

# The Western Roman Atlantic Façade

A study of the economy and trade in the  
Mar Exterior from the Republic to the Principate

Edited by

C. Carreras  
R. Morais

BAR International Series 2162  
2010

Published by

Archaeopress  
Publishers of British Archaeological Reports  
Gordon House  
276 Banbury Road  
Oxford OX2 7ED  
England  
bar@archaeopress.com  
www.archaeopress.com

BAR S2162

*The Western Roman Atlantic Façade: A study of the economy and trade in the Mar Exterior from the Republic to the Principate*

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ISBN 978 1 4073 0706 0

Printed in England by Blenheim Colour Ltd

All BAR titles are available from:

Hadrian Books Ltd  
122 Banbury Road  
Oxford  
OX2 7BP  
England  
www.hadrianbooks.co.uk

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## 2.3 ROME AND WHALE FISHING – ARCHAEOLOGICAL EVIDENCE FROM THE *FRETUM GADITANUM*<sup>1</sup>

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### A DIVERSIFIED MARINE ECONOMY

Archaeology offers very poor evidence of the kind of goods subject to trade in Antiquity, and the picture shown hardly corresponds with the variety of natural resources offered by the fertile lands and the rich waters of the Roman Empire (an interesting and recent overview in Curtis, 2001; Alcock, 2001). Due to the perishable nature of most of the goods, except in privileged contexts with exceptional conditions for preservation, such as Pompey/Herculaneum, Egypt or the Red Sea, the evidence is in most cases indirect, and needs to be taken in combination with the iconographic and textual evidence to allow for a basic reconstruction of trade links, sea routes and, thus, the outlines of so-called “provincial inter-dependence” during the first centuries of the empire.

The reductionism forced upon us by the remarkable difficulty in recognizing these goods in the records will only be progressively overcome by the use of new techniques and thorough analysis of available ecofacts. This has been our line of research during the past few years, including first-hand study of new stratigraphic sequences and attempts to tackle the problematic issue of non-ceramic evidence in fishing sites in our area of interest, the Gibraltar Strait (Bernal, 2007). Our work is, to a substantial degree, based on the analysis of the rich unpublished material offered by rescue archaeology. This includes sites on the African shores of the strait, such as the ancient *municipium* of *Septem Fratres* (modern Ceuta)<sup>2</sup> and especially Andalusia, including *Baelo Claudia* for the late republic and the early empire

(Arévalo and Bernal, 2007; Bernal and Arévalo, 2008) and *Carteia* and *Traducta*, both in the bay of Gibraltar, for Late Antiquity (Bernal *et al.*, 2003 and 2008b). A few examples will suffice to show the potential gain derived from reviewing these rescue excavation reports; the excavation carried out by the University of Cadiz on the *cetariae*/preserves factories found in *Iulia Traducta* (Algeciras), has shown that economic activities in the *Fretum Gaditanum* included, among others, oyster-farming, the production of fish flour and other by-products, made by the milling of fish bones (exclusive of fish meat milling) in rotating mills – some of them were probably even powered by water – and also the production of shellfish preserves. All this evidence dates from the second half of the V<sup>th</sup> and the early VI<sup>th</sup> century AD (Bernal *et al.*, 2003; Bernal, 2009, ed.), a period of alleged economic stagnation according to traditional interpretations (Bernal, 2008). Apart from this, other activities which hitherto were scarcely known in the ancient world are beginning to offer some very significant archaeological evidence, including shellfish harvesting and purple production; furthermore, the evidence also shows that all these activities were interrelated, as recently shown, at least in the IV<sup>th</sup> century AD town of *Carteia*, (Bernal *et al.*, 2008 b), the site of the first textile dyers’ workshop documented to date in the *Baetica* (García Vargas, 2004). Also the excavation of the first “rotting” deposit of tuna known in the Mediterranean, found in *Baelo Claudia*, and the remains of mixed preserves, based on fish but which also incorporated land mammals and even snails, all within a II<sup>nd</sup> century BC context. In this period, the late Phoenician fisheries became heavily influenced by Italian colonization, active in this area since *Carteia*’s *deductio* in 171 BC (Bernal and Arévalo, 2008).

An analysis of these practices often relies, due to the aforementioned scarcity of direct evidence, on mosaic iconography – especially common in *Africa Proconsu-*

<sup>1</sup> This work is set in the framework of development of research project SAGENA (HUM-03015) supported by the *Consejería de Innovación, Ciencia y Empresa* de la *Junta de Andalucía*, and Research Group HUM-440, *IV Plan Andaluz de Investigación, Desarrollo e Innovación* de la *Junta de Andalucía*.

<sup>2</sup> Studies made possible thanks to two research grants funded by *Instituto de Estudios Ceutíes* in 2006 and 2007.

*laris* – and written sources; this situation leads to excessive generalisation and, especially, the inability to account for the regional variations that we know existed between the different Mediterranean and Atlantic regions during the Roman period and Late Antiquity, beyond the international fame of *garum* and other derived products (*muria, liquamen, allec...*).

Our work, which has a twofold aim, stands in this context. First, we will try to gather and show several pieces of evidence, of miscellaneous nature but mainly archaeological and zooarchaeological, regarding the hunting and economic exploitation of whales, fin whales and other cetaceans that populated the Atlantic shores and the Gibraltar strait in the Roman period. Second, we suggest that whaling and the economic exploitation of whale by-products was an important activity in the Roman period, trying to go beyond the most optimistic statements to date, which limit this activity to the exploitation of aground individuals; we suggest, therefore, that whaling began in the *Fretum Gaditanum* at least in the Roman period. As we will see, Spanish literature on the matter dates the origin of this activity in the Late Medieval period in the Cantabrian Sea, and its generalisation in modern times. The evidence available for these later periods is indeed far more abundant, especially documents and studies on historical retrospective (i.e. the search for the origins of whaling harbours known in the XIX<sup>th</sup> and XX<sup>th</sup> centuries). With this we aim to develop a research agenda already outlined in a previous work (Bernal, 2007, 97-99), with the addition of the new archaeological evidence available.

### WHALING IN ROME – A PROMISING YET INSUFFICIENTLY CONSIDERED FIELD

In the following paragraphs we will display several pieces of evidence, both historical and archaeological, which show the common practice of whaling in the Roman world.

#### Oppian's eloquent literary account. First detailed description of whaling?

Whaling in the Mediterranean is mentioned in several scattered passages from a variety of cultural contexts, some dating back to proto-historic chronology, as shown by the mention of a *nakhiru*, a cetacean offered by a group of rulers of the Phoenician coast as a gift to the Assyrian king Ashur-nasir-pal II (Giammellaro, 2004, 452).

Pliny, in his *Natural History*, offers rich information on cetaceans and on their presence in *Gaditano oceano* (IX, 5), and although references to whale hunting are minimal, the passage on Ostia proves that they were indeed captured (IX, 4-6). Unfortunately, Aelian's *On the Nature of Animals – De Natura Animalium*, dated in the mid III<sup>rd</sup> century, also lacks explicit references to whaling. This Italian author, born in Praeneste, spent a good deal of his life in Rome, chaotically transcribing his own and other's

observations on the animal kingdom and is of little scientific interest but enormous literary value, thanks to his characteristically Attic sarcasm (Díaz Regañón, 1984, 9-10). His texts include several references to whales and other cetaceans (IX, 49; XI, 37, XVI, 18), but their hunting is not explicitly mentioned, although these animals are described as a “terrible and invincible enemy” (IX, 49, 8-9), which could be taken as indirect evidence of their perception as potential prey.

On the other hand, Oppian, a Greek author from Cilicia, has left us a poem called *Haliéutica* or *On Fishing*, dated between 177 and 180 AD, which is the first text which treats this matter extensively – the Spanish translation of C. Calvo Delcán (1990, 9 & 14) has been used.

In the first place, there is an explicit reference to the presence of whales in the western Mediterranean shores, as shown in the following quotation: “often too – referring to sea monsters – they bring terror to ships when they meet them in the Iberian Sea in the West, where chiefly, leaving the infinite waters of the neighbouring Okeanos, they roll upon their way, like unto ships of twenty oars” (Oppian, V, 56-60). That is: major cetaceans travelled across the *Fretum Gaditanum*, on their entrance into the western Mediterranean waters after leaving the Atlantic. According to Rougé's definition of the geography of the Mediterranean (1975), this *Mare Ibericum* broadly corresponds with the sea of Alborán, to the south of Cartagena.

Regarding their capture, Oppian explicitly says that “Often also they stray and come at night to the beach where the water is deep inshore; and there one may attack them” (Oppian, V, 60-62). That would obviously be an indirect practice of economic exploitation.

Of the long passage that Oppian dedicates to whaling (V, 114-358), we are especially interested in underlining the following:

- it is a collective fishing practice, compared to the siege of a city (V, 115-120).
- the first step of the process is the determination of the weight and size of the animal, based on the way it swims (V, 125-130).
- the fishing equipment used is explicitly described: “For these monsters, the line is fashioned of many strands of well-woven cord, so thick as the forestay of a ship, neither too large nor too small, and of a suitable length. The well-wrought hook is rough and sharp with barbs projecting alternately on either side, strong enough to take a rock and pierce a cliff... a coiled chain is cast about the butt of the dark hook – a stout chain of beaten bronze... in the midst of the chain are set round wheels close together, to stay his wild struggles and prevent him from straightway breaking the iron in his bloody agony, as he tosses in deadly pain, but let him roll and wheel in his fitful course (Oppian, V, 132-147)... “and the fishermen, as if waging war, carry strong tridents and harpoons and heavy axes and other metal weapons”

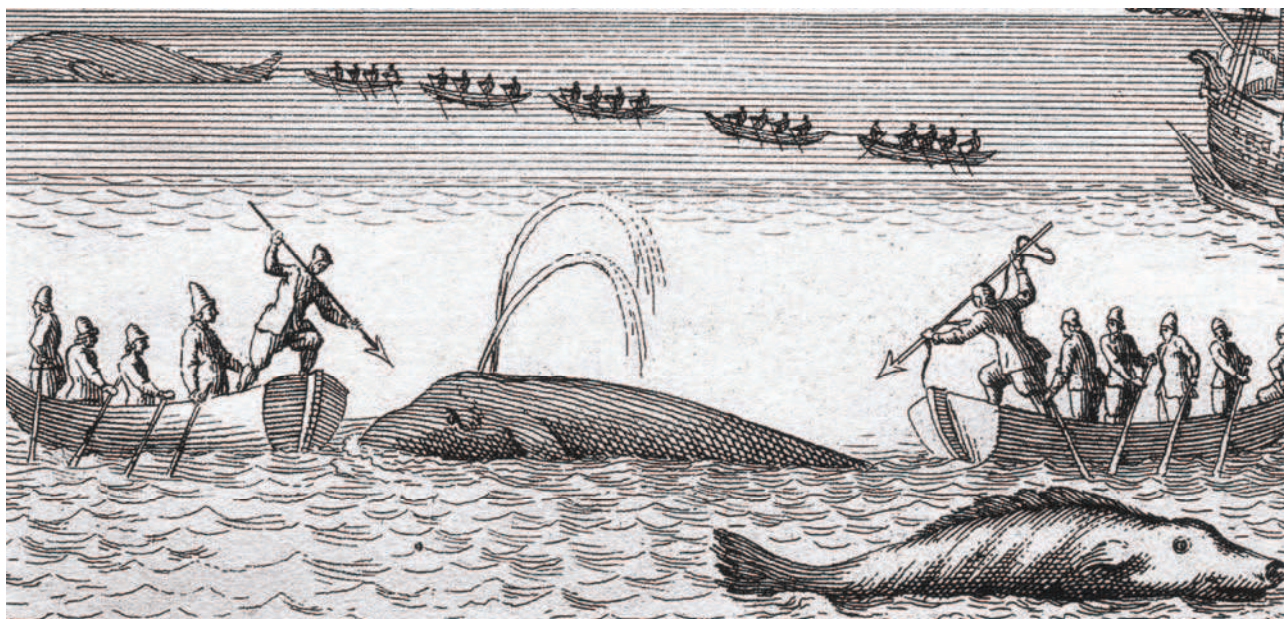


Figure 2.3.1 Idealized cetacean hunt by Basque fishermen in Greenland, performed with the kind of equipment described by Oppian, in a 1715 print (Cazeils, 2000, 52)

(V, 150-154). The specific equipment used seems to depend on the size of the animal: “for those with smaller arms, the weapons are appropriate for the prey; the cords are finer, the hooks are smaller and the bait is scarcer and, instead of goatskins, emptied dry marrows tied to the cord pull the beast’s body to the surface” (V, 352-357).

- the process includes the use of bait, as it is said that “For the fatal banquet, the hook is baited with part of a bull’s black liver or a bull’s shoulder, suitable for the guest’s jaws” (Oppian, V, 148-150).
- to make the captures easier and help recover the equipment, “they [the fishermen] let go with him into the water large skins filled with human breath and fastened to the line. And he, in the agony of his pain, heeds not the hides but lightly drags them down, all unwilling and fain for the surface of the foamy sea. But when he comes to the bottom with wavering heart, he halts and spits up abundant foam” (V, 178-183).
- once the prey is tired, “one of the whalers, rowing at speed, leads the vessel to land and ties the cord to a rock on the coast, returning hurriedly” (V, 224-227).
- when finally exhausted and pulled up by the inflated skins, the animal resurfaces, the killing begins: “then one carries the sharp pointed trident, another the spear, others the sickle. There is work for them all; they finally bludgeon the beast to surrender” (V, 255-259).
- sea-water is poured into the open wounds: “they [the fishermen] take water and pour it into his wounds, and the salt sets him on fire” (V, 279-282).
- once the task is finished, “he is then tied and brought to land”, “and the fishermen... sing their song to speed up the oars” (V, 290-294).

This brief outline of Oppian’s references neatly describes the traditional whaling practices so common prior to the introduction of mechanized harpoon (Cazeils, 2000): collective fishing, multiple hooks, ropes and bait, use of skins/dry pumpkins to act as floats, tying of the rope to the shore and close distance killing with all sort of weapons – harpoons, tridents, sickles and axes. The practice, therefore, involves a heavy investment in equipment, which explains the common recurrence of the topos among seamen (figure 2.3.1). The texts show that hunting beached whales near the shore was also a common practice. It should be stressed that, when referring to cetaceans, the only geographical indication made in the *Haliutica* is to mention the presence of these animals in the western waters of the Iberian sea, into which they occasionally entered from the Atlantic through the Gibraltar strait. That reference shows an extensive knowledge of the life cycle of these animals, as proven in recent works on the Gibraltar strait waters (García y Ocaña, 2006).

These references, dated to the late II<sup>nd</sup> century but obviously based on earlier sources (Calvo Delcán, 1990, 14-17), show that this form of whaling was already practiced in the Antonine period, and probably much earlier, as can be inferred from Pliny’s *Natural History* from the I<sup>st</sup> century. Cetacean hunting in Rome must, therefore, at least date back to that period.

Rather surprisingly, such explicit sources have been overlooked in the literature about fishing in the ancient world; to our knowledge, this issue has been subject to no specific analysis, neither in the Gibraltar strait area (AA.VV., 2006; Bernal, 2006) nor, obviously, in other areas of the *Mare Nostrum* or the Black Sea, in which these cetaceans were either absent or very seldom found (Bekker-Nielsen, 2005).

### First zooarchaeological evidence in *Hispania*: A promising beginning

M. Ponsich, in the earlier references about zooarchaeological evidence, explicitly mentions whale bones among the remains found in several Roman preserves factories, but without giving specific locations (Ponsich, 1988, 39 and 43). In the case of *Baelo Claudia*, he mentions several vertebrae “alrededor de un pilar de mayores dimensiones y un volumen muy escaso, cosa que no se encuentra en ninguna otra factoría de salazón conocida hasta hoy (around a pillar, bigger in size, but with a smaller volume, something not found elsewhere)” (Ponsich, 1988, 39). Ponsich explicitly argues that these big pseudo-conical vats could have been used to process whale meat (1988, 40). Unfortunately, the detailed archaeological recording of the remains found in the excavation of this factory is not preserved, so these references cannot be zooarchaeologically tested today. Nevertheless, the size of the bones in question makes it likely that the identification was accurate.

In fact, the collection in the *Baelo Claudia* archaeological complex includes a whale vertebra of unknown provenance which could have originated in this excavation or come from a different archaeological context. Regardless of its unknown provenance, it is a significant piece of evidence, especially so because it shows abundant cut marks in its joint faces, suggesting its probable use as a working surface (figure 2.3.2). Recent zooarchaeological analysis carried out in several contexts belonging to the industrial areas of *Baelo Claudia* have drawn no further evidence in this direction (Cáceres, 2007; Morales and Roselló, 2007).



Figure 2.3.2 Cetacean vertebra from *Baelo Claudia*, showing cut marks, from which we can infer the used it was put to (courtesy of I. García Jiménez)

On the other hand, recent excavations uncovered a significant proportion of the industrial quarters of *Iulia Traducta* (San Nicolás Street, Algeciras) (Jiménez-Camino and Bernal, 2007), including five preserves factories/*cetariae*, active during the late republic and the

late V<sup>th</sup> and early VI<sup>th</sup> centuries AD (Bernal *et al.*, 2003; Bernal, 2009, ed.), offering new evidence.

The abandonment levels of the factory known as Industrial Complex I, in numbers 3-5 San Nicolás Street, provided a whole vertebra, which had been used as a butcher's anvil, as shown by the abundant cut marks on one of its joint faces (figure 2.3.3). This find could be understood as evidence for the exploitation of cetaceans in these factories, as I argue elsewhere (Bernal, 2007, 97-99), although its isolation could also mean that it was a piece brought *ex profeso* to be used in the fish cleaning/butchering process. Subsequent zooarchaeological analysis show that the vertebra, *grosso modo* 32-36 cms in diameter, belongs to a major cetacean; its fragmentary state does not allow for an accurate taxonomic identification, but size points to a major cetacean, above 8 meters long which, considering the two most common species in the Mediterranean, could be a fin whale (*Balaenoptera physalus*) or a sperm whale – *Physeter catodon* – (Morales and Roselló, 2009), both common in the Gibraltar strait (García and Ocaña, 2006, 51).



Figure 2.3.3 Cetacean vertebra used as an anvil, showing cut marks on the cranial joint face, from the Industrial Complex I, numbers 3-5 San Nicolás Street, in *Traducta*/Algeciras

A third batch of new evidence comes from the preserves factory of *Septem Fratres*, on the strait's African Shore. A recent excavation carried out in late 2006 in number 3 África Square uncovered a stratigraphic sequence running from the mid-imperial period to the present day (Bernal *et al.*, 2007 b; Sáez *et al.*, 2009). No material from this excavation has been published, other than the report and the cited works, but we can mention that the pre-Islamic remains belong to the major preserves factory previously identified in this area of Ceuta's urban centre. The factory was active between the II<sup>nd</sup> and the VI<sup>th</sup> centuries AD (Bernal and Pérez, 1999), as shown by the abundant remains of fish exploitation activities, including fishing equipment, and the proximity to several salting facilities, such as those found in Gómez Marcelo Street or in Paseo de las Palmeras Street. The excavation of the significant

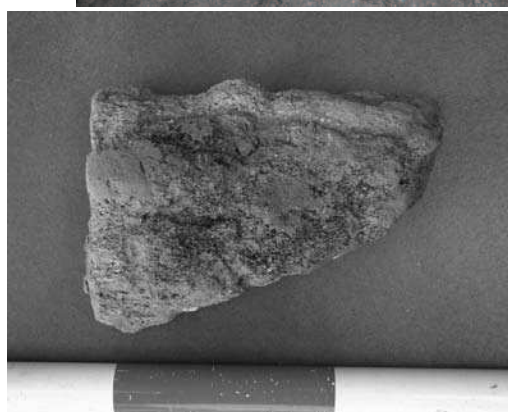
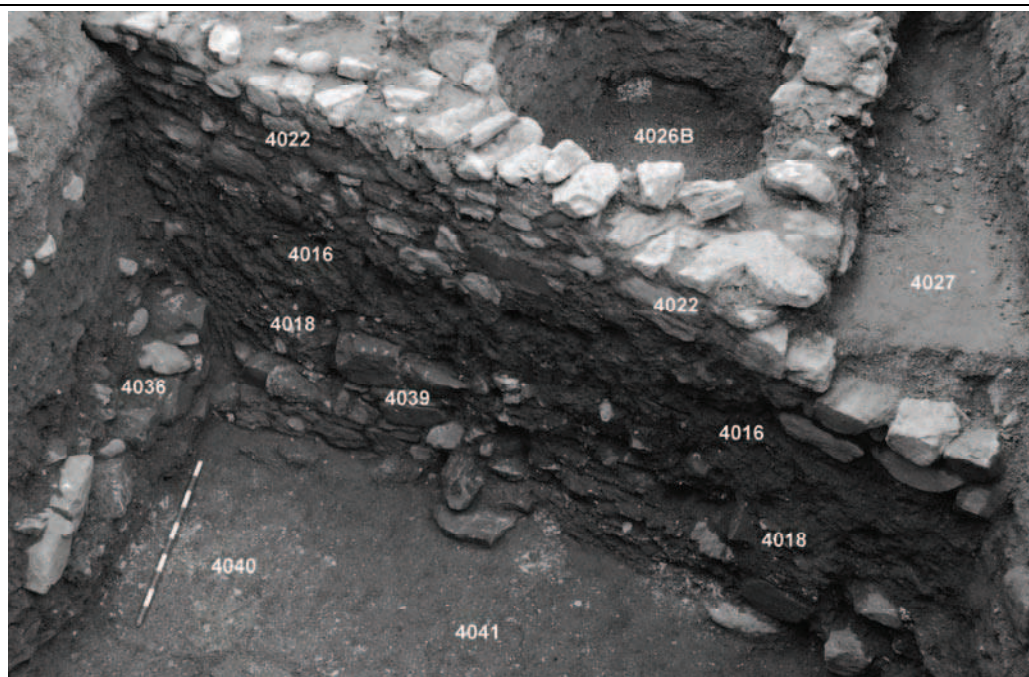
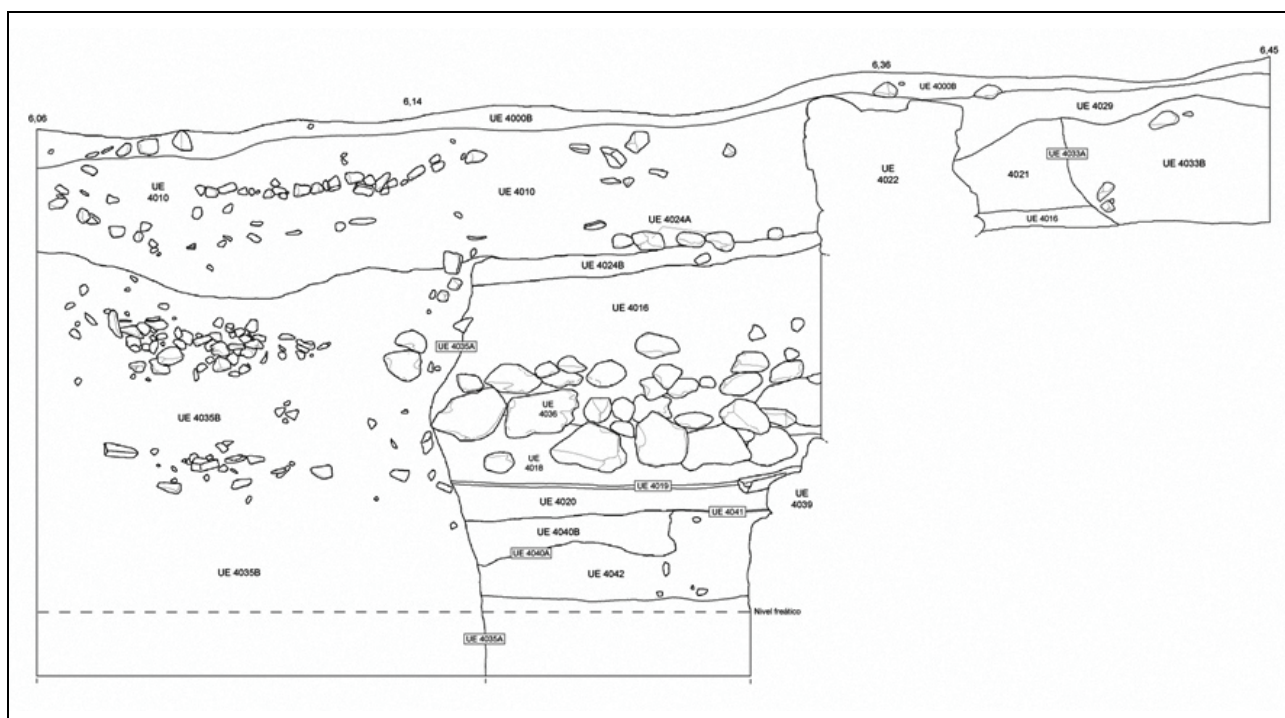


Figure 2.3.4 Stratigraphic section (A) and view from above (B) of Trench 4, number 3, África Square, including the strata (SS.UU. 4018 and 4042) in which the burned cetacean rib (C) and other bone remains (D) were found (Illustrations from Bernal, Lorenzo, Sáez and Bustamante, 2007 b)

pre-Islamic levels of this wide sequence (figure 2.3.4, A and B) produced several contextualized bone remains that could belong to cetaceans.<sup>3</sup> On one side, a fragment, more than 15 cm long, belonging to the joint face of a rib, was found in the Stratigraphic Unit (S.U.) 4018. The fragment shows obvious traces of thermo-alteration in its inner face (figure 2.3.4 C). S.U. 4018 is one of the latest levels within the Late Roman sequence excavated in number 3 África Square, dating to the late V<sup>th</sup> or early VI<sup>th</sup> centuries, as shown by several shapes of African sigillatas (Hayes 99, late varieties of Hayes 61, Hayes 91 B, etc.), imported amphorae (Keay XXXV, Keay LIII, etc.), slow wheel pottery, two bronze hooks, and a significant deposit of muricidae, apparently intentionally milled, maybe evidence for a purple workshop. The stratum corresponds with the demolition of the factory's structures and the levelling of the area. In one of the earlier levels (S.U. 4042), five further fragments of bone were recovered. They all were of considerable size, in some cases more than 10 cm in length, and were heavily weathered, none preserved any of the outer surfaces, and presented a spongy consistency, due to the extreme humidity conditions caused by a high water table, which even forced some interruptions in the excavation process. The final anatomical identification is not yet ready, but according to the preliminary assessment by the zooarchaeologists, based on dimensions, it is likely that they were vertebrae or ribs belonging to cetaceans. This context, which also includes other marine remains – especially shellfish – is dated to the II<sup>nd</sup> century AD, probably the later half, by the presence of African cooking pots (among others, Lamboglia 9 B and 10 A cooking pans, Hayes 197, etc.), and the amphoric remains (evolved Beltrán II A, Gauloise 4 and Dr. 20).

The outstanding importance of the excavation in number 3 África Square lies, therefore, in that it sheds light into three essential questions. First, it offers confirmation for the presence of whale bones within an industrial context of preserves processing, as shown by the spatial relationships with other *cetariae septenses* of similar date and by the sort of archaeological evidence found (multiple remains of marine fauna, salted products/preserves amphorae and fishing implements): that is, its presence within this productive context is not incidental, but shows a practice of cetacean exploitation in Ceuta's fishing industry. That would explain the traces of thermo-alteration shown by the rib in a context otherwise devoid of evidence of fire and full of other unburned faunal remains: the traces are due to warming incurred in the course of food processing. Second, the detection of whale bones in two different stages of the site's life span is particularly important. Their chronology also coincides with pivotal moments for this economic activity in *Septem Fratres*, between the II<sup>nd</sup> century (S.U. 4042) and approximately 500 AD (U.E. 4018): the evidence unmistakably shows that cetaceans were exploited in this small *municipium* of the *Fretum Gaditanum* at least in

these two moments (II<sup>nd</sup> and late V<sup>th</sup>/early VI<sup>th</sup> centuries), although the most likely hypothesis is that the activity took place continuously over the five centuries in between.

Other factories in the Gibraltar strait area have also drawn similar evidence. That is the case with the recent excavations in Manilva Castle (Málaga), where a complete vertebra, of remarkable dimensions, has been found in a mid/late imperial context. The evidence is currently under analysis.<sup>4</sup> It is likely that the publication of the excavation results, including the find of several *cetariae*, related with a *macellum* and several housing and bathing complexes, will increase our available evidence.

Outside the strait area, the pre-medieval evidence is almost inexistent, according to our bibliographical survey and consultations made with several zooarchaeologists.

To our knowledge, the only occurrence comes from the Galician castro of A Lanzada, where a vertebral disc belonging to a cetacean was recently found in a pre-Roman context of unknown date – but probably earlier than the II<sup>nd</sup> century BC – and interpreted as evidence of secondary exploitation of a beached animal (Fernández Rodríguez, 2003, 50, foto 1). Regardless of its apparent isolation, the importance of this piece of evidence is twofold. On the one hand, it is the first evidence for cetacean exploitation (or hunting?) ever found in the northern Atlantic, far away from the Gibraltar strait. This area would later play, along with the Cantabrian area, a leading role in whaling (Cazeils, 2000). On the other hand, it is the first evidence of cetacean exploitation prior to the Roman presence, confirming the importance of the exploitation of marine resources before Italic colonization.

Much of the evidence offered by seaside sites in *Hispania's* Cantabrian and Atlantic coasts probably remains unpublished; a comprehensive review of such evidence would require a monographic study, well beyond the scope of this paper.

#### **Further archaeological evidence from the *Fretum Gaditanum***

The presence of cetaceans in Atlantic and Mediterranean waters during Classical Antiquity can be also drawn from other indirect archaeological sources.

Among them, the iconographic representation of several cetaceans on a clay disc found in *Tamuda* (figure 2.3.5), in Mauritania, dated between the late III<sup>rd</sup> and the I<sup>st</sup> century BC, and known from old, but recently re-studied (Tarradell, 1950; Fumadó, 2006). Interpreted as a baker's stamp, its interest lie in the idealized scene it depicts,

<sup>3</sup> We thank Drs. M. Soriguer, J. Hernando and C. Zabala for providing us with the identification of this material, currently under study in Cádiz University, and of which only a draft publication has been produced (Soriguer, Zabala and Hernando, 2007).

<sup>4</sup> We thank J. Suárez, from *Arqueotectura*, for making a visit to this recent excavation possible, and C. León, archaeologist in charge of Manilva, for showing us all these recently excavated contexts, including the one in which the cetacean remains were found.





Figure 2.3.5 Clays disc from *Tamuda*, depicting a harpoon armed figure riding a hippocampus, surrounded by big sea creatures, a shark and a whale among them (Fumadó, 2006, 2013, figs. 2 y 3)

some character armed with a double harpoon riding a double-tailed hippocampus, according to the most recent iconographic interpretation. The animals represented, traditionally interpreted as dolphins, have been reassessed as sharks or, in the case of the larger one, a whale (Fumadó, 2006, 2014-2015), interpretations with which we agree. The lack of iconographic parallels in other Mediterranean contexts is of utmost importance, proving its singularity, especially in a geographical context such as the Mediterranean *Mauritania Tingitana*, in which the capture of these animals is a common activity. Its chronological relevance should also be underlined, being the earlier iconographic representation of its type in the Gibraltar area. It should be interpreted as a representation of an “heroic scene” of whaling, aimed at decorating cakes for a community of fishermen: maybe used on the occasion of a successful fishing season, or of the capture of a major cetacean, it is yet further evidence of how well known these mammals were in the strait area during Antiquity.

Regarding iconography, the episode of Jonah and the whale should not be forgotten. Although the theme reaches its *floruit* during the medieval period, and no pre-medieval iconographic depiction is known for the area, the story grows from ancient predecessors, particularly in the Late Roman period.

The previously mentioned pseudo-conic salting vats should also be brought here. The only known examples have been found in *Baelo Claudia* (figure 2.3.6 A), and therefore, they must be regarded as an exclusive feature of preserves processing during Antiquity. Their capacity is remarkable, 16 and 18 m<sup>3</sup> for the containers numbers 9 and 8 in the Industrial Complex VI in *Baelo* (Bernal *et al.*, 2007 a, 168), almost doubling the capacity of other such facilities. As already suggested by Ponsich, that makes their potential use as salting containers for cetacean meat an appealing hypothesis for the future (1988, 40, fig. 14). This area of the Industrial Complex

VI is dated in the late imperial period on the basis of stratigraphy, standing upon parts of Casa del Oeste (Bernal *et al.*, 2007 a). Therefore, the chronology matches with that of the evidence listed above, dating back to the II<sup>nd</sup> century but peaking during Late Antiquity. We can even go as far as to suggest that this factory could have specialized in the processing of cetacean meat during the late empire. Regarding this hypothesis, we should keep in mind that a cetacean vertebra bearing evidence of reuse was found in this *cetaria*.

The only other known examples of circular salting vats in the Roman Mediterranean are in several *cetariae* in eastern Sicily (Portopalo and Torre Vindicari), near Syracuse (Purpura 1989, 26 and 30-31, figs. 2 and 9). They are not well known, for they remain unexcavated, so they must be handled with care (figure 2.3.6 B). Furthermore, their location in the central Mediterranean places them far away from the routes followed by cetaceans in their life cycle.

#### **Specific fishing arts? The scarcity of bronze *hami catenati* and harpoons**

As shown in the first section, whaling was carried out with specialized equipment, of which the archaeological record bears little, at least well known, evidence. Regarding harpoons, only a handful have been published. In *Hispania*, the only known example of a certain size was found in San Martí de Empuries – Gerona (Castanyer, 2006, 22). It is dated to the VI<sup>th</sup> century BC, and is evidence of the use of this sort of fishing implement in pre-Roman dates (figure 2.3.7 A), although given the area where it was found, it was probably used for hunting other major species (sharks or others). No comparable specimens have been found in the area around the Gibraltar strait or the Atlantic coast. Our evidence is limited to small harpoon heads made of bone, for example, the one found in the factories in *Treducta*

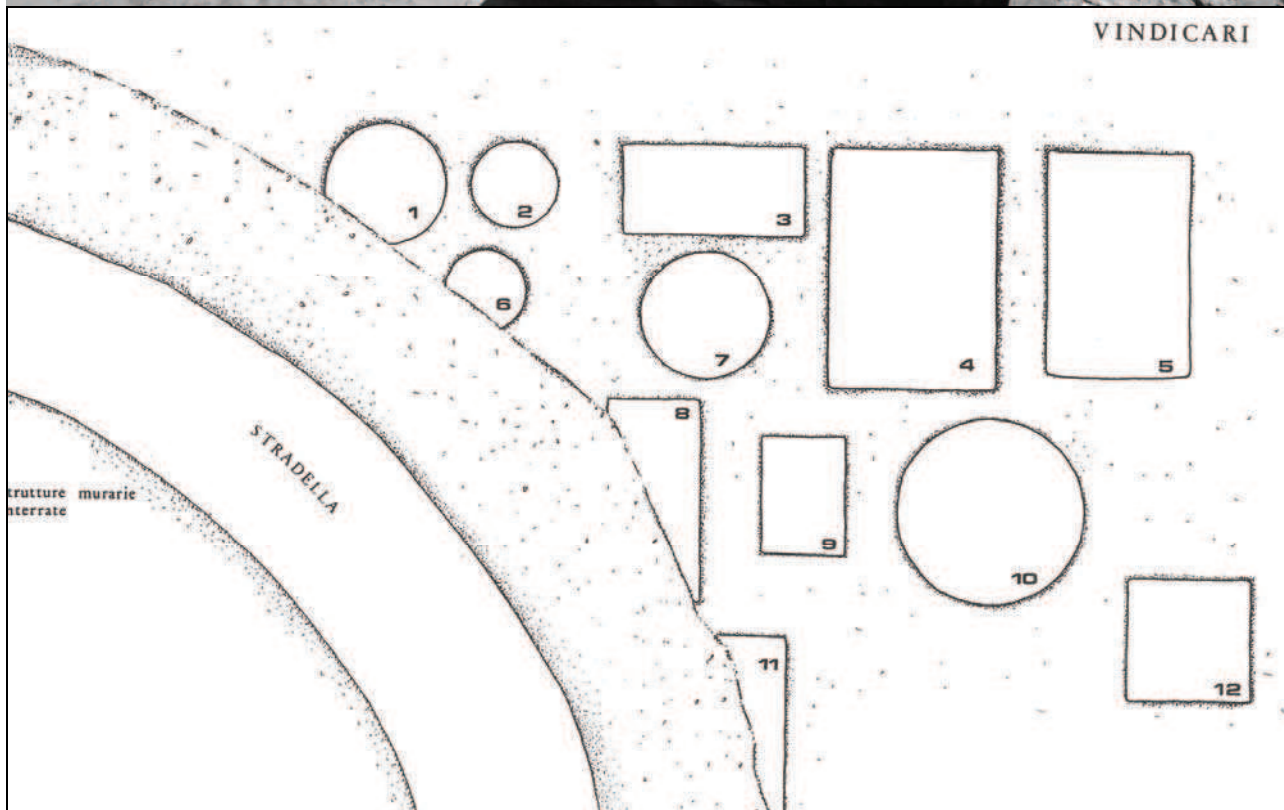


Figure 2.3.6 Circular vats from the Industrial Complex I in *Baelo Claudia* (A), and drawings of the preserves factory at Torre Vindicari (B), south of Syracuse (Púrpora, 1989, fig. 9)

(Algeciras), of early VI<sup>th</sup>-century date (figure 2.3.7 B) and obviously too small to have been used for larger cetaceans. This kind of harpoon is paralleled elsewhere in

the Mediterranean; a similar specimen dated on the VI<sup>th</sup>/VII<sup>th</sup> centuries was found in *Castrum Perti* (Figure 2.3.7 C), the known Byzantine settlement on the Ligurian coast

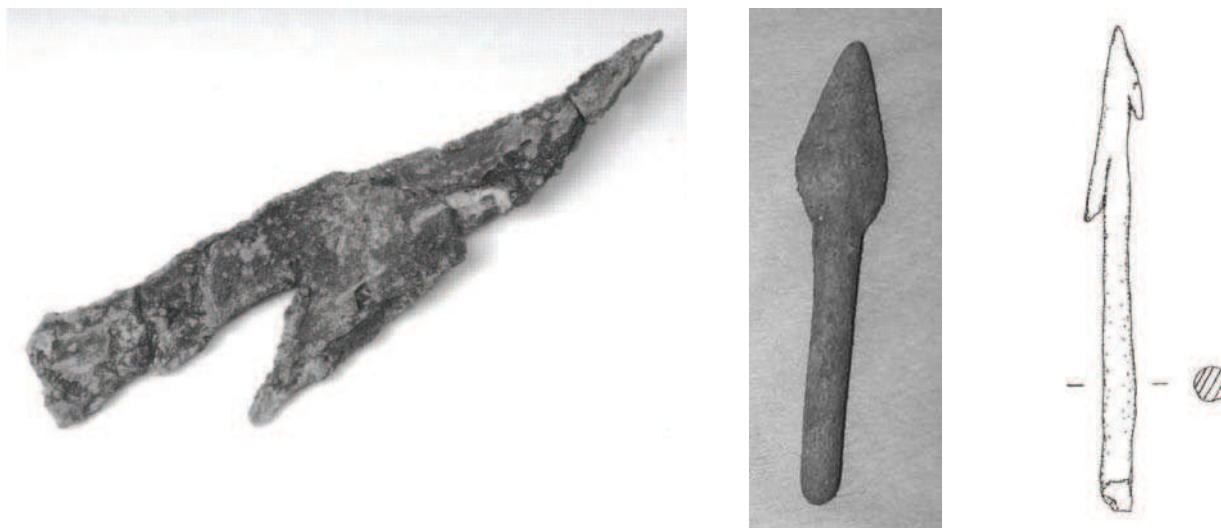


Figure 2.3.7 Fishing harpoons from the western Mediterranean  
 A. Bronze harpoon from San Martí d'Empuries, VI<sup>th</sup> century BC (Castanyer, 2006, 22)  
 B. Small bone harpoon from *Traducta*, early VI<sup>th</sup> century AD (Bernal, 2009, eds., chapter 26)  
 C. Bone double-headed harpoon from *Castrum Perti*, early Byzantine period  
 (De Vingo and Fossati, 2001, 659, fig. 95,1)

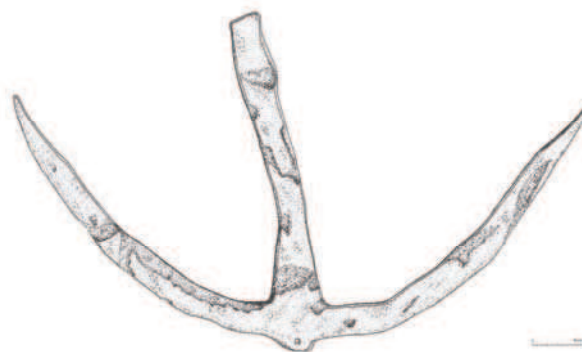
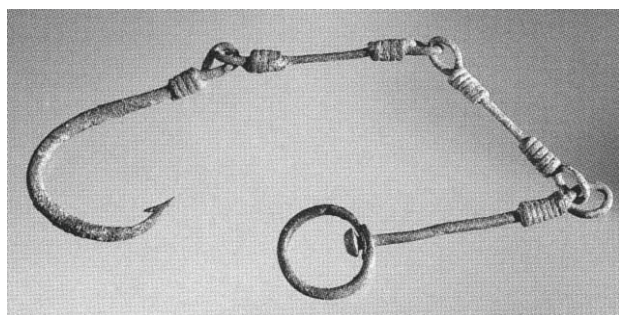


Figure 2.3.8 Chained hook from the suburbs of Pompey (A; Stefani, 1991, 14),  
 and double anchor from Pisa's harbour (B; Bigagli, 2000, 97, fig. 4)

(De Vingo and Fossati, 2001, 659, fig. 95, 1). No examples, unfortunately, of the large metal harpoons, as the first one shown, have been found in the *Fretum Gaditanum*.

Regarding hooks attached to chains, mentioned by Oppian, the evidence is minimal. The known *hami catenati* of Roman date are very few (and none come from *Hispania*) including an example found in a *villa* in Ascitutta, south of Pompey (Stefani, 1991, 14, n° 4229 a); other examples are currently under study, and remain unpublished. In any case, these hooks, of no more than 10 cm in height (figure 2.3.8 A), were obviously not used for whaling, but for smaller species such as tuna, sword-fish or even sharks, around 1 meter in length and 20/40 kilos in weight. They cannot, therefore, correspond with the hooks described by Oppian (V, 135-145), with their "terrible curve" capable of "piercing a cliff".

We think that the "hooks" mentioned by Oppian must have been very similar to the single anchor so often found

in archaeological sites, as illustrated by the specimen shown in figure 2.3.8 B, recently excavated in Piazza San Rossore, in Pisa, and dated in the I<sup>st</sup>/II<sup>nd</sup> centuries – area 2, US 78- (Bigagli, 2000, 96-97, fig. 4). This identification helps to clarify some references otherwise obscure, as the mention of iron hooks, an item almost inexistent in the record, or the reference to the chain attached to the end "of the dark hook" (Oppian, V, 135), a dark colour that could be explained by the use of iron. A future reassessment of single anchors – that is, not the three-pieced classical type – found in Atlantic and Mediterranean waters around the Gibraltar strait might prove rewarding because, probably, whaling practices lie behind many of them.

#### Meat and what else?: the importance of cetacean by-products in Antiquity

Apart from the meat itself, cetaceans could be exploited in a variety of other ways: their fat, skin, teeth, etc., could

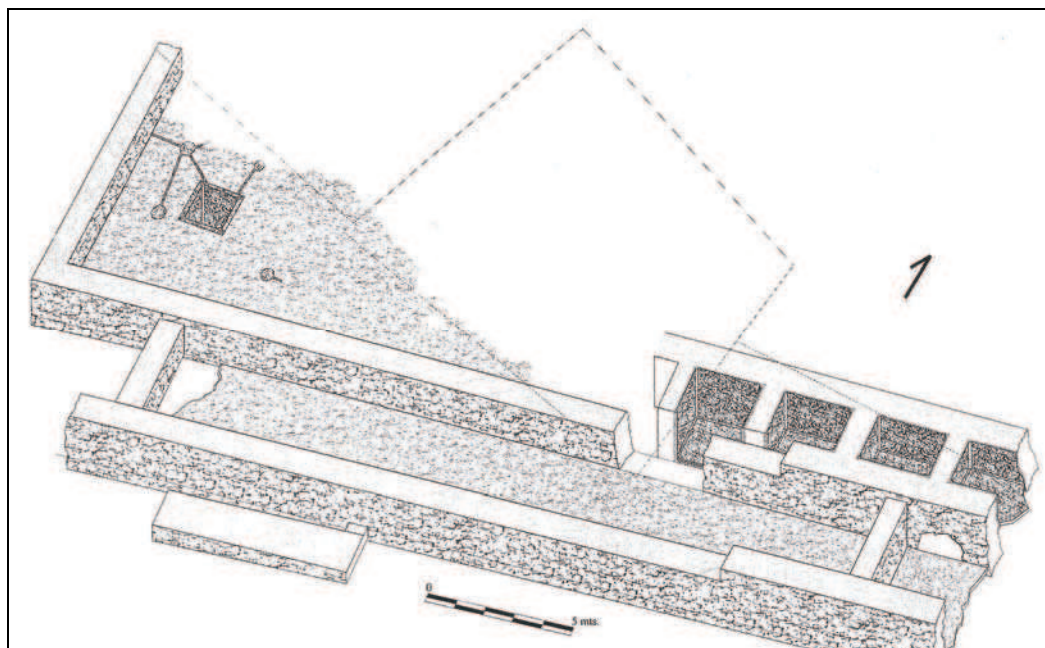
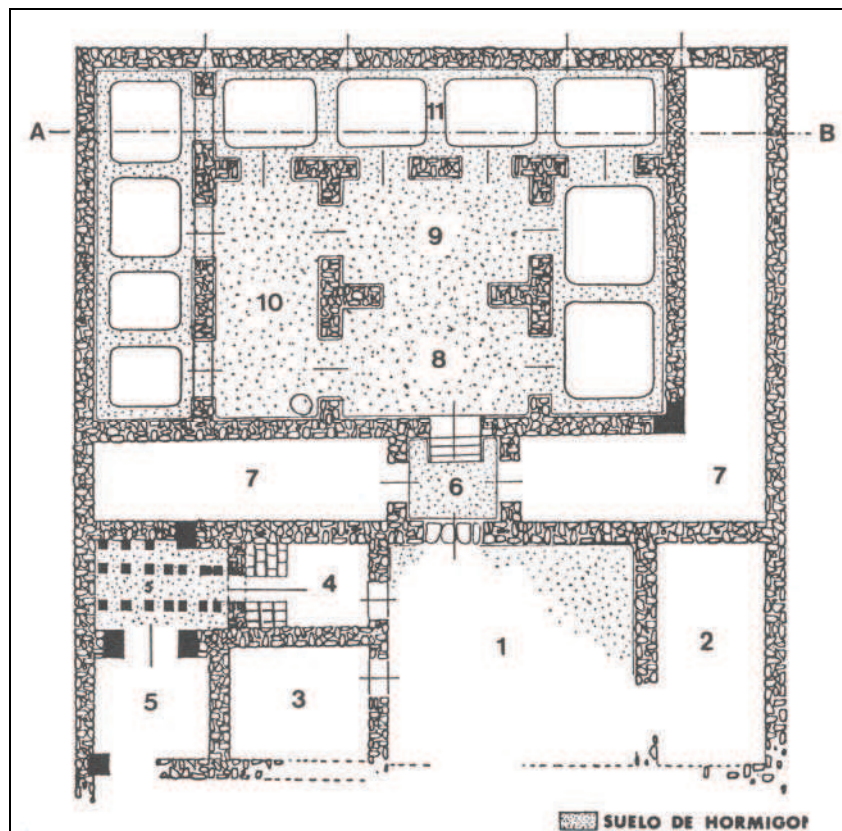


Figure 2.3.9 Hippocaustum from the preserves factory of Tahadart –A- (Ponsich, 1988, 144, fig. 76), and draining structures from *Gigia's cetaria* – B- (Fernández Ochoa, 1994, 143, fig. 21), potentially linked to cetacean by-products exploitation

be used for food, fuel, or wood-working (Cazeils, 2000, 41-43). Given the state of our knowledge on whaling in Antiquity, it goes without saying that the issue of the exploitation of their by-products has been largely ignored. The exploitation of “grey amber” is well attested for the Canary Islands in historical times, at least from the XVI<sup>th</sup> century. This substance, produced in the intestines, was excreted along with undigested remains, floating

towards the beaches in considerable quantities. “Grey amber” is known to have been used for the production of perfumes – due to its own smell, and for its capacity to retain other scents. Also used were the fat, for burning, and the so-called “espermaceti”, an oily substance found in great quantities in the head of sperm whales, for oiling precision instruments (Sánchez Pinto, 2004, 214-216).

Table 2.3.1 Histogram of whale fishing evidences in the Ancient World

YACIMIENTO	EVIDENCIAS	CRONOLOGÍA
A Lanzada	Disco intervertebral	¿ss. IV-III a.C.?
Tamuda	Medallón de arcilla decorado con cetáceos	III-I a.C.
–	<i>Haliéutica</i> de Opiano	s. II d.C.
Factoría de <i>Septem</i> (Plaza de África nº 3, Ceuta)	Costilla termoalterada (U.E. 4018)	s. II d.C.
	Restos óseos diversos (U.E. 4042)	Finales s. V – principios s. VI
Factoría de <i>Baelo Claudia</i>	Restos óseos citados por Ponsich	¿Bajoimperial?
	Vértebra del Conjunto Arqueológico	Indeterminada
Factoría del Castillo de Manilva	Una vértebra al menos	¿Bajoimperial?
Factoría de <i>Traducta</i> (c/ San Nicolás 3-5)	Vértebra	Finales s. V – principios s. VI

So far there is no evidence for their exploitation in Antiquity although, as argued elsewhere, we find it very likely (Bernal, 2007, 98-99); it is through future archaeometric residue analysis that we might achieve some progress. Why waste such valuable, and prized, fats and oils? Could the heating devices found in some *cetariae* in the *Tingitana*, for example Cotta or Tahadart, have been used to process these by-products? It would be an alternative explanation to their interpretation as facilities to obtain salt, by heating sea water (Hesnard, 1998). In historical times, the whaling factories in the Gibraltar strait were equipped with big “caldrons” for processing fats, oils, and other by-products obtained from whales (Vargas, 2005). Some of these facilities, dating to the XIX<sup>th</sup> century, have been archaeologically excavated, for example, in Australia (Jacomb, 1998). We should bear in mind that all *suspensurae* found in Roman *cetariae* – Cotta and Tahadart – are located along the Atlantic coast between Larache and Tanger, an area which is particularly relevant for whaling (figure 2.3.9 A). This interesting fact, pointed out a few years ago (Bernal, 2007, 99), should find future confirmation with new archaeological evidence.

In addition, the excavation of the preserves factory found in Marqués Square, in Gijón, in the Cantabrian coast, and dated in the late imperial period (III<sup>rd</sup>-IV<sup>th</sup> centuries), uncovered an interesting network of pipes connected to a series of circular containers and a cistern (Fernández Ochoa, 1994, 26-27). This structural arrangement, to our knowledge exceptional in fish processing factories, could have been used to decant these by-products, which are produced in sufficient quantities as to justify the construction of such facilities (figure 2.3.9 B). The location of Gijón in the Cantabrian Sea makes this find even more suggestive. Notwithstanding, no cetacean remains have been found in this preserves factory (Roselló and Cañas, 1994), so no empirical evidence can be offered; nevertheless, it is possible that these large mammals were butchered on the beach, so only the meat and other semi-solid matters – skin, fat, bones, entrails, etc. – reached the factories.

## CONCLUSIONS AND FUTURE PERSPECTIVES

First, we would like to underline the importance of Oppian’s *Haliéutica*, which would in itself be enough justification for this work: indeed, whales were subject of specialized hunting, which followed well established procedures and used specific equipment, during the Roman period.

It seems safe to say that the hunting of major cetaceans was already on its way by the II<sup>nd</sup> century BC. The literary evidence, the *Haliéutica* and the archaeological record, lets remember the thermo-altered rib attested for the II<sup>nd</sup> century in the preserves factory of *Septem Fratres* (Number 3 África Square excavation), seem to point in that direction. However, we still lack enough evidence as to know whether these activities began taken place earlier in time or if they actually were inaugurated during the Antonine period. The logical assumption is that this activity must have pre-dated this period. The indirect references in Pliny’s *Natural History* and the economic significance of fishing practices and other derived activities in the *Fretum Gaditanum* from the Phoenician period are in support of this idea. Indirectly, *Tamuda*’s discs’ iconography and the finds in A Lanzada are also supportive of the idea of cetacean hunting on the strait and the Atlantic. It seems, however, that fishing intensified on a significant degree in the strait during the II<sup>nd</sup> century, intensification which becomes especially apparent in cases such as *Septem Fratres*, in which a major factory is built (Bernal, 2006), remaining active until the end of the Late Antiquity. Therefore, more evidence is needed to date the beginnings of these activities which, as said before, were well on their way by the II<sup>nd</sup> century.

It would seem that most of the evidence groups around the Late Roman period, as shown by the faunal remains in Manilva and, indirectly, by the previously mentioned evidence from Gijón, *Baelo Claudia* (including the dates in which the Industrial Complex VI or “factory of the pseudo-conical vats” was active), Cotta and Tahadart. The cetacean faunal remains found in *Traducta* and



Figure 2.3.10 Archaeological sites related to whaling in Antiquity, due to faunal evidence (1-4 and 7), facilities potentially used in whaling (3, 5, 8 and 9), and iconographic depictions of cetaceans (6): 1.- Manilva Castle; 2.- *Traducta*; 3.- *Baelo Claudia*; 4.- A Lanzada; 5.- Gijón; 6.- Tamuda; 7.- *Septem Fratres*; 8.- Cotta; 9.- Tahadart

*Septem Fratres* in late V<sup>th</sup>-/early VI<sup>th</sup>-century contexts are especially relevant, for they show the persistence of the activity until the end of Antiquity. Thus, we must conclude that these fishing activities were carried out at least over a period of 350 years (150-500 BC), although is likely that new evidence will push back the initial date even further.

Regarding the sites from which this evidence comes from, we must not forget that all of them, apart from A Lanzada and Tamuda, were preserves production centres, so the interpretation seems self-evident. The most incontrovertible evidence comes from the *cetariae* of *Septem Fratres*: a thermo-altered rib of which interpretation cannot be doubted. For the others, the only available evidence so far consists of a variety of reused vertebrae.

From a geographical point of view, as shown in figure 2.3.10, the sites group mainly around the strait (n° 1-3 and 6-9), with the exception of some Atlantic locations (n° 4 and 5): that is, a distribution logically determined by the life cycle of cetaceans. In this respect, the emergence of some evidence in waters east of this area, as illustrated by the case of Manilva Castle, is interesting, for it gives archaeological support to Oppian's mentions of "incursions" of cetaceans into the waters of the *Mare Ibericum*.

Admittedly, our survey for sites with faunal remains has not produced a long list, returning only five names (Manilva, *Baelo*, *Septem*, *Traducta* and A Lanzada) after almost two years of research. Although we are sure that the future will provide us with further evidence, especially around the strait and the Atlantic and Cantabrian areas, we are not very optimistic on the quantitative side, for strictly methodological reasons: the butchering of the whales must have taken place, for obvious reasons, on the beaches, so most of the remains must have been left there or buried near the shore. Only some parts would reach the factories; for example, the ventral parts or the skeleton, as illustrated by the case of *Septem Fratres*. This problem of archaeological "visibility" would explain the under-representation, or complete absence, of faunal remains in the Spanish preserves factories (we only know the cases of *Portus Illicitanus*, *Baelo*, *Septem*, *Traducta*, Gijón....).

The reuse of vertebrae as anvils for butchering fish seems to be an exclusive feature. We know of at least two examples (*Traducta* y *Baelo*), and possibly of a third in Manilva. The shape of these large vertebrae makes them ideal for creating butchering surfaces; they were rigid but not too hard, so no damage could be done to the metal instruments used upon them, and their light weight also made them very versatile.

The exploitation of cetacean by-products has already been commented on; fat, oils, bones, and “grey amber/espermacite”, etc. It is difficult to dig deeper into the issue without reference to archaeometric studies, and this is one of the main topics to be addressed in the future; more evidence is needed in the form of equipment/ structures – e.g. the examples from Gijón or Cotta/Tahadart – likely to have been used for the exploitation of said by-products.

Another issue to be addressed in the future is the commercial projection of these products. Whale meat was probably salted, and perhaps *Baelo Claudia* offers a ready example of the salting facilities (Industrial Complex VI or “factory of the “pseudo-conical” vats). How was it marketed? We think that it must have been sold in amphorae, among other kinds of containers, due to the high quantity of meat; it was, however, no delicatessen to be sold in smaller quantities. Amphorae containing cetacean meat is an appealing notion, not demonstrated so far in the absence of specific *tituli picti* and physical remains. Some recent readings of inscriptions written over Italian Dr. 21/22 have identified the formula “*CET(vs)*” followed by numbers, that is, a reference to a large-sized species and the number of slices contained (Botte, 2007, 445). Is this reference *ceti* – a large species of fish – pointing to cetaceans? These Dr. 21/22 were produced in a big scale in central Italy – especially in *Cumae* – and additionally in Sicily and, “suspiciously”, in El Rinconcillo, in Algeciras, during the late republican period and the early empire (Bernal y Jiménez-Camino, 2004). Further developments require for this sort of evidence to emerge in consumption contexts. Regarding the amphorae types employed, we favour the Beltrán IIB and Keay XVI types for the II<sup>nd</sup>/III<sup>rd</sup> centuries, and the Keay XIX and Almagro 51c for the IV<sup>th</sup> century, although this later type, due to a narrow neck, was more suited for fish pastes than for *salsamenta*. It may be worth inquiring into some Atlantic productions, “exclusively” Lusitanian, with broad necks, such as the Lusitana 8 and 9 types (Fabiao, 2008, 728, fig. 2); the former’s shoulders characteristically inscribed with numbers, maybe allusive to the content in pieces of *salsamenta*, flat based the later. It is an interesting suggestion which needs further evidence for confirmation. However the storage of unusual products in amphorae should not surprise us; thanks to the *tituli picti*, we know of oyster preserves – as indicated by Aelian in the III<sup>rd</sup> century – stored in tailor-made amphorae manufactured in the Danubian provinces (Dyzcek, 2008, 518, fig. 4), among other examples (Bernal, 2007).

Finally, some considerations must be made bearing in mind recent traditional whaling, which in the strait area remained “officially” active until 1954. The only two whaling factories in the area were Bahía de Getares in Algeciras (“Ballenera del Estrecho”) and Benzú in Ceuta (“Industrial Marítima”), as recently shown (Vargas, 2005, 99 and 100). Additionally, some smaller factories existed in the Moroccan coast, as in the mouth of the Martil River, near Tetuan, in Sidi Abdeselam del Behar. It

seems to no coincidence that all three locations mentioned have their own preserves factory from the Roman period, *Traducta* for Getares (in addition, more of this facilities can be found in *Caetaria*, in the mouth of the Pícaro river), *Septem Fratres* for Benzú<sup>5</sup> and the recently documented preserve factory/purple workshop of Metrouna, active during the II<sup>nd</sup> century, for Sidi Abdeselam del Behar (Bernal *et al.*, 2008 a). As argued elsewhere (Bernal, 2007, 97-99), everything points to a close relationship between whale exploitation at the *cetariae*, in the absence of specifically devised whaling facilities in the Roman period; the finds of cetacean faunal remains in some of these factories (*Baelo*, *Traducta* and Manilva Castle) also supports the idea.

We have already mentioned that whales would be butchered on the beaches, due to their size, before their transport to the factories. It is therefore interesting to note that the contemporary factories were always equipped with ramps, from which the captures were lifted. These ramps are well attested in two of the relevant sites from the Roman period. *Traducta* (Algeciras) had a ramp connecting the urban industrial quarters, located on a hill, with the embankment area of Río de la Miel. The ramp, excavated in Méndez Núñez Street, was covered in the VII<sup>th</sup> century, and was interpreted as embankment and access to the industrial area (Bernal, Iglesias y Lorenzo, 2009). In *Baelo Claudia*, the harbour area has been recently interpreted as a stone ramp with wooden dykes (Alonso, Menanteau, Gracia and Ojeda, 2007), which could also have been used for partially lifting the captures to be butchered.

Apart from the ramp, no other specific equipment was required for the processing of these animals, apart from an open area for butchering and caldrons; the settlements were often of a temporary nature and the structures were built with perishable materials – the only outstanding feature would be the watchtowers – as recently shown by archaeological projects carried out in Australia for XIX<sup>th</sup> and XX<sup>th</sup> century examples (Lawrence and Staniforth, 1998).

These pages have set the basis for the study of whaling in the Roman Empire, an almost forgotten topic by modern economic historians. Although its historiographic origin is set in the Middle Ages, partially due to the popularity of Basque seamanship in the North Atlantic, now we know that the initial date must be pushed at least back to the Early Roman Empire.

This is one of the earliest studies addressing the issue, so many topics are still awaiting further development. First, we must hope that more faunal studies will be developed in the future, for so far only *Traducta* has produced such evidence.

<sup>5</sup> We thank our colleague A. Bouzouggar from the INSAP of Rabat for the reference to the find of cetacean bones in some caves around the Moroccan area of Benzú Bay, in association with Neolithic remains, currently under study.

Another potential line of research must point to the extension of the chronological/cultural framework; for it is surprising that these practices did not begin in the *Fretum Gaditanum* until the II<sup>nd</sup> century (did they not apply in the Phoenician period?). Most of the known evidence dates in the late empire and Late Antiquity, so we could be tempted to think that the “systematic” capture of cetaceans could be a complementary measure in the face of the exhaustion of Mediterranean fishing grounds and the shortage of tunids, as some scholars have suggested for the III<sup>rd</sup> century onwards. We believe that the archaeological and faunal evidence available is yet too thin to support this hypothesis, although it is well worth pursuing.

It is also too soon to draw a theory on the volume of commercialization and the real impact of these products on the Atlantic-Mediterranean trade, for we even ignore the containers in which they were traded. This issue must also be addressed in the future.

Finally, this is one of the links between the area around *Gades* and the *Fortunatae Insulae*, because many of the contemporary whaling routes either whirled around the Gulf of Cadiz (between the capes of San Vicente and Cantín – Vargas, 2005), or set out for waters near the Canary Islands. Maybe, evidence for the knowledge of the Canary Islands, and even of links between them and *Hispania*, will follow from the study of these fishing practices.