, 2021

production of the plaques, other than at the Águas Frias site on the Guadiana River between Portugal and Spain, where, in 2003, plaque roughouts were found, some sketchily engraved and some finished (Gonçalves, 2013).

That only a minority of the plaques (4 per cent) have clear biomorphic traits, such as ‘eyes’ (or oculi) or a ‘nose’ (or ‘beak’), presents a challenge to the notion that all plaques represent a deity, such as a Mother Goddess. These plaques include the Biomorph Simple and Biomorph Whiskered types (Figure 2 g and h). The overwhelming majority (70 per cent) are of the Classic type—the focus of this article. Classic plaques have a ‘top’ and a ‘base’ separated by a horizontal line or bands (Figure 3). The bands are filled with

hachures or small triangles, or are unfilled. The top can have straps (horizontal or vertical) or other motifs, such as inverted ‘v’s, rays, and a collar. In rare cases ($n=10$), Classic plaques have ‘eyes’ or oculi (Figure 3g), like the Biomorph plaques. The base is typically decorated with six design motifs, which can be found on their own or in combination with other motifs, and are most often organized along horizontal registers. These motifs include triangles, checkerboard, vertical bands, chevrons, zigzags, and herringbone. That these motifs are all textile weaves may suggest that the plaques were inspired by clothing or other woven goods that have not survived, except in rare cases (Lillios, 2008: 131–33).

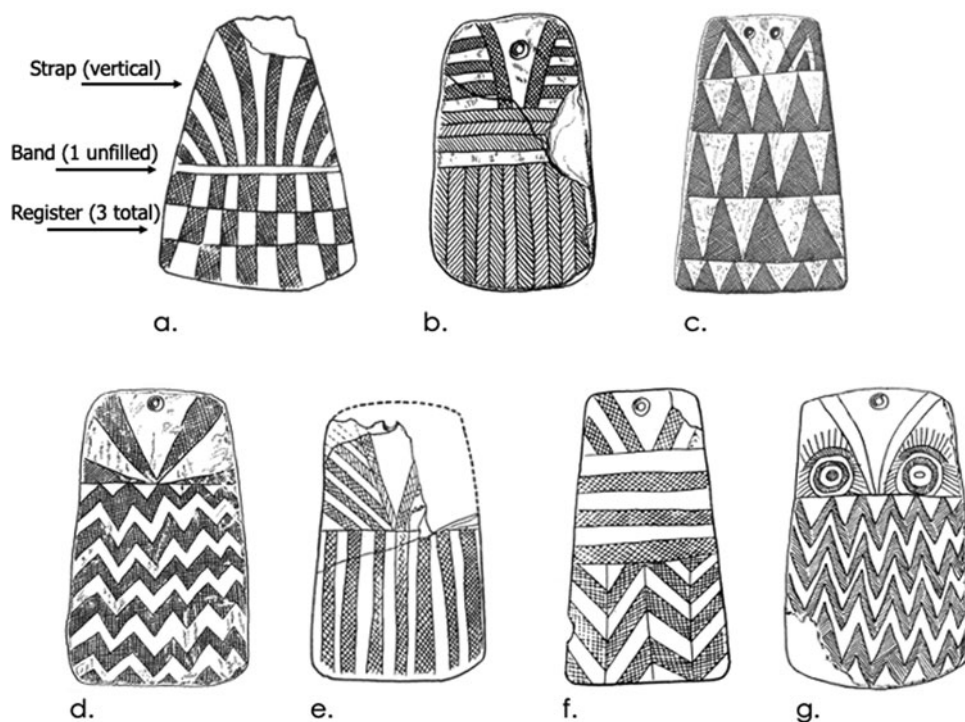


Figure 3. Classic plaques. a: Cebolinho 1; b: Santiago; c: Aljezur; d: Brissos 6; e: Comenda; f: Olival da Pega 1; g: Pessilgaís 2.

Sources: a, e, f: Leisner & Leisner, 1951: pl. XXXIV, 16; pl. XI, 72; pl. XXVIII, 37; b, d: Leisner & Leisner, 1959: pl. 34, 1, 3; pl. 22, 1, 36; c: Leisner, 1965: pl. 131, 52; g: Leisner & Leisner, 1969: pl. 7, 20, 1. Reproduced by permission of the Deutsches Archäologisches Institut.

Analyses of the formal organization of the Classic plaques, their spatial distribution, design, engraving style, formal and stylistic patterning by tomb, and other indicators of social differentiation, suggested they were genealogical records for a special class of the dead, or a kind of heraldry (Lillios, 2008). Given the available evidence, it seemed reasonable to suggest that they were a form of writing, namely semasiography, or writing without words (Boone & Mignolo, 1994), with the base design referencing a lineage or clan, and number of registers recording the genealogical distance separating the deceased from a founding ancestor. This was supported by preliminary studies showing that Classic plaques with a lower number of registers were more concentrated in the Alentejo (the likely 'birthplace' of the plaques and possibly the ancestral home of associated lineages or clans), while those with a higher number of registers were distributed over a wider area (as would be expected as later generations moved away from their homeland). Statistical analyses were not conducted then, and evidence pointing to the importance of the number of registers was qualitative. For example, on one plaque from Dolmen das Conchadas, there was an unfinished sketch on one side, and on the other completed side, a different number of registers, suggesting that the draft was an error that was corrected (Leisner and Leisner, 1965, Tafel 27, 64, ESPRIT #160). In other plaques, either ample space remained to create another register, but was not, or a register was tightly squeezed in. These design features indicated that qualitative and quantitative approaches to the plaques are needed.

While analyses that would definitively assess the genealogical model, such as aDNA, are not currently available for associated individuals, they could become possible through excavation and analysis of

sites with plaques with well-preserved skeletal remains. In the meantime, other proxy methods could provide possible insights. García Rivero and O'Brien (2014) tested the genealogical model using phylogenetics by analysing a sample of all plaque types—not only Classic plaques. They concluded that the plaques' formal patterning is more likely indicative of a south-western Iberian 'common ideological background' and rejected the genealogical hypothesis. This study, however, misunderstood the original hypothesis, which was proposed only for Classic plaques, and did not consider any of the plaques' qualitative features.

Given that the genealogical model was proposed over fifteen years ago and there are now nearly double the number of plaques in ESPRIT, this seems an opportune moment to evaluate whether the genealogical hypothesis can still be substantiated. To do so, we employ statistical methods. We pose two questions that assess the relationship between two variables—geography and tomb size—and two design components—the number of registers and number of bands:

- 1) Is there a statistically significant relationship between the number of registers of Classic plaques and their geographic distribution? This relationship had been addressed in an earlier study but with fewer plaques known at that time and without the use of statistics.
- 2) Is there a statistically significant relationship between the number of bands separating the top and base of a plaque and the size of the tomb in which that plaque was found? The number of bands was noted to be highly variable (with most plaques having no bands, and a few with many bands), so it seemed worth investigating whether bands may have marked some form of social identity or status. To assess this question, we selected tomb size as a

known and independent variable that could be viewed as a proxy for the social status of the dead or community that constructed the monument.

REGISTERS AND PLAQUE DISTRIBUTION

Classic plaques are characterized by a base organized by registers (most often horizontally) with iterations of geometric designs. That registers were an important design feature is suggested by qualitative evidence, including corrections and uneven spacing. For these reasons, the number of registers was recorded in ESPRIT. The Classic plaques analysed for this study are those with triangle ($n = 428$), chevron ($n = 102$), zigzag ($n = 79$), and checkerboard ($n = 48$) designs, totalling 657 plaques (see Supplementary Material: Table S1). For those with herringbone and vertical band designs, it was less evident how the registers should be counted; as these are also very rare design types (herringbone: $n = 11$; vertical bands: $n = 8$) that would be difficult to compare statistically to the other more common design types, they were not included in analyses.

If the registers of Classic plaques recorded genealogical information, we would expect to see a correlation between the number of registers, assuming this reflects a temporal dimension, and genealogical relationships. Specifically, we would expect to see: 1) fewer plaques with a low number of registers, with an increase in the number of plaques with more registers; and 2) plaques with low numbers of registers more tightly clustered in the Alentejo (their presumed area of origin) and those with higher numbers of registers more widely dispersed throughout south-western Iberia. Translated into human social behaviour, we would expect the number of people from earlier (older) generations of an important ancestor to be fewer and living (and buried) closely

together in the Alentejo, where the first plaques are most likely to have been made, and those of later generations to be more numerous and more widespread.

The relationship between the number of plaques and number of registers is indicated in Figure 4; these are shown aggregated and by each of the four design elements. As the plot shows, the number of plaques initially increases with the number of registers, but after a certain number of registers, the frequency of plaques decreases for all design types. This could be due to a lack of space on the plaques (it becomes increasingly difficult to make a plaque with more registers), represents what was considered an aesthetically pleasing design, or reflects the memory of genealogies (or their importance) decreasing over time. Alone, these results are not illuminating, but they are not inconsistent with a genealogical interpretation.

To assess the question of the Classic plaques' spatial distribution by register number, we used an unpaired two-samples Wilcoxon test to compare the means of register numbers of plaques from Évora *vs* plaques not from Évora (Hogg & Tanis, 2006). For this, we aggregated the Classic plaques by all four designs as well as looked at patterns by design element. Évora is the district in the Alentejo where the largest number of plaques was found and is generally accepted by archaeologists as the engraved plaques' 'heartland'. These two sample groups were roughly similar in size and, thus, could be analysed statistically.

The results of these analyses are shown in Table 2. In the case of the triangles, checkerboard, and zigzag designs, the plaques from Évora are likely to have smaller numbers of registers. For those with chevrons, the pattern is inversed (plaques from Évora have a higher mean number of registers than those outside Évora). Statistical significance was, however, only detected among the triangle

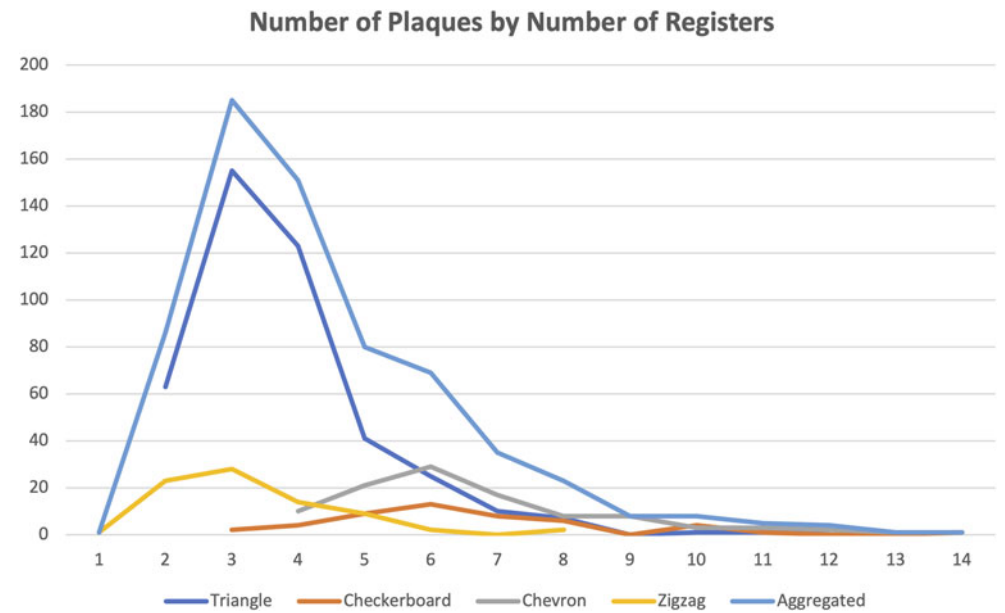


Figure 4. Number of plaques by number of registers.

plaques, as sample sizes were not sufficiently large for the other three designs.

The distribution of the plaques by register number (aggregated) can be seen in Supplementary Material: Figure S1. In this series of maps, the distribution of the plaques expands outward from a core region in Évora (and Beja, for a plaque with one

register) with increasing number of registers, and then shrinks again back to Évora.

These analyses, in combination, while not conclusive, support geographic patterning in the distribution of the Classic plaques by number of registers, which is consistent with them serving a role in genealogical (or temporal) reckoning.

Table 2. Mean number of registers.

	From Évora	Outside Évora	P-value from unpaired two-samples Wilcoxon test
Checkerboard	6.451 (n = 31)	6.867 (n = 15)	0.306
Chevron	6.551 (n = 69)	6.333 (n = 30)	0.701
Triangle	3.534 (n = 234)	4.0413 (n = 183)	<0.001*
Zigzag	3.133 (n = 60)	3.790 (n = 19)	0.12

* Significant p-value is labelled with an asterisk.

SITE SIZE AND PLAQUE DESIGN

In a further series of analyses, we examined internal design patterning among the Classic plaques in relationship to the contexts in which they were found. Communities of Late Neolithic and Copper Age Iberia housed their dead collectively in a range of contexts. These included dolmens (with or without corridors), tholoi (corbelled structures), hypogea (rock-cut tombs), caves, rockshelters, and pits associated with ditched enclosures. ESPRIT has records for plaques recovered from 303 sites (although the precise provenance of 32 sites, associated

with 143 plaques, is unknown, as they were published only with region or country information). Plaques of known (and relatively specific) provenance (n = 1683) have been found in all types of burial contexts and some settlements (Table 3). The vast majority were recovered in megaliths (dolmens and tholoi) (81.4 per cent).

Given the labour involved in construction—from quarrying stones to building the chamber and corridor (if there was one), transporting them to the construction site, erecting them, and covering them with rubble and earth—megaliths have long been viewed as expressions of investment and social hierarchy. The bigger the tomb, the more labour. How much labour could be mobilized may be related to demographic factors (how many people were available) and/or social and ideological factors (nature of leadership, religious beliefs). Renfrew (1983) posited that the enormous labour required for constructing monuments like Stonehenge, at thirty million person-hours, must have entailed the existence of a central authority, like a chief, although this view is no longer widely accepted. More recently, archaeologists have turned to energetics and task analyses to generate more nuanced understandings of the labour involved in building megaliths in Ethiopia (Zena, 2021) and Spain (Barrientos & García Sanjuán, 2021). It is generally recognized that monuments not only reflect a particular

social landscape or form of organizing labour but that they actively shaped that landscape and the identities of the people who engaged with them. Once a collective tomb was built, people would have visited it repeatedly to bury their (new) dead and would thus have interacted with the previous dead and their associated objects, triggering memories of the past and actions that sedimented histories and guided future actions. Although in this study we only consider megaliths (dolmens and tholoi), labour was certainly also involved in carving rock-cut tombs (hypogea). Given the difficulty in comparing the labour associated with carving hypogea to that of erecting megaliths, and the rarity of plaques in hypogea (5.8 per cent), we do not include hypogea (nor caves, rockshelters, or tumuli) in this analysis. It should also be noted that the stones of megalithic structures were sometimes moved during the site’s use, i.e. their size could have changed over the monument’s life.

To explore megalith size as a proxy for the status of the individuals buried within them (and by inference, the function of the plaques associated with them), we compiled information on the sites’ size. The monographs of Georg and Vera Leisner were important sources (Leisner & Leisner, 1943, 1951, 1956, 1959; Leisner, 1965, 1998), as was the doctoral dissertation of Leonor Rocha (2005), who studied

Table 3. *Frequency of sites and plaques, by site type.*

	No. of sites	No. of plaques	% of sites	% of plaques
Burial: dolmen	206	1232	76.0	73.2
Burial: tholos	10	138	3.7	8.2
Burial: cave/rockshelter	18	185	6.6	11.0
Burial: hypogeum	17	98	6.3	5.8
Settlement	15	23	5.5	1.4
Burial: tumulus	3	5	1.1	0.3
Ditched enclosure	2	2	0.7	0.1
	271	1683	99.9	100

megaliths in the Alentejo excavated by Manuel Heleno (1894–1970). In general, three measurements were reported: chamber diameter, corridor length, and chamber height. Since not all megaliths are passage graves and therefore do not all have corridors, corridor length could not be used for comparison. Of the remaining two measurements, more tombs had their chamber diameter reported ($n = 117$) than their height ($n = 71$) (see Supplementary Material: Table S2). Chamber sizes range from 1 m^2 at Amieiro 5 (Cardoso et al., 2003) to 36 m^2 at Anta Grande do Zambujeiro (Soares & Silva, 2010). Chamber heights range from 0.7 m at Monte da Velha 2 (Soares & Arnaud, 1984) to 5 m at Anta Grande do Zambujeiro (Soares & Silva, 2010). To maximize the number of sites that could be compared for this study, and because chamber height is a strong indicator of labour (the taller and hence probably the heavier the stone to achieve the chamber's height, the more labour involved), we first confirmed the correlation between chamber height and chamber size. Since chambers are more accurately described as polygonal than perfect circles, chamber size was calculated as an area (by multiplying the dimensions of the two axes reported, if different, or by squaring the diameter). It was assumed that if a correlation were found between chamber area and height, chamber area could be used as a proxy for labour and to compare the labour involved in the tombs' construction. Using Pearson's product-moment correlation test, we indeed found a significant correlation between chamber size and chamber height ($p < 0.001$; correlation coefficient = 0.54). With this knowledge, we were able to generate a dataset of 117 tombs with known areas. Using a boxplot, five tombs were recognized as outliers, or particularly large tombs: Olival da Pega 1 (22.4 m^2), Boiça 1 (26.5 m^2), Escoural (36 m^2), Vale de

Rodrigo 1 (36 m^2), and Anta Grande do Zambujeiro (36 m^2).

What would mobilize a community to build such enormous tombs as Anta Grande do Zambujeiro? When a biographical approach is taken to site histories, it often becomes apparent that labour-intensive monuments were often constructed in persistent places, i.e. those that already had a sacred or special quality (Schlanger, 1992). This seems to have been the case at Stonehenge (Jacques et al., 2017) and is likely for the largest of the Iberian megaliths. Geoarchaeological studies have shown that some of the stones used to build Iberian monuments originated some distance from the tomb, ranging from a few hundred metres to twenty kilometres (Kalb, 1996, 2011; Lozano et al., 2014; Boaventura et al., 2020). Thus, in its early career, tomb size would have been a variable dependent on the sacredness of the space and available labour. Once built, the sacredness or potency of the tomb would have accrued as more people were buried and the site increased in mnemonic density (Lillios, 2015). Particularly large and sacred tombs would have become the preferred resting places for elites, and by virtue of their size they were also able to house larger numbers of the dead. Perhaps not surprisingly, there is a positive correlation between the size of a tomb and the number of plaques found in it (using Spearman's rank-order correlation test; $p = 0.014$). Thus tomb size can be viewed as both a dependent variable (in the tomb's early history) as well as an independent variable, once the monument was built.

TOMB SIZE, BANDS, AND COLLARS

Turning to the relationship between some of the design elements of Classic plaques, if these plaques were simply part of a shared

iconographic system among communities in south-western Iberia (as García Rivero & O'Brien, 2014 suggested), there should be no correlation between their designs and labour proxies, such as tomb size. In our study, we assessed this hypothesis.

A key feature of Classic plaques is the separation between the top and base fields by either a horizontal line or a set of bands, which can be un-hachured and/or hachured (or filled with tiny triangles). As Table 4 shows, most have no bands and just a horizontal line (69 per cent; $n = 594$), while another twenty per cent ($n = 175$) have one band (either un-hachured or hachured). The maximum number of bands is fourteen. To see if there is a relationship between the number of bands and tomb size, a Spearman's rank-order correlation test was applied, because the numbers of bands in the sample are not normally distributed. The results indicate a significant positive correlation between the two variables (correlation coefficient = 0.14, p -value < 0.001), although the correlation is relatively weak. The highest

number of bands was on a plaque from Anta Grande do Zambujeiro (Figure 5a), one of the largest tombs in Iberia. Two other plaques from Anta Grande were in the 'top ten' of those plaques with the largest number of bands (one has ten bands, another has seven) (Figure 5c and 5g). Other plaques with numerous bands (i.e. more than seven) come from Escoural (Figure 5d), another extraordinarily large tomb with one of the greatest number of plaques found (at least ninety), and the very large tomb of Comenda da Igreja (21.6 m^2) with a plaque featuring seven bands (Figure 5i). Two others come from the ditched enclosures of Perdigões and Pijotilla (Figure 5b and 5e), which have been considered special aggregation places with a cosmological significance (Valera et al., 2020). The remaining 'top ten' with large numbers of bands include one from Cebolinho 1 (16 m^2 ; seven bands) (Figure 5f) and Freixa (11.25 m^2 ; seven bands) (Figure 5h). The size of Barcarrota, which yielded a plaque with seven bands (Figure 5j), could not be determined.

Another intriguing pattern is that all those plaques with high numbers of bands (seven or more) have a collar. However, collars are generally rare in Classic plaques (18 per cent). To assess whether band number and chamber area are significant predictors of the presence of a collar, a logistic regression model was used. The presence of a collar was the response variable, while the number of bands and the size of the chamber area were the explanatory variables (Supplementary Material: Table S3). The results show a significant positive correlation (correlation coefficient = 0.631) between the number of bands and the presence of a collar, meaning that plaques with more bands are more likely to have a collar. Such a correlation was noted in earlier analyses using a smaller dataset (Lillios, 2008: 164). On the other hand, there does not seem to be a

Table 4. Frequency of Classic plaques by number of bands.

No. of bands	No. of plaques
14	1
13	0
12	0
11	0
10	2
9	2
8	0
7	5
6	5
5	11
4	7
3	12
2	49
1	175
0	594

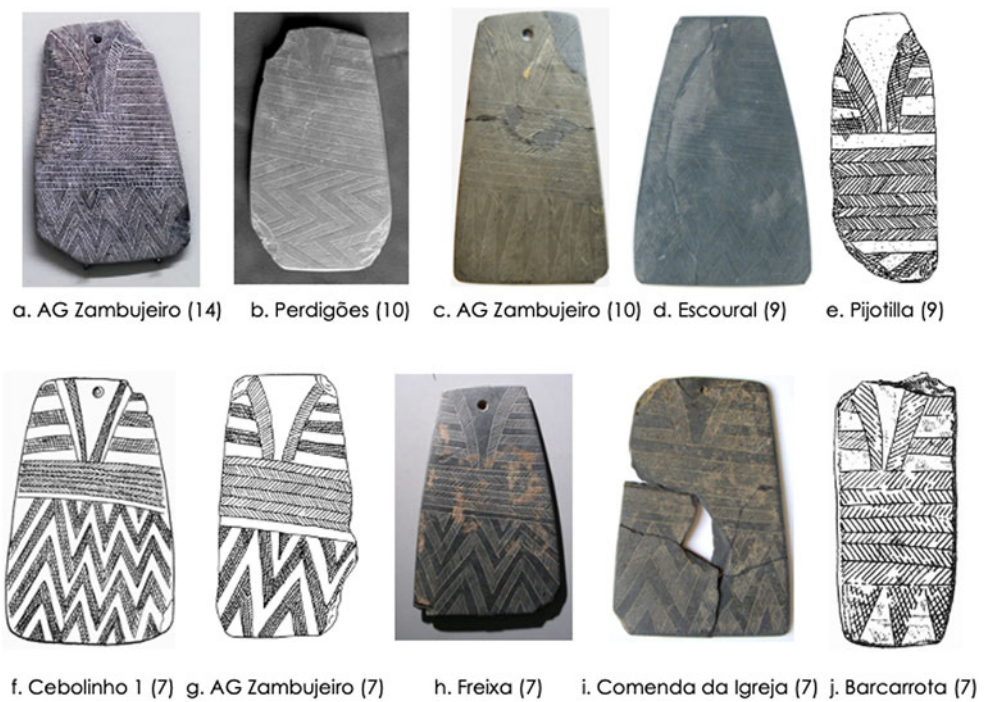


Figure 5. Classic plaques with seven or more bands. a: Anta Grande do Zambujeiro; b: Perdigões; c: Anta Grande do Zambujeiro; d: Escoural; e: La Pijotilla 2; f: Cebolinho 1; g: Anta Grande do Zambujeiro; h: Freixa; i: Comenda da Igreja; j: Barcarrota.

Sources: a: photograph by Eduardo Estellez/Adobe Stock, b: photograph by K. Lillios, photograph by permission of Antonio Valera; c: <http://www.matriznet.dgpc.pt/MatrizNet/Objectos/ObjectosConsultar.aspx?IdReg=1038032>; Reproduced by permission of Museus e Monumentos de Portugal, E.P.E. d: <http://www.matriznet.dgpc.pt/MatrizNet/Objectos/ObjectosConsultar.aspx?IdReg=128935>; Reproduced by permission of Museus e Monumentos de Portugal, E.P.E.; e: Hurtado Pérez, 1979, photograph by permission of V. Hurtado; f: Leisner & Leisner, 1951: pl. XXXIV, 15; reproduced by permission of Deutsches Archäologisches Institut; g: Gut, 1990, vol. I, pl. 6b; Reproduced by permission of Deutsches Archäologisches Institut; h: <http://www.matriznet.dgpc.pt/MatrizNet/Objectos/ObjectosConsultar.aspx?IdReg=140479>; Reproduced by permission of Museus e Monumentos de Portugal, E.P.E.i: photograph by K. Lillios, courtesy of Museu Nacional de Arqueologia; j: Leisner & Leisner, 1959: pl. 52, 11, 12; reproduced by permission of Deutsches Archäologisches Institut

significant relationship between chamber area and the presence of a collar.

It was also noted that almost all plaques with large numbers of bands (and a collar) had a zigzag base design. A logistic regression model using the presence of zigzag design as the response variable and band number and the presence of a collar as explanatory variables (Table 5) indicate that there is a significant positive correlation between the number of bands and the odds of having a zigzag base design.

Given that Classic plaques with a zigzag design and numerous bands tend to be found in the largest tombs, and that

Table 5. Results of the logistic regression of presence of zigzag design.

	Estimate	p-value
Intercept	-2.21	<0.01*
Band number	0.23	<0.01*
Presence of a collar	-0.06	0.86

* Significant p-values are labelled with an asterisk.

collars are strongly correlated with high band numbers, plaques with both a collar and many bands appear to have been markers of elite individuals. What these designs represent is not at all clear. It may be that the zigzag marked a special lineage or clan (religious specialists?). It may be relevant that a fairly large percentage (37 per cent) of the Biomorph Simple plaques (often viewed by scholars as deities, owls, or hybrid beings) also bear a zigzag design.

DISCUSSION AND CONCLUSION

Our work reassesses the genealogical hypothesis for the Classic plaques using a series of statistical analyses to evaluate whether significant patterning exists among their design, their geographic distribution, and the size of the tombs in which they were found. Our study indicates a positive relationship between tomb size and the presence of plaques with high numbers of bands. There is also a relationship between the number of bands, the presence of a collar, and the base design. What the bands and collars specifically denote is, however, unclear. Perhaps bands recorded the number of children, territorial claims, military conquests, or something else considered remarkable enough for Late Neolithic and Copper Age people to record on that plaque (and the person associated with it).

One design element we have not yet discussed are the straps on Classic plaques (Figure 3), which can be horizontal or vertical. For the two Classic plaques with sexed individuals, the one with horizontal straps (from Cova das Lapas) was found with a young male, while the one with vertical straps (from Monte Canelas) accompanied a female (Table 1). Neither site was included in the analyses discussed above, as Cova das Lapas is a cave and Monte Canelas is a hypogeum. The other

two plaques with sexed individuals are a Biomorph plaque (from Porto Torrão, with a female) and one too fragmented to assign to a type (from Santa Margarida 3, with a female). An intriguing possibility is that the straps on Classic plaques indicate biological sex (horizontal = male; vertical = female), especially given the similarity of the plaques' designs with textile weaves and the highly gendered nature of clothing. This proposition clearly requires further investigation with a much larger sample of sexed individuals.

Within our hypothesis, there are four possible interpretations of the Classic plaques: 1) they were *definitely not* genealogical records; 2) they were *possibly* genealogical records; 3) they were *likely* to have been genealogical records; and 4) they were *definitely* genealogical records. Their formal patterning, which is not random nor simply the outcome of a shared iconographic template, rules out the first interpretation. Given the absence of aDNA linked to individuals with plaques, it is not possible to assess the fourth option. With currently available evidence, which supports statistically non-random associations between the plaques' designs and their spatial distribution, the third interpretation, that they were likely to have been genealogical records, is our best explanation for Classic plaques.

If Classic plaques communicated specific information about the identity of certain individuals, they would be some of the oldest form of known writing or recording systems in the world, as they are contemporary with early Mesopotamian writing, although some work suggests that proto-writing systems existed as early as the Upper Palaeolithic (Bacon et al., 2023). As a means to record kinship, the engraved plaques may have been a textual component of the ideological arsenal used to legitimize the status and attendant social privileges of individuals or kin groups in the Iberian

Late Neolithic and Copper Age and to perpetuate these over time.

The end of the era of the Iberian plaques was ushered in by the emergence and dispersal of the so-called Beaker culture (Olalde et al., 2019). Intriguingly, all the geometric motifs of the engraved plaques are found on Iberian Bell Beakers. Perhaps the memories of clan histories persisted through the late third and early second millennia BC in Iberia, although reconfigured in new media. The engraved plaques appear to us to be the experiments of ancient Iberians in recording histories. If they were a form of writing, they could be viewed as another nail in the coffin of 'prehistory', a concept many would argue is dead (Schmidt & Mrozowski, 2013). Clearly much more work remains to be done on the plaques to elucidate their formal patterning and understand the organization of their production.

To conclude, much of the debate around the Iberian plaques, which is centred around whether they were heraldic, or were related to ancestors, or represented deities, obscures more than reveals. Individual plaques clearly had social lives (Kopytoff, 1986), and as a class of objects, perhaps sacred texts, their use or meaning no doubt changed over time. When they were first created, Classic plaques may have been accorded to individuals whose genealogical history was central to the mythos of a community, but who, over time, became important ancestors, or even deities themselves.

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SUPPLEMENTARY MATERIAL

To view supplementary material for this article, please visit <https://doi.org/10.1017/ea.2024.34>.

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Les plaques d'ardoise gravées du Néolithique final et du Chalcolithique en Ibérie : une évaluation statistique de l'hypothèse généalogique

En Ibérie, les plaques d'ardoise gravées faisaient partie d'une classe large et variée d'objets rituels datant du Néolithique final et du Chalcolithique, le type Classique étant le plus répandu et standardisé. Ce type comprend une partie supérieure et inférieure (qu'une ligne ou des bandes horizontales séparent), le registre inférieur contenant des motifs répétés (triangles, damier, etc.). On a interprété ces plaques, associées à des sépultures, comme servant de document généalogique ; les motifs sur la partie inférieure pourraient évoquer un clan ou autre groupe social et le nombre de registres pourrait dénoter le nombre de générations entre le défunt et un ancêtre important. Les auteurs évaluent cette hypothèse sur la base d'un ensemble de données plus vaste que quand elle a été initialement formulée. Ils utilisent des outils statistiques pour examiner le rapport entre le nombre de registres sur ces plaques et le lieu de leur découverte ainsi qu'entre certains motifs et la taille des sépultures. La taille des sépultures est considérée comme indiquant la capacité d'une communauté à mobiliser une main-d'œuvre collective et pourrait donc représenter le statut des individus ensevelis. Ces analyses démontrent que le nombre de registres semble lié à la distribution géographique des plaques et que certains motifs paraissent correspondre à la taille des sépultures, ce qui suggère que l'hypothèse généalogique reste une explication plausible pour les plaques Classiques. Translation by Madeleine Hummler

Mots-clés: Péninsule ibérique, Néolithique final, Chalcolithique, plaques d'ardoise gravées, généalogie, mémoire

Die spätneolithischen und kupferzeitlichen gravierten Schieferplatten in Iberien: eine statistische Auswertung der genealogischen Hypothese

In Iberien gehörten die spätneolithischen und kupferzeitlichen gravierten Schieferplatten zu einer breiten und vielfältigen Kategorie von rituellen Gegenständen. Der klassische Typ von Schieferplatten war der zahlreichste und am meisten standardisierte Typ mit oberen und unteren, durch einen horizontalen Strich oder Bänder getrennten Teilen. Die unteren Register waren mit wiederkehrenden Mustern (Dreieck-, Schachbrett-Muster usw.) verziert. Diese mit Bestattungen verbundenen Gegenstände sind als genealogische Darstellungen interpretiert worden: Vielleicht weisen die Muster im unteren Teil der Platten auf eine Sippe oder andere gesellschaftliche Einheit und die Anzahl von Registern beziehen sich möglicherweise auf die Anzahl von Generationen zwischen dem Verstorbenen und einem wichtigen Ahnen. Die Verfasser bewerten diese genealogische Hypothese auf der Basis einer Datenmenge, die größer war, als wann die Hypothese formuliert wurde. Ihre statistischen Analysen untersuchen den Zusammenhang zwischen der Anzahl von Registern und dem Fundort der Platten und die Beziehungen zwischen spezifischen Verzierungsmustern und dem Ausmaß der Gräber. Es wird angenommen, dass diese Größe die Fähigkeit einer Gemeinschaft, eine kollektive Arbeitskraft zu mobilisieren und dadurch den sozialen Status der Bestatteten widerspiegelt. Die Untersuchungen zeigen, dass die Anzahl der Register mit der Verbreitung der Fundorte der Platten zusammenhängt und dass spezifische Musterelemente mit dem Ausmaß der Gräber verbunden sind, was darauf schließen lässt, dass die genealogische Hypothese immer noch eine gültige Deutung der klassischen Schieferplatten sein könnte.

Translation by Madeleine Hummler

Stichworte: Iberien, Spätneolithikum, Kupferzeit, gravierte Schieferplatten, Genealogie, Erinnerung