

From harbour regionalism to a harbour *koine*. Technology, architecture and function in harbour networks of Roman Mediterranean

Ioannis Nakas
University of Birmingham

Abstract: During the Roman period, thanks to the unification of the region under Roman rule, the *pax romana* and subsequent financial development of the region, a multitude of harbours of the Mediterranean developed into important centres of commerce and human interaction, as well as of urbanism and monumentality. The importance of these harbours is clearly reflected in their size, lavishness and use of new technologies (maritime concrete, dredging), often sponsored by ambitious rulers, state officials or the imperial family. These attributes constitute a harbour *koine*, a network of cleverly designed ship havens that served the commercial networks of the period and offered facilities for the accommodation of ships, cargoes and people. But a closer look at a great number of harbour sites reveals a much more complicated image: many harbours remained relatively poor and ‘obsolete’ in terms of harbour works, infrastructures and technology employed. Each of these harbours presents a unique configuration, related to regional conditions and local needs and dynamics. Such a harbour regionalism contradicts the idea of harbour *koine* described above. This paper examines these two different realities with regard to Roman harbours of the Mediterranean and explores the ways these realities interacted with each other and how this dialectic relationship influenced contemporary commerce and seamanship.

Keywords: Roman Harbours, Networks, Koine, Regionalism, Harbour Technology, Harbour Architecture

Foreword

The Roman period in the Mediterranean has been characterized as an unprecedented commercial development, based both on the political unification of the region as well as to the long period of peace and stability achieved under the Roman *principatum* (Horden and Purcell 2000: 27). This development is closely related to the growth of seaborne commerce, seamanship and interactions, a growth in which harbours played a key role, developing into centres of commercial networks, but also of urbanism and monumentality (Rostovtzeff 1941, 1042; Oleson and Hohlefeldler 2011: 814-9; Feuser 2020). This reciprocal and intricate relationship between Roman harbours and their contemporary world has been studied in depth during the last decades and their multi-levelled function has been explored (Keay 2012; Zarmakoupi 2014; 2018b; Reger 2016), several aspects of their function remain, however, unknown.

This paper examines the parallel existence of a harbour *koine* that concerns the establishment of large, monumental harbours of ‘international’ character and of harbour regionalism that includes simpler, ‘secondary’ harbours of regional character and explores the ways these different but coexisting “harbour realities” (Reger 2016) interacted with each other and the ways they were related to contemporary commerce and seamanship.

Definitions, theory and previous scholarship

This paper revolves around the notions of a harbour *koine* (Greek κοινή, i.e. *common*) and harbour regionalism. Both terms and concepts come from outside harbour scholarship, instead from linguistics (the Greek Hellenistic *koine* language; Horrocks 1997, 4-6; Krevans and Sens 2006: 186-7) and political and financial studies respectively (the regionalism of interdependent states in political and financial terms; Keating and Loughlin 1997; Kawai and Lombardi 2015), but the terms can be very useful for the study of Roman harbours and the purposes of this paper.

Koine has been widely employed in archaeology to denote a common idiom of decoration and craftsmanship concerning mostly ancient ceramics (e.g. the Mycenaean *koine* pottery developed in Late Bronze Age Greece; Hood 1978: 291; Laffineur 1984). This notion of a *koine* follows the principles of linguistics as a material idiom that communicates common and specific attributes between producers and consumers in a way that they are recognisable and appreciated by everyone. Although not employed as an explicit term in the study of Roman commerce and economy (the term has been suggested for the monetary *koine* of the Hellenistic worlds by Green 1990, 362 and as a diachronically “maritime *koine*” of the Mediterranean by Horden and Purcell 2000: 396), the existence of a common commercial *lingua franca*,

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expressed through administrative mechanisms, products, currency and even shipbuilding of the unified and largely coherent Mediterranean world under Roman rule is evident (Horden and Purcell 2000: 27; Pomey et al. 2012; Chaniotis 2018: 10-30). Concerning harbours and in analogy to the cultural or linguistic term, a *koine* can thus be defined as a series of common characteristics in the visible configuration of harbours (technology employed, architecture, infrastructures, as well as the common way in which these were perceived by contemporary people travelling the seas). This *koine* also conveys the image (real or imaginary) of a friendly harbour, where merchants and mariners could find shelter for themselves and their ships and a market for their products, guaranteed by the protection of state authorities and rulers.

Regionalism has also been used in history (predominantly) but also in archaeology in a similar way to *koine* to describe local variations of artefacts, once again mostly pottery (e.g. pottery regionalism in Prepalatial Minoan Crete; Wilson and Day 1994), but has also extended to administrative, financial and commercial patterns, especially of the Hellenistic and Roman world (e.g. Reger 1994; Harpster 2017; Elton and Reger 2019). It has not, however, been employed as a term in the scholarship of ancient harbours, the former having been studied as specific regional or provincial groups (Schörle 2011; Daum 2018) but not in relationship with each other, in a wider context and within a possible harbour *koine* as described above. Furthermore, previous scholarship has mainly targeted, for reasons of historical importance and availability of evidence, mostly the large, monumental harbours of the period (the ones belonging, as we will see below, to the *koine*) and only relatively recently have scholars dealt with regional, 'secondary' or 'opportunistic' harbours (Rickman 1988; Leidwanger 2013). The relationship of the two types of harbours is a gap this paper aims to cover as well as to answer questions concerning differences between them in function and operation, their coexistence and reciprocity.

A harbour *koine*

The existence of a harbour *koine* is attested both by archaeological evidence, as well as by the ways contemporary people experienced and described harbours, as documented through textual and iconographic testimonies. Written sources make no distinction between harbours at all based on their architecture and infrastructure. Strabo, one of the most important sources for the early Imperial Period, regularly mentions harbours, but his concern is not to describe them in detail, either as groups or individually, but to simply report on their sheer existence, usefulness or drawbacks (the terms *εὐλίμενος* and *ἀλίμενος* are very common to denote good and bad, or, better, harbourless sites) and to mark the operation of an *ἐμπόριον* (port-of-trade or market city; Étienne 1993). Similarly, the *periploi* and *stadiasmi* geographical and navigational handbooks of the period list harbours, distances between them and their main characteristics, but do not distinguish them according to their configuration,

size or monumentality (Rougé 1966: 23-5; Beresford 2013: 192-4). Vitruvius, however, seems to acknowledge the existence of a 'model harbour' in his writings, giving very specific instructions of how such a harbour should be constructed (5.12.1-2). Unfortunately Vitruvius' text is highly theoretical and his description does not relate with any specific harbour of the period, even the most important and technologically advanced ones, although, as we will see, some of his directives apply to contemporary harbours (Dubois 1905; Casson 1971: 366).

Iconography is another important and more explicit source of information, which conveys a very coherent image of harbours, especially from the series of reliefs, frescoes and mosaics that span from republican Rome period to late antiquity (Picard 1959; Zarmakoupi 2020; Ugolini 2020). These images portray exquisitely monumental harbours with impressive harbour works and lavish, well-organised maritime façades, the latter with many parallels in contemporary Roman harbours, especially the ones of central Italy like Puteoli or Portus (Blackman 1982: 83-5). However, iconography is above all art and its purpose is not so much to document with precision existing structures but to convey messages and ideas in a coherent and easily conceivable manner (Zarmakoupi 2020: 153). Thus, much like the case of Vitruvius, the harbours portrayed in the sacro-iddyllic Pompeian frescoes or the mosaics along the coasts of the Roman Mediterranean cannot be considered as firm proof for the existence of a harbour *koine* but of an artistic and symbolic *koine*, in which harbours played their part as symbols of wealth, peace and political power, all ideas fundamental to the ways in which the world was perceived during the Roman period (Zarmakoupi 2020; Ugolini 2020). Although elements of contemporary harbour structures are fused in this idiom, one can never be certain which ones reflect existing harbours, which are relics of Hellenistic iconography and which are purely imaginary creations (Zarmakoupi 2020: 149-53). They do, however, underline the existence of common attributes that existed and formed, in the perception of contemporary people, the definition of a harbour, even if these were freely manipulated and combined by contemporary artists.

More solid evidence for the existence and form of a harbour *koine* in the Roman Mediterranean comes from archaeological and geomorphological data. Probably the most evident attribute of Roman harbours concerning technology and monumentality is the **use of maritime concrete**. Developed in the early 1st century BCE in Italy and described in detail by Vitruvius (Dubois 1905; Brandon et al. 2014: 14-23), this new method was introduced in harbours along the Mediterranean coasts especially in the Augustan and Flavian periods, its use continuing, albeit sporadically, as late as the 6th century CE, as recent finds prove (Brandon et al. 2014: 223-35; Güngör and Lovén 2018; Figure 13.1). The method was transmitted beyond its source in central Italy and the Tyrrhenian harbours to the greater Mediterranean region, from Sebastos in Caesarea Maritima to Narbonne and Thapsus, in different extents and various forms (Brandon et al. 2014: 121-40). Related



Figure 13.1. Map of the Mediterranean indicating harbours where the use of Roman maritime concrete has been confirmed by chemical analysis by the ROMACONS project (Roman Maritime Concrete Study; Brandon *et al.* 2014).

with the expansion of the Roman state and its sphere of influence, concrete harbour works became a hallmark of many harbours of the period. The application of maritime concrete not only allowed the efficient construction of moles and jetties in the water that could offer protection to ships inside harbour basins but also the creation of quays in deep water that allowed the direct berthing of ships on them and greatly facilitated loading and unloading of regular cargoes (amphorae, sacks etc.) as well as of special cargoes like stone and marble (Nakas 2019: 71).

Another technical characteristic of the harbour *koiné* was the **application of dredging**. Although evidence of dredging have been identified in the stratigraphic sequence of various harbours as early as the 3rd century BCE (Morhange and Marriner 2010: 28), archaeological and written evidence verify its widespread application during the Roman Imperial Period in sites like **Portus, Side, Tyre, Sidon, Naples and Marseilles** (Morhange and Marriner 2010; Morhange *et al.* 2016: 91-2; Figure 13.2). Especially in harbours such as Portus and Ostia, dredging was elaborate and extended, reaching depths of more than 5 m and allowing the accommodation of every large capacity ships (Salomon *et al.* 2016).

Harbour monumentality forms another attribute of many Roman harbours of the Mediterranean and is related not only to the technology employed but also with the exploitation of harbours as political and symbolic statements (Ugolini 2020; Nakas 2022: 122-3). This monumentality is, on the one hand, formulated by actual imposing harbour works (moles, quays, jetties), built largely thanks to the application of maritime concrete technology and, on the other hand, by thorough efforts to create a lavish maritime façade, embellished with imposing buildings, votives and works of art, often of little practical use, but greatly symbolic (Feuser 2020: 323-30).

The creation of a “coastal scenography” in harbours is evident in many sites: in Caesarea Maritima, the temple of Roma and Augustus dominated the harbour from its high terrace, creating a magnificent sight for the people arriving at the harbour (Stabler and Holum 2008: Fig.20); in Lepcis Magna, the series of two-storey porticoes, towers and temples formed an equally imposing scenery (Bartoccini 1958: Tav.C); in Ephesus, free-standing elaborate gateways of little practical use marked the harbour façade (Bouras 2012: 146-8; Feuser 2020: Figs.60-3); in Kos, a massive colonnaded propylon was added to the Hellenistic agora during the Antonine period to create a lavish façade towards the harbour (Rocco and Livadiotti 2011: Fig.23b; cf. Feuser 2020: Fig.135). Monumental coastal scenography of Roman harbours is clearly reflected in contemporary iconography, in which the elements described above appear in various ways and combinations (see above). This coastal scenography, although not rendering harbour iconography a more reliable source of information concerning the configuration of specific harbours, underlines the importance of the harbours’ monumentality in terms of a necessary characteristic of their configuration for them to be properly perceived as centres of shipping, commerce and seamanship (Ugolini 2020: 132-3).

Another common characteristic of many Roman harbours is the **existence of storage facilities**. This characteristic is a feature of the Imperial Period, since storage in earlier harbours like Hellenistic Delos or Miletus appears to have been dispersed in relatively small spaces within the urban fabric of the whole city (Karvonis 2008: 205-209; Zarmakoupi 2018a; 2018b, 35-6; Feuser 2020: 45-51). Spacious and well-organised warehouses become a common feature in Roman harbours after the 1st century CE (e.g. Ostia, Kenchreai; Boetto *et al.* 2016: 184; Scranton *et al.* 1978: 39-46) and especially in the 2nd century CE

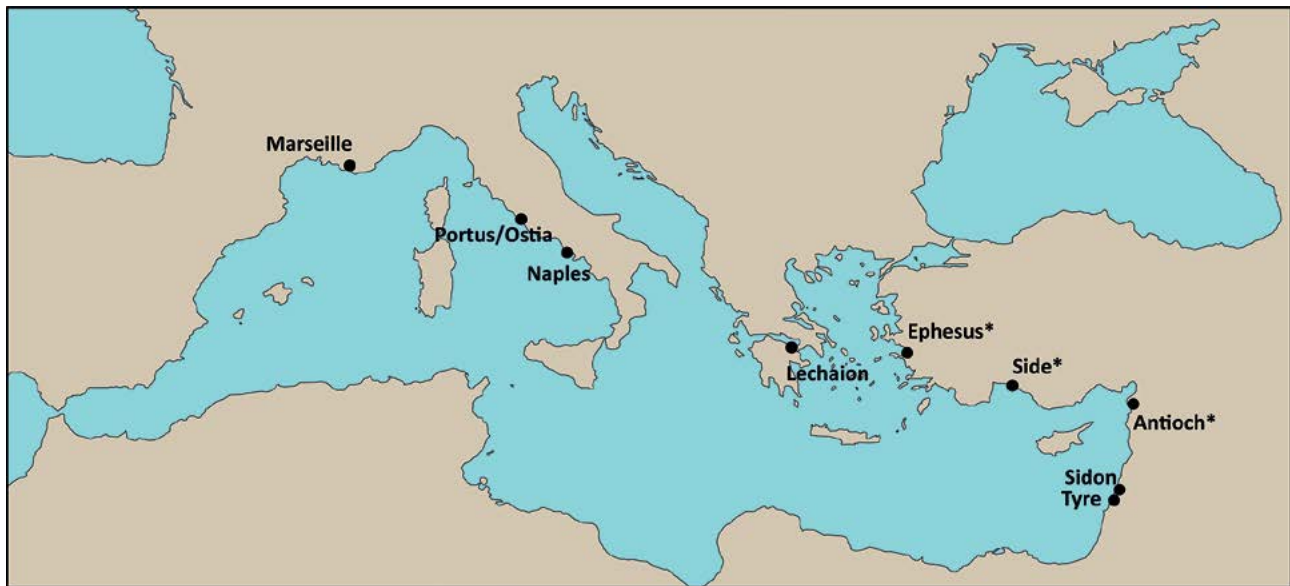


Figure 13.2. Map of the Mediterranean indicating harbours where dredging has been confirmed by fieldwork or by written sources (indicated by an asterisk).

(e.g. the Hadrianic *horrea* of Patara and Portus or the warehouses of Caesarea Maritima; Feuser 2020: 277-80; Keay 2010: 12-4; Rizos 2015: 294-6, Figs.7-9; Figure 13.3). The size and configuration of these buildings, as well as inscriptions relating them with imperial patronage, are clear indications that they were related to the provisioning of the *annona* grain for civilians and later for the *annona militaris* for the army (Rizos 2015; Nakas 2022: 122).

One final aspect of Roman Mediterranean harbour *koine* is the active and generous patronage by higher state authorities, namely emperors and other rulers. A series of written sources document the interest of emperors to build, expand, embellish and maintain harbours through generous funding of various projects. Beginning with Herod who created, under Roman influence and using Roman technology, the great artificial harbour of Caesarea Maritima and continuing with Caligula (Rhegium), Nero (Antium, Patara), Claudius (Portus), Trajan (Portus, Centumcellae, Anconca, Ephesus), Antoninus Pius (Puteoli) and Septimius Severus (Lepcis Magna), Roman emperors took an active interest in funding extensive harbour works both in the sea as well as on dry land, following the habit of Hellenistic rulers (Figure 13.4; Casson 1991: 158; Arnaud 2015).¹ Improving, expanding and embellishing harbours was a way not only to stimulate trade and create new urban centres and markets, but also to affirm their power and euergetism towards the public

through the creation of monumental maritime façades (Ugolini 2020: 132-3, 170-1).

Harbour regionalism

What has been conventionally described above as a harbour *koine* of lavish, impressive harbours, built and maintained under the control and patronage of the state is, as we will see in the following, not a universal phenomenon. A closer look at the evidence paints a more varied picture concerning the harbours of the Roman Mediterranean,

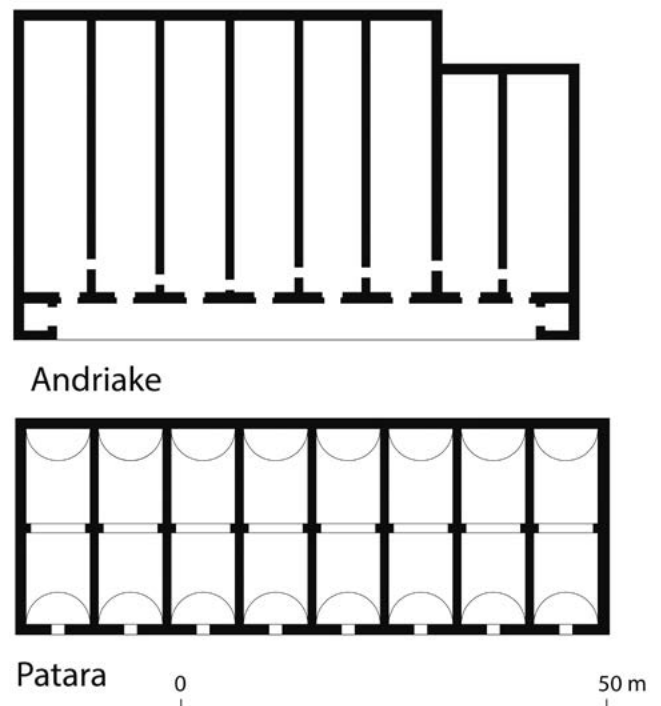


Figure 13.3. Plan of the *horrea* of Andriake and Patara (drawing by the author based on Rickman 1971, Figs. 230-1).

¹ The patronage of harbours by emperors is documented in a series of historical texts and inscriptions: for Caesarea Maritima see Flavius Josephus AJ 15.331-39 and BJ 1.408-15, for Rhegium see Flavius Josephus, AJ 19.2, for Antium see Suetonius Nero 9, for Patara see Engelmann 2008, 93, for Portus see Cassius Dio, 60.11.1-5, Suetonius, Cl.XX and IvE 274, for Centumcellae see Pliny the Younger, Ep.6.31, for Ephesus see IvE 2061.II, I 1ss and IvE II.274, for Puteoli see CIL X.1640= D 336, for Anconca see CIL IX: 5894, for Lepcis Magna see Spartianus Sev. 1 and Aurelius Victor Ep. 20.

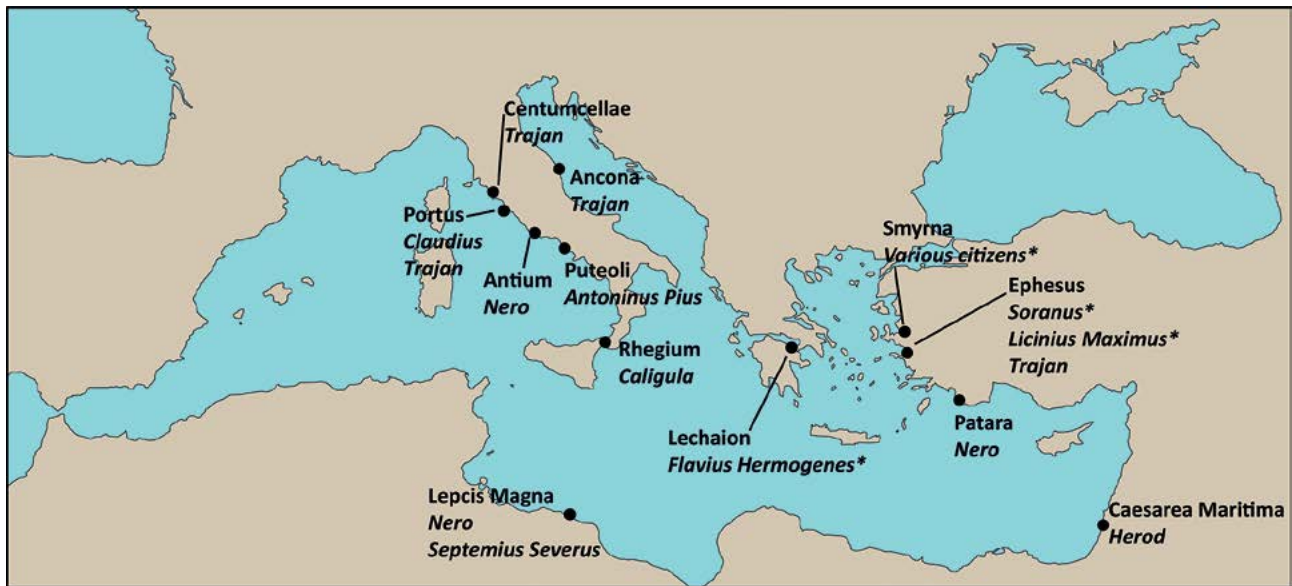


Figure 13.4. Map of the Mediterranean indicating harbours where patronage and funding from emperors or individual citizens (indicated by an asterisk) has been documented by written sources.

which contradicts the predominance of a harbour *koine*. The reason for this paradox is that the sheer number of harbours that fall under the category of harbours of the *koine* is much smaller than the number of harbours that can be characterised as part of harbour regionalism.

Evidence for harbour regionalism comes mostly from archaeological sources, since these harbours were apparently rather too mundane to be included in iconographic and written sources. **One of the main characteristics of harbour regionalism is simplicity.** A great number of Roman Mediterranean harbours are little more than natural bays protected by few and simple harbour works, as well as, often, with few land infrastructures (Delano Smith 1979: 361; Houston 1988: 560-4). In the case of the harbours of Delos, despite the development of the tiny island into a commercial and urban centre in the early Roman period, these were never equipped with any substantial harbour works (Figure 13.5): the mole of the Main Harbour was, most likely, a late Classical structure, maintained and probably enlarged in the period studied (Hellmann 1980; Duchêne *et al.* 2001: 147; Zarmakoupi 2018b: 34), whereas the ashlar quay of Gourni auxiliary harbour was a small and exposed structure (Zarmakoupi 2015: 126). The long ashlar quays along the Merchant Harbour were little more than low retaining walls, supporting coastal roads and buildings, but unable to operate as proper docks, due to their distance from the sea in antiquity (Desruelles and *al.* 2007: 237, Fig. 7; Nakas 2022: 72).² The 1st century CE rubble and ashlar mole of Kyme was also the harbour's only protective work (Esposito *et al.* 2002: Fig.27). A similar situation is observed in a series

of harbours in Northern Africa (Salakta, Thapsus, Acholla, Lepcis Minor; Wilson 2011: Fig.2.25), which, despite their importance as centres of trade towards Rome, especially after the end of the 2nd century CE, were equipped only by single breakwaters and had, according to our current knowledge, little commercial infrastructure on land.

This 'poverty' of harbour works in many Roman harbours is reflected in their technology, too. Concerning the state-of-the-art maritime concrete, a closer look at its geographic distribution, as has been explicitly researched by the ROMACONS project (Brandon *et al.* 2014), shows that it was not as common as one would expect within the limits of the unified Mediterranean of the Roman Empire: although its use has been documented along all the coasts of the Mediterranean (Brandon *et al.* 2014: 121-40), its distribution is quite uneven, with the majority of sites located in central Italy, an area close both to the sources of material (volcanic pumice) as well of funding from the imperial family of Rome and in areas like the coasts of Spain, Libya and the Aegean (with few exceptions) the new technology was never introduced (Figure 13.1; Nakas 2022: 115-7). Field research has also showed that many harbours in which concrete was used did not include actual maritime concrete but the regular type of concrete, used above the surface of the water (e.g. the Ampurias 'breakwater' or Lepcis Magna where concrete was included either in land structures or as simple filling for ashlar harbour works; Bartoccini 1958: 27-38; Nieto *et al.* 2005; Brandon *et al.* 2014: 124, 138). What is instead observed is the survival of older methods of construction, **the 'Greek' method of building moles by depositing rubble on the seabed and then erecting ashlar quays and other structures above sea level and the method of building ashlar walls directly on the seabed** (Rickman 1996: 285; Blackman 2008: 643-644). **The 'Greek' method was the most common one and is attested by the construction**

² Delos' quays stand today semi-submerged at the end of the sea, giving the impression of actual dock foundations, but this was not the case in antiquity, when, as verified by geoarchaeological studies, the sea was about 2 metres lower and 10-20 metres away from these structures.

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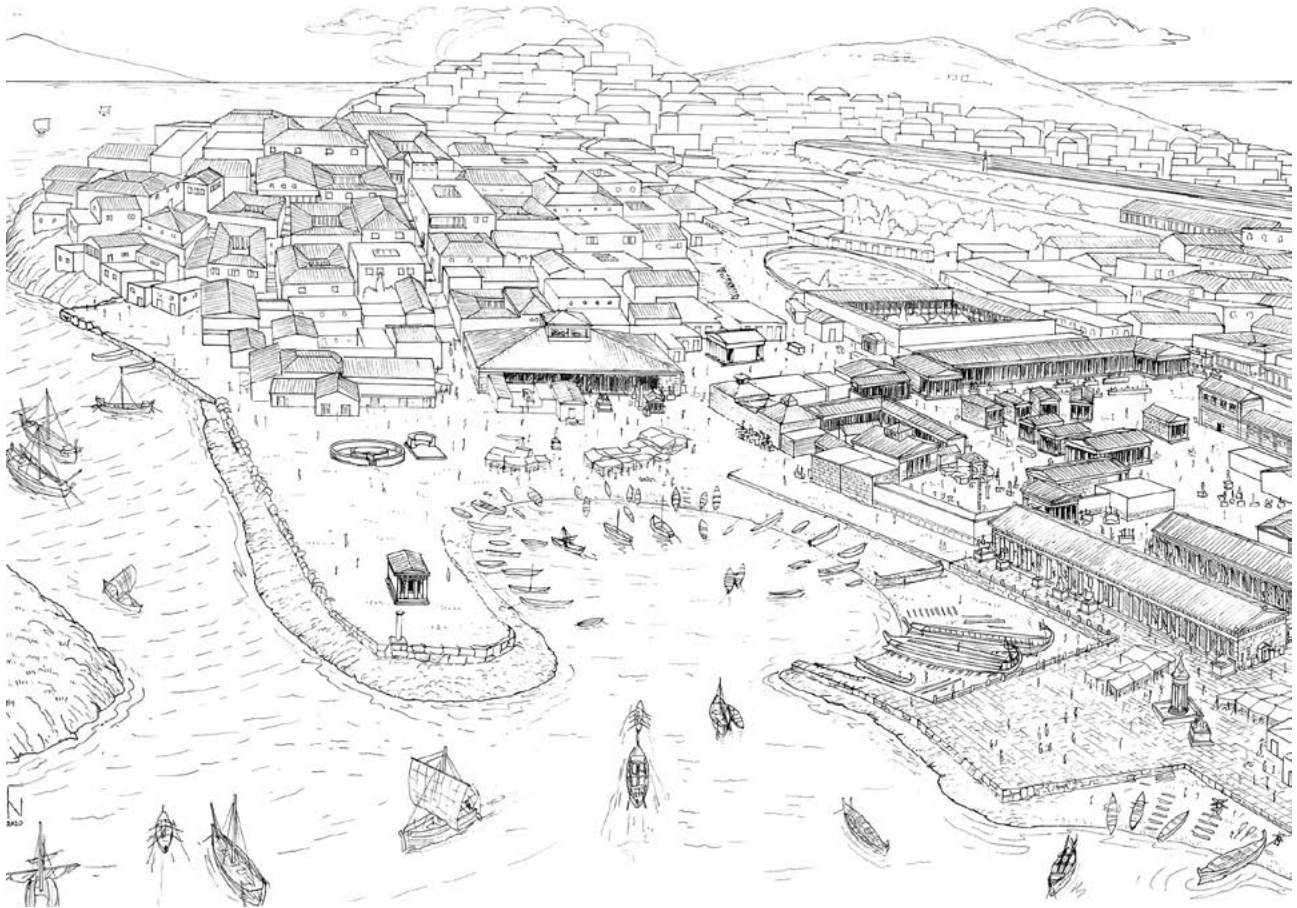


Figure 13.5. Reconstruction of Delos' Main Harbour during the early Roman period (drawing by the author).

of such moles in harbours like Kenchreai and Thapsus (Scranton *et al.* 1978; Davidson and Yorke 2014).³ The method of building directly on the seabed, known from the large Hellenistic harbour of Amathus (Empereur and Koželj 2017), was less common and was employed in few sites like Centumcellae (according to Seneca's account; *Ep.* 6.31) and most probably Kyme and Pompeiopolis (Esposito *et al.* 2002; Brandon *et al.* 2014: Fig. 4.47).

Related to the simplicity of harbour works is the application of dredging. Similarly to the use of maritime concrete, dredging has been confirmed either through archaeological or written sources in very few harbours in relationship to the total number of harbours operating during the Roman period (Figure 13.2; Morhange and Marriner 2010: Fig. 1). Many important harbours, heavily affected by siltation, like Utica, Delos' Main Harbour, Elaia or Miletus were most likely never dredged and were left to be gradually silted, the harbour basins changing and moving according to the natural evolution of their environment.

³ One of the major problems in the study of ancient rubble breakwaters is their precise dating. The conglomerated rubble foundations do not allow proper excavation and retrieval of datable material like coins or pottery, whereas similar material accumulated on them (often also poorly preserved due to its exposure to waves) attests to their later use but not to their construction.

One final aspect of harbour regionalism that contradicts harbour *koine* is patronage. According to written sources, patronage was not only relatively rare (as shown above only ten harbours of the Roman Mediterranean are positively known to have received direct imperial patronage and four were renovated by local patrons or state officials; Figure 13.4),⁴ but also uneven and dictated by very specific political circumstances (Wilson 2011: 51; Arnaud 2015). A good example of the irregularity of patronage is the eastern harbour of Roman Corinth, Kenchreai (Figure 13.6). Despite the fact that the destroyed metropolis was lavishly rebuilt by the Roman authorities after 44 BCE (Rougé 1966: 152; Engels 1990: 33) and the whole region colonised by Roman settlers and reorganized through land centuriation (Romano 1993: 2010), there is no evidence for any patronage in the extensive renovation of its harbours that, according to archaeological evidence, took place in the 1st century CE (Scranton *et al.* 1978: 37; Nakas 2022: 99-101). Kenchreai played a key role in the development of Corinth and of Roman Greece in general, as a node in the east-to-west trade and through development into a thriving harbour community (Salmon 1984: 139-42; Rife

⁴ The construction and renovation of Roman harbours by people outside the imperial family is documented mainly in inscriptions. For Lechaion see IG IV 209, for Smyrna see Petzl 1987, no. 696 p. 191, for Ephesus see IVE 2061.II, I.13ss, IVE VII.1 3071 and Tacitus, *Annales* 16.23.

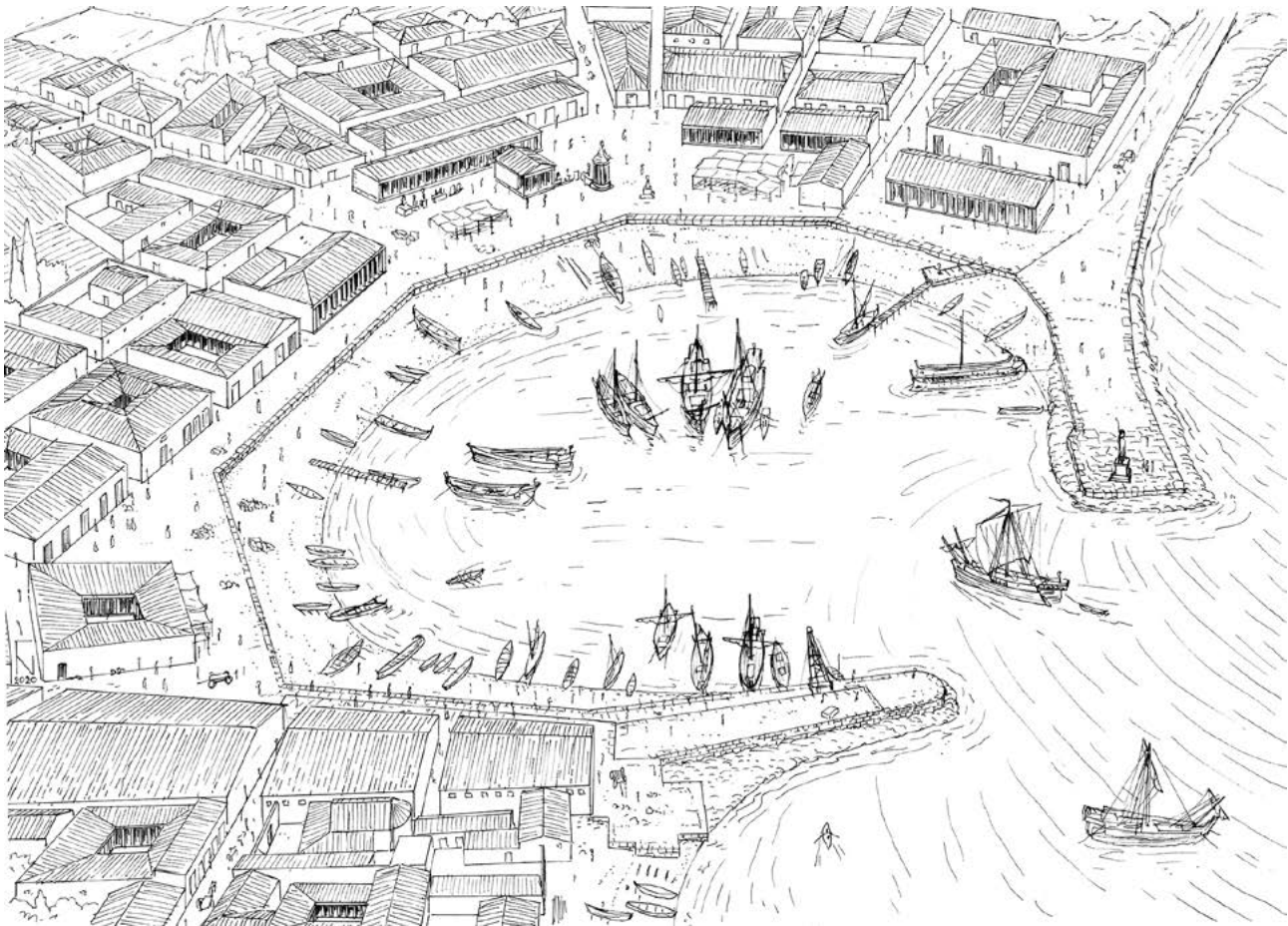


Figure 13.6. Reconstruction of Kenchreai's harbour during the Roman period (drawing by the author).

et al. 2007: 176). Nevertheless, finds from the land and underwater excavations indicate that the construction of the harbour was a slow process (Hohlfelder 1985: 84-5), while the lack of euergetism most likely caused the harbour to be simple in terms of monumentality: despite the fact that it was thoroughly equipped with rubble moles and surrounded by a well-planned urban settlement, Kenchreai never acquired the monumentality of other contemporary harbours like Ephesus, Portus or Lepcis Magna (Figure 13.6). Apparently, as likely happened in most of the Roman harbours of the Mediterranean, local authorities were left to their own devices to construct, maintain and embellish harbours, when they were not agile or lucky enough to receive imperial funding (Nakas 2022: 118-9).

Discussion

Through examination of the two types of harbours in the Roman Mediterranean the parallel existence of a harbour *koine* and harbour regionalism becomes evident. What was, however, the role of each harbour type in contemporary commerce and seamanship and how did they interact with each other? Was there a predominant and a secondary type of harbour during the Roman period?

The geographic distribution of the two types of harbours points towards a strong relationship with specific

commercial networks. Trade routes and commercial networks of the Roman Mediterranean have been widely studied by a series of scholars and the existence of both long-haul, 'international' networks along with short-haul, 'local' ones has been verified (Hopkins 1983: 94-6; Davies 2006: 78-9; Alcock 2007: 686-9; Tchernia 2011: 88). Long-haul networks covered the provisioning of the growing metropolis' of the empire and especially Rome in grain and other victuals, which played a crucial role in maintaining civic order and therefore the public image of state/imperial authority. Accordingly, they were served by greater numbers of merchant ships, some of great capacity of more than 300 tons (Pomey and Tchernia 1978: 233-5; Nantet 2020: 83), carrying larger cargoes, which required more space, depth and supporting infrastructure in the harbours they visited. It would thus be natural for the harbours serving these ships to be the focus of state intervention. This intervention can be translated into the harbour *koine* described above, with massive harbour works that included the advanced technology of the maritime concrete, monumental buildings, lighthouses and storage infrastructures, all under the necessary patronage and funding of high-ranking authorities (Figures 13.1, 13.2 and 13.4). Short-haul networks, covering the relatively limited needs of smaller urban centres and rural populations and served by smaller ships carrying mixed cargoes were naturally considered less important for the

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‘great trade’ of the empire and received less attention from the authorities, resulting in smaller, less elaborate harbours and harbour cities. The need to confirm state authority in these sites was less, as was the funding abilities of local harbour administrators.

Archaeological data confirm this general rule but only to a certain extent. The series of lavish harbours of the Tyrrhenian Sea like Portus, Puteoli or Centumcellae were related to the provisioning of the large populations of central Italy and Rome and were inevitably the foci of imperial funding of patronage (Schörle 2011: 95). The same happened in other termini of such networks, like Alexandria, Caesarea Maritima, Ephesus or Lepcis Magna (Rostovtzeff 1941: 1263-4), as well as in major stops ships had to make during their voyages like Pompeiopolis, Ephesus, Kenchreai or Chersonissos (Malkin 2011; Bouras 2016). This rule, however, does not apply to all harbours related with such networks. Harbour cities that received substantial ship and cargo traffic like Delos or the harbours of Northern Africa remained, as we saw above, simple establishments, often not equipped with any substantial land infrastructure and usually with poor sea protection, limited to single breakwaters or groynes.

The technology employed in harbours of both types was also quite variable. As shown above, the use of maritime concrete was not universal at all, depending on the availability of funds and resources, as well as on the active interest of state authorities to offer their support (Figures 13.1 and 13.4). Compared to the total number of harbours operating in the Roman Mediterranean, harbours receiving imperial/royal patronage were very few, as reported in written sources (Portus, Antium, Centumcellae, Puteoli, Rhegium, Lepcis Magna, Ephesus and Caesarea Maritima) and are related with the great networks provisioning the capital with grain (Arnaud 2015: 68). This is evident even in the case of Kenchreai, extensively renovated by the Roman authorities after the reconstruction of Corinth in 44 BCE, which appears to have received no imperial funding at all, despite its importance (see above). Local euergetism was active, especially in the East, practiced by individuals and high-ranking state dignitaries (Lechaion, Ephesus, Patara), but could not compete with imperial funding, and could also be viewed as disrespect towards the emperor if it was excessive (For example, T. Claudius Aristi and his wife Iulia Claudia Laterane were put on trial because of their excessive spending for the creation of an aqueduct in Ephesus during the reign of Trajan (Plin.*Ep.*6.31.3; Arnaud 2015: 66).

Conclusions

The comparison between the harbours of the Roman Mediterranean shows that different approaches to harbour construction and operation could coexist within the unified and highly consistent world of the Roman Empire. On the one hand, a harbour *koine* was developed, related to imperial patronage, long-haul commercial networks and the creation of monumental harbours, symbols of state

authority and euergetism. Harbours belonging to this *koine* had high construction and maintenance costs both for the application of advanced technology in the sea (mainly the maritime concrete) and for the creation of lavish land infrastructure and other monuments that underlined their symbolic role. Despite the importance of these harbours as statements of euergetism and evident symbols of state authority and power, their number was small, since they required substantial funding that could only be delivered by high state authorities and officials and often by emperors themselves

On the other hand, a great number of harbours belonged to what has been defined here as harbour regionalism, which included mainly simpler, less elaborate harbours. These were very rudimentary structures compared to the harbours of the *koine*, with relatively few, simple, and much less monumental harbour works that continued older, less costly, and complicated technologies like the construction of rubble moles. Despite, however, their reasonable connection with ‘secondary’, short-haul networks they could also serve the long-haul networks and the “great trade” of the period as middle harbours, important stops for re-victualling, maintenance and rest. With less pressure to accommodate larger ships for long periods of time or to handle the loading and unloading of larger cargoes, these harbours followed much more functional architectural and administrative schemes in which simplicity and economy prevailed against monumentality and lavishness.

In general a dialectic relationship existed between the two types of harbours and commercial networks. Each harbour was a specific case, built and operated under different and ever-changing conditions. Harbours were adjusted to these conditions as political and symbolic statements, commercial centres and markets or ship havens. Both monumentality as well as functionality was necessary to the seaborne commercial world of the Roman Mediterranean and harbours fulfilled such functions according to specific conditions, needs and dynamics. The harbour *koine* and regionalism were the two sides of the same coin and one did not contradict the other in the dynamic and ever-changing world of the Roman Mediterranean. As such there was no model harbour in the period, since harbour configuration, technology, size and monumentality were dependant on specific conditions.

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