

PORTS OF THE ROMAN MEDITERRANEAN

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Abstract

Roman ports have long been seen as interesting *per se* but have been usually studied in strictly maritime or commercial contexts, in isolation from their broader economic, political and cultural contexts. This paper argues that this is a reductive perspective that diminishes their potential for helping us understand the distinctive character of the Roman empire, that was a political institution with a maritime core. It thus attempts to re-position ports as having been central to the growing convergence of economic and commercial activity that gradually transformed the communities of Rome's Mediterranean provinces during the later Republic and early Empire.

Introduction

The Roman empire can be distinguished from other great empires of antiquity by the fact that it was land-based, and because it depended upon the Mediterranean basin for its unity and cohesion. The *mare nostrum* was under complete Roman control for a period of at least 420 years, permitting a far greater degree of political, economic, social and cultural cohesion amongst the communities that bordered it than has been possible before or since. In some senses, therefore, the empire was rooted in the maritime sphere even though conquest took its armies far beyond, across temperate Europe, sub-saharan Africa, and into the heart of the Middle East. Until recently, however, our geographical perception of the Roman empire has been dominated by the land that surrounds the *mare nostrum* rather than the sea itself. And so, emphasis has been laid upon the major towns and roads that criss-crossed the empire, rather than the ports and their associated sea-routes. Indeed, the maritime role of those ports that are frequently discussed, like Ostia, Carthage and Ephesus, has often been downplayed in favour of their broader terrestrial contexts.

The archaeological investigation of the ports of the Roman Mediterranean really began with the study by Lehmann-Hartleben (1923), who compiled available archaeological, literary and iconographic evidence for harbours. The ninety years since then have also seen the publication of many studies of most conceivable aspects of Roman Mediterranean ports, focusing on parts of individual ports or, in some cases, whole port complexes and related issues. The only synthesis has been the selective survey by Blackman (1982; 1982a),¹

who discussed the location and siting of harbours, their siltation and topographical relationships to broader port contexts. Since then the range of port-based research has diversified. Much of it has been driven by the research interests of archaeologists, ancient historians and geomorphologists using traditional land-based techniques of excavation or, where appropriate, as in the case Caesarea Maritima and Alexandria, underwater excavation. This has revealed tantalizing glimpses of parts of port buildings, basins and canals, and provided outline sedimentary histories of silted-up basins and canals. Some of this research, however, has been driven by the imperatives of urban development at modern ports, particularly during the 1980s and 1990s, with the undertaking of major excavations at such ports as Naples and Istanbul. A newer development has been the large scale geophysical surveys of "green-field" ports, such as those at Portus (Keay et al. 2005), Ephesus (Groh 2006) and Elaia (Pirson 2009) that enable us to understand overall port landscapes that include harbours, port buildings and their immediate terrestrial contexts. Another angle of research has been to focus upon connections between ports and their broader Mediterranean contexts. The initial impetus for this has come from the growth of underwater archaeology and the mapping of shipwrecks (Parker 1992). It has been complemented by the publication of ceramic assemblages from ports and shipwrecks, particularly those including amphorae. While the most common approach has been to document the presence and absence of different classes of material at specific ports and wrecks, some studies have used this evidence as an index of inter-provincial trade both in the early Imperial and late antique periods.² A more recent development that has

1. See however the websites Navis I (www2.rgzm.de/navis/home/frames.htm) and Navis II (www2.rgzm.de/navis2/home/frames.htm) although these are now both rather dated.

2. Fulford 1987 amongst many others.

taken its cue from the field of maritime archaeology has been the analysis of the navigational routes between ports (Arnaud 2005). Taken altogether, this work is has begun to produce a series of significant studies that are starting to place ports in their broader geographical, maritime, economic and cultural contexts across the Mediterranean.³

Important advances have also been made in our conceptualization of the broader Mediterranean context within which these ports functioned. Two of these are fundamental. The first is the exhaustive study by Braudel in 1949 (1972), whose analysis of the geographical characteristics of the Mediterranean during the reign of Philip II has major relevance for the Roman period.⁴ He argued that it should not be understood as a single sea so much as a series of interlocking seas that constituted a form of unity in diversity, a view that echoes the rather more frequent references by ancient sources to regional seas like the *mare tyrrhenium* and the *mare hibericum* than to the broader *mare nostrum*. He also understood broader Mediterranean history in terms of three levels of time — that of the longer-term environment, the long-term social, economic and cultural history, and that of historical events. More recently in *The Corrupting Sea*, Horden and Purcell (2000) focus *inter alia* upon the mechanics of how unity in diversity might have worked within the Mediterranean basin, and its consequences. In particular, their concept of “connectivity” helps us better understand how the diverse regions of the Mediterranean might have been integrated, and the significance of this for our understanding of cultural development. Both of these works, but particularly the latter, have major implications for our understanding of the complexity of the different *milieux* in which ports functioned.

Account also needs to be taken of key works on the maritime structure of the Roman Mediterranean within which the ports functioned. The first major study of the commercial structure of the Roman Mediterranean *per se* was by Rougé (1966), a historian who dealt with (a) the infrastructure of maritime commerce — notably the terminology and infrastructure of Roman ports together with ships and maritime routes — (b) a discussion of the structure of maritime commerce, and (c) the structure of maritime commerce, together with juridical and economic issues. In a sense Sirks (1991) continues one aspect of this approach by looking at legal issues related to corporations, the organization of the state food supply (*annona*), freight and issues concerning the involvement of the state and individual in

commerce. A second strand of research has focused upon the military infrastructure of the Roman Mediterranean, that culminated with the key study by Reddé (1986), who reviewed archaeological and historical evidence for those Mediterranean ports, such as the Portus Iulius, Forum Iulii, Ravenna, Misenum and others, that served as fleet bases under the empire.

Despite all of these advances, there is still need for a more “joined-up” approach to the study of ports, since it is the contention of this paper that is the relationships *between* ports, hinterlands, agricultural settlement and flows of trade that have most to teach us about the pivotal roles that they played in promoting political, cultural and economic life of the Roman Mediterranean. Although the precise mechanics of coin distribution in the Roman empire are uncertain, there is an argument that coins from the mint at Rome destined for the Mediterranean provinces would have been transported to major ports by sea for subsequent re-distribution through payment of taxes, since this was more rapid than movement overland. In this way, the widespread distribution of centrally determined types of official imperial portraits⁵ and imperial ideological statements upon the accession of a new emperor that is known to take place (Noreña 2011, 215-8 and n. 77) would also have been mediated through ports. The same is probably true of the honorific terminology employed on the imperial inscriptions, statue bases and commemorative inscriptions that abound at ports and inland sites between the 1st and late 2nd centuries AD (Høtje 2005; Noreña 2011, 200-44). One can also argue that ports were central to the spread of religions through the Mediterranean. The cult of Cybele and Attis, for example, has been attested on inscriptions, in the plastic arts and through the existence of shrines at a number of port sites across the Mediterranean between the 3rd century BC and the 3rd century AD (Vermaseren 1977, 1978, 1982, 1986 and 1987), while the spread of Christian communities in the first two centuries AD can be explained in the same way.

Ports were particularly central to the commercial and economic relationships that existed between the City of Rome and the ports of the Mediterranean during the imperial period. These have been surprisingly understudied, even though inward flows of trade to Rome and individual ports have a long history of research. However, if one is to follow the logic of established broad-brush arguments characterizations of the Roman economy,⁶ it is not difficult to see how much could be gained from a clearer understanding of

3. Most recently, and amongst many others, Gravina 2007; Marriner and Morhange 2007; Hohlfelder 2008; Harris 2011; Robinson and Wilson 2011; Keay 2012a.

4. See also Braudel 2007.

5. Presumably in the form of plaster casts (Pfanner 1989).

6. This is truest of the “taxes and trade” model formulated by Hopkins (1980; id. 2002); see also more recent discussions, such as Morley 2007.

the roles played by ports in mediating between the demands of the City of Rome and rhythms of agricultural production in the core provinces of the Mediterranean region (Keay, In Press). The aim of this paper,⁷ therefore, is to take this approach as a starting point and to briefly examine the extent to which ports might have contributed to promoting the development of economic cohesion across the Roman Mediterranean. It argues that in the context of a Mediterranean dominated by Rome, early imperial ports played key roles in maintaining an equilibrium between the demands of the City and provincial responses in terms of economic and commercial activities, as well as in the flow of political, cultural and social influences.

The Development of Ports

The imposition of Roman power across the entire Mediterranean basin by the middle 1st century AD provided the conditions that enabled a unique range of maritime ports and anchorages, associated hinterland communities and river ports to flourish. It is important to remember that while there is a modern tendency to think of ports as a single “class” of site that was somehow distinct to towns, the Romans thought of them foremost as towns, each having their own status and legal relationship to Rome. At the same time ancient writers gave their characteristics and functions careful consideration, describing them as being primarily places where commercial activity occurred (*emporion*), that were dependant upon another town (*epineion*), that had a well sheltered harbour (*hormos*), or in terms of the best siting for it (*limen*), a large closed market other than an entrepot (*portus*) and a temporary mooring place shelter (*statio*).⁸

The ports of the Roman Mediterranean comprised loose aggregations of regionally-focused centres that emerged as a result of different cultural and economic imperatives in the west and east during the Republic and early imperial periods (Fig. 1). In the former, earlier Phoenician, Greek and Carthaginian harbours and portscapes of the 8th to 5th centuries BC remained influential in the layout of their Roman successors, as recent work has shown at Carthage (Hurst 2012), Gadir (Bernal 2012), Marseille (Hesnard 2004), Ne-

apolis (Naples: Giampaola & Carsana 2005), even though these seem to have lacked the scale and monumentality of contemporary harbours in the eastern Mediterranean. Specifically Roman initiatives during the Republic are not well known, although there is a clear case of Roman involvement in the establishment of the port complex at Puteoli after its establishment as a colonia in 194 BC and the relationship of this with the neighbouring Greek colony at Cumae.⁹ One imagines, however, that in many cases Roman authorities worked with pre-existing infrastructure, as in the case of Carthago Nova (Ramallo 2012). This changed under the empire, when Rome established ports in places that served its strategic interests. One sees it first of all with the establishment of fleet bases at Portus Iulius, Misenum, Forum Iulii and Ravenna (Reddé 1986). It is most marked, however, with the establishment of massive new artificial ports. Although the best-known examples are at Portus and Centumcellae, the presence of *opus caementicium* at a range of port infrastructure along the coast of Iberia (Tarraco and Emporiae), southern Gaul, north Africa, and particularly Italy (Brandon et al. 2005), suggest that Roman intervention of this kind was quite widespread, even though the extent of the new infrastructure at many of these sites is not yet clear. Otherwise, Roman planners seemed content to work with and develop earlier installations, upgrading them as necessary, as was the case at Carthage (Hurst 2010) and Lepcis Magna (Bartoccini 1958). In other cases, Roman engineers established ports in lagoonal¹⁰ and fluvial¹¹ contexts — even though much remains to be learned of the character and extent of these. All of these developments would appear to have taken place in the course of the first two centuries AD, as provincial economies began to develop and the pan-Mediterranean commerce grew in volume. In the eastern Mediterranean, by contrast, the development of the myriad of known ports owed much to developments during the Classical and Hellenistic periods. The challenge here, therefore, is to evaluate the extent and significance of Roman intervention within pre-existing port infrastructures. Ports played key roles during the developing trading networks of the 8th to 6th centuries BC and the conflicts of the 6th and 5th centuries BC, with the Peiraius becoming a key centre (Panagos 1997). It was only from the 4th century BC, however, that major regional Mediterranean ports began to emerge, serving the Hellenistic kingdoms that emerged following the death of Alexander the Great, notably at Alexandria (Egypt) (McKenzie 2007), Seleukeia Pieria and

7. It arises from a project led by the author that aims to better understand the relationship between Portus, Rome and the Mediterranean. The Portus Project (2007-2014) is financed by the Arts and Humanities Research Council of the UK, and is undertaken by the University of Southampton in collaboration with the British School at Rome, the University of Cambridge and the Soprintendenza Speciale per i Beni Archeologici di Roma (Sede di Ostia) and other UK and European research institutions (www.portusproject.org).

8. Discussed by Rougé 1966.

9. The extent of the harbour in the earliest phase of this port is unclear.

10. Narbonne: Sanchez and Jézégou 2011.

11. Arelate: Long and Picard 2009

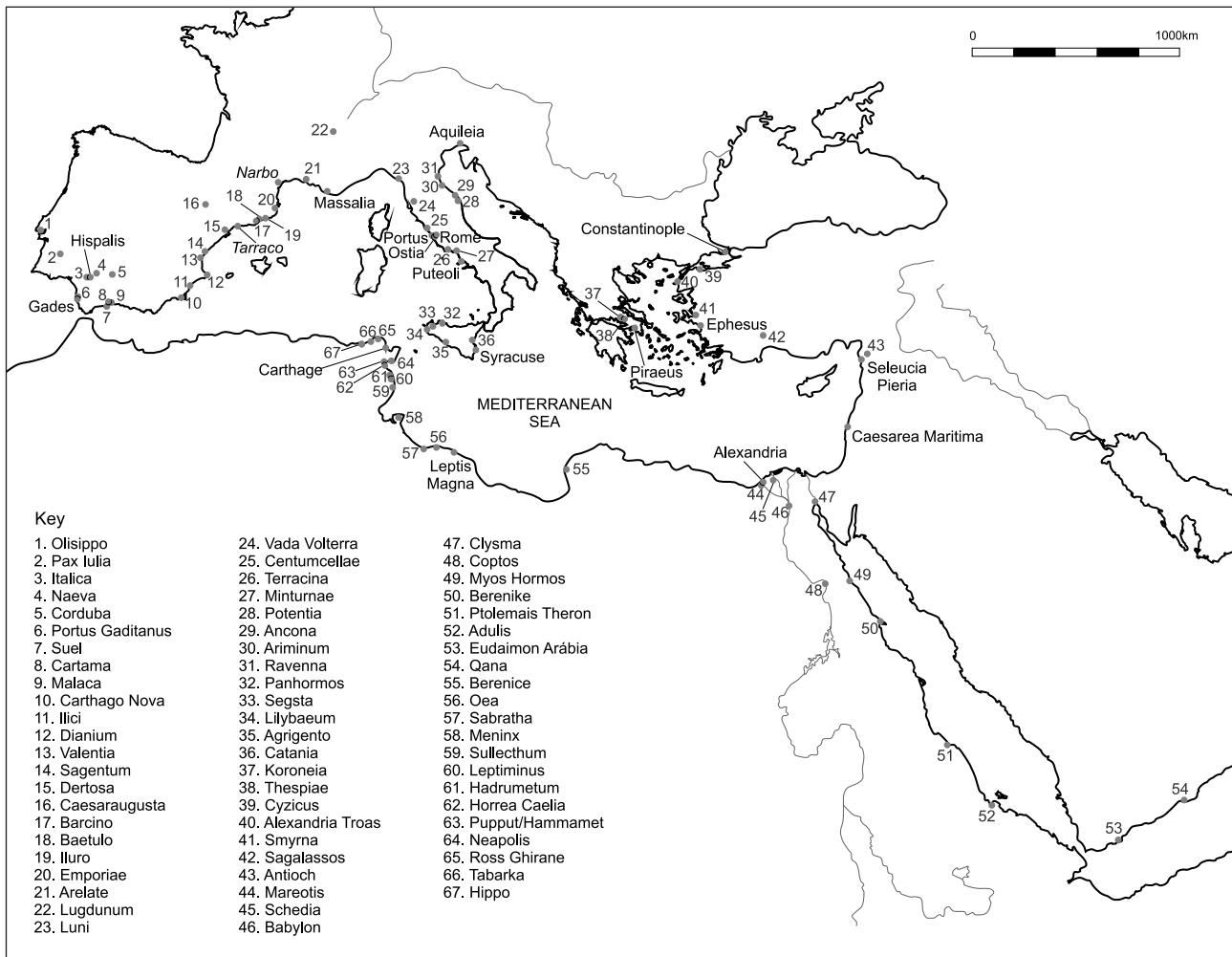


FIGURE 1. Map of key ports in the Mediterranean basin (P. Copeland).

Tyre (Syria), Elaea (Attalid Kingdom), as well as other regional centres on the Greek mainland (the Lechaion [W] and Kenchreai [E] Corinth) (Scranton et al. 1978), along the west (Smyrna, Ephesus and Miletos) and south (Patara) coasts of Asia Minor, Egypt (Thonis/Canopus) and north Africa (Cnidos and Apollonia) and on the islands of Rhodos (Rhodos) and Cyprus (Nea Paphos) etc. All of these were planned on a large scale that was not be paralleled in the west for another 250 years, and which possessed a range of specific topographical features that included inner military basins and shipsheds (neoria), granaries, sanctuaries, lighthouses and major public buildings.¹² Ongoing research has suggested that the “Roman” contribution to ports such as these was limited to minor additions to the extant topography and infrastructure, as well improvements to harbour facilities. One example of this is the use of Roman hydraulic concrete for harbour infrastructure that has been recorded at

12. Alexandria is the classic example of this (McKenzie 2007, 19-74; Fabre and Goddio 2010). For Hellenistic planning more generally, including at port sites see Winter 2006, 207-18.

harbours on Crete (Chersonnesus), the Greek mainland, the south coast of Asia Minor, the coast of Israel and Egypt (Brandon et al 2005); the best documented example of this is the harbour of Caesarea Maritima which was an entirely new creation of the late 1st century BC (Patrich 2011).

The Ports of Imperial Rome

1. The Demands of Rome

The large size of the population of Rome, the physical extent of the City, and the scale and range of imports from across the empire, means that it is often understood as having been primarily a centre of consumption. It is well known that it had rapidly outgrown the ability of Italy alone to supply it during the Republic, and that imports from Sicily, Spain, Africa, Gaul and Egypt became progressively more important during the later Republic, and peaked under the early Empire. By the 2nd century AD, the extent of the City had grown considerably since the Republic and the population will have been reached a figure in the order of up

to c. 1 million (Morley 1996: 33-54),¹³ representing a major challenge to the authorities and individuals charged with ensuring that it was adequately supplied (Morley 2007: 576-8).¹⁴ The successive reorganizations of the grain supply under Augustus, Claudius and Trajan (Rickman 1980) are symptomatic of the state's response, while assemblages of amphorae from excavated 1st and 2nd century AD deposits (Rizzo 2003) in the City illustrate the range of sources supplying the more archaeologically visible foodstuffs. At the same time, successive major building programmes under the Flavians, Trajan, Hadrian, the Antonines and the Severans¹⁵ monumentalized much of the centre, ensuring that there was an ever greater demand for building materials that was met locally and from sources across the Mediterranean basin.

Recent archaeological work shows that this transformation of the City had major consequences for its *suburbium* (Morley 1996), both in areas closer to Rome (Pergola et al. 2003; Jolivet et al. 2009), and in the Tiber Valley further to the north (Patterson 2004; Patterson and Coarelli 2008). This has led Witcher (2005) to argue that conceptually at least we should consider the *suburbium* to have encompassed a far greater area than is traditionally assumed. While many of the communities within the *suburbium* would have been self-sufficient, growing economic prosperity during the early imperial period coupled with emulative strategies by towns and inhabitants of the wealthier villas generated needs for key commodities from across the Mediterranean. These included marble, fine table-wares and imported foodstuffs that would have been imported from Rome, but which would have originated at the maritime ports of Portus, Ostia and Centumcellae, amongst others (Fig. 2). This model assumes that Rome was a centre for the inward re-distribution and export of Mediterranean goods. It played a similar role outwards to the Mediterranean at large, with construction material, millstones and wine, amongst other commodities, being transported down the Tiber Valley to Rome through the river port at Otriculum (Otricoli), as well as from areas closer to hand. The success of this role was underpinned by the river port at Rome and its relationship to the maritime ports at the mouth of the Tiber.¹⁶

2. The 'Port System' of Imperial Rome

Prior to the reign of Trajan, Rome had relied upon a series of arrangements that had developed over time.

13. Others, for example Lo Cascio 2001, favour a lower figure.

14. Guidobaldi 2002 provides a good general account of one archaeological correlate for this in the spread of residential housing in the City down to the late antique period.

15. Respectively Coarelli 2009; Bennett 1997: 148-60; Boatwright 1987; Thomas 2007; Gorrie 1997.

16. Discussed in more detail in Keay 2012 In Press b.

Puteoli (Pozzuoli) had been the principal maritime port for ships from across the Mediterranean from the 2nd century BC, particularly those from the east (De Romanis 1993). Cargoes were stored in ample warehouses at the port before being shipped up the coast in smaller ships and boats. Once they reached the mouth of the Tiber they passed through the river port at Ostia, before moving up river to the emporium and portus tiberinus at Rome. While this arrangement clearly worked, Puteoli lay a long way to the south and cargoes had to be transshipped into smaller coastal craft before heading north. Once these arrived at Ostia they would have been berthed along the sea-front, with the c. 2 Ha harbour basin, or along the c. 1.3km of quays along the Tiber, before moving up river to Rome.¹⁷ Thus by the early 1st century AD, arrangements for supplying Rome were logistically complex and did not allow for cargoes to be delivered with the speed and regularity needed to meet Rome's burgeoning demands (Fig. 3).

Claudius' establishment of the artificial deep-water harbour at Portus needs to be seen against this background.¹⁸ It can be interpreted as an attempt to reinforce the role of Ostia as a holding place for cargoes coming up the coast from Puteoli, which continued to play an important role in supplying Rome until some time in the course of the later 2nd or even earlier 3rd century AD (Keay 2010). In this way, the Roman authorities had begun to work towards developing an administratively easier and more rapid arrangement for supplying the Capital. Claudius' initiative comprised the construction of a massive artificial anchorage 3km to the north of Ostia. It encompassed c. 200Ha with a depth of c. 5m, and partnered a lesser c. 2Ha basin (Darsena) and massive warehouse (Foro Olitorio), as well as some kind of embryonic river port close to the Tiber.¹⁹ The basins were connected to both the Tiber and the sea by two canals,²⁰ and to Ostia in the south by a road in the later 1st century AD at the latest. The complex was inaugurated by the emperor Nero in AD 64 and continued to develop in the course of the 1st century AD, with the establishment of the *statio marmorum* and a small settlement on the north side of the Isola Sacra immediately to the south of Portus in the late 1st century AD.²¹

By the end of the reign of the emperor Trajan (AD 98-117), Rome was served by an integrated "system" of ports comprising the banks of the Tiber in the City

17. Discussed in more detail in Keay 2012 In Press.

18. Discussed in Keay et al. 2005: 297-305.

19. For recent work on the Claudian port see Morelli et al 2011.

20. These canals also played an important role in helping ease the level of the Tiber during flood, with a view to easing the threat of flooding at Rome (Keay et al. 2005: 298).

21. Discussed in more detail in Keay 2012 In Press b.

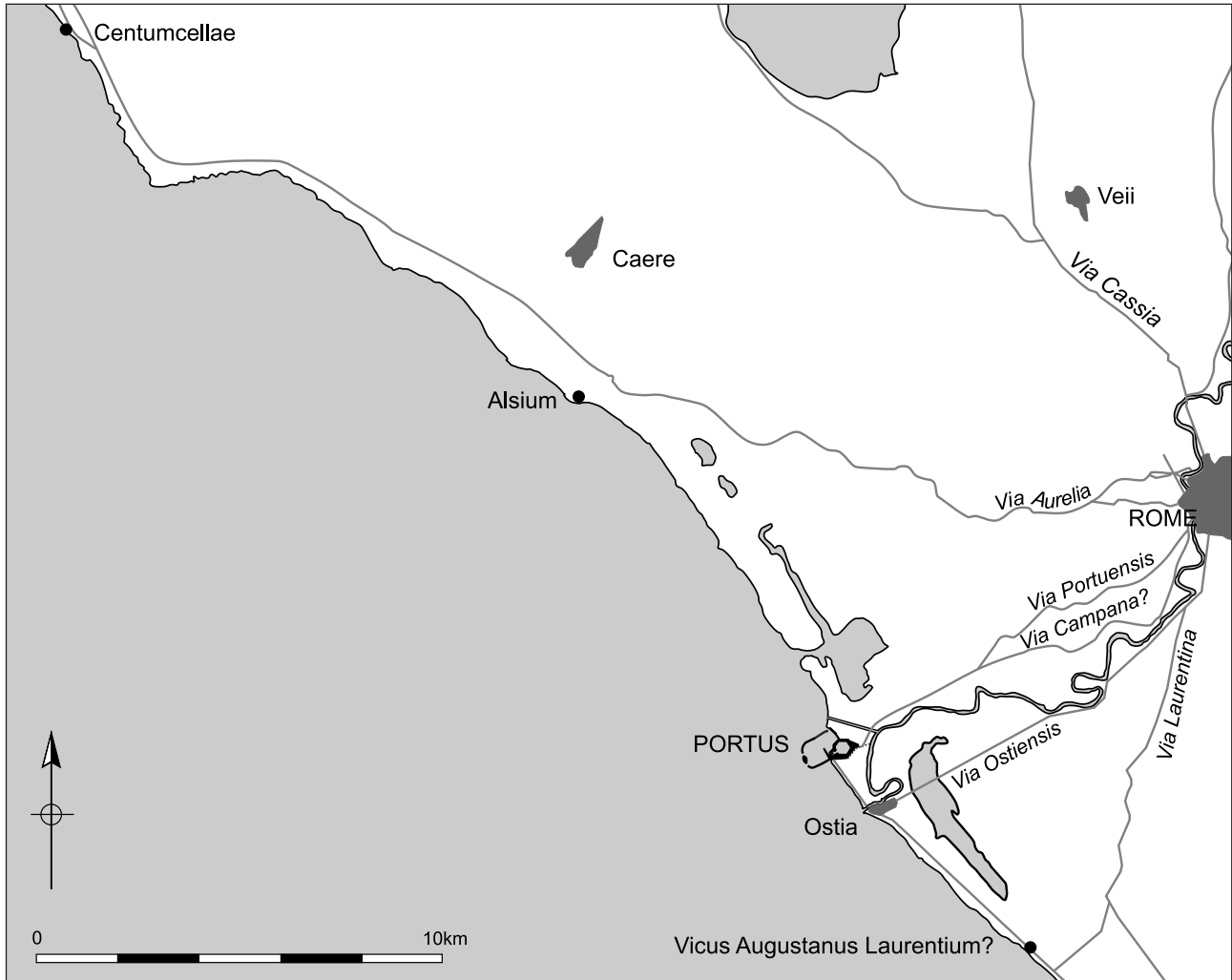


FIGURE 2. Map showing relationship between Rome, Ostia, Portus and Centumcellae (P. Copeland).

itself and at Ostia, and artificial ports on the Tyrrhenian coast at Portus and Centumcellae (Civitavecchia).²² In the City, the river embankment in the lower lying areas of the river port at Rome was raised in the first years of the 2nd century AD to protect port facilities when the Tiber was in flood. This was followed by the construction of riverside storerooms and offices in the emporium between AD 105 and 123 (Mochegiani 1984, 1985), as well as large warehouses set further back from the Tiber, most notably in the portus tiberinus at some time after AD 105; another major warehouse was built in the emporium under the reign of Hadrian.²³

A second project involved the enlargement of pre-existing facilities at Portus between AD 110 and

117. Its principal feature was a new 32 Ha hexagonal basin that was c. 5m deep and lay immediately to the east of the Claudian basin (Fig. 4). This meant that the port now offered a maximum of c. 234 Ha of anchorage deep-water anchorage space for large sea-going ships together with a maximum of c. 13.89 km of quay space.²⁴ Not enough is yet known about the use of any of the basins or of canals that connected them to the Tiber to enable meaningful calculations about the number of ships and boats that might have used the port complex as a whole.²⁵ This movement of this traffic, however, was coordinated from building known today as the “*Palazzo Imperiale*” that overlooked both basins at the centre of the port. It would have been assisted in this role with ships that were sheltered and repaired in the recently discovered shipsheds (*navalia*), which lay immediately to the east.²⁶ Portus was also

22. This was supplemented by works at other Tyrrhenian ports as well as the development of a military port at Ancona on the Adriatic coast (Keay 2012 In Press b).

23. At the Nuovo Mercato Testaccio at the foot of Monte Testaccio (Sebastiani and Serlorenzi 2008); for a broader discussion of this and aspects of the port of Rome see Keay 2012 In Press b.

24. The calculations for this are provided in Keay 2012 In Press b.

25. See however Boetto 2010 for a first attempt at relating depth of basins and canals to known ship sizes.

26. Keay et al. 2012 In Press.

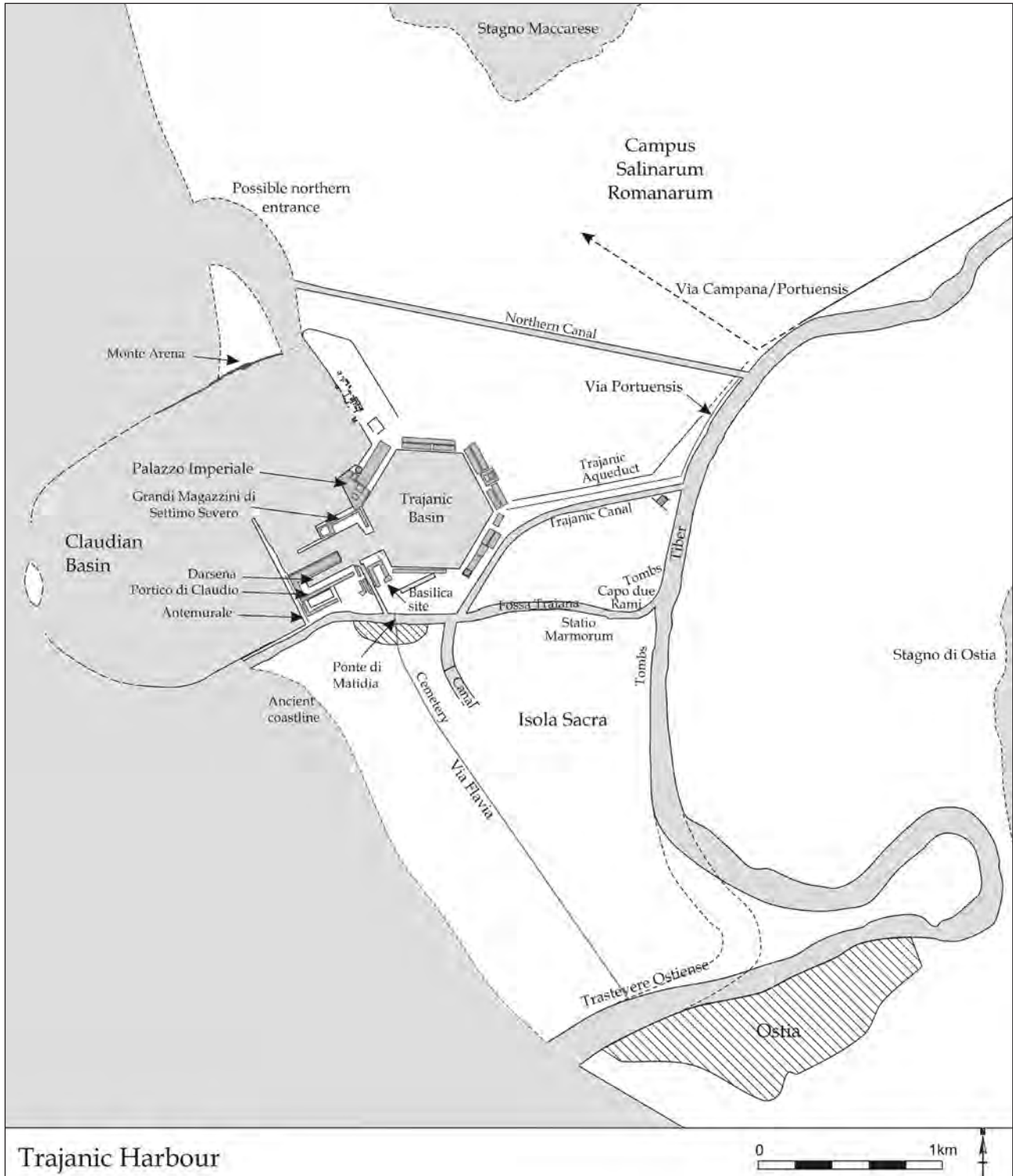


FIGURE 3. Map showing the Portus, Ostia and other elements of the port-system (P. Copeland).

equipped with new warehouses, with recent estimates suggesting that capacity increased from some in the region of 32,790m² in the pre-Trajanic period, to 92,278m² under Trajan (Keay et al. 2005: Table 9.1).²⁷ These figures assume that many of the build-

ings that border the hexagonal basin were warehouses of Trajanic date. However, recent research underlines how little is known of their development. Furthermore it suggests that the establishment of warehouses at Portus was a more gradual process that began under

27. Although this will have to be revised in view of the recent discovery that in its primary phase the building adjacent to the

Palazzo Imperiale was a *navalia* and not a warehouse, and new work at the *Magazzini Traiane* (Boetto and Bukowiecki 2010).



FIGURE 4. Aerial photo of the Trajanic basin at Portus (S. Keay).

Trajan but continued through the 2nd into the 3rd century and beyond. What evidence we have so far points to the existence of warehouses on only two of its six sides in the earlier 2nd century AD. The first is the south-eastern side of the basin (Keay et al. 2005: Area 11), where *magazzini* of 2nd century AD stored grain that was transshipped onto lighters for transport to Rome by canal and the Tiber. Secondly, there is a temple and temenos dominating the middle of the north-eastern side (Keay et al. 2005: Area 12), flanked by long buildings that one can probably assume were warehouses, but are of uncertain date. The north-western side (Keay et al. 2005: Areas 8 and 9) was dominated by the “*Palazzo Imperiale*” and the adjacent *navalia* neither of which were intended for storage (Keay et al. 2011; Keay et al. 2012 In Press Forthcoming). The south-western side, by contrast, is pierced by the entrance to the basin from the *Canale di imbocco al porto di Traiano*. Nothing is known of the northern side prior to the later 2nd century, while to the south lies the *Scalo all’Imboccatura del Porto* (Keay et al. 2005: Area 6) lies a small building of unknown function and date. At present nothing is known of the nature of the buildings that would have lined the southern (Keay et al. 2005: Area 10) and northern (Keay et al. 2005: Area 14) sides of the hexagonal basin. Away from the basin, the Trajanic and subsequent periods saw the construction of a massive complex of warehouses in the area centred upon the *Darsena* and lying between the *Canale di Imbocco al Porto di Traiano* to the north, the harbour frontage to the west and the *Fossa Traiana* to the south: recent research suggests that they were used largely for the storage of grain.²⁸

However, these developments represent a first stage in what was probably a continuous sequence of building work that took place during the reigns of Hadrian and the Antonines. These are clearest at the centre of the port, with the continued use and further

development of the *navalia* (Keay et al. 2012 In Press) and the construction of the *Grandi Magazzini di Settimio Severo* (during the later 2nd century AD. There were further important changes in the Severan period, particularly when the “*Palazzo Imperiale*” was enlarged and structurally united to the adjacent *Grandi Magazzini di Settimio Severo* (Keay et al. 2011), and there were major developments at the *Magazzini Traianei* (Buckowiecki and Boetto 2010). Overall, therefore, the provision of warehouse space must have risen to well over 145,072m² (Keay et al. 2005: fig. 9.1) by the early 3rd century AD.

While these developments provided Portus with an ever-greater capacity for storage than it had enjoyed previously, others promoted a more direct movement of cargoes and people between the port, the Tiber and Rome. A canal that was dug between the *Fossa Traiana* and the river Tiber to the east ran parallel to the warehouses on the south-eastern side (Keay et al. 2005: Area 11) of the hexagonal basin. This enabled cargoes from sea-going ships that had been unloaded and stored to be transshipped onto lighters that could then move them up to Rome by the canal and the river (Keay et al. 2005: 309-10). Furthermore the *Via Campana/Portuensis* was now extended as far as Portus and, as it approached the port, ran parallel to this canal. A second and even more substantial canal ran southwards from Portus across the *Isola Sacra* towards Ostia, and one imagines that this may have been established in part to speed up the movement of cargoes between Portus and Ostia (Germoni et al. 2011).

A third development involved an increase in warehouse space at Ostia, rising from 17667m² in the first to 31,882m² in the second and 46,118m² in the later 2nd centuries AD (Keay et al. 2005: table 9.1). Most of the earlier 2nd century AD warehouses were built in the area between the *Decumanus Maximus* and the Tiber between AD 112 and 115 (Mar 2002: 153) late in the reign of Trajan and during the early years of Hadrian.²⁹ The development of these, and indeed other buildings, has been interpreted as a consequence of the enlargement of Portus (Rickman 2002: 355-6; Mar 2002: 144-8) under Trajan and subsequent developments by his successors. While it is tempting to interpret these as an attempt by the municipal authorities to provide additional warehousing for supplies destined for Rome, an alternative might be to see them being used to hold supplies imported to Ostia from Portus in order to feed a growing population whose economic fortunes were increasingly tied to the growing traffic moving through Portus.

A fourth and final Trajanic initiative involved the establishment of a massive new artificial port at Cen-

28. Respectively Boetto and Bukowiecki 2010; see also Lugli and Filibeck 1935: 116-121.

29. See Delaine 2002 for the chronology of the brickstamps from these buildings.

tumcellae, come 60km to the north of Rome on the Via Aurelia, between AD 106 and 110.³⁰ This consisted of an inner and outer basin (14 Ha), whose depths in the Roman period are unknown, as well as at least two warehouses — one bordering the inner basin and another adjacent to the outer basin. None are as yet known from the substantial urban settlement (Toti 1992, plan).

It would seem hard to argue against the Trajanic initiatives at Rome, Centumcellae and Portus being the result of integrated strategic planning by the emperor and his advisors, drawing upon the gold from Dacian gold mines following the conquest of Dacia (AD 101-106). The comments in Pliny's letter to Cornelianus (*Epistulae* 6. 31), for example, make it clear that Trajan himself was the driving force behind this project, while the commemorative coin issue of AD 112/114 that announces his works as the *Portum Traiani* (Keay et al. 2005: fig. 9.4) suggests the same. Realizing all of these projects between AD 106 and 117, however, must have involved coordination between imperial procurators, *the curatores alvei tiberis et riparum et cloacarum Urbis* and the *praefectus annonae* (Keay 2012 In press b). They would also have to have liaised with agents of the annona and port authorities at Puteoli, which still played a role in supplying Rome at his time, as well as local officials responsible for administering lesser ports along the Tyrrhenian coast to the south of the Tiber mouth. Evidence for further integrated planning at the ports of Rome later in the course of the 2nd centuries AD is an issue that is less well understood at present.

The inter-relationships between all four of these ports suggest that they functioned as an integrated "port-system" within which each centre exercised a range of complementary roles. Portus, with its capability for receiving ships of all sizes, acted as the re-distributive hub for cargoes to the river ports of Ostia and Rome, thereby ensuring that their roles became complementary. Ostia acted primarily as a centre of administration and population that supported the harbour-led role of Portus, while the facilities at Rome were further enhanced to receive the increased volume of merchandise from overseas and the Tiber valley, and to re-distribute this within the Capital and beyond.

An initial consideration of the transformation of harbour facilities at Portus and Centumcellae during the 2nd century suggests that there was a major initial boost to capacity under Trajan, with further increases following down to the early 3rd century AD. In particular, their deep-water capability ensured that they were able to receive the largest c. 400 ton and above ships plying trade routes across the Mediterranean, as well as craft of lesser size.³¹ These developments that

must have helped confirm Portus, Ostia, Centumcellae and Rome as the pre-dominant commercial hub in the Mediterranean — with major implications for provincial ports. Together they dwarf provision at other major west Mediterranean ports in the West Mediterranean, such as Carthage, Gades, Tarraco and Massilia. The only real parallel in terms of scale was the Alexandria-Mareotis complex,³² although it needs to be remembered that the primary mission of this under the early Empire was export, while that of the port-system of Rome was primarily import.

3. The Significance of the "Port System"

One of the implications of these developments was that they provided a major boost to the volume of commercial traffic across the Mediterranean. However, this is difficult to measure. The most direct approach would be to calculate the number of ships and boats that entered the "port-system" of the early 2nd century AD and make a comparison with estimates for the 1st century AD. But there are too many variables and lacunae in our understanding of how any of these ports functioned to make this worthwhile.³³ Another approach is to analyze the data from Mediterranean shipwrecks with a view to gauging whether there was an increase during the period of the 2nd century AD, that might be taken as an index of a growing volume of maritime traffic that might reasonably be explained as arising from the development of port infrastructure at Portus and Centumcellae. Recent re-analysis (Wilson 2009) of the data originally published by Parker (1992), however, suggests that the 'centre of gravity' in the chronological distribution of wrecks was the 1st rather than the 2nd century AD. There are many reasons, however, why this may provide a misleading impression of the overall trend in the volume of maritime traffic. It is entirely possible, for example, that simply treating all wrecks the same might mask the fact that while the numbers of ships in the 2nd century were the same or less than before, a higher proportion of them might have been of a much greater tonnage than before, in the region of c. 400 tons and above, taking advantage of the deep-water basins offered by Portus, and presumably Centumcellae. In this way although the numbers of ships might have remained roughly constant, the volume of cargo coming into the ports might have been greater than in previous period.³⁴ Alternatively, the lack of archaeological visibility of grain sacks on wrecks might have led to an

32. Khalil 2010.

33. There have been various attempts to gauge this by calculating the number of ships and boats that might have used the port in the 2nd century AD: Brandt 2005 is one of the more recent of these.

34. Wilson 2011: 213-7 for discussion of ship size in the imperial period.

30. Quilici 1993 provides a useful summary of the port.

31. The sizes of Roman ships are discussed by Wilson 2011.

under-representation of these in favour of those that carried more visible amphorae (Wilson 2009: 226-8).

Interpretation of the evidence for traded goods presents similar interpretative difficulties. One of the most important commodities, grain, leaves very little archaeological trace. Our understanding of it, therefore, is almost entirely based upon indirect information passed on to us by the Classical sources, and it is impossible to get any sense of whether there was an increase in supplies to Rome during the course of the 2nd century. One of the few directly relevant comments refers to the emperor Commodus creating the African grain fleet (*commodiana herculea*) that was to be held in reserve if the Alexandrian grain supply should happen to fail (SHA Commodus 16.9). Of all the archaeological evidence at our disposal, ceramics and marble are the best known and the most abundant. However characterization of many varieties of the former, particularly white varieties, is not straightforward, while quantification of material from port sites is rare, with techniques varying from one site to the next. Nevertheless the extensive building programmes at Rome during the 2nd century, particularly under Hadrian (Boatwright 1987) and the Severans (Gorrie 1997), suggest that large-scale import to the ports of Rome was at least maintained.

Ceramics, therefore, remain the most accessible source of evidence for gauging the volume of commerce centred at the ports of Rome. Of the many varieties that survive in the archaeological record, amphorae remain the most appropriate material since they were manufactured to carry foodstuffs over long distances and were transported primarily for their contents. However, published deposits of appropriate dates from all of the port sites are rare, and those that do exist are fairly small and do not readily lend themselves to quantitative analysis. At Portus there are just a handful of small unpublished Trajanic deposits from the *Palazzo Imperiale* and *Navalia*, while excavations at the *Basilica Portuense* revealed a deposit of only 109 sherds of pottery from the Period IB (AD 80/90-120) (Di Giuseppe 2011). The nearest deposit in time at Ostia dates to the Antonine period (Rizzo In Press 2012), while from the emporium at Rome there is a Hadrianic deposit from the recent excavations at the Nuovo Mercato di Testaccio (Sebastiani and Serlorenzi 2008). The Severan period is slightly better served, with some substantial published deposits at the Palazzo Imperiale (Zampini 2011) and the Basilica Portuense (Di Giuseppe 2011) at Portus, and none at either Ostia or the emporium at Rome. None of the material from Centumcellae has yet been published. There would also be a need for earlier and later deposits against which to chart the quantity of Trajanic or Severan material in circulation. Lastly the proportion of material from each deposit would have to be scaled

proportional to site area to ensure that deposits from different sites were readily comparable. In short, it is simply not yet possible to use ceramics to calculate the volume of commerce passing through Portus in the course of the 2nd century AD.

On the other hand, there is evidence from Ostia and Rome that suggests that the transition from the 1st to the 2nd centuries AD saw an increase in the *range* of overseas imports at the expense of products from Italy.³⁵ By the later 2nd century AD Ostia (Rizzo 2012 In Press) and Portus (Di Giuseppe 2011) were importing amphorae and other ceramics from Baetica, Tarracensis, Gallia Narbonensis, the Tyrrhenian and Adriatic coasts of Italy, Africa Byzacena, Tripolitania, Cos, Crete, Cnidos and Asia Minor etc, consolidating their roles as key nodes within integrated commercial networks criss-crossing the whole Mediterranean. While this kind of evidence is often ascribed to a collapse in Italian production and increasing provincial competition, an alternative might be to see it as a greater diversification in supply arising from the opportunities offered by the enhanced port facilities at Portus, Centumcellae and Ostia. This in turn would reflect an increased degree of economic integration across the Mediterranean basin.

It is clear, however, that west Mediterranean sources predominated at both ports. Baetica was the most important of these, supplying large quantities of olive oil, and to a lesser extent, fish sauce from the 1st until the c. the mid-3rd century AD. Recent finds from excavations at Monte Testaccio are a good index of this, so far allowing us to document the mechanics of supply for the period between the mid 2nd to mid 3rd centuries AD (Blázquez Martínez & Remesal Rodríguez 1994; 1999; 2001; 2003; 2007; 2011). They also show that Africa Byzacena and Tripolitania (for olive oil and fish sauce) were key suppliers from the later 2nd century AD onwards. There is a surge in the proportion of the latter in the early 3rd century (Blázquez Martínez & Remesal Rodríguez 2001), which is a phenomenon also noted at Portus, but which is different to the totals noted at Ostia (Rizzo 2011 In Press); there is then a surge in the proportion of African material by the middle of the 3rd century AD (Blázquez Martínez & Remesal Rodríguez 2007). By contrast, the evidence for marble imports suggests that supplies were dominated with material from the eastern Mediterranean since this is where the majority of the quarries were located — even though material from African quarries is also present at both the ports³⁶ and at Rome.³⁷

35. See most recently, Martin 2008: 107-111; Sebastiani and Serlorenzi 2008.

36. See most recently Pensabene 2007.

37. Maischberger 1997.

Roman Mediterranean Port Networks

During the Imperial period, the ports of the Roman Mediterranean were connected to one another by a myriad of maritime routes. Ships, people and goods moved along these, thereby drawing the micro-regions of the Mediterranean into closer economic and commercial relationships with Rome. Central to the success of these connections were the major ports, or entrepôts, of which Portus was clearly the most important. It was supplied directly and indirectly by key coastal³⁸ fluvial³⁹ and island⁴⁰ entrepôts, as well as itself acting as a key point of re-distribution. Furthermore while all of these ports were influenced by the demands of Rome, it is also important to remember that they were not dominated by them, and that they also played key roles as nodes in the ebb and flow of inter-regional commerce, in conjunction with a myriad of lesser ports and anchorages. Marked differences in the strategic importance and operating scale of ports is evident in the contrasting scales of infrastructure from one port to the next, most notably in the capacities of harbours and warehouses, as well as in the presence of imperial officials involved in the *annona* to Rome⁴¹ and in the range and volume of imported materials present. In practice this meant that there was effectively a hierarchy of ports that was structured primarily to serve the interests of the Roman state, but which also played a very important role in facilitating increasingly large flows of goods and people across the Mediterranean.

In the sense that most Mediterranean ports enjoyed some kind of direct or indirect commercial relationship with Rome, they can all be said to have formed part of what was a loosely configured series of inter-connected regionally-based groups of ports, or networks, that ensured the movement of ships and their cargoes around the Mediterranean. These were given coherence and directionality by the “pull” of the major entrepôts, giving rise to the *grands axes du commerce*, which were commercial mainstays of the Roman Mediterranean. Some of these networks, particularly in the eastern Mediterranean, can clearly be traced back to the Hellenistic or earlier periods, but upon integration into the Roman empire, relation-

ships within and between them were altered by changing economic imperatives and growing volumes of commerce.

Our greatest challenge here lies in trying to identify connections and networks between ports. The ancient authors are clearly an important source of information, informing us about some of the major routes (Arnaud 2005: 61-148). Also important are the itineraries, most notably the *itinerarium maritimum* and the *stadiasmus magnis mari*,⁴² although they only record particular routes or itineraries between ports that were followed at one particular time, or over time, rather than describe the broader networks of routes of which they were a part. The sheer abundance of Greek and Latin inscriptions at most Mediterranean ports is another very important but under-exploited resource, as recent analyses of sample texts from Ostia (Salomies 2002), Puteoli and Hispalis amongst other ports, have shown, and can be supplemented by key historical and papyrological texts (Rathbone 2009). The main archaeological evidence comes in the form of the abundant ceramics, primarily amphorae but also finewares, coarsewares and marble — both from port sites and shipwrecks. However, the interpretation of these is not straightforward since most of this material is found at its point of destination, and the routes or ports by which it arrived are hard to distinguish.⁴³ It is only by combining both approaches that we can learn more about networks of connection between individuals, cities and ports across the Mediterranean.⁴⁴

One example will suffice to show this. It is well known from Pliny (NH, 19.3) and others that the sea-route between Gades and Ostia/Portus was important, although their accounts tell us little about the ports at which ships moving along this route might have called. However, the spacing of known ports along this route, likely sailing routes, and the evidence of manufactured and traded goods from shipwrecks, ports and other sites allow us to make some suggestions. Thus the hypothetical movement of a ship along the *grande axe commerciale* between Hispalis and Portus needs to be understood in the context of connections between the Gades, Tingis, Malaca, Carthago Nova, Carthage, Leptiminus, Sullecthum, Ebusus, Saguntum (Grau Vell), Dianium, Palma, Caralis and Portus, which can be synthesized in the following manner.⁴⁵

38. Such as Massalia, Carthago Nova, Tarraco, Gades, Iol Caesarea, Utica, Carthage, Hadrumetum, Lepcis Magna, Apollonia, Alexandria, Caesarea Maritima, Seleukeia Pieria, Halicarnassos, Smyrna, Elaea, Aexandria Troas, Thessalonika, Peiraeus, Corinth, Dhyrrachium, Ravenna, Ancona and Brundisium etc.

39. Such as Arelate, Aquileia, Ephesus, Narbonne, Hispalis, Pisae etc.

40. Such as Palma, Caralis, Mariana, Catina, Syracusae, Panormus, Rhodos, Nea Paphos.

41. Most notably at Ostia, Portus, Centumcellae, Puteoli and Hispalis etc.

42. See for example Medas 2008.

43. Bonifay and Tchernia 2012 is an excellent example at using the ceramic evidence from wrecks for distinguishing commercial networks.

44. See for example Earl et al. 2012.

45. The broader background to this is discussed by Keay 2012 In Press a; while different aspects of this synthesis can be found in Blázquez and Remesal Rodríguez 2011; Remesal 1998; Domergue 1998; Bernal 2010; García Vargas 2012 In Press; González Acuña 2010; papers in Keay 2012 In Press.



FIGURE 5. “Colonnade and warehouses running along the eastern side of the Severan port of Lepcis Magna (Photo: S. Keay)”

Stage 1. Sea-going ship (A) sets off from Hispalis (Seville), a major re-distributive hub in Baetica, carrying Dressel 20 olive oil amphorae from estates along the Guadalquivir river, possibly alongside lead from mines in the Sierra Morena and gold that had arrived at the port from the mines of north western Tarracoensis by road.

Stage 2. Prior to moving through the Straits of Gibraltar (*gaditanum fretum*), the first stop would be at Gades (Cádiz), another re-distributive hub in Baetica, (1) to offload some of the Dressel 20 amphorae, and (2) to collect fish sauce in Beltrán IIA and IIB amphorae manufactured at kiln sites in the hinterland of the port, or that had been transported to Gades by ship (B) from a regional port close to where they were manufactured in Mauretania Tingitana; from the 2nd (?) century AD onwards, ship (A) could have also have picked up African amphorae that had arrived by ship (C) from a regional port (viz. Leptiminus or Sullecthum) or major hub (viz. Carthage) along the coast of Africa Proconsularis, and have carried Dressel 20 and Beltran IIA and B back in the direction of Africa Proconsularis, from where some of them could have been re-exported to ports in the east Mediterranean.

Stage 3. Ship (A) moves into the *ibericum mare*, sailing along the coast of southern Spain, stopping firstly at the regional port of Malaca (Málaga) and then

the redistributive hub of Carthago Nova (Cartagena) in south-eastern Tarracoensis. At this point (1) some of the Baetican amphorae might have been unloaded for use locally or regional distribution, and (2) some silver and lead from mines in the hinterland of the port could have been loaded on board.

Stage 4. Ship (A) sails northwards across the *ibericum mare* to the Balearic Islands to stop at Ebusus, where it might have (1) unloaded a small quantity of Baetican amphorae and (2) received on board Dressel 2-4 and other classes of wine amphorae that had been manufactured in the hinterland of Dianium (Denia) or Sagnuntum and tramped along the coast of the *hispanum mare* by ship (D).

Stage 5. Ship (A) could have then *either* headed further north to Palma on Mallorca to offload or load up with additional cargoes, *or* might have sailed directly westwards in the direction of Sardinia and Corsica.

Stage 6. Ship (A) would then have either headed eastwards through the straits of Bonifacio (*fretum gallicum*) into the *mare tyrrhenium* and then onwards directly to Portus, or south-eastwards towards Caralis in southern Sardinia, where it could have stopped to offload cargo or collect cargo — possibly from north African ports (Utica, Carthage etc) to the south, before eventually reaching Portus.

Stage 7. The cargo was unloaded at Portus for stor-

age in warehouses — with only the Dressel 20 amphorae being transhipped for immediate transport upriver to the emporium at Rome; once emptied of their olive oil they were broken and deposited on Monte Testaccio.

This is largely an ideal picture involving a degree of guesswork, in which the composition of the network could have varied considerably in the course of the year, and from one year to the next. However it emphasizes the point that the *grande axe commerciale* between Gades and Portus was really an aggregation of smaller routes that were negotiated through a network of contemporary ports. One could concoct similar scenarios for cognate groups of ports playing similar roles along (1) the coasts of north-eastern Spain, southern Gaul and north-western Italy, (2) the coasts of Tripolitania, Africa Proconsularis, Sicily and Italy, (3) the Adriatic coast, (4) Tripolitania, Egypt and Crete etc. Furthermore, there would have been indirect connections between all of these groups — so that if one tried to integrate all of them to produce an overall “map” of “commercial routes”, the picture would be one of almost unimaginable complexity.

The high degree of economic and commercial integration implied by this evidence does, however, need to be tempered by considering the realities and challenges of moving foodstuffs and non-perishable goods from places of production in the hinterlands of provincial ports to their penultimate destination at Portus and Centumcellae. A proper consideration of this lies beyond the scope of this paper. However it is clear that there significant delays were likely at every stage of the route taken by specific goods from (i) production area to warehouse at port of origin, (ii) from there to embarkation on the ship, (iii) in sailing out of the harbour, (iv) the choice of route taken by the ship, (v) upon entering and being unloaded at Portus, and (vi) and on moving through the port system before final arrival at warehouses in the emporium of the portus tiberinus. While they are difficult to quantify they do better help us understand why the flow of information between Rome and the Mediterranean provinces could sometimes be extremely slow (Keay 2012a). Thus while there is a temptation to think of a closely integrated Mediterranean basin with goods and people moving fairly quickly from one region to another, delays of this kind raise important questions about the depth of economic integration.

Economic Cohesion across the Mediterranean

Port networks of the kind described above make it easier to understand the nature of commercial relationships between ports across the Mediterranean. They were fundamentally important in promoting a

closer integration of urban communities than had been the case before, particularly in the western Mediterranean. Furthermore since the regional ports were themselves played a key role in the local and regional economies where they were situated, they provide us with clues as to the nature of commercial integration achieved between the Mediterranean regions. This can be illustrated with reference to the relationship between Portus and one of its key trading partners with Portus during the 2nd century AD, namely Lepcis Magna in Tripolitania. It focuses the development of infrastructure at the port, agricultural production in its hinterland, and the commercialization of its surplus production as reflected in the Tripolitanian amphorae.

The origins of the port city of Lepcis Magna are to be sought in a small Phoenician settlement of c. the 7th century BC (Kenrick 2009: 90) located in the northern extreme of the later Roman city, situated on the Libyan coast to the east of Tripoli. The port was located at a critical junction on the coastal road between Carthage and Alexandria, and the road leading south-westwards towards Thenteos in the interior. This position ensured that it benefitted from the movement of traffic along the north African coast and between the Mediterranean and the interior. This privileged position, coupled with the rich agricultural resources of its immediate coastal hinterland and Gebel, notably olive oil, ensured that Lepcis Magna became one of the most prosperous cities along the north-African coast (Mattingly 1995: 140-59). As is well known its flourish occurred during the reign of Septimius Severus, a native of the port, when the town was substantially enlarged and embellished with a suite of major public buildings, only to fall upon hard times subsequently.

The harbour originally encompassed a relatively small area located between the eastern side of the city near the Forum Vetus and the original coastline at the mouth of the Wadi-Libdah (Kenrick 2009: 126 and fig. 55) (Fig. 5). Little of this is visible apart from traces of a Neronian portico on the western side and the temple of Jupiter Dolichenus to the east, making it difficult to get an accurate idea of its scale. However, it was greatly expanded during the Severan enlargement of the town (Bartocchini 1958), which was complete by AD 216. The whole mouth of the Wadi Leb-dah, including elements of the earlier port on its western side and three small offshore islands, were incorporated into large moles that framed a large polygonal inner basin and a roughly rectangular basin, some 13 Ha overall, of which the latter is now underwater (Laronde 1988): this is an arrangement that is in some ways similar to the Trajanic enlargement at Portus. Nothing, however, is known about the depth of the basin although one must assume that one of the pur-

poses of its construction was to enable the port to take larger ships in the region of c. 400 tons and above, and that it must therefore have been in the region of c. 5m. A lighthouse and warehouses were sited on the western mole framing the inner and outer basins, while a “semaphore”, small temple and a row of storerooms preceded by a colonnade were established on the eastern mole; the earlier temple of Jupiter Dolichenus was incorporated within the architectural scheme of the south side of the basin. Aside from the storerooms on the northern and eastern moles, however, there is as yet little evidence for the extensive warehouse space that one imagines would have been key to the success of the harbour, on account of a lack of research. An ideal position would have been on the southern side of the basin between the temple to Jupiter Dolichenus on the west and the south side of the storerooms on the eastern mole; another would have been on the higher ground on the western mole, between the end of the Severan colonnaded street and the storerooms on the northern mole. The only possible warehouses so far identified lie in the western suburbs (Mattingly 1995: Fig. 6.2). One explanation for this might be that some goods were kept in buildings not specifically designed for storage. As the evidence currently stands, however, the size of the basin is out of proportion to available warehouse space, raising questions about the scale of transshipment that may have taken place at the port.

A key element in the prosperity and commercial success of Lepcis Magna was its role in the production and export of olive oil. The fine of 3 million pounds of olive that Caesar (*Bellum Africanum* 97.3) imposed on the city provides an index of its production potential in the mid 1st century BC, and by the later 2nd and early 3rd centuries AD it became one of the main olive oil producers of the western Mediterranean. Surveys in the hinterland of the town have shown that olive oil was produced widely both along the coast and in the Gebel (Munzi et al. 2004-2005; Mattingly 1988), and that the 2nd and early 3rd centuries AD represented a high point in output. Much of this was destined for overseas markets primarily in the western Mediterranean, including Rome. The oil was sealed in Tripolitana I and III amphorae that were produced in kilns at estates owned by leading members of the Lepcitanian aristocracy (Mattingly 1995: 153-5) in the coastal hinterlands of Lepcis Magna, Oea (Tripoli) and the Gebel, and which were then exported overseas. A particularly important phase in the development of this export trade was the later 2nd and early 3rd centuries AD. Following the elevation of Septimius Severus to the imperial purple in AD 197 and his subsequent grant of *ius italicum* to Lepcis Magna (Birley 1988: 218), there followed an especially intense period in the export of olive oil to the City of Rome. Tripolitanian

amphorae accounted for a particularly large share of imports to late 2nd/early century AD contexts at the “*Palazzo Imperiale*” at Portus (Zampini 2011), as well as at Ostia and at Monte Testaccio in Rome. This fluorit was short lived, with the occupation of oil and amphora production sites falling back in the course of the 3rd century AD. A possible broader context for this might have been the inclusion by Septimius Severus of olive oil as one of the staples for free distribution in the City of Rome in the early 3rd century AD (*Historia Augusta* Severus 18.3ff), a development which makes it easier to understand the establishment at Rome of a *procurator ad olea comparanda per regionem Tripolitanaam* (Munzi et al 2004-2005: 447).

A further dimension to this picture can be added by a consideration of the traffic in marble. Recent research (Pensabene 2012 In press) suggests that a significant proportion of the marble that was used in the monumentalization of Lepcis Magna under Septimius Severus derived from east Mediterranean quarries. In particular, however, he suggests that while some of it was imported directly, a significant proportion of it was re-exported from the *statio marmorum* at Portus. In this scenario one can perhaps see ships that had transported Tripolitanian olive oil amphorae to Portus and Rome being used to bring the marble to Lepcis Magna on the return journey.

Conclusion

Roman ports have long been seen as interesting *per se* but have been usually studied in strictly maritime or commercial contexts, in isolation from their broader economic, political and cultural contexts. This paper argues that this is a reductive perspective that diminishes their potential for helping us understand the distinctive character of the Roman empire as a political institution with a maritime core. It attempts to re-position them as central to the growing convergence of economic and commercial activity that was gradually transforming the communities of Rome’s Mediterranean provinces during the later Republic and early Empire. Many of the ports that served Rome’s interests in the eastern Mediterranean originated during the Classical, and particularly the Hellenistic, periods, while some of those in the west can be sought in Phoenician, Greek and Carthaginian predecessors. It is only from the end of the 1st century BC onwards that we see the gradual creation of a hierarchy of ports serving Rome, both through the creation of a series of artificial ports and with the enhancement of earlier facilities. This paper argues that relationships between these ports are best understood in terms of a series of complex maritime networks that were ultimately focused upon Rome and its ports and which

functioned within the constraints of the myriad of Mediterranean micro-regions. Distant regions were brought into ever-closer political, economic and cultural relationships with Rome and the major cities of the Mediterranean — even though movement through these maritime networks may have been slower than is sometimes appreciated. The paper also argues that the ubiquity of these networks, and the depth of their penetration inland, made it possible for economic demands by Rome to have a significant impact upon the commercial and economic development of the Mediterranean regions.

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