CYLINDRICAL BONE AND IVORY HINGES FOUND IN PHOENICIAN SITES OF THE WESTERN MEDITERRANEAN

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Abstract: Bone or ivory cylindrical hinges have not traditionally appealed the attention of researchers. Even though more than a hundred and fifty of these archaeological elements have been found in the Phoenician sites of the Western Mediterranean since early dates, their functionality has been discussed for long. Their manufacture reveals the use of techniques coming from the Near East and they can be dated between the 7th century BCE and the 1st century AD.

Keywords: Cylindrical Hinges; Bone; Ivory; Phoenician; Western Mediterranean.

1. Introduction

In the following pages we deal with an element which has traditionally received little attention by researchers: cylindrical hinges. Most of them have been attested in the westernmost area of the Mediterranean. The main material for their manufacture was bone and, to a lesser extent, ivory, and their inner part was completely hollowed out in the process. Despite having been known at least since the 19th century by scholars, who argued about their functionality, in other areas of the Mediterranean they had been identified as hinges long before. We believe that this lack of interest is mainly due to their low artistic value as they are simple cylindrical hinges that would be part of more sumptuous objects such as furniture. In addition to this, when they appear fragmented are not always easy to be identified by archaeologists, a circumstance which has undoubtedly hindered their correct interpretation.

This disinterest has caused them not to be included in reference works on Phoenician furniture, which has meant not being studied in depth, questioning aspects such as their functionality. Likewise, we quite often ignore the exact number of pieces coming from different places where excavations have been carried out since the old times. This fact certainly affects their quantification, but also concerns their dating because in many occasions their context is not as well-known as we would like. An example of this above mentioned fact is found on the island of Mogador where among several findings made during the excavation campaigns hinges and boxes appeared, but nothing else is indicated about this matter.[1] The same happens at the important site of Almuñécar where the appearance of some of these objects is known but not the slightest news about them has been published so far.

Therefore, in order to draw on the study of these pieces and to facilitate future research on them, we will offer a typology that is likely to be expanded with new findings or even to be used in other spots where these eastern navigators settled. At the same time, we will examine the technical aspects involved in their manufacture, as well as the location of the different workshops that made them, only including those dis-

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1 López Pardo – Mederos Martín 2008, p. 272.

Fig. 1. Hinges from Cádiz (after Rodríguez de Berlanga 1891, pl. III).

coveries that have been published with a minimum amount of information.

2. The Origin of Hinges

The oldest examples of this type of hinges take us directly to the Near East, as we can see in a small wooden book discovered in the Ugaritic wreck of Ulu Burun dated within the 14th century BCE. It consists of two small hollow boards that would have been filled with wax and were assembled by small cylindrical hinges.[2] Another example with hinges corresponding to the type that we are now analyzing and dated in the 9th century BCE was found in room AB of the Assyrian palace of Nimrud.[3] Related to them, it is interesting to recall the appearance of a fragment likely to have belonged to one of these small boards in Huelva, although the small hinges which should have been attached to it had not been preserved. It could be chronologically dated between the 9th and the 8th centuries BCE.[4]

We also find these hinges in Phoenician contexts of the central Mediterranean dated throughout the 1st millennium BCE, particularly in the island of Sardinia as the pieces coming from Tharros preserved in the Chese collection reflect,[5] as well as in the graves 10 and 20 of the same necropolis, dated between the years 509 and 238 BCE, together with the sanctuary of Monte Sirai.[6] We can also mention the site of Nora which has provided several pieces of bone and ivory that belong to a box which can be dated within the 5th century BCE.[7]

Of course, it is worth mentioning the attested pieces in the most famous Phoenician colony, Carthage, where about twenty of these bone hinges have been found in habitat levels at the hill of Byrsa, dated from the beginning of the 5th century BCE onwards.[8] They have also been found within its area of influence as we can see in the necropolis of Bou Hadjar, where wooden sarcophagi using this system of assemblage were used during the 3rd and 2nd centuries BCE.[9]

3. Geographical Distribution

Starting in the westernmost area of the Mediterranean Sea, we can comment on the case of Cádiz where thirty-one pieces have been documented, although their actual number must have been higher. We know about the discovery made in 1887 consisting of three tombs, rectangle-shaped ashlar cists, dated in the 4th century BCE (Fig. 1). One of them contained the famous male anthropoid marble sarcophagus,

2 Pendleton – Warnock 1990, pp. 255-259.

3 Herrmann – Laidlaw – Coffey 2009, pp. 104-105.

4 González de Canales Cerisola – Serrano Pichardo – Llampart Gómez 2004, p. 160.

5 Moscati 1987, p. 52.

6 Barnett – Mendlenson 1984, pp. 43-45.

7 Aubet Semmler 1988-1989, pp. 126-129.

8 Aubet Semmler 1988-1989, pp. 126-129.

9 Picard 1956, p. 184; Cintas 1976, p. 377.

Fig. 2. Hinges from Cádiz Astillero area (after Rodríguez de Berlanga 1888, pl. I).

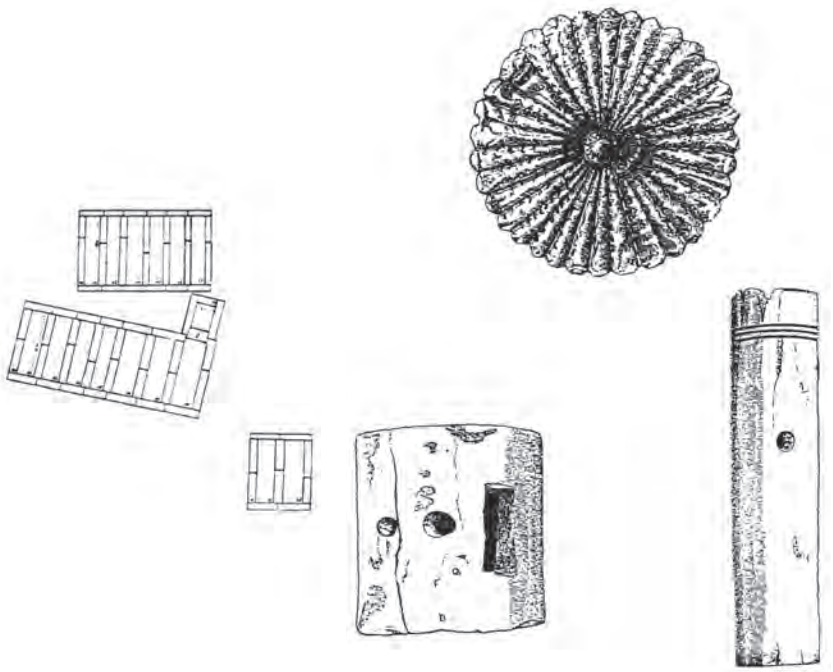

Fig. 3. Hinges from Málaga, Andrés Pérez street (after Rodríguez de Berlanga 1891, pl. IV).

and another one provided the remains of a man together with his weapons and six of these hinges.[10] It was between 1912 and 1916 when another finding that now interests us was made, this time in the Astillero area, also consisting of a group of cists with a similar date to the above mentioned, one of them containing gold jewellery, scarabs and three hinges.[11] In 1920, in Playa de los Números another group of tombs with identical characteristics and chronology appeared, one of them also containing golden jewels and up to twenty-two ivory hinges (Fig. 2).[12]

On the other hand, on Andrés Pérez Street in Málaga, in 1875 an ashlar cist was unearthed containing a lead box with human bone remains inside, as well as several gold discs and hinges (Fig. 3). These ashlar had a hollow space in their internal union where another burial was arranged, in turn providing new hinges to add a total of twenty-seven, being possibly dated between the 2nd and the 1st century BCE.[13] On another site, on Campos Elíseos Street, a necropolis with tombs of the same chronology was excavated. Tombs 5, 6, 9, 17 and 19 provided a total of sixty-five pieces including others with no archaeological context in the same burial grounds (Fig. 4).[14] This means that Málaga is so far the site that has provided the highest number of pieces among those sites placed in the so-called Circle of the Straits. Unfortunately, those hinges discovered in 1906 either in the area of Alcazaba or in Ibn Gabirol Gardens cannot be added to them since we know

10 Rodríguez de Berlanga 1888, pp. 38-40; Rodríguez de Berlanga 1891, pp. 320-325.

11 García y Bellido 1982, p. 405.

12 Cervera y Jiménez Alfaro 1923, p. 17; Perea Caveda 1986, pp. 297-301.

13 Rodríguez de Berlanga 1891, p. 36; Rodríguez de Berlanga 1995, pp. 36-38.

14 Pérez-Malumbres Landa – Martín Ruiz – García Carretero 2000, pp. 8-10.

Fig. 4. Hinges from Málaga (after Pérez-Malumbres Landa – Martín Ruiz – García Carretero 2000, fig. 10).

Fig. 5. Hinges coming from Morro de Mezquitilla (courtesy of Witte, Instituto Arqueológico Alemán).

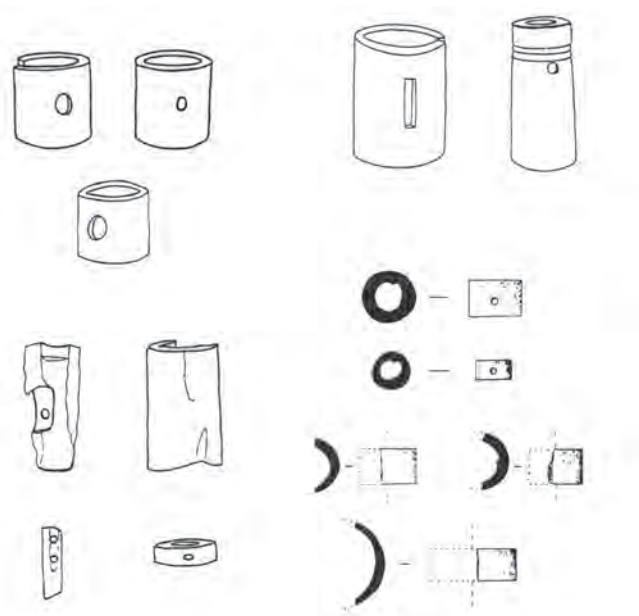

Fig. 6. Hinges from Villaricos (after Astruc 1951, pl. XLVII).

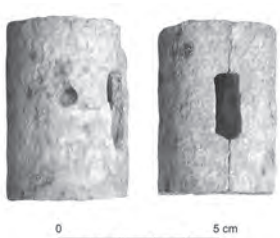

Fig. 7. Hinges found at Can Cordá (after Puig Moragón – Díes Cusí – Gómez Bellard 2004, pp. 123-124).

nothing about their number or characteristics.[15] As a result, although hinges have been found in both habitat and burial areas, we only have information regarding those from the latter contexts.

In the settlement of Morro de Mezquitilla (Fig. 5), two of these pieces were unearthed, one made of bone and the other made of ivory. They were found in stratum B2/3 thus being dated throughout the 7th century BCE.[16]

Regarding the necropolis of Villaricos (Fig. 6), even though it is certain that their real number was higher, we can list two pieces found in tomb 42 and one more in tomb 221 of group I, as well as at least

15 Amador de los Ríos 1907, p. 32; Rodríguez de Berlanga 1973, pp. 88-89; Pérez-Malumbres Landa – Martín Ruiz – García Carretero 2000, p. 11.

16 Schubart 1984, pp. 94-95.

Fig. 8. Hinges from Lixus (after Albelda Borrás *et al.* 2010, fig. 22).

six in burials 1, 5 and 9 of hypogeum 414 and burial 1 of the hypogeum 1080 of the group J,[17] in addition to another five in the hypogeum 556.[18] As for their dating, we deal with the problem brought about by the continuous reutilisation of these burial chambers, making it difficult to establish the time period when they should be placed, although a date within the 6th century BCE seems acceptable.

Drawing on the discoveries made on the island of Ibiza, we can point out that Puig des Molins necropolis has provided a total of eight pieces with an imprecise chronology that ranges between the 5th and the 1st centuries BCE,[19] while three more come from one of the rooms of the rural village of Can Cordá with a date that goes from the last years of the 3rd century BCE to the 1st century AD (Fig. 7).[20]

On the southern shore of the Straits of Gibraltar, we can mention the settlement of Lixus (Fig. 8), whose Punic-Mauritanian levels dated between the 2nd and the 1st centuries BCE have offered four bone hinges,[21] while finally a last hinge comes from the ancient site of Rusadir (Fig. 9), specifically from a landfill related to a building with a storehouse dated between the 2nd century BCE and the 1st century AD.[22] All those findings are detailed in the following charts and graphs:

Site	*Number of items*	*Percentage*	*Chronology*
Cádiz	31	19,7%	4th BCE
Málaga	92	58,6%	2nd-1st BCE
Morro de Mezquitilla	2	1,3%	7th BCE
Villaricos	15	9,5%	6th-1st BCE
Puig des Molins	8	5,1%	5th-1st BCE
Can Cordá	3	1,9%	3rd BCE/1st AD
Lixus	5	3,3%	2nd-1st BCE
Rusadir	1	0,6%	2nd BCE-1st AD
	157	100%	

17 Astruc 1951, pp. 64, 80.

18 Almagro Gorbea 1984, pp. 59, 81.

19 Vives i Escudero 1917, p. 84; Vento Mir 1985, pp. 110-111.

20 Puig Moragón – Díes Cusí – Gómez Bellard 2004, pp. 123-124.

21 Albelda Borrás *et al.* 2010, pp. 149-150.

22 Aragón Gómez *et al.* 2006, p. 90.

Fig. 9. Hinges from Rusadir (after Aragón Gómez *et al.* 2006, fig. 25).

As we can appreciate, sites located in the north shore of the Straits of Gibraltar are more abundant, something possibly responding to a more intense research, appearing equally in habitats and necropolises, although the greatest part of the findings is documented within the latter. However, we always have to bear in mind that the number of sites must be higher but they have not been published. With the exception of the village of Can Cordá in Ibiza, all of them are well-known important sites, with very few of them located on the southern shore of the Straits of Gibraltar, being Málaga where the highest number of pieces has been attested by far.

Up to now, the most ancient chronology offered by Morro de Mezquitilla has not surpassed the 7th century BCE. This is followed by a second stage for all those hinges discovered in Cádiz which are dated in the 4th century BCE. Nevertheless, it turns out to be when these territories were annexed to the Roman sphere at a time before the turn of the 1st century AD that we can find more pieces as we can see in Málaga, Lixus, Rusadir, Can Cordá and some of the hinges from Villaricos and Puig des Molins.

4. Typology

The excavation campaigns carried out in the necropolis of Campos Elíseos in Málaga allowed to establish a typology for these pieces with up to six different types according to their characteristics and number of perforations, or their absence, to which we can now add a seventh type. In the first of these types the hinges lack perforations, while in the second, sometimes of very small size, they show a round hole that in the third type becomes rectangular. In the fourth type there are two perforations, a rectangular one and a round one, while the fifth bears a rectangular opening with round holes on both sides. The sixth type presents a rectangular hole and only on one of its sides two circular ones, and the seventh has two round perforations located one above the other.

Unfortunately, it has only been possible to establish their typological characterization for a hundred and eleven items, turning out to be 70.70% of those included in this work. For the Cádiz pieces we can establish their typology in a total of twenty-six cases: fourteen would be ascribed to type I, another three to type II and the remaining nine to type IV. Regarding Málaga findings, five of them can be included in type I, nine in type II, ten in type III, twenty-seven in type IV and five more in type V, adding two more to type VI and finally one to type VII. On the other hand, two hinges from Morro de Mezquitilla correspond to type II and another to type III, while for Villaricos we can say that it is only possible to discern their typology in nine cases, seven of them to type II, another one to type III and one more to type VII.

In addition to them, one of those found in the necropolis of Puig des Molins can be included in type I, while five others would do so in type III and two more in type VII, being two of those documented in Can Cordá related to type IV. About Lixus we can state that one belongs to type I, another to type II and one more to type IV, being that of Rusadir associated to type VII. This classification is detailed in the following table:

Site	*Type*	*Number of items*
Cádiz	I	14
	II	3
	IV	9
Málaga	I	5
	II	9
	III	10
	IV	27
	V	5
	VI	2
	VII	1
Morro de Mezquitilla	II	1
	III	1
Villaricos	II	7
	III	1
	VII	1
Puig des Molins	I	1
	III	5
	VII	2
Can Cordá	IV	2
Lixus	I	1
	II	1
	IV	1
Rusadir	VII	1

If we group all of them taking into account the various types that we have established, their typological classification would be graphically displayed as follows:

Type	*Number of items*	*Percentage*
I	21	18,9%
II	27	24,3%
III	12	10,8%
IV	39	35,2%
V	5	4,5%
VI	2	1,8%
VII	5	4,5%
TOTAL	111	100%

As we have seen, the most represented type in the Phoenician sites of the western Mediterranean is type IV, closely followed by type II, and at a remarkable distance from them types I and III, the rest being scarcely present, especially type VI which turns out to be the least abundant. Therefore, most of these pieces correspond to types IV and II.

As for the material, bone and ivory were interchangeably used at first – so far we do not know wooden hinges – and then from the 4th century BCE onwards, in a process similar to that observed in other areas,[23] bone absolutely prevailed in what we believe could have been a trend seeking to reduce costs and therefore increase the clientele. Within the one hundred and fifty-seven pieces commented only twenty-three of them

23 Aubet Semmler 1988-1989, pp. 128-129.

-14.64% of those studied- were made of ivory, all of them coming from Cádiz, although it is true that in many cases we ignore the material which they were made of.

5. Technical Aspects

In the current state of research it is possible to recreate, at least in their main phases, the different stages of the manufacture of these hinges. Thus, in the first place it was necessary to cut off the apophysis of the bones of bovines, as this seems to have been the main animal used. In spite of the current lack of analysis, it has been suggested that donkey, pig or horse bones could also have been used.[24]

Then, they proceeded to turn the diaphysis, as can be seen in the thin parallel grooves that some pieces show and in the homogeneity of their diameters. Also at that time of the process, the parallel incisions showed by some pieces in one of their ends were possibly made. They have only been documented in pieces of types II and VII and are usually filled with a thick blackish paint possibly with a decorative purpose so it is likely that they were placed as finishing ends of the set of hinges.

Subsequently, the diaphysis was sectioned into lengths according to the desired size, in some cases with great regularity, indicating the existence of a standardisation process that has also been pointed out in the case of Carthage.[25] Later, the bevelling of their ends was carried out in order to reduce the friction between them, something that would also be favoured by the use of grease or wax as their bevelled and concave ends show a more intense gloss than the rest of the piece, at the same time that their tone becomes darker in that spot.[26]

Then, the necessary perforations were made in order to let rectangular or circular shanks be introduced inside them, even though some hinges lack perforations. We can add that these shanks must have been made of wood, bone or ivory, but not possibly of metal since none of these hinges has oxide remains on their surfaces. Finally, polishing was carried out with some abrasive stuff, maybe sand.[27]

Barely anything can be said about the instruments used by the workers who manufactured these parts, though we consider they cannot have been different from those used for wood or ivory,[28] being logical to assume that saws would have been used to cut the diaphysis, as well as a punch or drill to make the perforations perhaps moved by a bow.

We know about the functioning of these pieces thanks to their continuity in Roman times when they are quite well documented.[29] Thus, the assemblage was accomplished by alternating hinges without side perforations with others that did have them, keeping in mind that those that lacked these holes on their sides were attached to the lid, while those that presented them were inserted both in the box and the lid of the container.[30]

Although workshops must have been extended widely enough to supply furniture to the various Phoenician communities settled in the far west, the truth is that there are few of them to offer reliable evidence in this regard. A place where one of these workshops was probably established is Málaga during the 2nd and 1st centuries BCE, as shown by the different pieces that display on their surfaces the different phases of the production process, as well as some manufacturing faults.[31]

24 Velasco Estrada 2009.

25 Lancel 1982, p. 54.

26 Morena López 1996, p. 228; Pérez-Malumbres Landa – Martín Ruiz – García Carretero 2000, pp. 9-11.

27 Morena López 1996, p. 228; Pérez-Malumbres Landa – Martín Ruiz – García Carretero 2000, pp. 9-11.

28 Gubel 1987, pp. 25-28; Martín Ruiz 2011, pp. 89-91.

29 Béal 1984, pp. 25-30.

30 Velasco Estrada 2009.

31 Pérez-Malumbres Landa – Martín Ruiz – García Carretero 2000, pp. 10-11.

In addition to this, the presence of a tiny hole in one of the hinges from Lixus that, however, does not have side perforations to introduce shanks, could support the existence of another of these workshops in this North African site, until new evidence is found. Moreover, the high number of hinges found in Cádiz, together with the fact that all of them have been found in burials dated in the same century, such as the 4th century BCE, could suggest that in that period the city was home to a craft centre dedicated to this activity.

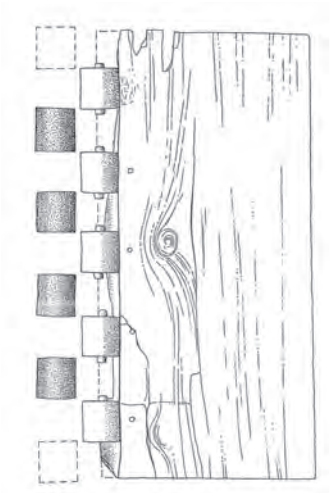

Fig. 10. Wood board with wooden hinges from Samos (after Kyrielis 1980, pl. 5).

Fig. 11. Clay lid from Campos Elíseos necropolis (after Pérez-Malumbres Landa – Martín Ruiz – García Carretero 2000, fig. 12).

6. Functionality

Since the appearance of the first findings in the 19th century, the inescapable question of determining what these pieces were used for had been raised. The first attributions linked them with beads, parts of necklaces, knife handles,[32] or as fragments of batons,[33] but surprisingly enough a right interpretation of those findings was not offered.[34] The belief that they were parts of musical instruments, particularly, flutes, pipes or whistles has also been widespread over time,[35] and this despite the fact that as early as the 17th century it was beyond any reasonable doubt that they were hinges.[36]

However, the most accepted hypothesis among researchers as we say, and which has been fully corroborated by the discoveries made in the necropolis of Campos Elíseos in Málaga, is that they should be considered as hinges to facilitate the opening and closing of chests and boxes.[37] In this sense, there is an evident parallelism with the wooden hinges found on the island of Samos dating from the 7th century BCE, which provided clear evidence of their purpose as they were found together with lids of the same material to which they were attached (Fig. 10).[38]

The appearance of two clay lids in the above mentioned Málaga necropolis helps to clarify this point since one of them consisted of a rectangular plaque to which a hollow cylinder was attached (Fig. 11). On that cylinder, several decorative incisions drawing other rectangles with the same dimensions as the hinges

32 Rodríguez de Berlanga 1891, pp. 320-321; Rodríguez de Berlanga 1973, pp. 88-89.

33 Botella 1926, p. 8.

34 Ramos Folqué 1962, p. 96.

35 Vives i Escudero 1917, p. 84; Lafuente Vidal 1934, p. 46; Vento Mir 1985, p. 111; Grau Mira 1996, pp. 113-114.

36 Balil Illana 1975, p. 84.

37 Sáez Martín – Estrada Tuset 1947, p. 179; Figueras Pacheco 1956, p. 60; Balil Illana 1975, p. 84; Ruano Ruiz 1992, p. 65.

38 Kyrielis 1980, p. 129.

had been made. On the other hand, the second one was fragmented and corresponds to the partial corner of a lid ending in a disc where a division matching the size of the hinges is again simulated.[39]

Those hinges found inside burials would be part of boxes or chests that would have been deposited inside tombs, even suggesting that they could have been part of coffins or sarcophagi.[40] In this sense, it is worth remembering that the longitudinal dimensions of the hinges coming from tomb 17 of the necropolis of Campos Elíseos in Málaga match the measurements of the interior of the clay brick casket that constituted the grave,[41] so their use as an opening system for a coffin where the incinerated remains would have been introduced cannot be ruled out.

7. Conclusions

Although the number of bone and ivory cylindrical hinges found in the area comprising the so-called Circle of the Straits must have been much higher, it has been possible to quantify at least a hundred and fifty-seven pieces distributed over a total of eight sites, mostly of the highest importance except for some farming villages, being those located in the North African shore are a minority. We have been able to establish the accurate typology for a hundred and eleven hinges, allowing us to form a classification into seven different types according to whether they have side perforations or not and, if so, their number and characteristics.

Although their functionality has been discussed for a long time and many different uses have been proposed such as musical instruments, batons or knife handles, today it is indisputable that these cylinders must be considered as hinges. These pieces appear indistinctly in settlements and necropolises, although they are more numerous in the latter where they would be part of chests or boxes integrating the grave goods, or even would serve as containers for the burned bone remains. So far, we have reliable evidence of the existence of a workshop dedicated to their manufacture in Málaga, the site that has provided more pieces up to now, being quite likely that they also existed in Cádiz and Lixus. In any case, these hinges inform us of craftsmen who made furniture in the western Mediterranean following techniques and models well-established in the Near East.

The oldest specimens known so far in this area of the Mediterranean date from the 7th century BCE and were elaborated similarly in bone and ivory, although from the 4th century BCE the latter will yield its position to bone in full coincidence with what was observed in other spots such as Nora. However, it seems that in the Italic area this trend began a little earlier, in the 5th century BCE,[42] possibly trying to reduce costs and therefore being able to supply a wider market.

These hinges would be an essential element in the production of furniture, in particular to facilitate the closure of chests or boxes, within a trade circuit mainly affecting the aristocratic sectors of both the Phoenician and the indigenous society.[43] Part of this furniture was sold to the indigenous communities as evidenced by the presence of these hinges in sites such as Cruz del Negro,[44] La Serreta[45] or La Albufereta,[46]

39 Pérez-Malumbres Landa – Martín Ruiz – García Carretero 2000, p. 12.

40 Figueras Pacheco 1956, p. 60.

41 Pérez-Malumbres Landa – Martín Ruiz – García Carretero 2000, p. 12.

42 Aubet Semmler 1988-1989, pp. 128-130.

43 Martín Ruiz 2006, p. 128.

44 Amores Carredano – Fernández Cantos 2000, p. 162.

45 Grau Mira 1996, p. 110.

46 Lafuente Vidal 1934, p. 46; Figuera Pacheco 1956, pp. 60, 122.

sometimes being part of high social status grave goods, especially if we consider that this assemblage system does not seem to be typical of the native population of this area during the 1st millennium BCE.[47]

To sum up, we believe that the study of these hinges allows us to get to know an important aspect such as the furniture manufactured by Phoenician artisans,[48] who not only supplied themselves, but also inserted this furniture as a product into the commercial relations they maintained with the indigenous communities with whom they lived. Those pieces of furniture had an enormous acceptance in the Roman Empire until its end when they ceased to be made.

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