

Fishing Factories and the Limitations of Navigation in the Ancient Roman Mediterranean

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Salted Fish and the Development of the British Navy

Out of all the many accounts of mariners and their provisions, the largest number probably comes from the British Royal Navy, and these provide a suitable starting point for examining the food received by sailors at sea. In 1677, Samuel Pepys, the secretary to the Admiralty, copied into his *Naval Precedents* a contract he had set up with suppliers to the Navy,¹ specifying predetermined rations for each sailor. According to Navy regulations, either pork or beef were provided on four days each week up to the 1730s, with salted fish on the other three days.² As regards civilian vessels, rations for common sailors were not too dissimilar to those of the Navy, the main difference being the practicality of carrying livestock for the crew. The Navy did sometimes attempt to keep significant numbers of live animals on board for the consumption of the crew, but the primordial need was often for space for the large crews.³

The Navy did experience difficulties with the regular supply of provisions to ships stationed a long way from England, but, as time went on, sailors began to develop other means of obtaining additional food during their voyages.⁴ The fishing industry, though, unquestionably played a key role in selling sailors sufficient foodstuffs to enable them to survive at sea. The quantity of salted fish issued was dependent on the type and size of fish. Pepys' contract, from 1677, mentions North Sea cod, haberdine (a different variety of large cod), "Poor John" (a type of hake) and stockfish (yet another kind of cod).⁵ The rations provided were to change little in the century and a half following Pepys' signing of the contract.⁶

Given that dried fish constituted the principal ration in the Navy for three out of every seven days, the needs of British sailors had long exerted an important influence on the growth of domestic fisheries at some distance from England,⁷ for example in Scandinavia as far back as the sixteenth century.⁸ In the reign of Henry VIII (1509–1547 AD), demand from the English Navy may still have been modest in terms of quantity,⁹ but the Navy had nevertheless become a priority for the King, and this became even more the case during the reign of Elizabeth I (1558–1603 AD), when England found itself in competition with increasingly global powers such as Spain.¹⁰ Elizabeth's reign saw the creation of an explicit link between commercial fisheries and the Navy, with the introduction of weekly 'fish days' to encourage domestic consumption and thus the development of a commercial fleet.¹¹ The principal aim of this legislation was to ensure a supply of trained mariners, but it must at the same time have represented a secure source of supplies for the Navy, in the form of dried fish.¹²

Navigation and the Limited Fishing Capacity of the Mediterranean

As has been pointed out by Fernand Braudel, the Mediterranean is not especially productive in terms of fish¹³ and so throughout most of its history there have been relatively few fishermen, given that a significant fishing industry needs to provide sailors with staples, which often involves the maintenance of ports and recruiting available mariners. Furthermore, it has always been difficult to provision large fleets of galleys and sustaining trading routes: the population of a large fleet is equivalent to that of an ancient city of substantial size and supplying provisions for so many men has traditionally been beyond the power of most communities, since permanent naval bases have to be set up and careful organisation is required.

It has, therefore, been much more typical of Mediterranean history that large fleets have been built up from scratch, with specific expeditions in mind.¹⁴ When war fleets have been needed, they have been generally constructed, collected and manned *ad hoc*,¹⁵ and Braudel has indeed already identified the chronic shortage of maritime manpower in the Mediterranean in comparison with the North Sea and the Atlantic Ocean.¹⁶

While for much of the Classical Age the Athenians did possess comparatively organised naval forces, even they had to build ships and call up men for specific campaigns, as described by Thucydides in his account of preparations for the Sicilian expedition that began in 415 BC.¹⁷ Octavian, too, was responsible for raising a series of war fleets in the early 30s BC to combat Sextus Pompeius, with preparations beginning in 38 BC after the loss of a fleet at Scyllaeum, which in itself illustrates the somewhat chaotic process of building a fleet.¹⁸ Even in the twelfth and thirteenth centuries, when the Venetians did maintain relatively large fleets, their regular requirements were insignificant, and most of their naval forces were only called up in times of trouble.¹⁹ In the sixteenth century, the Ottomans too tended to produce large fleets from scratch, aided no doubt by their good access to materials for construction,²⁰ and the other powers of the time also assembled large fleets from different sources, as was the case in the battle of Lepanto in 1571 AD.²¹ Up until the seventeenth century, this shortage of manpower in the Mediterranean encouraged the use as rowers of slaves, part-time paid workers or condemned prisoners.²²

From the time of Augustus onwards, though, the increasing political unification of the Mediterranean, the reduction in piracy and the consequent expansion of towns was a major stimulus for economic growth.²³ The greatest achievement of the Romans was perhaps their ability to facilitate over several centuries the mobilisation of manpower around the Mediterranean's key fishing grounds, and also to maintain fisheries in these important areas of the *Mare Nostrum*, whether for the use of the Imperial classes or to provide other services of political or commercial importance. The expanding presence of vats and fish-salting installations in the Mediterranean was not, then, primarily attributable to an increase in the consumption of fish in

inland regions of the Mediterranean countries, and the spread of salted or dried fish during Imperial times should certainly not to be compared with the growing consumption of vegetables, cheeses and pulses in Italy, Spain and Greece.²⁴ It seems reasonable to infer instead that it was military, Imperial and logistical need which contributed to the expansion of fish-salting installations in key areas of the Mediterranean, as it is likely that at the time naval rations for the sailors, rowers and soldiers who lived and sailed in the great fleets were based on dried and salted fish.

Fish-Salting Installations in the Roman Western Mediterranean and the *classis Misensis*

Fish-salting activity in the Roman Imperial world is highly visible from an archaeological perspective, because of the use of batteries of vats, made of *opus caementicium* and normally lined with the typical hydraulic mortar known as *opus signinum*, which was regularly used in Roman constructions that required waterproofing, such as cisterns and treading floors. It is not clear whether the use of salting as a preserving method for fish originated with the Greeks, with the Romans learning the process via their colonies in southern Italy, or whether it was a technique of Punic origin.

However, there is only clear evidence of salting vats in the Roman World in second-century BC Pompeii,²⁵ and it was during this period that Portus and Puteoli emerged as the main centres of the industry in Italy, supported by satellites, Centumcellae and Antium in particular, but also many smaller harbours, including those of the various *villae maritimae* of the region. It was only in the Roman Imperial period, though, and not before, that large installations with the typical batteries of concrete vats began to spread throughout the Mediterranean. The installation of most of the Roman fish-salting workshops of Southern Spain (and Portugal) may be dated then to the late first century, or the Julio-Claudian period, though it is also worthy of note that urban fish-salting workshops continued to be set up right into the days of the late empire, and in the fourth and fifth centuries AD most Hispanic *cetariae* were in fact located in urban or harbour areas.²⁶

The spread of Roman fish-salting installations, whether large or small units of production, is an indicator of the complex organisation behind the activity, which was obviously dependent on supply of the items required for production (salt, fish and containers for distribution).²⁷ Everything points, though, to Italian fishermen having played a key role in providing the impetus for fish salting in the Iberian peninsula and elsewhere, with the dissemination of various more advanced techniques for the storage and treatment of the fish in the vats. Italian fishermen did in fact continue to exert an important influence on the fishing industry in different areas of the Mediterranean

up to the nineteenth century, and it may be surmised that this was also the case in Roman times.²⁸ Indeed, the term ‘transmerance’ equates the changes in the sea and the movement of schools of fish to the seasonal paths followed by shepherds and their flocks, so it seems logical to suggest that fishermen played a similar role with regard to trade and the establishment of new settlements.²⁹

As regards the spread of batteries of concrete vats throughout the Western Mediterranean and the role played in this by Italian fishermen, it should, as Meloni pointed out, be stated that “the Misensis fleet was not always and entirely based at Misenum”.³⁰ For several centuries, in fact, Rome supplied important logistical and maritime support to the whole of the Western Mediterranean from Bay of Naples and the south of Hispania, presumably making use of the Misenum fleet, which left its mark on cities such as Gades, Carteia, Málaga, Almuñecar and Carthago Nova, all of which had highly significant fishing industries.³¹ It is, then, very likely that, at certain times of the year during specific periods, these great ports housed significant detachments of the *classis Misensis*, the imperial fleet of Misenum, as well as civilian cargoes involved in semi-official transport and other duties related to trading activity in the western Mediterranean. Indeed, had there been no Misenum fleet or regular transport of staple products by organised fleets using official or sponsored semi-official maritime channels, then the fishing industry in the Iberian Peninsula would never have been maintained after the first and up to the 5th century AD. The case of Spain was not an isolated one, either, as similar Roman fleets loaded with *annona* products circulated in the western Mediterranean between the Rhône valley, Rome and Africa continuously in the life of the empire.³²

Fish-Salting Installations in the Roman Eastern Mediterranean and the Rise of the Bosphorus Region

The *Stadiasmus Maris Magni*, which was collated anonymously around the middle of the 2nd century AD, provides navigational information regarding the routes and harbours of the eastern Mediterranean.³³ The majority of the routes mentioned by this source, but also by Strabo (14.1–2), travel in an east–west direction, perhaps suggesting that the majority of maritime movements also moved in that direction,³⁴ at least as far as political and directed trade is concerned.³⁵ This apparent reality probably also indicates that Alexandria and other ports of the Levant controlled navigation from east to west in the Mediterranean via southern, or southern-central, maritime lanes.

Egypt was by the time of Augustus a major supplier of wheat and basic staples to Rome, with the Emperor claiming to have distributed grain to the *plebs* of Rome from his own granaries in Egypt.³⁶ At the end of his reign, Augustus left direct control of the *praefectura annonae* in the hands of two former praetors, who were to

be reappointed to the office each year.³⁷ The official maritime trading lane between Egypt and Italy was also reinforced by Claudius through his promotion of winter navigation by merchants, attracting them to the *annona* service by offering privileges to shipbuilders and ship owners,³⁸ as well as other favourable terms financed by the state.³⁹ A passage by Seneca the Younger suggests that later, under Nero or shortly before, a truly “Alexandrian fleet” was created, bringing all or most of the grain from Egypt, first to Puteoli and then to Rome.⁴⁰ As Tacitus notes explicitly,⁴¹ by the time of Vespasian, to capture Rome, one first had to control Alexandria, the “key” to Rome’s *annona (claustra annonae)*.⁴²

Because of sailing conditions, it is of course somewhat unlikely that sailors travelling from Egypt to Italy would have used exactly the same southern Mediterranean maritime itinerary to sail back to their starting point. They would instead have made use of more favourable winds or currents, probably taking a more northerly route. The importance of the southern Mediterranean maritime lane from the east to the central Mediterranean, though, is probably proof of the virtual hegemony of Alexandria over the eastern Mediterranean during most of the lifetime of the Roman Empire. Alexandria might also have controlled, in Roman times, as it had done for several centuries before, another south-north route in the eastern Mediterranean, which used Rhodes as a central node⁴³ and took in many of the maritime regions of Asia Minor, even extending across the Aegean into Thrace.⁴⁴ In due course, this south-north axis developed even further, and in Justinian’s time Egyptian trade channelled throughout Alexandria played an all-important role in supplying Constantinople with all of its needs, from luxury goods to raw materials and grain. Annual shipments of grain from Egypt to Constantinople in Justinian’s reign amounted to 8,000,000 *artabes* or 27,000,000 *modii*, or enough to feed about 600,000 people, a truly enormous number.⁴⁵

So important to the Mediterranean were Egyptian cargoes of grain that emperors sometimes distributed – or allowed to be distributed – Egyptian grain in the provinces, as they did in Rome.⁴⁶ Since Egyptian grain belonged formally to the emperor, both actions were in any case probably interpreted as acts of generosity on his part.⁴⁷ We know, for example, that Tralleis⁴⁸ and Ephesus⁴⁹ were given permission by Hadrian to import Egyptian grain, but Cyzicus too received Hadrian’s authorisation to do so.⁵⁰ As some coin types from Tarsos demonstrate, both Caracalla and Severus Alexander also provided that city with Egyptian grain,⁵¹ and when during the Antonine and Severian period many cities in Moesia and Thrace freely stamped their coins with images of Egyptian deities, even using production techniques typical of Egypt,⁵² this was in all probability connected with the distribution of Egyptian grain in the region. Leaving aside Tomi, which was unique in displaying a notable and consistent Egyptian character to its coin issues, similar series are known to have been minted at Callatis, Nicopolis ad Istrum, Marcianopolis (Moesia Inferior), Pautalia, Augusta Traiana, Hadrianopolis

and Anchialus (Thrace), as well as in other cities such as Serdica.⁵³ The enormous proliferation of granaries and *horrea* in Thrace and Moesia from the end of the second century onwards⁵⁴ coincides with cities in both regions minting coins with Egyptian motifs and hosting particularly large numbers of soldiers, who gathered there during the second, third and fourth centuries AD, either to act in the region or to be transferred to Asia Minor and the east.

As regards the concentration and movements of Roman troops around Thrace during Imperial times, it might also be mentioned that the Black Sea and Sea of Marmara regions were known for different kinds of fish including, but not limited to, tuna, mackerel, sardines and anchovies.⁵⁵ A. Marzano suggests that Black Sea products may in the third and fourth centuries have replaced Spanish ones in some markets.⁵⁶ I would suspect, though, that the activities of the Roman navies at the time were focused mostly on this region, and that this encouraged the proliferation and production of fisheries there. The numerous production centres in the region are similar to those found in the first and second centuries AD in the western Mediterranean at Carthago Nova, the mouth of the Rhône and the straits of Messina, and it seems likely that this shift in fishing activity illustrates how the Bosphorus region took advantage and become the heart of Imperial and official maritime activity from the second century onwards.

Conclusions

In this paper I have argued that the building of the Roman Empire and the subsequent *Pax Romana* had fundamental consequences for the fishing industry in the Mediterranean. The use of Roman technology in the fishing industry was not, however, primarily market-oriented, but geared to consumption by sailors and by the crews of Roman vessels, and above all by the Roman imperial navies.

There is no doubt that the Roman emperor did indeed act as a benefactor, but he was also responsible for maintaining and supporting large population groups, such as Rome and later other cities too, as well as a number of Roman armies spread throughout the empire. It was, therefore, under such a regime that the mechanics of imperial organisation had the space to evolve, and indeed were required to do so.

I have also suggested in my paper that the imperial *classes* played an essential role in monitoring communications in the Roman Mediterranean. The Mediterranean of the Romans was not rich in fish and other basic staples, and maintaining the maritime lanes necessary to the functioning of the empire was possible only with great effort, which was in turn dependent on the existence of a vast network of fishing installations. It was this fishing industry that made possible, but also came to limit, the intensive and safe navigation that characterised the Mediterranean in Roman times.

Notes

- ¹ Fictum 2016, 3; Bryant 1938.
- ² Fictum 2016, 8.
- ³ Fictum 2016, 16 f.
- ⁴ Fictum 2016, 21.
- ⁵ Fictum 2016, 8.
- ⁶ Fictum 2016, 4.
- ⁷ Hutchinson et al. 2015, 9.
- ⁸ Holm, 1998.
- ⁹ Knighton – Loades, 2000.
- ¹⁰ Quinn – Ryan, 1983.
- ¹¹ Jackson, 2000.
- ¹² Hutchinson et al. 2015, 9.
- ¹³ Braudel 1972, 138–140. 436. 448; Hopkins 2014, 136 f.
- ¹⁴ Hopkins 2014, 16.
- ¹⁵ Hopkins 2014, 15.
- ¹⁶ Braudel 1972, 138–140; Hopkins 2014, 17.
- ¹⁷ Thuc. 6.30–32; Hopkins 2014, 16.
- ¹⁸ App. B Civ. 5.89; Dio 48.47–48; Hopkins 2014, 16
- ¹⁹ Lane 1973, 49; Hopkins 2014, 15.
- ²⁰ Brummett 1994, 96; Hopkins 2014, 15.
- ²¹ Hopkins 2014, 15.
- ²² Lane 1973, 368; Zysberg-Burlet 1990; Hopkins 2014, 17.
- ²³ Hopkins 2014, 20.
- ²⁴ Marzano 2013a, 96.
- ²⁵ Marzano 2013a, 98.
- ²⁶ Marzano 2013a, 103.
- ²⁷ Marzano 2013a, 121.
- ²⁸ Marzano 2013a, 86.
- ²⁹ Marzano 2013a, 87.
- ³⁰ Meloni 1958, 93; See also Vegetius, 4. 31 on the fleet of Misenum during the period of the Late Roman Empire.
- ³¹ López Sánchez 2012, 2014.
- ³² Southern 2007, 112.
- ³³ Bouras 2016, 204.
- ³⁴ Bouras 2016, 216.
- ³⁵ Scapini 2016, 222.
- ³⁶ Res Gestae Divi Augusti 18.
- ³⁷ Scholars take different positions regarding this, and a few (such as Garnsey 1988, 255) claim that the main contributor of grain was the African provinces.

³⁸ Suet. Claud. 18.2.

³⁹ Garnsey 1988, 74.

⁴⁰ Ep. 77.1; Scapini 2016, 226. 228.

⁴¹ Hist. 2.82; 3.8.

⁴² Scapini 2016, 226, note 53.

⁴³ Buraselis 2013.

⁴⁴ Gabrielsen 2013.

⁴⁵ Jones 1964, 698; Durliat 1995, 19–33.

⁴⁶ Garnsey 1988, 256 f.

⁴⁷ Scapini 2016, 237.

⁴⁸ I Tralles 80 (=CIG 292); Scapini 2016, 232.

⁴⁹ I Ephesos 211, SEG LII 2002, n° 1132. On this document, see Wörrle 1971; Scapini 2016, 232.

⁵⁰ OGIS 389. There is evidence of such Imperial permits from the first decade of Augustus' Principate up until the early 3rd century.

⁵¹ Ziegler 1977: the coins are described at 34 f. (pl. 3).

⁵² Peter 2005, 112 f.

⁵³ Tacheva-Hitova 1983, 44–54.

⁵⁴ Lemke 2017.

⁵⁵ Marzano 2013a, 97.

⁵⁶ Marzano 2013b.

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